OPERATOR & ELECTRONICS DIVISION
DASMA 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 horizontally 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.

- "monitored" system: the edge/operator system checks for the presence and correct operation of the entrapment protection device. Therefore, a monitored system will detect any 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 edge/operator system will not detect faults in the circuit. It is important to test the activation monthly along the entire length of the sensing edge. Any 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:

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.

To achieve proper operation of the door/grille/gate, the electric air switch should be adjusted to the highest possible sensitivity taking into account (leaving margin for) possible temperature changes (e.g. moving from sun to shadow). If the triggering of the edge/switch works fine with factory settings when tested, adjustment might not be necessary.

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.

Electric Sensing Edge

An electric sensing edge 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 edge/operator system.

Electric sensing edges may be configured as follows: 2-wire normally closed (monitored), 4-wire normally closed (monitored), or 2-wire normally open (non-monitored). In the 4-wire configuration, external wires are connected to both ends of the conductive materials

Optical Electronic Sensing Edge

An optical electronic sensing edge consists of a light transmitter and a light receiver. When a door/grille/gate contacts an obstruction, the light beam is interrupted, thus activating the sensing edge circuit. The system contains self-monitoring circuitry to detect faults occurring from eye blockage, wiring opens/shorts, and loss of power. The transmitter and receiver may be inserted into the weather seal (astragal) or inserted into a holder.

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.)

Transmitters

Though wireless transmitters and receivers are not types of sensing edges, they can be used to send signals from sensing edges to the door/grille/gate operator in place of “hard wires”, i.e., coil cords, retracting reels, etc. The transmitter is activated when the sensing edge is contacted.

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 high as possible or away from the metal enclosure of the door/grille/gate control. IR systems 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 monthly.
- Test stopping capability monthly or more frequently if 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.
- Fault conditions may be overridden by manual control of the door/grille/gate only if provided by the motor operator.