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2001 AUG 30 A 10:37
SECRETARY

SUBJECT: Standards Technical Panel for Door, Drapery, Gate, Louver, and Window Operators and Systems (UL 325).

DATE OF MEETING: August 23, 2001

PLACE OF MEETING: Underwriters Laboratories Inc., Northbrook Office, MacArthur Building, 2942 MacArthur Blvd., Northbrook, Illinois

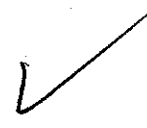
LOG ENTRY SOURCE: John R. Murphy

COMMISSION ATTENDEES: John R. Murphy

JRM

NON-COMMISSION ATTENDEES:

- Anthony Zagone, Underwriters Laboratories Inc.
- Amy Walker, Underwriters Laboratories Inc.
- Gary A. Leigh, Miler Edge Inc.
- John C. Dini, Electronic Entry Systems Inc.
- James Murray, Wayne Dalton
- Bob Ericson
- Barbara Kelkhoff, Chamberlain Group Inc.
- Colin Wilmont, Chamberlain Group Inc.
- Jim P. Hellander, Somfy Systems, Inc.
- Roy G. Bardwell, Manaras Door and Gate Operators Co.
- Joseph R. Hetzel, Technical Director, DASMA
- Carl A. Bloomfield, Intertek Testing Services
- Richard Sedivy, Door King
- Brian G. Denault, Hy-Security Gate Inc.
- Brett Reed, The Genie Company
- Larry Murphy, The Genie Company
- Greg Heckman, Raynor Garage Doors
- James R. Delhotal, Raynor Garage Doors
- John W. Hupfauer, Underwriters Laboratories Inc.
- James H. Taylor, White & Associates Electronics, Inc.
- Jim Ward, FAAC International
- Richard Buchanan, B & B Controls
- Frank D. Hinds, American Fence Association
- Brent Nichols, National Ornamental & Misc. Metals Association
- Dave Guthrie, AllStar Corporation
- Charles P. Coggins, AllStar Corporation



SUMMARY OF MEETING:

The meeting convened at 8:00 AM. Anthony Zagone of Underwriters Laboratories (UL) chaired the meeting. Amy Walker of UL provided an introduction to the ANSI Committee process. UL 325 will now follow the ANSI Committee process of standard development rather than the ANSI Canvas system.

The STP discussed the agenda items and proposed changes to UL 325 (attached).

The meeting adjourned at 5:00 PM

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Subject 325

333 Pfingsten Road
Northbrook, IL 60062
July 23, 2001

TO: Standards Technical Panel for Door, Drapery, Gate, Louver, and Window Operators and Systems

SUBJECT: Standards Technical Panel Meeting Agenda

As announced in the Subject 325 bulletin dated June 29, 2001, a meeting of the Standards Technical Panel of UL for Door, Drapery, Gate, Louver, and Window operators and Systems is scheduled for:

**Thursday, August 23, 2001
Northbrook Office
MacArthur Building
2942 MacArthur Blvd.
Northbrook, IL 60062
(847) 272-8800
Conference Rooms M1 – M4
8:00 A.M. – 5:00 P.M.**

The purpose of the Standards Technical Panel meeting is to discuss proposed revisions to UL 325. Please note that only those agenda item submittals which included specific standard revision proposals have been included under the "proposals" section of the agenda.

Attached is a list of agenda items for the meeting, proposals, and a roster of current members of the STP.

Due to a scheduled absence, Susan Malohn will be acting as an Interim Secretary for this meeting. Any questions or comments regarding the meeting should be sent to her attention.

Your membership on this STP is on an individual basis. Thus, if you have not already completed and returned an Attendance Form please do so immediately. If you are unable to attend the meeting and would like to specify a substitute, please complete the applicable information on the attached Attendance Form. Also, please note that business casual attire will be appropriate for the meeting.

This meeting is intended for STP members to meet and discuss proposed requirements and other standards issues. Space permitting, others may attend as observers. Anyone not on the STP who wants to attend the meeting is requested to contact UL for permission to do so. Such a request should be made as early as possible prior to the meeting. This practice is necessary and desirable to maintain the size and effectiveness of the meeting. Please keep in mind that those receiving a copy of this agenda will also receive a copy of any bulletin incorporating proposed revisions to the standard.

Materials for Distribution

Any material to be presented during the STP meeting is to be provided to the STP Interim Secretary in electronic format, such as Word, PowerPoint, RTF, or PDF.

Hotel Accommodations

For your convenience a list of local accommodation facilities located within a few miles of UL's Northbrook Office is provided below. Should you elect the use of these accommodations, it is suggested you request the UL Rate, which may offer you a lower room price than would otherwise be available. The UL Rate may not be available at all facilities during periods of high rates or lodging utilization.

Courtyard by Marriott, 800 Lake Cook Road, Deerfield, IL 60015, (847) 940-8222

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Hilton Northbrook, 2855 N. Milwaukee Avenue, Northbrook, IL 60062 (847) 480-7500

Hyatt Deerfield, 1750 Lake Cook Road, Deerfield, IL 60015 (847) 945-3400

Marriott Suites, Two Parkway North, Deerfield, IL 60016, (847) 405-9666

Radisson Hotel, 2875 N. Milwaukee Avenue, Northbrook, IL 60062, (847) 298-2525

Red Roof Inn, 340 Waukegan Road, Deerfield, IL 60015, (847) 205-1755

Transportation

Transportation to and from the meeting will not be provided. For your convenience a list of local transportation services is provided.

Executive Limo (847) 537-7988

Northbrook American Taxi (847) 272-8000

If you have not already done so, please complete an Attendance Form and return it as soon as possible.

UNDERWRITERS LABORATORIES INC.

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SR:DES

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Appendices:

Agenda for the STP meeting
Proposals

REVIEWED BY:

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Chair for STP 325
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STP Roster
Attendance Form

APPENDIX A**AGENDA FOR MEETING OF THE STANDARDS TECHNICAL PANEL FOR DOOR, DRAPERY,
GATE, LOUVER, AND WINDOW OPERATORS AND SYSTEMS, STP 325**

Please note that agenda items submitted with specific wording have been identified as PROPOSALS.

ORDER OF BUSINESS

- 1) Call to order
- 2) Introduction of members, guests, and observers
- 3) General announcement
- 4) Explanation of STP process
- 5) Review of the agenda
- 6) New business
- 7) Review of Action Items
- 8) Discussion of protocol for comment resolution by STP
- 9) Discussion on the need for future meetings
- 10) Adjournment

SUMMARY OF TOPICS

- 1) Clarification of the definitions for Inherent Entrapment Sensor System and External Entrapment Protection Device.
- 2) Revisions to the requirements for a combination rigid one-piece overhead residential garage door and operator system.
- 3) Clarification of requirements for audio alarms with respect to contact-type devices and relocation of the definition for Two Sequential Activations.
- 4) Revisions of the requirements regarding the Standard for Overheating Protection for Motors, UL 2111.
- 5) Addition of requirements for a spring mechanism used to support or counterbalance parts.
- 6) Clarification of component failures that are considered non-critical.
- 7) Use of Type B2 entrapment protection devices for gate operators used on swing gates and vertical barriers.
- 8) Addition of flowcharts for the functions of particular entrapment protection devices.
- 9) Clarification of the intent and sequence of entrapment protection operation of paragraph 30A.1.2(b).
- 10) Clarification of the description of the sequence of entrapment protection device combinations.
- 11) Revision of the required frequency range for audio alarm signals.
- 12) Clarification of the independent operation of manual release devices.
- 13) Clarification of the force measurement for Type C entrapment protection devices.
- 14) Clarification of paragraph 31.1.6 regarding the door and operator relationship for sensing.
- 15) Clarification of the shape and position of the obstruction used for tests for gates.
- 16) Revision to the radius of the Puncture Probe in Figure 47.1.
- 17) Revision to Table 40.1 to include motor and transformer temperature limits for Class 155 (F) insulation systems.
- 18) Clarification of the requirements for the use of software in programmable components.
- 19) Discussion of a future new edition of UL 325.

APPENDIX B**PROPOSALS**

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~. Proposed new requirements are identified by (NEW). In the case of extensively revised paragraphs, the original text is identified by (CURRENT) and is ~~lined-out~~, followed by the proposed text identified by (PROPOSED). A paragraph that is proposed to be deleted is identified by (DELETED) and is shown ~~lined-out~~.

