



DASMA
Door & Access Systems
Manufacturers Association
International

OPERATOR & ELECTRONICS DIVISION

TECHNICAL DATA SHEET

#368

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Sensing Edges

INTRODUCTION

Sensing edges detect obstructions in openings controlled by garage doors, rolling doors, rolling grilles, or gates and provide a signal so that operators can respond appropriately. These edge devices are usually attached to, or are part of, the bottom edge of an upward acting door or grille or the leading and/or trailing edge of a moving gate. When a sensing edge detects an obstruction, it will signal the operator to perform one of the following actions on a door/grille/gate:

1. stop during either a closing or an opening movement,
2. stop and open during a closing movement, or
3. prevent a closing action from an open position.

Sensing edges typically are used to protect against entrapment and are often defined in standards, such as the UL 325 *Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems*, as being an acceptable means of providing entrapment protection.

This Technical Data Sheet will help you understand the capabilities of sensing edges and will provide important safety information. It is important to remember that a sensing edge provides a signal to an operator and does not control a door/grille/gate itself.

Note: Refer to the operator instruction manual and contact the operator manufacturer or sensing edge manufacturer for information on compatible sensing edges.

PRINCIPLES

Entrapment protection devices, including sensing edges, in gate/door/grill systems are sometimes described as being "monitored" or "non-monitored." These terms refer to requirements in UL 325 that apply to various types of systems.

Note: Technical Data Sheets are information tools only and should not be used as substitutes for instructions from individual manufacturers. Always consult with individual manufacturers for specific recommendations for their products and check the applicable local regulations.

This Technical Data Sheet was prepared by the members of DASMA's Operator & Electronics Division Technical Committee. DASMA is a trade association comprising manufacturers of rolling doors, fire doors, grilles, counter shutters, sheet doors, and related products; upward-acting residential and commercial garage doors; operating devices for garage doors and gates, sensing devices, and electronic remote controls for garage doors and gate operators; as well as companies that manufacture or supply either raw materials or significant components used in the manufacture and installation of the Active Members' products.

- "monitored" system: the operator system checks for the presence and correct operation of the entrapment protection device. For example, a monitored system will detect a short or open condition in the edge device or its wiring.
- "non-monitored" system: the device is not checked for presence and correct operation. A non-monitored operator system will not detect faults in the circuit. It is important to test the activation regularly along the entire length of the sensing edge. An open or short in the wiring to the operator or in the edge will result in loss of signaling capability until the circuit is restored.

TYPES OF EDGES

There are several different types of sensing edges, as follows:

Contact Sensing Edges

- **Pneumatic Sensing Edge**

A pneumatic sensing edge is a flexible astragal or profile enclosing an air chamber along the full length of the astragal. The air chamber can also be defined through an additional rubber or plastic tube inside the astragal. The seal on the ends can be made with a plug or glued endpiece. A hose/tube exiting any side of the air chamber (e.g. through one of the plugs or through the back of the profile) leads to the pneumatically activated electric switch that is connected to the control circuit of the motor operator. When a door/grille/gate closes on an obstruction, the pressure in the edge/tube increases and activates the electric switch, thus activating the sensing edge circuit. Sensitivity of the electric switch should be adjusted, if necessary, per manufacturer's recommendations.

If the air chamber is damaged (e.g. punctured, the tube is cut open or an end plug falls out), the sensing edge may not function properly. In order to prolong the life and effectiveness of the sensing edge, the edge or, where applicable, the tube inside the pneumatic sensing astragal, should not be compressed when the door/grille/gate is closed. Stops can be attached to the door/grille/gate to prevent a compressed astragal/edge from occurring. Always follow the manufacturer's recommendations.

- **Electric Sensing Edge**

An electric sensing edge typically consists of two (2) adjacent conductive materials inside an astragal. These conductive materials are normally separated by a small gap. When the astragal is compressed, the conductive materials make contact, thus activating the sensing edge signal.

The signal may be monitored or non-monitored by the operator system.

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Electric sensing edges typically are configured as follows: 2-wire normally open [non-monitored], 2-wire terminated [monitored], 4-wire normally open [monitored], 2-wire normally closed [monitored]. In the 4-wire configuration, external wires are connected to both ends of the conductive materials. In the 2-wire terminated configuration, component(s) such as capacitor, resistor, diode, or any means that could be used as a part of the monitored system is/are connected across the two adjacent conductive materials at the end of line (opposite to the wire exit end).

- Optical Electronic Sensing Edge

An optical electronic sensing edge typically consists of a light transmitter and a light receiver plugged into an astragal. When the astragal is compressed the light beam is blocked, thus activating the sensing edge. The system could contain self-monitoring circuitry to detect faults occurring from light beam blockage, wiring opens/shorts, and loss of power. The edge signal may be monitored by the operator system.

Non-Contact Sensing Edges

- Capacitance Sensing Edge

A capacitance sensing edge is a non-contact sensing system consisting of a flexible astragal with an integrated sense antenna that is a part of a powered closing device. Connected to this sense antenna are electronics that create a field that surrounds or precedes the closing device. The field will sense conductive objects, such as individuals or metal items, in its path before contact is made. When an obstruction is sensed, the circuitry will send a signal, thus activating the sensing edge. (Note: Non-conductive materials like paper, wood, and plastic will not be detected.)

- Light Beam Sensing Edge

A light beam sensing edge is a non-contact sensing system consisting of a light transmitter and a light receiver plugged into a holder that travels with the door. When an obstruction blocks the light beam, the sensing edge is activated. The system could contain self-monitoring circuitry to detect faults occurring from light beam blockage, wiring opens/shorts, and loss of power. The edge signal may be monitored by the operator system.

MEANS OF CONNECTIONS

- Hard Wire

Connecting the edge sensor to the operator controls with wires, typically achieved through a coiled cord or retractable reel.

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- Inductive Signal Transmission

Connecting the edge sensor to the operator through a touchless connection along heavy duty steel cable without need for periodic maintenance due to servicing batteries.

- Wireless

Paired wireless transmitters and receivers can be used to send signals from sensing edges to the door/grille/gate operator in place of “hard wires”. They are part of the monitored or non-monitored system. The transmitter sends a signal when the sensing edge is activated.

Common wireless transmitter systems are radio frequency (RF) and infrared (IR). RF system range and operation may be affected by metal objects, EMI (electromagnetic interference), or RFI (radio frequency interference). Receiver antennas should be located as far away from the metal enclosure of the door/grille/gate control as possible. IR systems usually require an unobstructed line of sight between the transmitter and receiver. Periodic maintenance is required to ensure system integrity (such as servicing batteries).

IMPORTANT SAFETY INFORMATION

Refer to the operator instruction manual and contact the operator manufacturer or sensing edge manufacturer for information on compatible sensing edges.

- Sensing edges must be installed, visually inspected, and tested in accordance with the manufacturer’s written instructions.
- Check for damage to the sensing edge and the wiring between the sensing edge and the motor operator regularly as noted in the manufacturer’s instructions.
- Test stopping capability regularly as noted in the manufacturer’s instructions.
- DASMA recommends that installers of doors, grilles and gates verify that all functions of the door/grille/gate and the operator are working correctly according to the manufacturer’s installation instructions and also verify that the sensing edge works properly.
- manual control of the door/grille/gate only if provided by the motor operator.

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