

STANDARD INFORMATION

Standard Number: UL 325

Standard Name: Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems

Standard Edition and Issue Date: 7th Edition Dated May 19, 2017

Date of Revision: May 26, 2015, February 24, 2016, December 7, 2016, March 7, 2017, May 19, 2017

Date of Previous Revision of Standard: October 14, 2013

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **August 1, 2018**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revise requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revise requirements.

Overview of Changes:

May 26, 2015:

- Pedestrian door operators lowering maximum allowable force.

February 24, 2016:

- Revisions to Important Installation Instructions for residential garage door operators or systems.

December 7, 2016:

- Addition of a new section titled Unattended operation control accessory.

March 7, 2017

- Changes to entrapment protection.
- Change in requirements for edge sensors.

May 19, 2017

- The 7th Edition of 325 has been issued to reflect the adoption of this standard as a National Standard of Canada. It is technically equivalent to the 6th Edition revision dated March 7, 2017 of UL 325.

Specific details of new/revise requirements are found in table below. Changes are separated based on revision dates.

If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).



Client Action Required:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revised paragraphs noted in the attached or explain why these new/revised requirements do not apply to your product (s).

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.

STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
<p>Additions to existing requirements are <u>underlined</u> and deletions are shown lined out below.</p>		
<p>The following changes reflect the May 26, 2015 6th edition revision.</p>		
30	Info	Pedestrian Doors and Door Operators
30.4	Info	Entrapment
30.4.1		<p>A commercial or residential swinging pedestrian door or either single-leaf or double-leaf construction that is either remotely or automatically actuated, or both – see 30.1.1:</p> <p>a) Shall not close with a force greater than <u>30 lbf (133.4 N)</u> 40 lbf (177.9 N) at the latch side of the closing stile, and</p> <p>b) Shall not close through the final 10 degrees in less than 1.5 s.</p>
30.4.4		<p>To comply with the requirements in 30.4.3(a), the free leaf of a double-leaf door having one leaf jammed shall not have a closing force greater than <u>30 lbf (133.4 N)</u> 40 lbf (177.9 N) at the latch side of the closing stile.</p> <p><i>New clause added;</i></p>
30.4.6		<p>A commercial or residential single folding pedestrian door or center parting folding door that is either remotely or automatically actuated, or both – see 30.1.1:</p> <p>a) Shall not close with a force greater than 133.4 N (30 lbf) from the leading edge of the fold swing panel, and</p> <p>b) Shall not close through the final 10 degrees in less than 1.5 s.</p>



The following changes reflect the February 24, 2016 6th edition revision.

60 Info **INSTRUCTION MANUAL**

60.4 Info **Installation instructions for residential garage door operators and systems**

The installation instructions shall include the following or equivalent text:

IMPORTANT INSTALLATION INSTRUCTIONS

WARNING – To reduce the risk of severe injury or death:

1. READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS.

2. Install only on a properly operating and balanced garage door. An improperly balanced door has the potential to inflict severe injury. Have a qualified service person make repairs to cables, spring assemblies, and other hardware before installing the opener.

3. Remove all pull ropes and remove, or make inoperative, all locks connected to the garage door before installing the operator.

4. Where possible, install the door operator 2.14 m (7 ft) or more above the floor. For products having an emergency release, mount the emergency release within reach, but at least 1.83 m (6 ft) above the floor and avoiding contact with vehicles to avoid accidental release.

60.4.1

5. Do not connect the door operator to source of power until instructed to do so.

6. Locate the control button: (a) within sight of the door, (b) at a minimum height of 1.53 m (5 ft) above floors, landings, steps or any other adjacent walking surface so small children are not able to reach it, and (c) away from all moving parts of the door.

7. Install the Entrapment Warning Label next to the control button in a prominent location. Install the Emergency Release Marking. Attach the marking on or next to the emergency release.

8. After installing the opener, the door must reverse when it contacts a 38-mm (1-1/2-inch) high object (or a 2 by 4 board laid flat) on the floor.

9. For products having a manual release, instruct the end user on the operation of the manual release.

Exception: For horizontally sliding doors, Item 2 shall be replaced with “Have a qualified service person make repairs and hardware adjustments before installing the opener”.

60.6 Info **Commercial/industrial door operators (or systems)**



The Installation Instructions shall include the following or equivalent text:

IMPORTANT INSTALLATION INSTRUCTIONS

WARNING – To reduce the risk of severe injury or death:

1) READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS.

2) Install only on a properly operating and balanced door. A door that is operating improperly could cause severe injury. Have qualified service personnel make repairs to cables, spring assemblies, and other hardware before installing the operator.

3) Remove all pull ropes and remove, or make inoperative, all locks (unless mechanically and/or electrically interlocked to the power unit) connected to the door before installing the operator.