1. CLARIFICATION OF DEFINITIONS**RATIONALE**

For clarification, UL proposes to revise the definitions for inherent entrapment sensor systems and external entrapment protection devices. Manufacturers have indicated that for some designs an external entrapment protection device is an integral part of the operator. Therefore, UL is proposing to remove the words "and integral" from the definition of an external entrapment protection device. UL is also proposing to clarify the intent of the definition for inherent entrapment sensor system.

PROPOSALS

3.22 INHERENT ENTRAPMENT SENSOR SYSTEM – An automatic sensor system, examples being a motor current or speed sensing system, which senses an entrapment of ~~provides protection against entrapment upon sensing a solid an~~ object and is incorporated as a permanent and integral part of an operator.

3.25 EXTERNAL ENTRAPMENT PROTECTION DEVICE – A device, examples being a pressure sensitive edge sensor and an active photoelectric sensor or similar entrapment protection device, which provides protection against entrapment when activated and is not incorporated as a permanent ~~and~~ integral part of an operator.

2. COMBINATION RIGID ONE-PIECE OVERHEAD RESIDENTIAL GARAGE DOOR AND OPERATOR SYSTEM REQUIREMENTS**RATIONALE**

UL published requirements for combination residential garage door and operator systems on June 11, 2001 as proposed in the Subject 325 bulletin dated March 24, 2000. With this system, the garage door is provided and constructed to match the exterior decor of the building or house. The system is constructed in a manner different from previously Listed residential garage door operators in that it uses two independent operators; one to tilt the door away from the door frame in order to provide sufficient clearance prior to opening the door, and one for lifting the door. The system also has additional components and instructions to address the risk of injury to persons. Based on further evaluation of the current requirements, UL is proposing to revise them for clarification.

PROPOSAL

3.26 COMBINATION RIGID ONE-PIECE OVERHEAD GARAGE DOOR OPERATOR SYSTEM – A door, and operator combination where the door is constructed in one rigid piece ~~designed or structured to match the exterior finish of the building, or garage.~~

31A Combination Rigid One-Piece Overhead Residential Garage Door and Operator System

31A.1 A combination rigid one-piece overhead residential garage door and operator system shall comply with the applicable residential garage door requirements in this standard and shall additionally comply with the following:

- a) The speed of the door edge during the opening or closing motion shall not exceed 6 inches (152.4 mm) per second.
- b) The system shall be supplied with at least one independent primary and two independent a minimum of two different secondary entrapment protection devices complying with Secondary Entrapment Protection, Section 31.3. When photoelectric sensors are used, a minimum of two sensors in addition to a third secondary device shall be supplied. The instructions shall state that one photoelectric sensor shall be positioned to comply with Photoelectric Sensors, Section 33, and the other(s) shall be positioned on the left and right sides of the door to detect solid objects that would be within the space where the door moves as it opens or closes.
- c) A means to manually detach the both door operators from the door shall be provided. For systems where the mechanical drive is located on a wall adjacent to the door, the means is not required to comply with 31.4.1. Instead, the means shall be located between 4 feet (1.2 m) and 6 feet (1.8 m) 5 feet (1.5 m) above the floor, shall not require a downward force of more than 5 lbf (22 N) to initiate disconnection when the door is obstructed, and shall be clearly marked with operating instructions adjacent to the mechanism. The gripping surface (handle) shall be colored red and shall be distinguishable from the rest of the operator. The marking which includes instructions for detaching the operator shall be provided in accordance with 52.1 – 52.9.
- d) A means (interlock) shall be supplied to de-energize the operator whenever the operator is manually detached from the door. A mechanical switch or relay employed as the interlock shall also comply with the requirements in 45.5 and 45.6, as applicable.
- e) A means (interlock) shall be supplied to de-energize the operator whenever an operable window or access (service) door that is mounted in the garage door is opened perpendicular to the surface of the garage door.
- f) The door shall not move outward from the exterior wall surface during the opening or closing cycle.
- g) The door or door system (parts mounting hardware, track assembly, and components that make up the door) shall comply with Moving Parts, Section 27, supplied by the manufacturer shall comply with pinch point requirements in 31.1.6. Door sections, including their reinforced hinges, roller assemblies, and method of attachment to the door, shall support the weight of the door system when in the horizontal position.
- h) Installation of the system in accordance with the installation instructions shall not result in a risk of injury to persons as determined by a trial installation. A horizontal track assembly, including installation hardware, shall support a dead load equal to the door weight when the door is in the horizontal position when tested in accordance with Dead Load Test, Section 48A.
- i) Instructions for the addition installation of operable windows and access (service) doors and the interlocks specified in (e) shall be supplied with the operator.

45.7 An electromechanical interlock employed as described in 31A.1 (d) and 31A.1 (e) shall withstand 6000 10,000 cycles of operation, controlling a load not less than that controlled in the product, and shall function as intended upon completion of the test.

48A Dead Load Test

48A.1 ~~After 24 hours of being in a horizontal position, a door system~~ A horizontal track assembly as described in 31A.1 shall not deflect more than ~~1/120th~~ 1/240th of the ~~door width~~ vertical distance from the top of the track to the ground when measured before and after the door has been in the horizontal position for at least 24 hours. The distance is to be measured from the point on the track corresponding to the center of the door when in the horizontal position. Twist, deflection, or deformation of the track shall not interfere with the operation of the door. The installation instructions shall specify the locations where the horizontal track is to be supported in accordance with 51.9.1.

(NEW SECTION)

51.9 Combination rigid one-piece overhead residential garage door and operator system

51.9.1 The installation instructions provided with a combination rigid one-piece overhead residential garage door and operator system shall specify the locations where attachments to the horizontal track shall be made for the purpose of supporting the track.

53.3.15 An operator for a system complying with 31A.1 shall be marked to indicate the maximum weight limit of the completed door assembly power in foot-pounds per second or the maximum pull in pounds that it is intended to develop.

3. INTERACTION OF ENTRAPMENT PROTECTION SENSORS

RATIONALE

Manufacturers have requested clarification of the requirements for audio alarms in paragraph 30A.1.1A with regard to contact-type devices. The intent is to require the audio alarm to signal if the second device that functions is a contact type entrapment protection device. UL is proposing to revise 30A.1.1A to clarify the intent.

Furthermore, UL is proposing to move the definition of two sequential activations from paragraph 30A.1.1A to the glossary as it applies to multiple paragraphs.

PROPOSALS

(NEW)

3.27 TWO SEQUENTIAL ACTIVATIONS – Two activations of an entrapment protection device that are not interrupted by an open or close limit device.

30A.1.1A A vehicular gate operator or vehicular barrier (arm) operator for Classes I and II; shall be supplied with an audio alarm complying with 30A.1.1B and 30A.1.1C. The alarm shall function signal upon two sequential activations of the ~~Type A~~ entrapment protection device, provided that the second activation is of a contact-type device. Two sequential activations include two activations of an entrapment protection device, not interrupted by an open or close limit device. The alarm shall signal for a minimum of 5 minutes or until a renewed manual input from an integral control ~~or a wired control~~ intended to be located in the line of sight of the gate has been entered. An audio alarm is not required for Classes III and IV. An audio alarm provided with a Class III or IV operator is not required to comply with 30A.1.1B and 30A.1.1C.

4. REQUIREMENTS REGARDING UL 2111

RATIONALE

To clarify present practice concerning the Running Heating Temperature Test on motors, UL proposes:

- 1) To revise paragraph 17.1 to state that motors are required to comply under both running heating and locked-rotor conditions. These tests have always been required by UL 325, but are only required by the Standard for Overheating Protection for Motors, UL 2111, if required by the end-use standard;
- 2) To revise Exception No. 1 to paragraph 17.2(a) to include the Running Heating Temperature Test since this test is equally affected by the maximum run timer as defined by paragraph 31.2.6;
- 3) To revise paragraph 17.2(b) to update the terminology to that used in UL 2111; and
- 4) To delete paragraph 17.2A. Other than as indicated in the Exceptions to paragraph 17.1, motor overload protection is always required.

PROPOSALS

17.1 A motor shall be provided with incorporate thermal, inherent overheating, or overload protection for running-overload (heating) and stalled locked-rotor conditions in accordance with the applicable requirements for the protective device complying with the requirements in 17.2.

Exception No. 1: A drapery operator incorporating a momentary contact switch – a switch that requires continuous pressure – is not required to have overload protection.

Exception No. 2: An integral horsepower or polyphase motor used on a commercial or industrial door operator is considered to have acceptable overload protection if it is protected against locked-rotor conditions only.

