Stanley Access Technologies

Installation and Operating Manual

Stanguard™ Threshold Sensor Installation and Operation

203768

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Stanley Access Technologies

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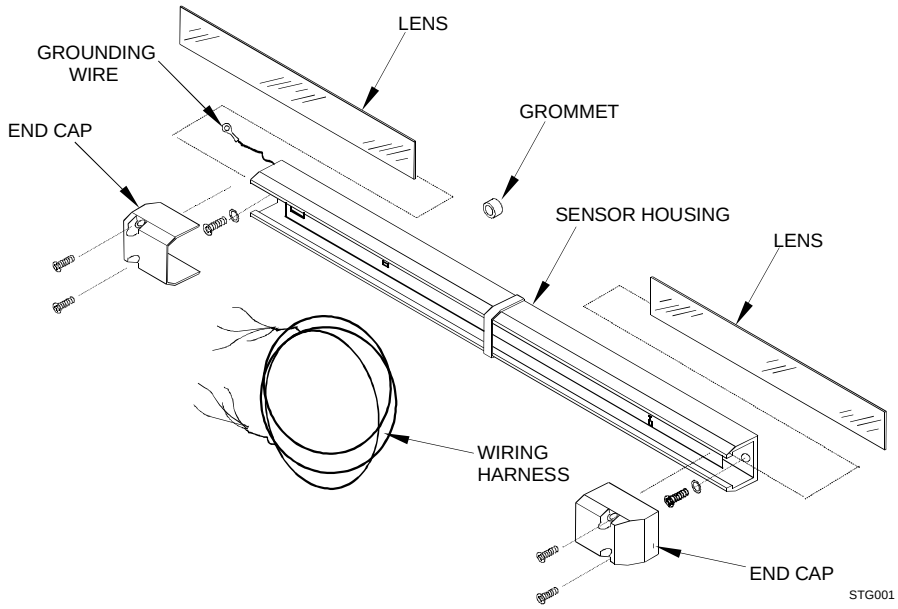
1. PURPOSE

1.1 Discussion

This manual provides component description information, principles of operation, installation instructions, and tune-in instructions for the Stanguard™ threshold sensor. The Stanguard threshold sensor is factory installed on door packages supplied by Stanley. The installation instructions provided in this manual describe installation of the sensor as a retrofit. Figure 1 illustrates the Stanguard threshold sensor assembly.

Figure 1. Stanguard Threshold Sensor Assembly



1.2 Applicability

Three configurations of the Stanley Access Technologies Stanguard threshold sensor are installed in the field: the original Stanguard, Stanguard Rev. E, and Stanguard with auto-tune. This manual is applicable to *only* Stanguard with auto-tune. This unit is a direct replacement for earlier versions of Stanguard. Replacement is recommended when earlier versions of the product cannot be adjusted to meet ANSI A156.10 specifications.

2. PREREQUISITES

2.1 Electrical work has been completed.

2.2 Finished floors and walls are installed. (These affect sensor detection zones and sensitivity.)

2.3 Protective barrier (caution/warning tape) has been set up to prevent unauthorized access to work area.

2.4 Attachment 1 has been reviewed for the following:

- Definitions of the terms used in this procedure
- A listing of the additional documents required during this procedure
- A listing of the tools, equipment, materials, and consumables used in this procedure.

3. PRECAUTIONS

3.1 The Stanguard threshold sensor must be adjusted in accordance with ANSI Standard A156.10, "American National Standard for Power Operated Doors." Stanley-trained personnel must perform adjustment.

3.2 If any equipment in the vicinity of the door appears to create a safety hazard, notify the Construction Superintendent or Building Manager.

3.3 When running power cords, make certain there are no trip hazards.

3.4 Block off work area to protect unauthorized personnel from hazards during work.

4. COMPONENT DESCRIPTION

4.1 General

4.1.1 The Stanguard threshold sensor is a programmable active infrared (IR) presence-sensing device. The presence of a person or object in the detection zone causes the reflection of IR light and activates the sensor. When the Stanguard sensor is activated, the sensor causes the door to remain open for as long as the person or object remains in the detection zone. Once the detection zone is clear, a built-in time delay extends the "hold-open" signal for 1.5 seconds.

4.2 Features and Functions

4.2.1 Automatic Retuning: Following initialization, the Stanguard threshold sensor automatically maintains its calibration and makes changes to its reference settings. Automatic retuning allows the door to compensate for gradual variations in temperature and illumination. The retuning sequence occurs for as long as the door is active and the detection zone is clear.

When the door has been closed for a longer time (such as overnight), or when a large variation in the detection zone occurs (such as a change to the number and positions of objects in the detection zone), the door may need to reinitialize. This allows the sensor to readjust to the objects in the detection zone. For example, if a store display or literature rack has been placed in the Stanguard detection zone, the sensor will detect its presence, but recognize it as a permanent object and not cause the door to remain open.