4) A commercial/industrial door operator that has exposed moving parts capable of causing injury to persons or employs a motor deemed indirectly accessible by 10.6 by virtue of its location above the floor shall include:

60.6.7

- a) Install the door operator at least 2.44 m (8 ft) or more above the floor ~~if the operator has moving parts~~; or
- b) If the operator must be installed less than 2.44 m (8 ft) above the floor, then exposed moving parts must be protected by covers or guarding, provided by the operator manufacturer; or
- c) Both (a) and (b).

5) Do not connect the door operator to the source of power until instructed to do so.

6) Locate the control station: (a) within sight of the door, and (b) at a minimum height of 1.53 m (5 ft) above floors, landings, steps, or any other adjacent walking surface and (c) away from all moving parts of the door.

7) Install the Entrapment Warning Placard next to the control station in a prominent location.

8) For products having a manual release, instruct the end user on the operation of the manual release.

63	Info	MARKING
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63.5	Info	Commercial/Industrial door operators (or systems)
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A commercial/industrial door operator ~~shall be marked to indicate that the operator is to be mounted more than 8 ft (2.44 m) above the floor if it that has exposed moving parts capable of causing injury to persons or employs a motor deemed indirectly accessible by 10.6 by virtue of its location above the floor shall be marked to indicate that:~~

63.5.1

- a) The operator is to be mounted more than 2.44 m (8 ft) above the floor; or
- b) Covers or guarding, provided by the manufacturer, must be installed when the operator is mounted less than 2.44 m (8 ft) above the floor; or
- c) Both (a) and (b).

The following changes reflect the December 7, 2016 6th edition revision.

33

Info

Residential Garage Door Operator and Door Operator Systems

New section added;

33.6

Unattended operation control accessory

33.6.1

General

A residential garage door operator control accessory shall be permitted to be supplied separate from the operator, and per 4.27 may permit unattended operation to close a garage door, provided the control accessory complies with the additional requirements of 33.6.2 – 33.6.6.

33.6.1.1

Exception: Unattended operation shall not be permitted on one-piece garage doors or swinging garage doors. A control accessory that has an unattended operation close feature shall identify that the unattended operation closing feature is only permitted to be enabled when installed with a sectional door by complying with:

- a) *The installation instructions of 60.4.2;*
- b) *The markings of 61.8; and*
- c) *The carton markings of 63.3.2.*

33.6.2

Operator System

33.6.2.1

The control accessory shall require one or more intentional actions to enable unattended operation to function when connected to an operator system, such as setting a power head switch or wall-control switch. For an accessory requiring installation and set-up in order to enable unattended operation, the installation and set-up may be considered satisfying this requirement.

33.6.3

Alarm Signal

33.6.3.1

The control accessory alone or in combination with the operator system shall provide an audible and visual alarm signal.

33.6.3.2

The alarm shall signal for a minimum of 5 seconds before any unattended closing door movement, or before any door movement if the next direction of door travel cannot be determined.



33.6.3.3	The audible signal shall be heard within the confines of a garage. The audio alarm signals for the alarm specified in 33.6.3.1 shall be generated by devices such as bells, horns, sirens, or buzzers. The signal shall have a frequency in the range of 700 to 3400 Hz, either a cycle of the sound level pulsations of 4 to 5 per second or one continuous tone, a sound level at least 45 dB 3.05 m (10 ft) in front of the device over the voltage range of operation.
33.6.3.4	The visual alarm signal of 33.6.3.1 shall be visible within the confines of a garage using a flashing light of at least 40 watt incandescent or 360 lumens.
33.6.3.5	When the visual alarm or the audio alarm, or both, are external to the control accessory and are not part of main operator unit, the control accessory shall monitor for the connection of and proper operation of both the visual and audible alarms, prior to initiating door travel.
33.6.4	Controls
33.6.4.1	During the pre-motion signaling period defined in 33.6.3.2, activation of any user door control (e.g. wall control, wireless remote, keypad) shall prevent the pending unattended door movement. Door movement resulting from activation of a user door control is not prohibited.
	Upon activation of a user door control during unattended door movement:
33.6.4.2	<ul style="list-style-type: none">a) The operator shall function in the same manner as if the control accessory were not present;b) The control accessory shall not interfere with, override, or alter the normal operation of the operator; andc) The door shall stop, and may reverse the door on the closing cycle. On the opening cycle, activation of a user door control shall stop the door but not reverse it.
33.6.4.3	If an unattended door travelling in the closing direction is stopped and reversed by an entrapment protection device, the control accessory alone or in combination with the operator system shall be permitted one additional unattended operation attempt to close the door.
3.6.4.4	After two attempts per 33.5.4.3, the control accessory alone or in combination with the operator system shall suspend unattended operation. The control accessory alone or in combination with the operator system shall require a renewed, intended input, via user door control (e.g. wall control, wireless remote, keypad) other than the unattended activation device, prior to re-enabling unattended operation.
33.6.5	Entrapment Protection
33.6.5.1	The control accessory shall not interfere with, override, or alter any entrapment protection features of the operator or system per 33.2 and 33.3. A control accessory that only provides a momentary signal (wired or wireless) to start the door is considered to comply with this requirement.