Exception No. 3: A motor supplied from a Class 2 circuit need not be provided with overload protection.

17.2 Motor-overload protection required for a product in accordance with 17.1 shall consist of one of the following:

- a) Thermal protection complying with the applicable requirements in the Standard for Overheating Protection for Motors, UL 2111.

Exception No. 1: When a product includes a control, such as a timer, that positively and reliably limits the length of time the product is able to operate, a shorter test duration for the Locked-Rotor Temperature, the Running Heating Temperature, and the Locked-Rotor Endurance tests meets the intent of the requirement. For this construction, the duration of these tests shall not be less than the time to which the control limits product operation.

Exception No. 2: When the time required to operate a manually reset protective device through 10 cycles of operation is longer than the time the product is intended to be operated during each use, less than 10 cycles of operation of the device for the Locked-Rotor Temperature Test meets the intent of the requirement. For this construction, the number of cycles shall be 4 cycles or the number of cycles required for maximum intended operating time of the product, whichever is longer.

Exception No. 3: A motor intended only for moving air and that has an air-moving fan that is integrally attached, keyed, or otherwise fixed to the motor shaft is not required to have running overload protection.

b) Impedance protection complying with the applicable requirements in the Standard for Overheating Protection for Motors, UL 2111, when the motor is tested as used in the product under ~~stalled motor~~ locked-rotor conditions.

c) Other protection that is shown by test to be equivalent to the protection specified in item (a).

(DELETED)

~~17.2A Motor overload protection provided for a product not required to have such protection shall:~~

~~a) Comply with the requirements in 17.2, or~~

~~b) Be shown by test not to result in a risk of fire, electric shock, or injury to persons.~~

5. SPRING MECHANISMS

RATIONALE

UL is proposing to expand the scope of the requirements for protection against risk of injury to persons to include parts supported or counterbalanced by a spring. UL proposes to add paragraph 25.3A to specify that a part supported or counterbalanced by a spring shall not develop a risk of injury due to breakage of the spring.

PROPOSAL

(NEW)

25.3A A part supported or counterbalanced by a spring mechanism, such as a torsion or extension spring, shall be equipped with a device capable of restraining the spring or any part thereof in the event the spring breaks.

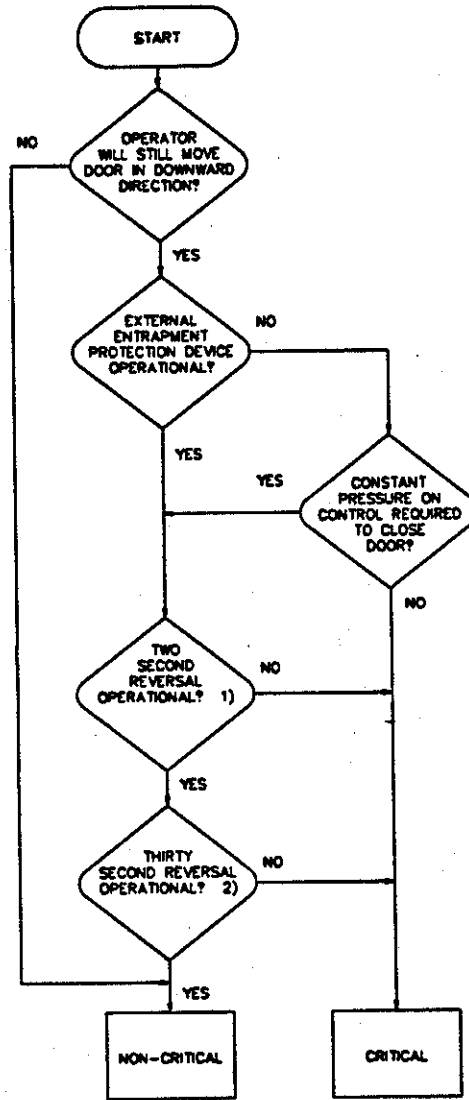
6. NON-CRITICAL COMPONENT FAILURES

RATIONALE

UL has been requested to clarify that those component failures, which result in a shutdown or inoperative unit before a full cycle of travel is completed, are considered non-critical. Therefore, UL is proposing to revise the notes to Figure 25.1 and revise paragraph 25.8 for clarification.

PROPOSAL

Figure 25.1
Critical condition flow chart for residential garage door operator entrapment protection devices and functions



SM395

NOTES-

1) See 31.2.1.

2) See 31.2.6.

NOTE-

If the fault in a component results in a shutdown or inoperative unit (any case in which the operator will not complete a full cycle, open and close, of travel) the component is considered non-critical.

25.8 The conditions specified in paragraph 25.9 shall be used during the following:

- a) Failure-mode and effect analysis (FMEA),
- b) Investigation of performance during the Environmental Stress Test, and
- c) Power Cycling Tests in accordance with the Standard for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991.

Exception: If the fault in a component results in a shutdown or inoperative unit (any case in which the operator will not complete a full cycle, open and close, of travel) the component is considered non-critical.

7. ENTRAPMENT PROTECTION DEVICES FOR USE WITH SWING GATES AND VERTICAL BARRIERS

RATIONALE

During the standards development process for the September 1998 revisions, the Type B2 sensor was considered for use as the primary entrapment protection device for swing gates. The general consensus was that there was an inability to provide sufficient protection with the types of entrapment devices then available and suitable entrapment protection could not be reasonably provided on swing gates. Due to the lack of potential designs to evaluate, the present requirements do not permit Type B2 sensors as the primary entrapment protection device for swing gates. Since then, UL has evaluated designs that accomplished the objectives and therefore is proposing to revise Table 30A.1 and paragraph 51.8.4(i)(6) to provide for the use of a Type B2 sensor as a primary entrapment protection device for Class III and IV swing gate operators.

UL also proposes to revise Paragraph 51.8.4 (g) to clarify the placement of placards on gates corresponding with paragraph 52A.1.1.

PROPOSAL

**Table 30A.1
Protection against entrapment**

Usage class	Gate operator category			
	Horizontal slide, vertical lift, and vertical pivot		Swing and vertical barrier (arm)	
	Primary type ^a	Secondary type ^a	Primary type ^a	Secondary type ^a
Vehicular I and II	A	B1, B2, or D	A, or C	A, B1, B2, C, or D
Vehicular III	A, B1, or B2	A, B1, B2, D, or E	A, B1, B2 , or C	A, B1, B2, C, D, or E
Vehicular IV	A, B1, B2, or D	A, B1, B2, D, or E	A, B1, B2 , C, or D	A, B1, B2, C, D, or E

Note – The same type of device shall not be utilized for both the primary and the secondary entrapment protection means. Use of a single device to cover both the opening and closing directions is in accordance with the requirement; however, a single device is not required to cover both directions. A combination of one Type B1 for one direction and one Type B2 for the other direction is the equivalent of one device for the purpose of complying with the requirements of either the primary or secondary entrapment protection means.

^a Entrapment protection types:
 Type A – Inherent entrapment sensing system. See 30A.1.2.
 Type B1 – Provision for connection of, or supplied with, a non-contact sensor (photoelectric sensor or the equivalent). See 30A.1.4, 30A.1.5, 30A.1.6, 30A.1.7, and 30A.1.8.
 Type B2 – Provision for connection of, or supplied with, a contact sensor (edge device or the equivalent). See 30A.1.6 and 30A.1.9 – 30A.1.11.

Table 30A.1 Continued

Usage class	Gate operator category			
	Horizontal slide, vertical lift, and vertical pivot		Swing and vertical barrier (arm)	
	Primary type ^a	Secondary type ^a	Primary type ^a	Secondary type ^a
Type C – Inherent adjustable clutch or pressure relief device. See 30A.1.12.				
Type D – Provision for connection of, or supplied with, an actuating device requiring continuous pressure to maintain opening or closing motion of the gate. See 30A.1.14 and 30A.1.15.				
Type E – An inherent audio alarm. See 30A.1.16, 30A.1.17, and 30A.1.18.				