Reinitialization occurs automatically after the door has been held open by the sensor for more than the selected wait time (1 minute or 5 minutes). When power to the door is cycled, the initialization sequence occurs automatically. (The retune wait time is automatically set to 1 minute after a failed initialization or when the door has been closed for approximately 25 minutes.)

4.2.2 Operating Mode Selection: The Stanguard sensor can be set for triggered operation or continuous operation. In triggered operation, the sensor must receive a signal from another device—such as a motion sensor—in order to activate. In continuous operation, the sensor operates as long as power is applied—without the need of an external activation signal. In a sliding door application, the sensor must be set for triggered operation.

4.2.3 Frequency Shifting: When two sensors are used on the same door, interference may occur. The frequency selector jumper can be installed to change the frequency of one sensor and eliminate the interference.

4.2.4 Detection Zone Width Selection: To accommodate variations in the door opening width, the Stanguard detection zone can be set to narrow or wide. Selecting the wide detection zone enables all eight IR-emitting diodes. Selecting the narrow detection zone enables only the center four IR-emitting diodes. For slide door openings less than 48 inches the narrow detection zone is recommended. For slide door openings 48 inches or more the wide detection zone is recommended.

4.2.5 Detection Sensitivity Selection: Detection sensitivity can be set to normal or high, depending on the height of the door. For doors 7 feet tall or less, the normal sensitivity

selection is recommended. For doors over 7 feet tall, the high sensitivity selection is recommended.

4.2.6 Infrared Receiver Gain Control: A gain potentiometer is provided to increase or decrease the IR receiver sensitivity.

4.3 Controls and Indicators

4.3.1 Figure 2 illustrates the Stanguard threshold sensor. Table 1 describes the controls and indicators shown in Figure 2.

