

**Underwriters Laboratories Inc.®**A not-for-profit organization dedicated to public safety
and committed to quality service**September 30, 1994****Standard for****Electrically-Actuated Transmitters****UL 632, Sixth Edition**

Attached to this transmittal notice is a revision of the sixth edition of UL 632.

A CHANGE ON A PAGE DATED SEPTEMBER 30, 1994 IS INDICATED BY A SMALL PRINT NOTE
FOLLOWING THE AFFECTED ITEM, PRECEDED AND FOLLOWED BY AN ASTERISK.

THESE NEW AND REVISED REQUIREMENTS ARE NOW IN EFFECT.

Attention is directed to the note on the title page of this standard outlining the procedures to be followed
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Revised and/or additional pages may be issued from time to time.

With the inclusion of the accompanying material, the standard consists of pages dated as shown in the
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Page	Date
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UL 632

Standard for

Electrically-Actuated Transmitters

First Edition – June, 1964
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Sixth Edition

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INTRODUCTION

1 Scope

1.1 These requirements cover electrically-actuated transmitters intended for permanent installation and use in ordinary indoor locations in accordance with the National Electrical Code, NFPA 70, and the National Fire Alarm Code, NFPA 72.

1.2 A transmitter covered by these requirements consists of a unit assembly of related electrical and mechanical parts in an enclosure. Installation wiring terminals are included for the connection of power supply circuits routed through the transmitter by a prescribed scheme of circuiting to terminals for the connection of conductors of circuits to separate transmitter actuated devices and to circuits of a system-control unit and other indicating devices.

1.3 An electrically-actuated transmitter having a pre-wound signaling mechanism and equipped with an integral part to permit manual actuation, and similar combination devices, will be evaluated with regard to compliance with the applicable requirements for both electrically-actuated transmitters and manually-actuated signaling boxes.

1.4 These transmitters are intended to transmit coded signals automatically when actuated electrically by non-coded signaling contacts of:

- a) Smoke and heat detectors,
- b) Water-flow detectors,
- c) Sprinkler-system supervisory attachments, and
- d) Similar devices which are not parts of the transmitter assembly.

1.5 These requirements do not cover manually-actuated signaling boxes.

1.6 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involve a risk of fire, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements as determined necessary to maintain the acceptable 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 cannot be judged to comply with this standard. Where considered appropriate, revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

1.6 added September 30, 1994

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 need not comply with a specific requirement that:

- a) Involves a feature or characteristic not needed 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 recognized rating established for the intended conditions of use.

2.1.4 Specific components are recognized as being 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 for which they have been recognized.

2.2 Units of measurement

2.2.1 If a value for measurement is followed by a value in other units in parentheses, the second value may be only approximate. The first stated value is the requirement.

2.2.2 Unless otherwise indicated, all voltage 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.

3 Glossary

3.1 For the purpose of this standard the following definitions apply.

3.2 **ALARM AND SUPERVISORY SIGNAL TRANSMITTER** – A transmitter which involves two or more separate transmitter mechanisms or circuits housed within the same enclosure.

3.3 **ALARM SIGNAL** – A signal indicating an emergency fire condition requiring immediate action, such as an alarm initiated from a manual box, a water flow switch, or from an automatic smoke and/or heat detector.

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- a) An alarm from a manual pull box,
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- c) An alarm from a heat or smoke detector, or
- d) Other emergency signal.

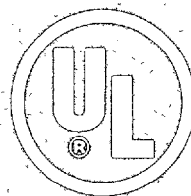
A distinctive coded trouble signal, resulting from an open or ground in the fire detector or initiating circuit, is also transmitted on the signaling line.

Standard for Safety

UL 632

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Electrically-Actuated Transmitters



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Standard

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UL Standards for Safety are developed under a procedure which provides for participation and comment from the affected public as well as industry. The procedure takes into consideration a survey of known existing standards and the needs and opinions of a wide variety of interests concerned with the subject matter of the standard. Thus manufacturers, consumers, individuals associated with consumer-oriented organizations, academicians, government officials, industrial and commercial users, inspection authorities, insurance interests and others provide input to UL in the formulating of UL Standards for Safety, to keep them consonant with social and technological advances.