A control accessory shall only be used with an operator when the combination of the operator and the control accessory comply with the applicable entrapment protection features including:

33.6.5.2

- a) Inherent Primary Entrapment Protection, in accordance with 33.2;
- b) Secondary Entrapment Protection, in accordance with 33.3.

A control accessory shall be marked to indicate “For use only with garage door operators complying with UL 325, manufactured after _____.”, or “For use only with the following garage door operators:_____.” The date (e.g. “1993”, “February 21, 2008”) or the additional information provided in the blank shall be added by the accessory manufacturer such that the combination of the control and operator(s) it is intended for use with complies with 33.6.5.2. This marking shall appear on the packaging and on the product, and shall be repeated in the instructions accompanying the accessory.

33.6.5.3

To comply with 33.6.5.2, a control accessory shall comply with one or more of the following:

33.6.5.4

- a) Not be capable of operating when connected to an operator that is not compliant with 33.6.5.2;
- b) Be restricted to function only with specific operators, such that the combination of the control and the operator are compliant with 33.6.5.2;
- c) Provide additional functionality to an operator or system such that when operating via the control accessory, the combination of the control accessory and the operator complies with 33.6.5.2;
- d) Be marked to indicate as indicated in 33.6.5.3.

33.6.6

Instructions and markings

The control accessory shall be provided with instructions as follows:

33.6.6.1

- a) Instructions per Section 60, as applicable.
 - b) Instructions that repeat any warning or cautionary product markings and field labels required below.
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The control accessory shall be provided with markings as follows:

a) Markings on the product per Section 63, as applicable.

33.6.6.2

b) In lieu of 63.3.2, the product package shall be marked with the following or equivalent: “WARNING: To reduce the risk of injury to persons – Only enable [+] feature when installed with sectional door.”, where + is the unattended operation closing function , or “WARNING: To reduce the risk of injury to persons – Do not use this device with one-piece doors or swinging doors.”

c) On the package or the product – any other markings related to use of the control with specific operators, per 33.6.5.4.

33.6.6.3

The control accessory shall be provided with a label for field installation as required by 61.3 – 61.7, including but not limited to 61.7(b)(5).

New section added;

60.10

Drapery Operators

60.10.1

A cord-connected drapery operator shall include: “Do not use an extension cord. If the power supply cord is too short, have a qualified electrician install an outlet near the drapery operator.”, or equivalent.

The following changes reflect the March 7, 2017 6th edition revision.

15

Info

Internal Wiring

15.4

Info

Secondary circuits

Cable supplied with the operator for connection of a Class 2 circuit to an external device, and cable supplied with an external device intended for connection to a Class 2 circuit of an operator shall be:

15.4.8

a) Type CL2, CL2P, CL2R, or CL2X complying with the Standard for Power-Limited Circuit Cables, referenced in Annex A, Ref. No. 12, or

b) Other cable with equivalent or better electrical, mechanical, and flammability ratings; or

c) Cable that is a factory-connected integral part of a Class 2 power supply complying with the Standard for Class 2 Power Units, referenced in Annex A, Ref. No. 13, or a Class 2 transformer complying with the Standard for Low Voltage Transformers - Part 3: Class 2 and Class 3 Transformers, referenced in Annex A, Ref. No. 11, or an LPS (Limited Power Source) supply complying the Standard for Information Technology Equipment - Safety - Part 1: General Requirements, referenced in Annex A, Ref. No. 14.

32

Info

Class I, II, III, and IV Vehicular Gate Operators and Systems

32.1

Info

General entrapment protection provisions



A vehicular gate operator or vehicular barrier (arm) operator shall:

32.1.1

a) Have provisions for (see 63.3.5), or be supplied with, a minimum of two independent entrapment protection means as specified in Table 32.1-At installation, both entrapment protection devices must be installed for each entrapment zone.

b) Operate only after installation and enabling of the minimum number of acceptable entrapment protection means, as specified in Table 32.2.

c) Be supplied with instructions regarding entrapment protection means in accordance with 60.8.2 – 60.8.4.

Table 32.1

Gate operator category	
Horizontal slide, vertical lift, and vertical pivot	Swing and vehicular barrier (arm)
Entrapment protection types ^a	Entrapment protection types ^a
A, B1 ,B2 or D	A, B1, B2, C or D
<p>Note – The same type of device shall not be utilized for both 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 entrapment protection means.</p> <p>^a Entrapment protection types: Type A – Inherent entrapment protection system. See 32.1.6. Type B1 – Non-contact sensor (photoelectric sensor or the equivalent). See 32.1.7 – 32.1.15. Type B2 – Contact sensor (edge device or the equivalent). See 32.1.8 and 32.1.17 – 32.1.19. Type C – Inherent force limiting, inherent adjustable clutch or inherent pressure relief device. See 32.1.21 and 32.2.1.1(b). Type D – Actuating device requiring continuous pressure to maintain opening or closing motion of the gate. See 32.1.22 and 32.1.23.</p>	