51.8.4 Instructions regarding intended installation of the gate operator shall be supplied as part of the installation instructions or as a separate document. The following instructions or the equivalent shall be supplied where applicable:

a) Install the gate operator only when:

- 1) The operator is appropriate for the construction of the gate and the usage Class of the gate,
- 2) All openings of a horizontal slide gate are guarded or screened from the bottom of the gate to a minimum of 4 feet (1.2 m) above the ground to prevent a 2-1/4 inch (57.15 mm) diameter sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers in the open position,
- 3) All exposed pinch points are eliminated or guarded, and
- 4) Guarding is supplied for exposed rollers.

b) The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening.

c) The gate must be installed in a location so that enough clearance is supplied between the gate and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates shall not open into public access areas.

d) The gate must be properly installed and work freely in both directions prior to the installation of the gate operator. Do not over-tighten the operator clutch or pressure relief valve to compensate for a damaged gate.

e) For gate operators utilizing Type D protection:

- 1) The gate operator controls must be placed so that the user has full view of the gate area when the gate is moving,
- 2) The placard as required by 52A.1.6 shall be placed adjacent to the controls,
- 3) An automatic closing device (such as a timer, loop sensor, or similar device) shall not be employed, and
- 4) No other activation device shall be connected.

f) Controls must be far enough from the gate so that the user is prevented from coming in contact with the gate while operating the controls. Controls intended to be used to reset an operator after 2 sequential activations of the entrapment protection device or devices must be located in the line-of-sight of the gate. Outdoor or easily accessible controls shall have a security feature to prevent unauthorized use.

g) All warning signs and placards must be installed where visible in the area of the gate. A minimum of two placards shall be installed. A placard is to be installed in the area of each side of the gate and be visible to persons located on the side of the gate on where the placard is installed.

h) For gate operators utilizing a non-contact sensor in accordance with 30A.1.1:

- 1) See instructions on the placement of non-contact sensors for each Type of application,
- 2) Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle, trips the sensor while the gate is still moving, and
- 3) One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier.

i) For a gate operator utilizing a contact sensor in accordance with 30A.1.1:

- 1) One or more contact sensors shall be located at the leading edge, trailing edge, and postmounted both inside and outside of a vehicular horizontal slide gate.
- 2) One or more contact sensors shall be located at the bottom edge of a vehicular vertical lift gate.
- 3) One or more contact sensors shall be located at the pinch point of a vehicular vertical pivot gate.
- 4) A hardwired contact sensor shall be located and its wiring arranged so that the communication between the sensor and the gate operator is not subjected to mechanical damage.
- 5) A wireless contact sensor such as one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless contact sensor shall function under the intended end-use conditions.
- 6) One or more contact sensors shall be located on the inside and outside leading at the bottom edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 6 inches (152 mm) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge.
- 7) One or more contact sensors shall be located at the bottom edge of a vertical barrier.

8. FLOW CHARTS

RATIONALE

Since the functions of the entrapment protection devices are complicated, manufacturers have requested flowcharts be included in the standard. The flowcharts would provide information dealing with linkage of the entrapment sensors and certain wireless controls and the inputs that were previously active. Therefore, UL is proposing to add Figures 30A.1, 30A.2, and 30A.3 to further clarify the functions of Type A, B1, and B2 entrapment protection devices.

PROPOSALS

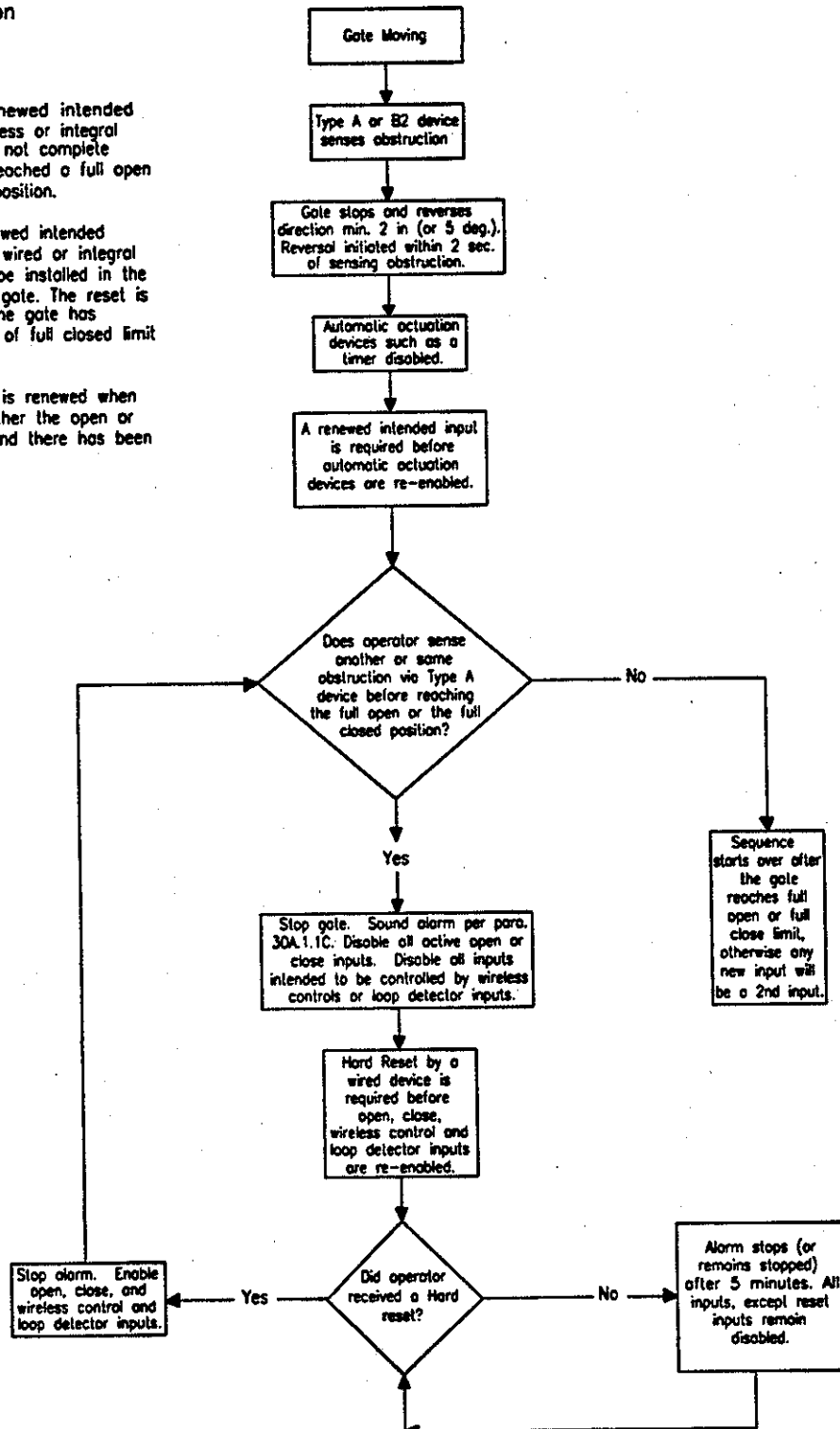
(NEW)
Figure 30A.1
Type A Entrapment Protection Device

TYPE A Initiation
(Ref. 30A.1.2)

SOFT RESET = Renewed intended input via wired, wireless or integral control. The reset is not complete until the gate has reached a full open or full closed limit position.