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FOREWORD

A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.

B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.

C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.

D. A product employing materials or having forms of construction differing from those detailed in the requirements of this Standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the Standard.

E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

INTRODUCTION

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- a) An alarm from a manual pull box,
- b) A water-flow alarm,
- c) An alarm from a heat or smoke detector, or
- d) Other emergency signal.

A distinctive coded trouble signal, resulting from an open or ground in the fire detector or initiating circuit, is also transmitted on the signaling line.

- 3.5 **DISTINCTIVE SIGNALS** – Signals obtained from different sounding appliances, such as bells, horns, sirens, and buzzers, or from a single appliance, such as an electronic horn, where a continuous signal is obtained during one condition and a pulsing signal during another, or from a coding mechanism where distinction is obtained by the number of rounds transmitted.
- 3.6 **END-OF-LINE DEVICE** – A device installed at the end of an initiating or indicating device circuit to limit the amount of or control the direction of current flow, or both. Examples of end-of-line devices are end-of-line resistors and end-of-line diodes.
- 3.7 **FAULT** – An open or ground condition on any line extending from a control unit.
- 3.8 **INDICATING DEVICE** – Any audible or visual signal used to indicate a fire, supervisory, or trouble condition. Examples of audible signal appliances are bells, horns, sirens, electronic horns, buzzers, and chimes. A visual indicator consists of a lamp, target, meter deflection, printer, or equivalent.
- 3.9 **INDICATING DEVICE CIRCUIT** – A circuit to which indicating devices are connected.
- 3.10 **INITIATING DEVICE** – A manually- or automatically-operated device, the intended operation of which results in a fire-alarm or supervisory signal indication from the transmitter. Examples of alarm signal initiating devices are thermostats, manual boxes, smoke detectors, and water flow switches. Examples of supervisory signal initiating devices are water level indicators, sprinkler-system valve-position signals, pressure supervisory switches, and water-temperature switches.
- 3.11 **INITIATING DEVICE CIRCUIT** – A circuit to which automatic- or manual-initiating devices are connected.
- 3.12 **NON-CODED SIGNAL** – An annunciated signal from an indicating device which is energized continuously.
- 3.13 **RESTORATION SIGNAL** – A signal indicating a return to normal standby condition of an initiating device or a fault condition of an initiating device or signaling line circuit.
- 3.14 **SIGNALING LINE CIRCUIT** – A circuit consisting of wires, such as a leased telephone line, over which signals are transmitted between a transmitter at a protected premises and a control unit at a central receiving location.
- 3.15 **SUPERVISORY SIGNAL** – A signal indicating the need for action in connection with the supervision of watchmen, sprinkler, and other extinguishing systems or equipment, or with the maintenance features of other protective systems.
- 3.16 **SUPERVISORY SIGNAL TRANSMITTER** – A transmitter that gives a coded signal indication from a device which signals the need of action in connection with the supervision of watchmen, sprinkler, and other extinguishing systems or equipment, or with the maintenance features of other protective systems.
- 3.17 **SUPPLEMENTARY ALARM SIGNAL TRANSMITTER** – A transmitter which has provision for connection to the trouble and alarm circuits of a control unit rather than a direct connection to fire alarm initiating circuits, such as manual pull boxes or automatic fire detectors. A coded fire alarm or trouble signal is transmitted to a separate location from the supplementary transmitter in addition to the signal at the protected premises.
- 3.18 **TROUBLE SIGNAL** – A visual or audible signal indicating a fault condition of any nature, such as a circuit break or ground or other trouble condition occurring in the device or wiring associated with a protective signaling system.

CONSTRUCTION

4 General

4.1 A transmitter shall be constructed for use with intended actuating devices, system-control units, and other indicating devices that enable it to be applied in conformance with applicable standards of the National Fire Protection Association.

4.2 An intended system-control unit actuating or indicating device is one that has been determined by investigation to be configured and rated for use with the transmitter.