New table added;

Table 32.2

	Opening	Closing
Horizontal Slide Gate	2	2
Horizontal Swing Gate	2*	2*
Vertical Pivot Gate	2	2
Vertical Lift Gate	1	2
<p>* For a horizontal swing gate operator, at least two independent entrapment protection means are required in each direction of travel. Except, if there is no entrapment zone in one direction of travel, only one means of entrapment protection is required in that direction of travel; however, the other direction must have two independent entrapment protection means.</p>		



32.1.8 A gate operator installed in accordance with the manufacturer’s instructions utilizing external entrapment protection designated Types B1 or B2 in Table 32.1 to comply with 32.1.1 by having provision for connection of such device(s), or providing such device(s) with the operator, shall monitor for the presence ~~and correct operation of the~~ every device at least once during each open and close cycle. Upon monitoring, should ~~any~~ the device not be present, or a fault condition occur that precludes the sensing of an obstruction, including an interruption of the wireless signal to the wireless device or an open or short circuit in the wiring that connects the external entrapment device to the operator and the device’s supply source, the operator shall function with constant pressure as required by 32.1.23 for the direction of travel being protected, or shall only be able to be moved manually as required by 32.1.25. Compliance with this section shall be verified by test per 32.2.1.4.

Exception: Emergency access controls only accessible by authorized personnel (e.g. fire, police, EMS) may override entrapment protection means as specified in 32.1.8.

New clause added;

32.1.9 For the purposes of 32.1.8, one open and close cycle is considered to be a complete sequence of: Open (fully or partially), Stop/Pause, Close (fully or partially), Stop/Pause.

New clause added;

32.1.10 With regard to connection points of an operator that are required to monitor external entrapment protection devices, it shall not be possible to make simple modifications in the field by adding, suppressing, or changing either on the operator or external entrapment protection device(s), to bypass, interfere with, or otherwise defeat the monitoring function:

- a) The connection of wires;
- b) Terminals;
- c) Switches;
- d) Jumpers; or
- e) Components supplied with the operator or external entrapment protection device.

New clause added;

32.1.11 The installation manual and the user manual shall not provide instructions for which the stated purpose of the instructions is to reprogram, reconfigure, or reset the monitored outputs such that they do not comply with the minimum requirements in Table 32.2 except to revert to original factory settings.

New clause added;

32.1.12 The operator shall not be provided with resistors installed or intended for installation across the terminals that are intended for monitored external entrapment protection devices and the manufacturer shall not recommend the use or installation of such resistors.



New clause added;

32.1.13 A component, such as a resistor, capacitor, etc. required for monitoring shall be permanently installed at the factory by the manufacturer of the entrapment protection device.

32.1.14 A gate operator utilizing a non-contact sensor for entrapment protection in accordance with 32.1.1 shall be supplied with instructions on the placement of the sensors for each entrapment zone in compliance with 60.8.3 and 60.8.4.

32.1.18 A gate operator utilizing a contact sensor for entrapment protection to comply with 32.1.1 shall be supplied with instructions on the placement of the sensors for each ~~Type of application~~ entrapment zone in compliance with 60.8.3 and 60.8.4.

32.2 Info **Entrapment protection (Types A, B1, B2, and C)**

New clause added;

32.2.1.4 The operator shall be tested in various configurations representing the minimum number of external entrapment protection devices specified by the operator manufacturer up to the maximum number specified.

32.2.2.1 With reference to 32.2.1.1, a 41.3-mm by 88.9-mm (1-5/8-in by 3-1/2-in) solid rectangular object not less than 152-mm (6-in) long is to be fixed in an immobile position with the longitudinal axis perpendicular to the edge of the gate. The 41.3-mm (1-5/8-in) side of the obstruction facing the leading edge is to contact the moving gate at various points along the leading edge of the gate. For vehicular horizontal slide-gates only and vertical lift gates, the same object is then to be arranged to contact the moving gate at various points along the trailing edge of the gate. For vertical pivot gates, the same object is to be arranged to contact the gate at various points in the pivot area representative of the greatest risk of entrapment except where guarded in the rear pivot edge area per instructions in 60.8.4.

39 Info **Edge Sensors**

39.1 Info **Normal operation test**

39.1.1 Info **Edge sensor**

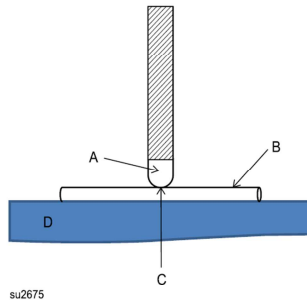
An edge sensor, when installed on a representative door or gate, shall actuate upon the application of a 66.7 N (15 lbf) or less force in the direction of the application when tested at room temperature 25°C ±2°C (77°F ±3.6°F) and, additionally, when intended for use with gate operators, shall actuate at 177.9 N (40 lbf) or less force when tested at -35°C ±2°C (-31°F ±3.6°F).