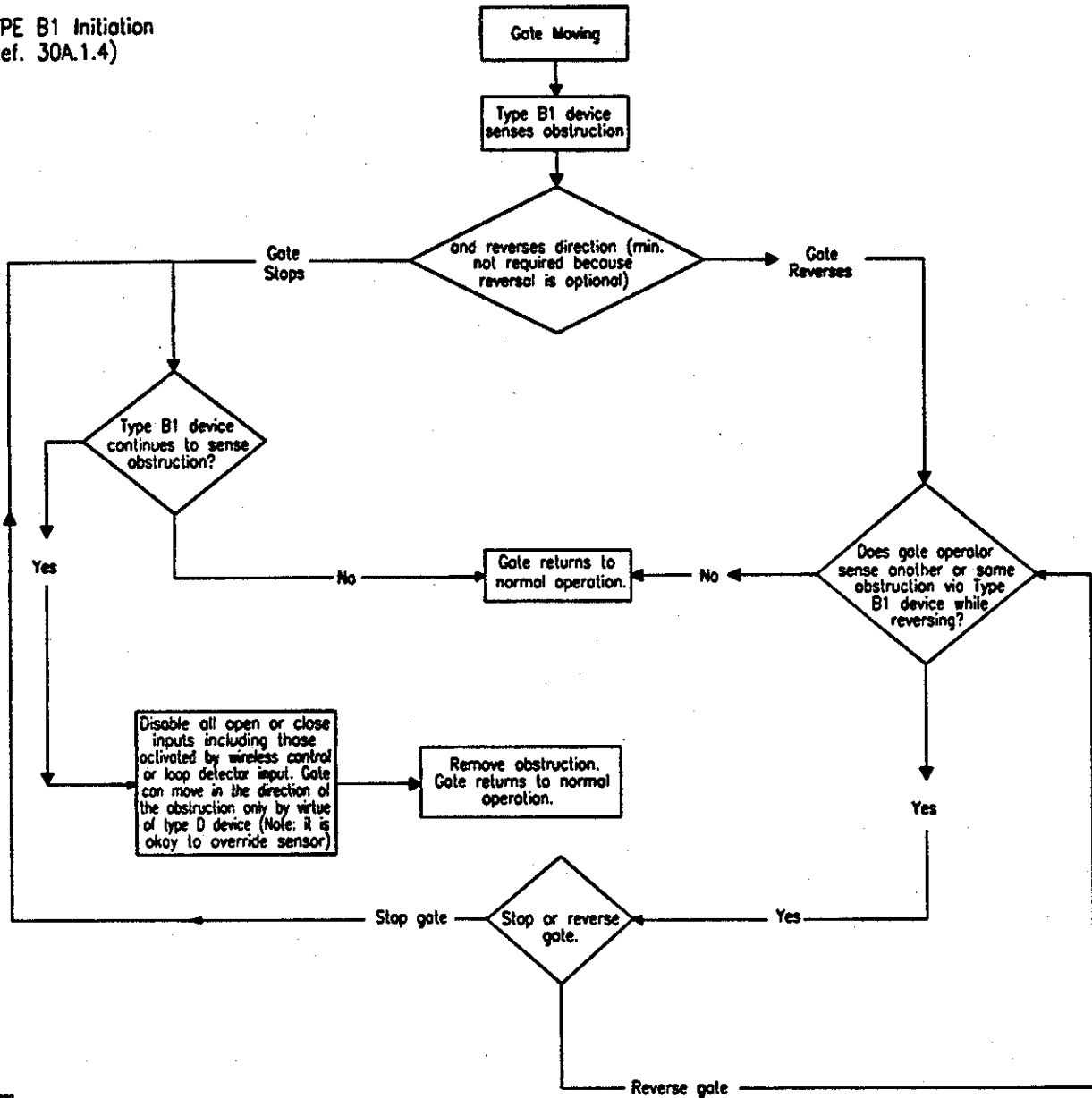
HARD RESET = Renewed intended input via a manual, wired or integral control intended to be installed in the line of sight of the gate. The reset is not complete until the gate has reached a full open or full closed limit position.

Note: The sequence is renewed when the gate reaches either the open or close limit device, and there has been a reset.



(NEW)
Figure 30A.2
Type B1 Entrapment Protection Device

TYPE B1 Initiation
(Ref. 30A.1.4)

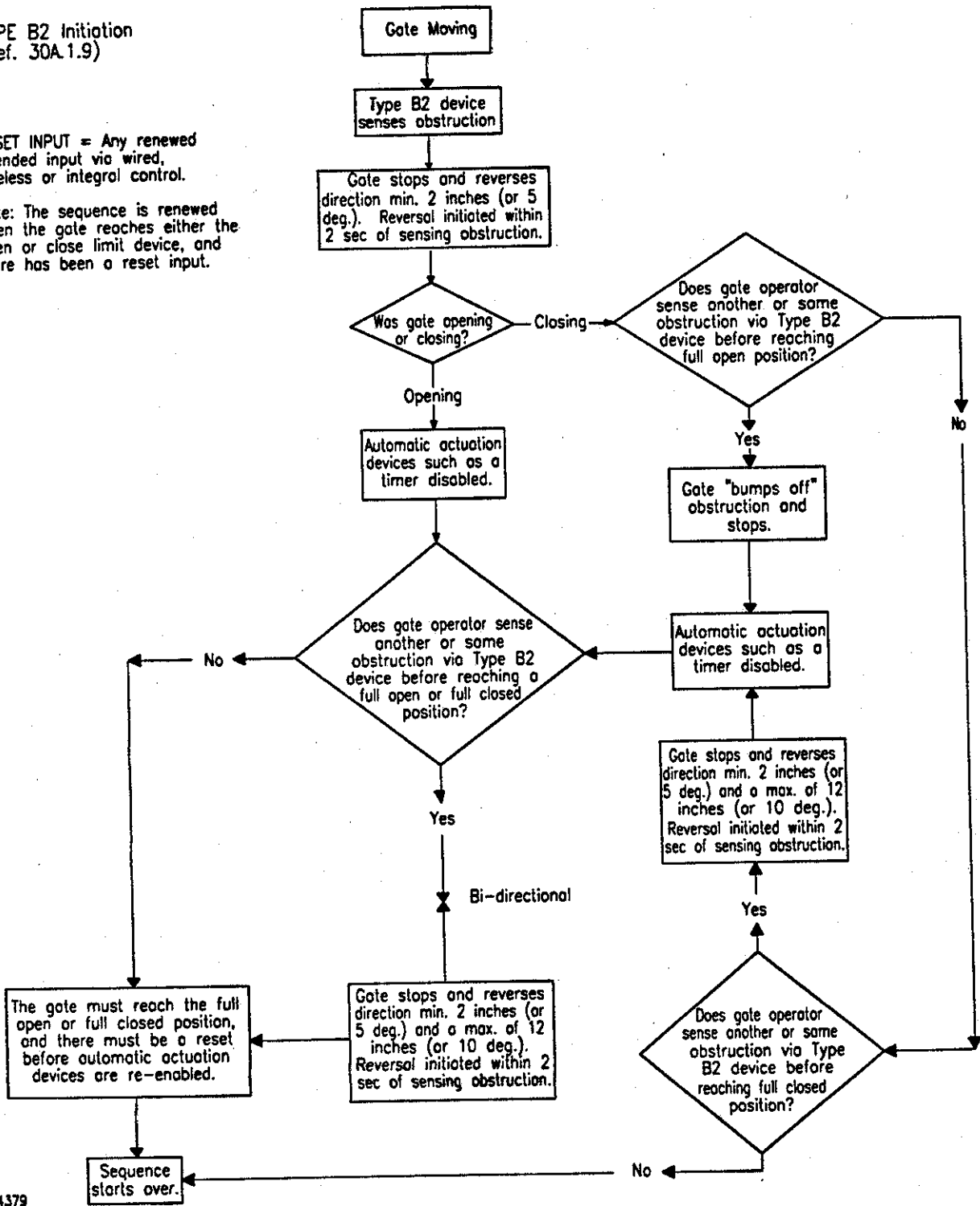


(NEW)
Figure 30A.3
Type B2 Entrapment Protection Device

TYPE B2 Initiation
 (Ref. 30A.1.9)

RESET INPUT = Any renewed
 intended input via wired,
 wireless or integral control.

Note: The sequence is renewed
 when the gate reaches either the
 open or close limit device, and
 there has been a reset input.



9. SEQUENCE OF ENTRAPMENT PROTECTION OPERATION AND CLARIFICATION OF 30A.1.2(b)

RATIONALE

Presently, paragraph 30A.1.2(b) does not adequately define the sequence referenced, as a sequence needs both a defined beginning and a defined ending. A modification is required to fully name and identify the sequence of operations possible, required, and anticipated. Therefore UL is proposing to revise paragraph 30A.1.2 to clearly define the beginning and ending of the sequence.

In addition, a key provision is the one dictating that the functioning of an entrapment protection device during a possible entrapment shall not keep the operator from being easily started again to resolve the entrapment. UL intended that a mandatory reset function be performed before anything else could function. Paragraph 30A.1.2(b) states: "The gate operator shall require a renewed, intended input (via an integral control or a wired remote intended to be in the line of sight of the gate) prior to enabling any automatic actuation devices such as a timer or any other maintained input that was present when the reversing input occurred." This statement, and usage of the phrase "automatic actuation devices" refers only to the automatic timers, but not the ability for a radio control to operate the gate, even after a second possible entrapment event.

The requirement is intended to prohibit any out-of-sight operation. There are two concerns addressed in the sentence in question: 1) renewed operation of the gate shall be only by a manual, intended, and line-of sight control, and 2) an automatic device such as a timer is to remain disabled until the manual, intended, line-of-sight input occurs. Therefore UL is proposing to revise paragraph 30A.1.2 to clarify the intent of the requirement.