5 Enclosures

5.1 General

5.1.1 Electrical parts of an electrically-actuated transmitter shall be located and enclosed to reduce the risk of unintentional contact with uninsulated live parts.

5.1.2 Space shall be provided within a terminal or wiring compartment for completing all wiring connections as specified by the installation wiring diagram.

5.1.3 An enclosure shall have means for mounting which shall be accessible without disassembly of any operating part of the unit. Removal of a completely assembled panel to mount the enclosure is not considered to be disassembly of an operating part.

5.1.4 A compartment enclosing electrical parts shall not be open to the floor or other support on which the unit rests, including a wall or vertical partition.

5.1.5 A unit enclosure, intended for recessed mounting and whose panel is to be flush with the surface of the wall, shall not have non-functional openings.

5.2 Cast metal enclosures

5.2.1 The thickness of cast metal for an enclosure shall be as indicated in Table 5.1, except that cast metal having a thickness 1/32 inch (0.8 mm) less than that indicated in the table may be used if the surface under consideration is curved, ribbed, or otherwise reinforced, or if the shape, size, or both of the surface is such that equivalent mechanical strength is determined to be provided.

5.2.2 If threads for the connection of conduit are tapped all the way through a hole in an enclosure wall, or if an equivalent construction is used, there shall not be less than 3-1/2 nor more than 5 threads in the metal, and the construction shall be such that a standard conduit bushing can be attached.

5.2.3 If threads for the connection of conduit are tapped part way through a hole in an enclosure wall, there shall not be less than five full threads in the metal, and there shall be a smooth, rounded conduit stop of inside diameter equal to that specified for a standard conduit bushing of the appropriate size for the protection of the conductors.

5.2.4 Zinc-base die cast metal shall not be used for a flush back box.

Table 5.1
Cast-metal enclosures

Use, or dimensions of area involved ^a	Minimum thickness, Inch (mm)	
	Die-cast metal	Cast metal of other than the die-cast type
Area of 24 square inches (155 cm ²) or less and having no dimension greater than 6 inches (152 mm)	1/16 (1.6)	1/8 (3.2)
Area greater than 24 square inches (155 cm ²) or having any dimension greater than 6 inches (152 mm)	3/32 (2.4)	1/8 (3.2)
At a threaded conduit hole	1/4 (6.4)	1/4 (6.4)
At an unthreaded conduit hole	1/8 (3.2)	1/8 (3.2)
^a The area limitation for metal 1/16 inch (1.6 mm) thick may be obtained by the provision of reinforcing ribs subdividing a larger area.		

5.3 Sheet metal enclosures

5.3.1 The thickness of sheet metal used for the enclosure of a transmitter shall not be less than that indicated in Table 5.2, except that sheet metal of lesser thickness may be used if the surface under consideration is curved, ribbed, or otherwise reinforced, or if the shape, size, or both of the surface is such that equivalent mechanical strength is determined to be provided.

Table 5.2
Sheet metal electrical enclosures

Maximum dimensions of enclosure		Minimum thickness of sheet metal			
		Steel		Copper, brass, or aluminum, Inch (mm)	
Length or width Inch (mm)	Area Inch ² (cm ²)	Zinc-coated, Inch (mm)	Uncoated, Inch (mm)		
12 (305)	90 (581)	0.034 (0.86)	0.032 (0.81)	0.045 (1.14)	
24 (610)	360 (2322)	0.045 (1.14)	0.042 (1.07)	0.058 (1.47)	
48 (1219)	1200 (7742)	0.056 (1.42)	0.053 (1.35)	0.075 (1.91)	
60 (1524)	1500 (9678)	0.070 (1.78)	0.067 (1.70)	0.095 (2.41)	
Over 60 (Over 1524)	Over 1500 (Over 9678)	0.097 (2.46)	0.093 (2.36)	0.122 (3.10)	

5.3.2 At any point where conduit or metal-clad cable is to be attached, sheet metal shall be of such thickness or shall be formed or reinforced so that it will have a stiffness determined to be at least equivalent to that of an uncoated flat sheet of steel having a minimum thickness of 0.053 inch (1.35 mm), and the construction shall be such that a standard conduit bushing can be attached.