- 39.1.1.1
- a) For an edge sensor intended to be used on a sectional door or slide gate, the force is to be applied by the longitudinal edge of a 1-7/8 in (47.6 mm) diameter cylinder placed across the sensor so that the axis is perpendicular to plane of the door or gate. See Figure 39.1 and 39.2.
 - b) For an edge sensor intended to be used on a one piece door, swinging door, or swinging gate, the force is to be applied so that the axis is at an angle 30 degrees from the direction perpendicular to the plane of the door or gate. See Figure 39.3 and 39.4.
-



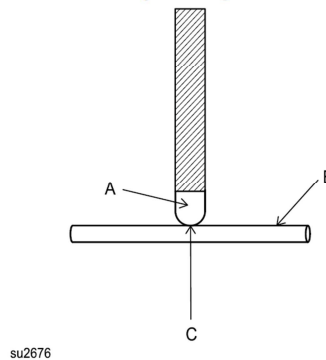
- c) For an edge sensor that wraps around the leading edge of a swinging one-piece door or a swinging gate, providing activation in both directions of travel, the force is to be applied so that the axis is at an angle 30 degrees from the direction perpendicular to both the closing direction and the opening direction. See Figure 39.5.

Figure 39.1
Side View – Sectional Door or Vertical Lift/Pivot Gate



- A – Edge Sensor
B – 47.625 mm (1-7/8 in) Diameter Cylinder
C – 66.7 N (15 lbf)
D – Ground/Floor

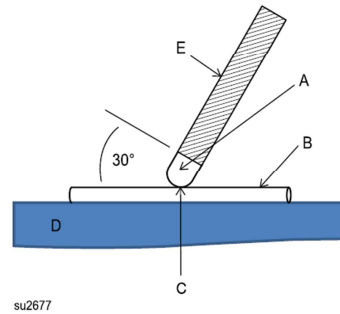
Figure 39.2
Top View – Horizontally Moving Door or Slide Gate



- A – Edge Sensor
B – 47.625 mm (1-7/8 in) Diameter Cylinder
C – 66.7 N (15 lbf)

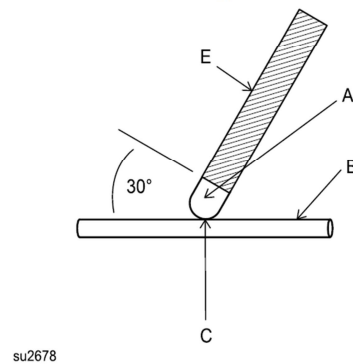


Figure 39.3
Side View – One-Piece Door



- A – Edge Sensor
- B – 47.625 mm (1-7/8 in) Diameter Cylinder
- C – 66.7 N (15 lbf)
- D – Ground/Floor
- E – Outside Surface

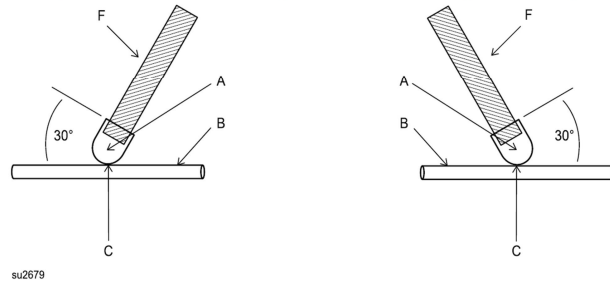
Figure 39.4
Top View – Horizontal Swing Gate or Swing Door



- A – Edge Sensor
- B – 47.625 mm (1-7/8 in) Diameter Cylinder
- C – 66.7 N (15 lbf)
- E – Outside Surface



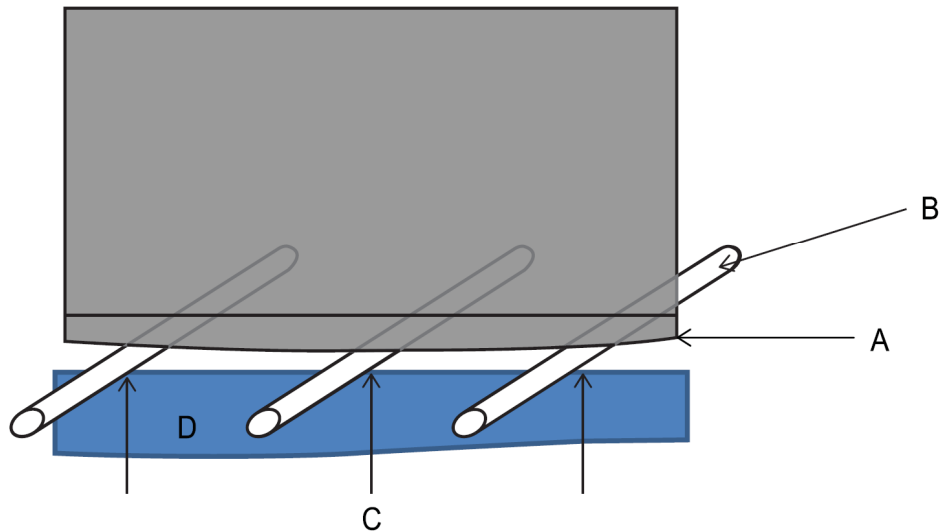
Figure 39.5
Top View – Horizontal Swing Gate or Door – Wraparound Edge



- A – Edge Sensor
- B – 47.625 mm (1-7/8 in) Diameter Cylinder
- C – 66.7 N (15 lbf)
- F – Direction of Travel

With respect to the test of 39.1.1.1, the test is to be repeated at various representative points of the edge sensor across the width of the door length of the edge sensor. See Figures 39.6 and 39.7.