PROPOSAL

30A.1.2 A gate operator installed in accordance with the manufacturer's instructions utilizing entrapment protection designated Type A in Table 30A.1 to comply with 30A.1.1 shall upon sensing an obstruction in any direction:

a) Stop and initiate the reversal of the gate within a maximum of 2 seconds. The gate operator shall reverse the gate a minimum of 2 inches (50.8 mm). The gate operator shall require a renewed, intended input (via wired or wireless control or integral control, a loop sensor, a card reader, or similar device) prior to enabling any automatic actuation devices such as a timer or any other maintained input that was present when the reversing function occurred.

b) Stop the gate and disable the operator upon sensing a second sequential obstruction. The gate operator shall require a renewed, intended input (via an integral control or a wired remote intended to be in the line of sight of the gate but excluding wireless controls and loop detectors) and this shall occur prior to enabling any automatic actuation devices such as a timer or any other maintained input that was present when the reversing function occurred, an actuation device that is not in the line of sight of the gate including a wireless device. An alarm shall comply with paragraph 30A.1.1A.

10. SEQUENCE OF ENTRAPMENT PROTECTION DEVICE COMBINATIONS

RATIONALE

UL's definition of the sequence combinations is not clear due to the mixed usage of certain phrases in paragraphs 30A.1.1, 30A.1.4, and 30A.1.9. Paragraph 30A.1.1 reads "Two sequential activations include two activations of an entrapment protective device, not interrupted by an open or close limit

device." However, in 30A.1.2(b) the phrase "second sequential obstruction" is used and in 30A.1.4(b) and 30A.1.9(b) yet another phrase "second sequential obstruction in the opposite direction, while in the process of reversal" is used.

A gate operator utilizing entrapment protection designated Type A, B1 or B2 to comply with 30A.1.1 shall stop the gate upon sensing a second sequential obstruction not interrupted by an open or close limit device. The sensing shall be deemed sequential regardless of the entrapment device that sensed the first entrapment. A single opening (or closing) cycle is intended to mean opening (or closing) without having reached the open (close) limit device. Therefore, UL is proposing to revise paragraphs 30A.1.4 and 30A.1.9 to clarify the intent of the requirement.

PROPOSAL

30A.1.4 A gate operator utilizing entrapment protection designated Type B1 in Table 30A.1 by having provision for connection of, or providing with the operator, a non-contact sensor (photoelectric sensor or equivalent) to comply with 30A.1.1 shall, when the sensor is actuated upon sensing an obstruction in the direction of travel of the gate:

- a) Stop or reverse the gate within a maximum of 2 seconds of sensing an obstruction in both the opening and closing directions,
- b) Stop the gate, or stop and initiate reversal of the gate a minimum of 2 inches (50.8 mm) or a maximum of 12 inches (304.8 mm) upon sensing a second sequential obstruction in the opposite direction while in the process of reversal as described in (a), not interrupted by an open or close limit device. The sensing shall be deemed sequential even if the first obstruction was sensed by any type of device.
- c) Result in a gate at rest remaining at rest unless a Type D device is actuated, and
- d) Return to normal operation when the sensor is no longer actuated.

30A.1.9 A gate operator installed in accordance with the manufacturer's instructions utilizing entrapment protection designated Type B2 in Table 30A.1 by having provision for connection of, or providing with the operator, a contact sensor (edge sensor or equivalent) to comply with 30A.1.1 shall, when the sensor is actuated upon sensing an obstruction in the direction of travel of the gate:

- a) Stop and initiate the reversal of the gate within a maximum of 2 seconds of sensing an obstruction in any direction. The gate operator shall reverse the gate a minimum of 2 inches (50.8 mm),
- b) Stop the gate, or stop and initiate reversal of the gate a minimum of 2 inches (50.8 mm) or a maximum of 12 inches (304.8 mm) upon sensing a second sequential obstruction in the opposite direction, while in the process of reversal as described in (a). Upon contact with a Type B2 entrapment protection device as the second sequential obstruction, the gate operator shall not enter the hard shutdown mode,
- c) Result in a gate at rest remaining at rest, unless a Type D device is actuated, and
- d) After the sensor is actuated no more than 2 times during a single closing cycle while closing without having reached the close limit device, or once in a single opening cycle, require a renewed intended input shall be required (via wired or wireless control or integral control, a loop

sensor, a card reader, or a similar device) prior to enabling any automatic activation devices such as a timer or any other maintained input that was present when the ~~reversing function~~ obstruction occurred.

11. ALARM SIGNAL FREQUENCY

RATIONALE

Manufacturers have expressed concern that commercially available alarms typically have a frequency range of 700 to 3000 Hz. Therefore, UL is proposing to revise paragraph 30A.1.18 to reflect the frequency range of commercially available alarms.

PROPOSAL

30A.1.18 The audio alarm signal for a Type E device shall be generated by devices such as bells, horns, sirens, or buzzers. The signal shall have a frequency range of 700 to ~~2800~~ 3000 Hz, a cycle of the sound level pulsations of 1 to 2 per second, a sound level at least 100 dB 1 foot (305 mm) in front of the device, and not vary more than ± 8 dB over the voltage range of operation. When the audio alarm is not supplied with the operator, instructions specifying the signal criteria shall be supplied with the operator.

12. MEANS FOR MANUAL OPERATION

RATIONALE

A concern was raised that the requirements in paragraph 30A.1.20 are not clearly stated regarding a manual release device. A manual release is required to be affixed to the gate operator and be capable of being operated in an entrapment situation. A "quick release" device is acceptable provided that:

- 1) The release is an integral part of the operator (non-removable for Class I, II or III gate operators);
- 2) A single non-repetitive movement will cause an action that would allow the gate to be pushed open (independently of the operator);
- 3) The manual release or the manual operation of the gate does not result in a risk of injury to persons during normal operation of the gate; and
- 4) The manual operation of the gate does not result in a risk of injury to persons if the operator is activated while the manual release is activated.

In order to clarify the requirements, UL is proposing to revise paragraph 30A.1.20.

PROPOSALS

30A.1.20 A vehicular gate operator shall have a means for manual operation so that the gate is capable of being moved independently of the gate operator. For a Class I, II, or III vehicular gate operator, the means for manual operation shall be supplied as an integral part of the gate operator and the gate operator shall be marked with instructions for manual operation on how to manually operate the gate. For a Class IV vehicular gate operator, the use of a nearby keyed release or a remotely located non-keyed release to release the gate operator from the gate meets the intent of this requirement. A risk of injury to persons shall not result when the manual release is activated and the gate operator is then energized.

13. TYPE C ENTRAPMENT PROTECTION DEVICES

RATIONALE

Presently paragraph 30A.1.22.1(b) does not specify a measurement distance from the hinge of a swing gate to the measurement point for the 40-pound maximum force limit of a Type C device. The manufacturer is required to specify the maximum force in accordance with paragraph 53.4.2. The intent is to limit the force at the free end of the gate as it closes on a fixed object. Therefore, UL is proposing to revise paragraph 30A.1.22.1(b) to specify that the measurement is made at the maximum length of the gate recommended by the manufacturer.

PROPOSAL

30A.1.22.1 When Types A, B2, or C entrapment protection devices are used as the primary or secondary entrapment protection provisions, a gate operator shall, upon contact with the obstruction specified in 30A.1.22.3 – 30A.1.22.5:

a) For Types A or B2 provisions, initiate reversal of the moving gate within 2 seconds. The gate operator shall reverse the gate a minimum of 2 inches (50.8 mm) unless a control is actuated or an entrapment circuit senses an obstruction to stop the gate during its reversal, or

b) For Type C provision, not open or close the gate with a force greater than 40 pounds (177.9 N), at the maximum setting when adjustable, at the leading edge of the gate, except for the first 10 degrees of movement of arc travel after any initiation of movement or a 2 second maximum time after any initiation of movement. The measurement is to be made at the maximum length of the gate recommended by the manufacturer.

A gate operator shall be tested in accordance with all applicable requirements specified in 30A.1.22.3 – 30A.1.22.5 for all types of gates with which the gate operator is intended to be used. Each entrapment protection provision shall be tested separately and independently with the other entrapment protection provisions defeated.

14. DOOR AND OPERATOR RELATIONSHIP FOR SENSING

RATIONALE

Manufacturers have questioned how to interpret the requirements in paragraph 31.1.6. The present wording implies that for a door operator system to comply with this Section, (1) the door must function as a sensor, and (2) in order to function as a sensor, the operator cannot drive the door in the closing direction. Therefore, UL is proposing to revise paragraph 31.1.6 to clarify the intent of the requirement.