Figure 39.6
Front View – Sectional or One-Piece Door or Vertical Lift/Pivot Gate

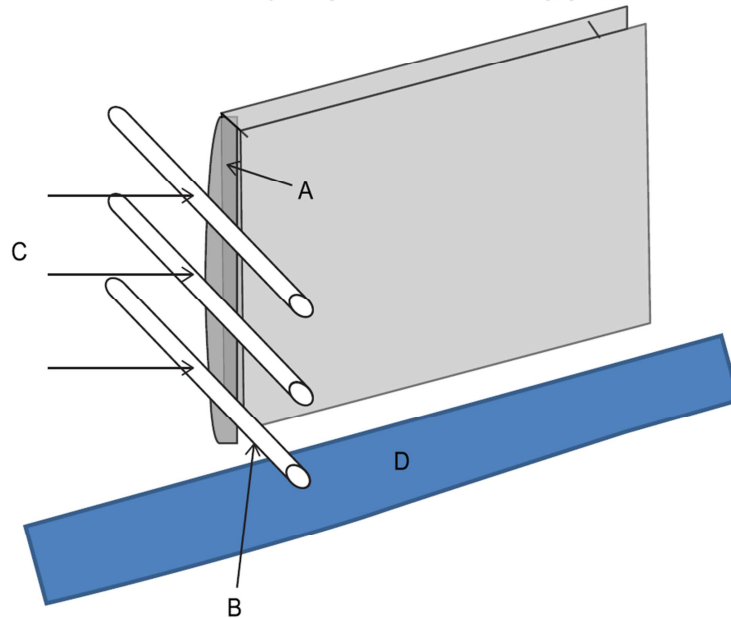


39.1.1.2

- A – Edge Sensor
- B – 47.625 mm (1-7/8 in) Diameter Cylinder – At various heights, perpendicular or at 30 degree angle, depending on door/gate type.
- C – 66.7 N (15 lbf)
- D – Ground/Floor



Figure 39.7
Side View – Horizontally Moving Door or Slide Gate or Swinging Door/Gate



A – Edge Sensor

B – 47.625 mm (1-7/8 in) Diameter Cylinder – At various heights, perpendicular or at 30 degree angle, depending on door/gate type.

C – 66.7 N (15 lbf)

D – Ground/Floor

New section added;

39.1.2

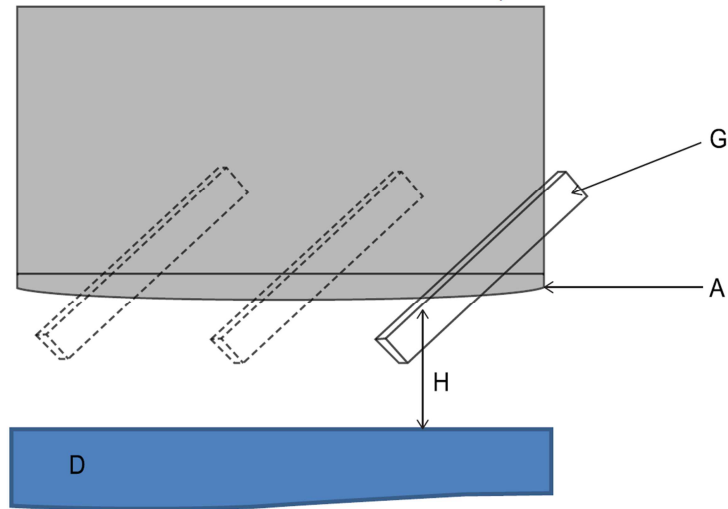
Commercial/Industrial door operators

39.1.2.1

For commercial/industrial door operators intended to be used with a contact type sensor, with reference to 31.2.1, a 41.3-mm by 88.9-mm (1-5/8-in by 3-1/2-in) solid rectangular object not less than 152-mm (6-in) long is to be fixed in an immobile position with the longitudinal axis perpendicular to the edge of the door at a distance of 152.4 mm (6 in) from the fully closed position. The 41.3-mm (1-5/8-in) side of the obstruction facing the leading edge is to contact the moving door at various points along the width of the door. See Figure 39.8.