PROPOSAL

31.1.6 In the case of a door operator system where the operator door is an integral part of the door operator design that provides for an inherent secondary entrapment protection for compliance with the requirements in this Standard, the door shall comply with the requirements in Specifications for Sectional Overhead Type Doors, ANSI/DASMA 102-1996. A pinch point shall not be contacted by the probe illustrated in Figure 9.1 using the procedures described in paragraphs 9.3, 9.4, 9.5, and 9.7. In addition, a section joint of a residential sectional garage door, that admits a 0.35 inch (9 mm) diameter rod that is 3.9 inches (100 mm) long, shall also admit a 1.0 inch (25 mm) diameter rod that is 3.9 inches (100 mm) long, at all positions of the door. Rubber or textile coverings or shields, when used to cover the joint, shall pass the same test. Evaluation of pinch points shall be made with the door installed on all track configurations supplied with the door.

15. OBSTRUCTION SHAPE AND POSITION

RATIONALE

Paragraph 33.1A.1 references paragraph 33.1.2 for the obstruction used for the test. The requirement in paragraph 33.1.2 and Figure 33.1 relates to garage door operators and UL has determined that its application to gates is not clear. Some Authorities having Jurisdiction have made interpretations that the photoelectric beam for gates must be located not more than 6 inches from the ground based on this requirement. This would not provide the intended protection for the gates covered by paragraph 33.1A.1. UL is proposing a new paragraph, 33.1A.2, to clarify the requirements for testing a swing gate and a sliding gate.

PROPOSAL

33.1A.1 When installed as described in 32.1.1 – 32.1.4, a photoelectric sensor shall sense an obstruction as described in ~~33.1.2~~ 33.1A.2 that is placed on a level surface in the path of the leading edge of the gate. The sensor is to be tested with the obstruction at a total of five different locations over the width of the gate opening. The locations shall include distances 1 inch (25.4 mm) from each end, 1 foot (305 mm) from each end, and the midpoint. The 1-foot side of the obstruction is to be centered across the gate opening perpendicular to a straight line across the opening.

(NEW)

33.1A.2 The obstruction used for the test is to consist of a white vertical surface, 27-1/2 inches (698 mm) high by 12 inches (305 mm) wide. The obstruction is to be placed on the ground in accordance with 31.1A.1.

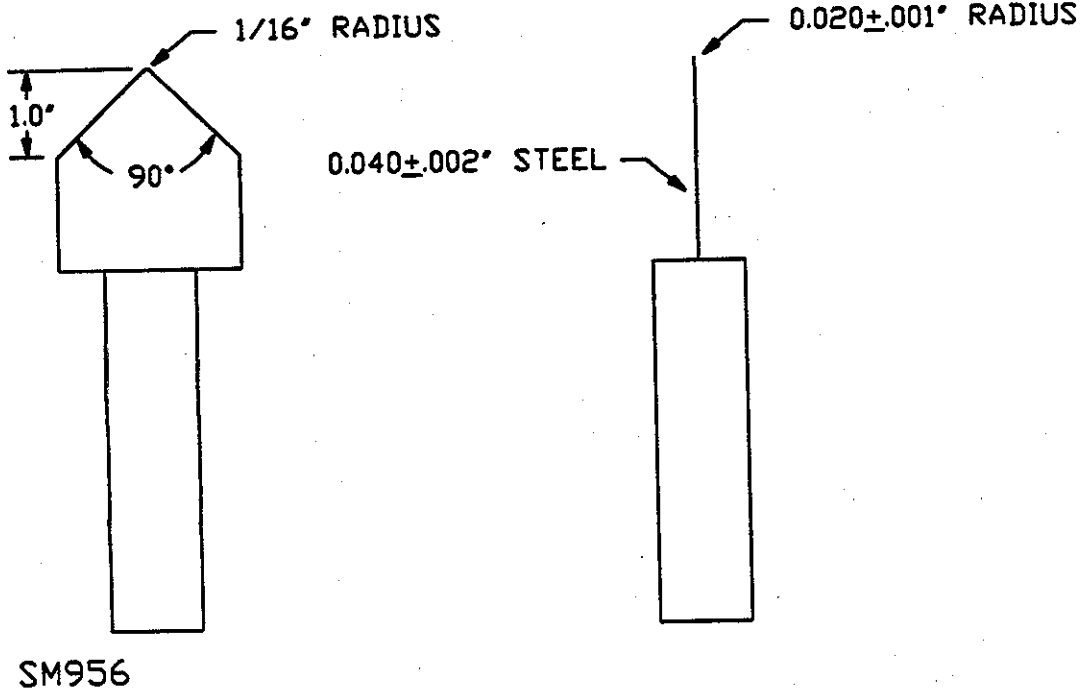
16. RADIUS OF PUNCTURE PROBE

RATIONALE

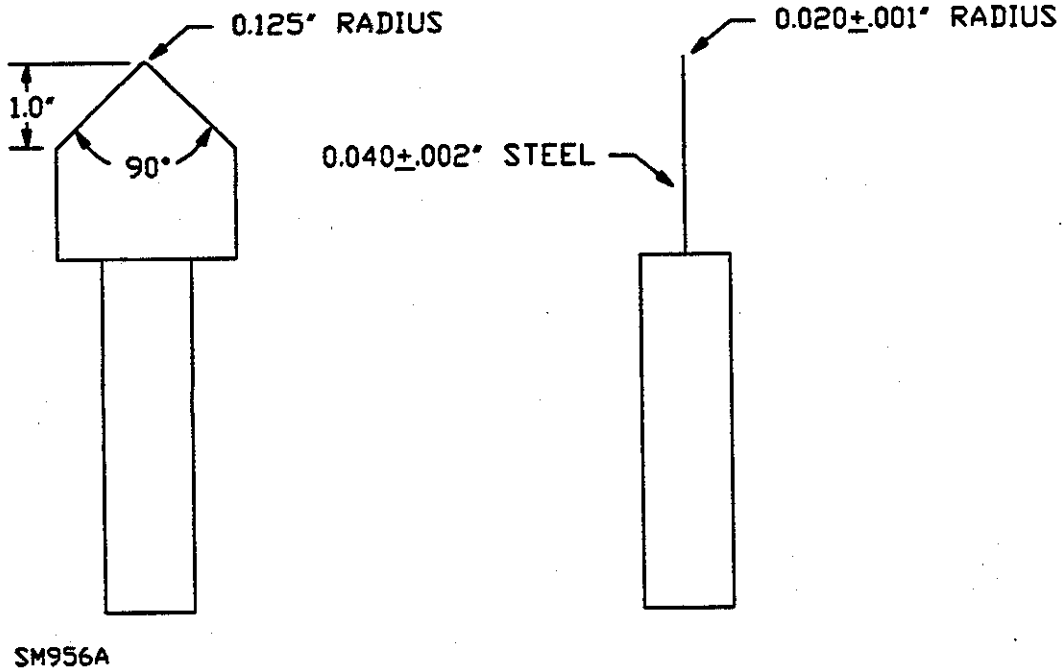
Representatives of industry have requested a change in the radius of the puncture probe shown in Figure 47 from 1/16 inch to 1/8 inch to provide for edge sensors with a lower activation force and greater sensitivity due to having thinner extrusion walls. By increasing the probe radius, the edge sensor wall thickness is reduced by 20-25 percent. The 20-pound force used on the puncture probe would remain unchanged. Therefore, UL is proposing to revise Figure 47.1 to reflect the increase in the probe radius.

PROPOSAL

(CURRENT)
Figure 47.1
Puncture probe



(PROPOSED)
Figure 47.1
Puncture probe



17. CLASS 155 (F) INSULATION SYSTEM

RATIONALE

More manufacturers are using motors and transformers employing Class 155 (F) insulation systems in products covered by UL 325. UL has investigated these systems when requested by manufacturers. Therefore, to reflect present practice, UL proposes to revise Table 40.1 to include Class 155 (F) temperature limits.

In addition, the superscript for note (c) has been inadvertently left out of the table for (8.), Subitem A and (15.), Subitem A. UL proposes to add them.

PROPOSAL

Table 40.1
Maximum temperature rises

Material and component parts		Degrees	
		C	F
1.	Varnished-cloth insulation	60	108
2.	Fuses	65	117
3.	Fiber employed as electrical insulation	65	117
4.	Wood and other combustible material	65	117
5.	At any point within a terminal box or wiring compartment of a permanently connected appliance in which power-supply conductors are to be connected, including such conductors themselves	35	63
6.	A surface upon which a stationary appliance is expected to be mounted in service, and surfaces that are expected to be adjacent to the appliance when so mounted	65	117
7.	Class 105 (A) insulation on coil windings of an a-c motor having a diameter of more than 7 inches (178 mm), of a d-c motor, and of a universal motor ^{a,b} :		
	A. In an open motor ^c		
	Thermocouple method	65	117
	Resistance method	75	135
	B. In a totally enclosed motor		
	Thermocouple method	70	126
	Resistance method	80	144
8.	Class 105 (A) insulation on coil windings of an a-c motor having a diameter of 7 inches or less excluding a universal motor and on vibrator coils ^{a,b} :		
	A. In an open motor and on vibrator coils ^c		
	Thermocouple or resistance method	75	135
	B. In a totally enclosed motor		
	Thermocouple or resistance method	80	144
9.	Class 130 (B) insulation, except as indicated in items 15 and 16 ^a		
	A. Transformers		
	Thermocouple method	85	153
	Resistance method	95	171
	B. Relays or solenoid windings		
	Thermocouple method	85	153
	Resistance method	105	189
		125	225
10.	Phenolic composition employed as electrical insulation or as a part, the deterioration of which results in a risk of fire or electric shock ^d		
11.	Rubber- or thermoplastic-insulated wire and cord ^{d,e}	35	63
12.	Capacitor		
	Electrolytic ^f	40	72
	Other types ^g	65	117
13.	Sealing compound	40°C (104°F) less than melting point	
14.	Class 105 (A) insulation on windings of a relay, a solenoid, or similar component ^{a,c}		
	Thermocouple method	65	117
	Resistance method	85	153
15.	Class 130 (B) insulation on coil windings of an a-c motor having a diameter of 7 inches or more, excluding a universal motor ^{a,b}		
	A. In an open motor ^c		

Table 40.1 Continued

Material and component parts		Degrees		
		C	F	
16.	Thermocouple method	85	153	
	Resistance method	95	171	
	B. In a total enclosed motor			
	Thermocouple method	90	162	
	Resistance method	100	180	
	Class 130 (B) insulation on coil windings of an a-c motor having a diameter of 7 inches or less, excluding a universal motor ^{a,b}			
	A. In an open motor			
	Thermocouple or resistance method ^c	95	171	
	B. In a totally enclosed motor			
	Thermocouple or resistance method	100	180	
17.	<u>Class 155 (F) insulation on coil windings of transformers</u>			
	Thermocouple method	<u>110</u>	<u>198</u>	
	Resistance method	<u>120</u>	<u>216</u>	
	<u>Class 155 (F) insulation on coil windings of motors, thermocouple or resistance method</u>			
	A. <u>In an open motor^c</u>	<u>120</u>	<u>216</u>	
	B. <u>In a totally enclosed motor</u>	<u>125</u>	<u>225</u>	

^a See 40.1.2.

^b See note a in Table 23.2.

^c At a point on the surface of a coil where the temperature is affected by an external source of heat, the temperature rise measured by means of a thermocouple is not restricted from being more than the maximum temperature rise specified in this table when the temperature rise as measured by the resistance method is not more than that specified. The temperature rise measured by means of a thermocouple shall not exceed the specified value by more than:

Item	Additional Temperature rise
7, Subitem A	15°C (27°F)
8, Subitem A	5°C (9°F)
14	15°C (27°F)
15, Subitem A	20°C (36°F)
16, Subitem A	10°C (18°F)
17, Subitem A	15°C (27°F)

^d The limitations on phenolic composition and on rubber and thermoplastic insulation do not apply to a compound that is rated for use at a higher temperature.

^e Rubber-insulated conductors within a Class-A-insulated motor, rubber-insulated motor leads, and a rubber-insulated flexible cord entering a motor is not restricted from being subjected to a temperature rise of more than 35°C (63°F), when a braid is employed on the conductor of other than a flexible cord. However, this does not apply to thermoplastic-insulated wire or cord. See 40.1.4.

^f For an electrolytic capacitor that is physically integral with or attached to a motor, the temperature rise on insulating material integral with the capacitor enclosure shall not be more than 65°C (117°F).

^g A capacitor that operates at a temperature rise of more than 65°C (117°F) shall be investigated on the basis of its marked temperature limit.

18. SOFTWARE USED IN PROGRAMMABLE COMPONENTS

RATIONALE

Paragraph 25.4A was separated from Secondary Entrapment Protection (for Residential Garage Door Operator and Door Operator Systems only), Section 31.3, and moved to General (for all products covered by the Standard), Section 25, effective June 11, 2001. As this requirement was moved in order to cover software used in components rather than just software used in inherent secondary entrapment protection devices, UL proposes to revise the wording to clarify this intent.

25.4A Software for use in a programmable component where failure is capable of resulting in a risk of fire, electric shock or injury to persons ~~in an inherent secondary entrapment protection device~~ shall comply with the Standard for Software in Programmable Components, UL 1998.

19. NEW EDITION OF THE STANDARD

DISCUSSION

As a result of the numerous revisions that have occurred over the last five years, UL 325 has become increasingly difficult to use. Therefore, UL would like to begin work on a new edition of the Standard. In order to make the new edition of UL 325 more usable, UL would like input from the STP on how to organize the standard, as well as identifying sections that will need to be clarified or expanded.

APPENDIX C

STP 325 ROSTER OF THE STANDARDS TECHNICAL PANEL FOR DOOR, DRAPERY, GATE,
LOUVER, AND WINDOW OPERATORS AND SYSTEMS

Name	Company	Interest Category
Grob, Don	Underwriters Laboratories Inc.	STP Chair, Non-voting member
Walker, Amy	Underwriters Laboratories Inc.	STP Secretary, Non-voting member
Bardowell, Roy G.	Manaras Door and Gate Operators Co.	Producer
Bloomfield, Carl A.	Intertek Testing Services	User
Buchanan, Richard	B & B Controls	User
Chamy, Peter G.	Marantec America Corp.	Producer
Clark, John E.	Independent	General
Coggins, Charles P.	AllStar Corporation	Producer
Delhotal, James R.	Raynor Garage Doors	Producer
Denault, Brian G.	Hy-Security Gate Inc.	Producer
Dini, John C.	Electronic Entry Systems Inc.	User
Hahn, Steven C.	Lawrence Roll-Up Doors, Inc.	User
Hellander, Jim P.	Somfy Systems, Inc.	Producer
Hinds, Frank D.	American Fence Association	General
Hupfauer, John W.	Underwriters Laboratories Inc.	User
Johnson, Richard C.	Door & Access Systems Manufacturers Assn. Intl.	General
Leigh, Gary A.	Miller Edge, Inc.	User
Martin, Joseph E.	Emerson Electric Co.	General
Mullen, John C.	The Genie Company	Producer
Murphy, John R.	U.S. Consumer Product Safety Commission	Non-Voting Member
Murray, James S.	Wayne-Dalton Corp.	Producer
Negrelli, Dean T.	Stanley Access Technologies	Producer
Nichols, Brent	National Ornamental & Misc. Metals Association	User
Peart, M. Virginia	Independent	General
Roffino, Claire B.	TXU Gas & Electric	General
Stelene, James A.	Clopay Building Products Company	Producer
Stuenkel, Mark S.	International Door Association	General
Taylor, James H.	White & Associates Electronics, Inc.	User
Willmott, Colin B.	Chamberlain Group Inc.	Producer
Yeager, Gerry E.	Entry & Exit Systems	User
Zelazny, George F.	Sears Roebuck and Co.	User

APPENDIX D

ATTENDANCE FORM

STP MEETING FOR UL 325, DOOR, DRAPERY, GATE, LOUVER,
AND WINDOW OPERATORS AND SYSTEMS
IN NORTHBROOK, IL
AUGUST 23, 2001

(Please Print or Type)

NAME: _____
(As you would like it to appear on your name tag/table tent)

COMPANY: _____

- I WILL be attending the Standards Technical Panel Meeting.
- I WILL NOT be attending the Standards Technical Panel Meeting.
- I WILL NOT be attending the Standards Technical Panel Meeting, but a substitute will be attending in my place.

If you plan to bring an observer or send a substitute, you are requested to inform the Standards Technical Panel Secretary by providing the information below.

NAME: _____
 COMPANY: _____
 ADDRESS: _____
 TELEPHONE: _____
 FAX: _____

Please send the completed form no later than August 8, 2001 to:

UNDERWRITERS LABORATORIES INC.
333 Pfingsten Road
Northbrook, IL 60062

Attention:
Susan Malohn
(Ext. 41725)
Interim Secretary for STP 325
Fax No. (847) 509-6217

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