Figure 39.8
Front View – Commercial/Industrial Door Operator



A – Edge Sensor

D – Ground/Floor

G – 41.3-mm by 88.9-mm (1-5/8-in by 3-1/2-in) solid object, min. 152.4 mm (6 in) long, placed at various locations along edge of door

H – 152.4 mm (6 in) from floor to centerline of object

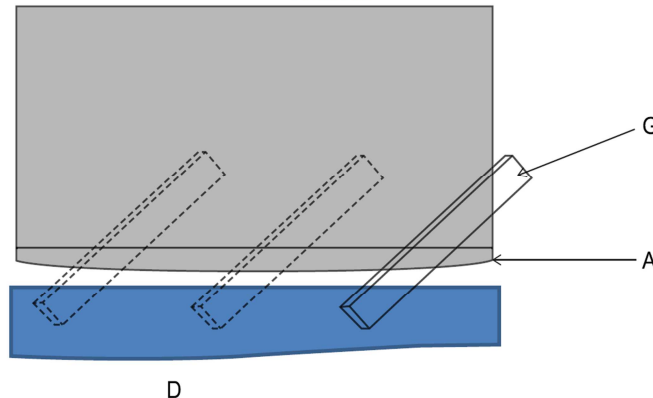
New section added;

39.1.3

Vehicular gate operations

Vehicular gate operators intended to be used with a Type B2 device, with reference to 32.1.17(a), shall be tested per 32.2.2 or 32.2.3 or 32.2.4 as applicable. Also see Figure 39.9 for a vertical pivot, vertical lift gate, or barrier arm; Figure 39.10 for a horizontal slide gate; or Figure 39.11 for a swing gate.

Figure 39.9
Front View – Vertically Moving Residential Garage Door, or Vertical Pivot or Vertical Lift Gate or Barrier Arm



A – Edge Sensor

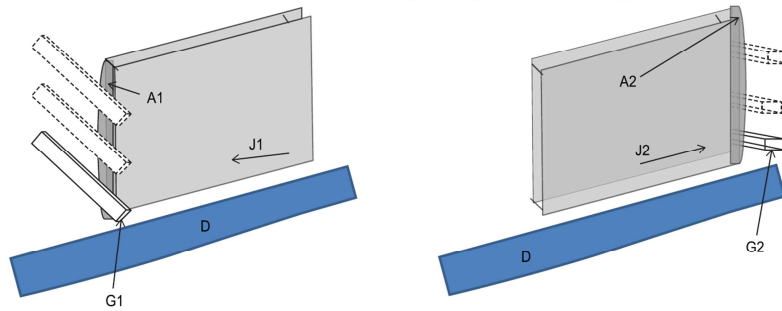
D – Ground/Floor

G – 41.3-mm by 88.9-mm (1-5/8-in by 3-1/2-in) solid object, min. 152.4 mm (6 in) long, placed at various locations along edge of door/gate

39.1.3.1



Figure 39.10
Side View – Slide Gate or Horizontally Moving Residential Garage Door



A1 – Edge Sensor on Leading Edge

G1 – 41.3-mm by 88.9-mm (1-5/8-in by 3-1/2-in) solid object, min. 152.4 mm (6 in) long, placed at various locations along leading edge

J1 – Movement when closing

D – Ground/Floor

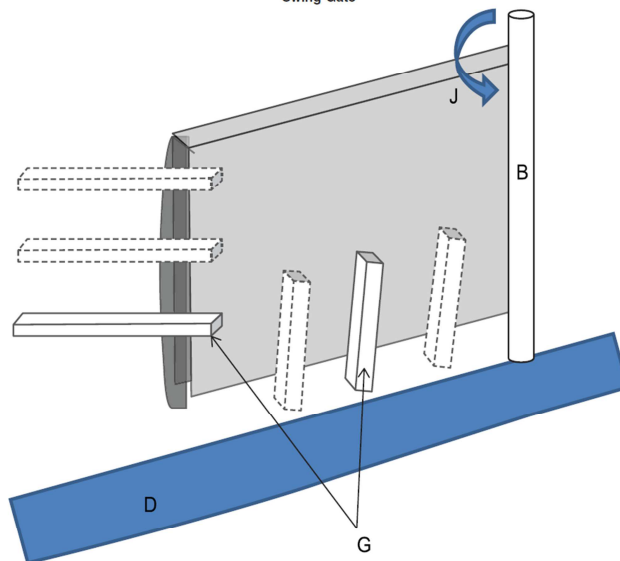
A2 – Edge Sensor on Trailing Edge

G2 – 41.3-mm by 88.9-mm (1-5/8-in by 3-1/2-in) solid object, min. 152.4 mm (6 in) long, placed at various locations along trailing edge

J2 – Movement when opening

D – Ground/Floor

Figure 39.11
Swing Gate



B – Post

D – Ground/Floor

G – 41.3-mm by 88.9-mm (1-5/8-in by 3-1/2-in) solid object, min. 152.4 mm (6 in) long, placed at various locations along leading edge and/or bottom edge

J – Movement when closing

39.1.4

New section added;

Residential garage door operators



39.1.4.1	For vertically moving residential garage door operators intended to be used with an external edge sensor, with reference to 33.3.1(b), a 41.3 mm by 88.9 mm (1-5/8 in by 3-1/2 in) solid rectangular object not less than 152 mm (6 in) long is to be fixed in an immobile position at the fully closed position with the longitudinal axis perpendicular to the edge of the door. The 41.3 mm (1-5/8 in) side of the obstruction facing the leading edge is to contact the moving door at various points along the width of the door. See Figure 39.9.	
39.1.4.2	For horizontally moving residential garage door operators intended to be used with an external edge sensor, with reference to 33.3.2(b), a 41.3 mm by 88.9 mm (1-5/8 in by 3-1/2 in) solid rectangular object not less than 152 mm (6 in) long is to be fixed in an immobile position with the longitudinal axis perpendicular to the edge of the door. The 41.3 mm (1-5/8 in) side of the obstruction facing the leading edge is to contact the moving door at various points along the leading edge of the door. The same object is then to be arranged to contact the moving door at various points along the trailing edge of the door. See Figure 39.10.	
Info	INSTRUCTION MANUAL	
60	Info	Details
60.1.8	Information shall be supplied with a gate operator for: a) The required installation and adjustment of all devices and systems to effect the protection against entrapment (where included with the operator) as specified in Table 32.1, and b) The intended connections for all devices and systems to effect the protection against entrapment as specified in Table 32.1. The information shall be supplied in the instruction manual, wiring diagrams, separate instructions, or the equivalent. <u>The recommended placement location of external entrapment protection devices for each entrapment zone, if using Type B1 or B2 devices.</u>	
<i>New clause added;</i>		
60.1.17	For an operator, system, or external device requiring field installed wiring between a Class 2 output of an operator and an external device, unless the wiring is provided as part of the operator or external device, the instructions shall specify the type of wiring to be used in accordance with 15.4.8.	
60.8	Info	Vehicular gate operators (or systems)
60.8.3	Instructions for the installation and connection of external controls and devices serving as required protection against entrapment shall be provided with the operator when such controls are shipped with the operator. <u>When shipped separately from the operator, external entrapment protection devices shall be provided with instructions for installation, adjustment, and wiring.</u>	
60.8.4	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 1.83 m (6 ft) above the ground to prevent a 57.2 mm (2-1/4 inch) 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 areas of the moving vertical pivot gate panel from the bottom of the gate to the top of the gate or a minimum of 1.83 m (72 in) above grade, whichever is less, that pass by a fixed stationary object, and in the area of the adjacent fence that the gate covers during the travel of the gate, shall be designed, guarded or screened to prevent a 57 mm (2-1/4 in) diameter sphere from passing through such areas.
- 4) All exposed pinch points are eliminated or guarded, and
- 5) Guarding is supplied for exposed rollers.
- 6) The operator instructions shall list the maximum number of open and close entrapment protection devices capable of being connected to the operator.

b) The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come in contact with the vehicular gate during the entire path of travel of the vehicular gate.

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 an improperly installed, improperly functioning, or 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 62.1.6 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) Permanently mounted controls intended for user activation must be located at least 1.83 m (6 ft) away from any moving part of the gate and where the user is prevented from reaching over, under, around or through the gate to operate the controls.

Exception: Emergency access controls only accessible by authorized personnel (e.g. fire, police, EMS) may be placed at any location in the line-of-sight of the gate.



g) The Stop and/or Reset button must be located in the line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.

h) A minimum of two (2) WARNING SIGNS shall be installed, in the area of the gate. Each placard is to be visible by persons located on the side of the gate on which the placard is installed. Also see 62.1.1.

i) For gate operators utilizing a non-contact sensor in accordance with 32.1.1:

- 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.

j) For a gate operator utilizing a contact sensor in accordance with 32.1.1:

- 1) One or more contact sensors shall be located where the risk of entrapment or obstruction exists, such as 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 device 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 device shall function under the intended end-use conditions.
 - 6) One or more contact sensors shall be located on the inside and outside leading edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 152 mm (6 in) but less than 406 mm (16 in) 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 (arm).
-



New clause added;

60.8.7 Instructions provided with an operator shall specify each external entrapment protection device or external entrapment protection device accessory that is suitable for use with the operator. The external device(s) shall be specified by type of device (e.g.: photo sensor, edge sensor), device manufacturer, and device model number or model family. The device(s) specified in the instructions shall only be those that have been tested and found to be acceptable with the operator during evaluation to this standard.

New clauses added;

63.4.9 The markings described in 63.4.3 through 63.4.8 shall be located on the outside housing of the operator, control box, or control panel.

The following changes reflect the May 19, 2017 7th edition revision.

Info The 7th Edition of 325 has been issued to reflect the adoption of this standard as a National Standard of Canada. It is technically equivalent to the 6th Edition revision dated March 7, 2017 of UL 325.

CUSTOMERS PLEASE NOTE: This Table and column “Verdict” can be used in determining how your current or future production is or will be in compliance with new/revised requirements.