Figure 2. Stanguard Threshold Sensor Controls and Indicators

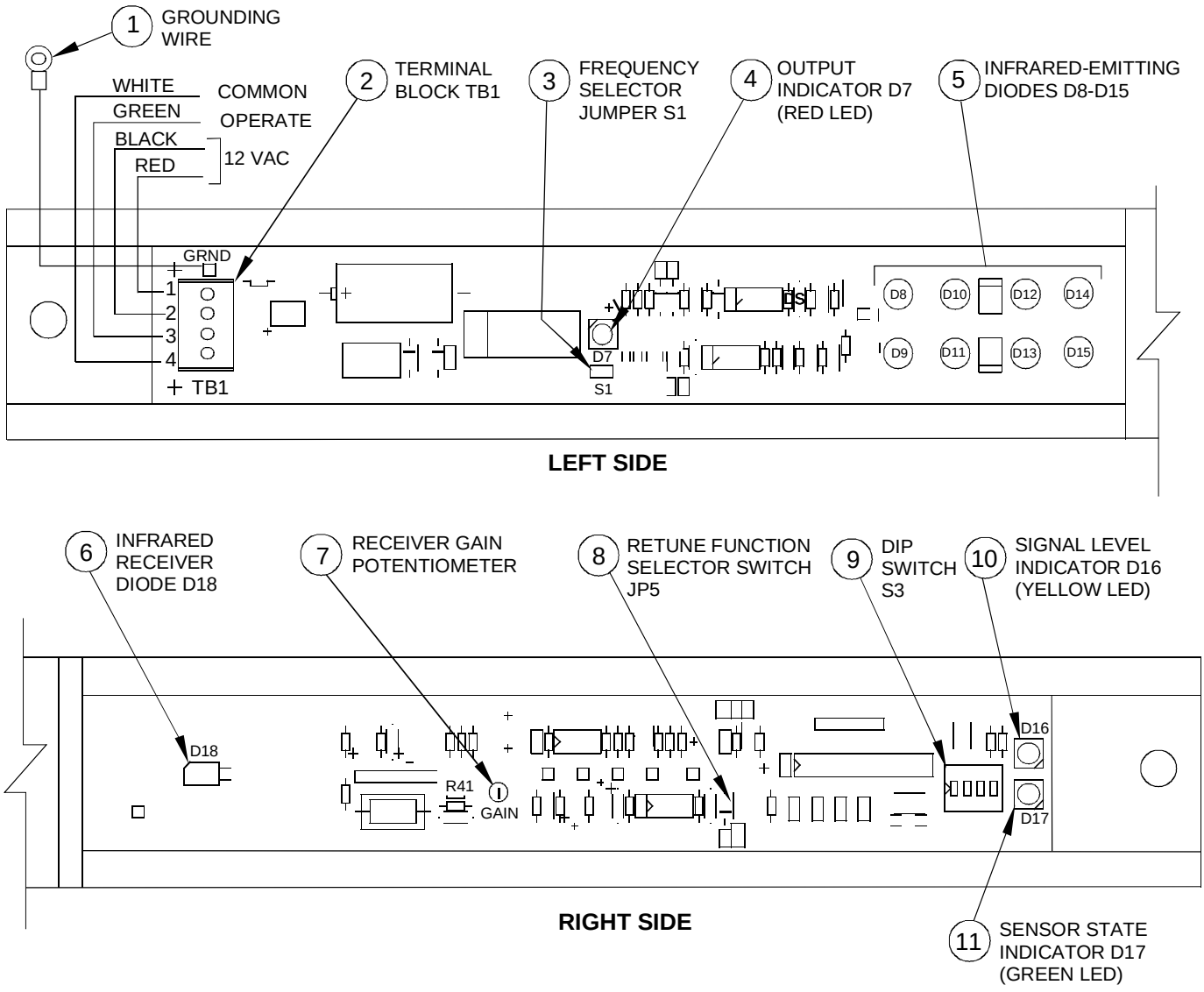


Table 1. Stanguard Threshold Sensor Controls and Indicators

Item	Control/Indicator	Description
1	Grounding Wire	Connects to header to provide ground.
2	Terminal Block TB1	Interface connection. Signal inputs and outputs are as follows: Terminal 1: 12 VAC input power (red) Terminal 2: 12 VAC input power (black) Terminal 3: Operate output (green) Terminal 4: Signal common (white) Output terminals 3 and 4 are polarized. A reverse connection may result in door opening and staying open.
3	Frequency Selector Jumper S1	Two-position jumper shifts sensor operating frequency. Eliminates electronic interference from closely located units on the same door.
4	Output Indicator D7 (Red LED)	Indicates the state of the Stanguard output. When red LED is off, an activation signal is being sent to the door (the Stanguard output contacts are closed). When red LED is on, *no* activation signal is being sent to the door (the Stanguard output contacts are open).
5	Infrared-Emitting Diodes D8 through D15	Provide the infrared source. When a narrow detection zone is selected (DIP switch S3 position 1 set to ON), only the four central IR-emitting diodes (D10 through D13) function. When a wide detection zone is selected (DIP switch S3 position 1 set to OFF), all eight IR-emitting diodes (D8 through D15) function.
6	Infrared Receiver Diode D18	Detects reflected infrared light.
7	Receiver Gain Potentiometer	Adjusts sensor receiver gain. (The sensor receiver measures reflected infrared light. Gain is the measure of receiver sensitivity.) Clockwise rotation increases gain. Counterclockwise rotation decreases gain. After adjusting receiver gain, power can be reset to initiate a retune.
8	Retune Function Selector Switch JP5	Set to ON to disable the retune function. Set to OFF to activate the retune function. When set to OFF, the retune function will be reset, and sensor retuning will occur every time the door is held open by the sensor beyond the 1-minute or 5-minute retune wait time (as selected via DIP switch S3 position 3). The sensor avoids retuning with the door closed by separately detecting this condition. (A closed door is indicated by a flashing yellow light.)
9	DIP Switch S3	Position 1: Detection zone width selection switch. Set to OFF to select wide detection zone (slide opening 48 inches or more). Set to ON to select a narrow detection zone (slide opening less than 48 inches). When a wide zone is selected, all eight IR-emitting diodes (D8 through D15) function. When a narrow zone is selected, only the four central IR-emitting diodes (D10 through D13) function. For openings 48 to 60 inches wide, first try the wide zone. Position 2: Operating mode selection switch. Set to OFF for triggered (threshold sensing) operating mode. Set to ON for continuous (presence sensing) operating mode. (For a sliding door, always set to OFF.) Position 3: Retune wait time selection switch. Set to OFF to select a 5-minute retune wait time when the sensor is holding the door open. Set to ON to select a 1-minute retune wait time when the sensor is holding the door open. For most applications the longer wait time is recommended. The wait time is automatically set to 1 minute after a failed initialization or when the door has been closed for approximately 25 minutes.

Table 1. Stanguard Threshold Sensor Controls and Indicators

Item	Control/Indicator	Description
		Position 4: Sensitivity level switch. Set to OFF for normal sensitivity. (Normal sensitivity is typically used for doors 7 feet high or less.) Set to ON for higher sensitivity. (Higher sensitivity is typically used for doors greater than 7 feet high.)
10	Signal Level Indicator D16 (Yellow LED)	During tune-in or retuning indicates the level of reflected light being received by the infrared receiver diode—if there is sufficient ambient light. This reading is used in the setting of receiver gain. (See item 7.) NOTE: Auto-tune is disabled when the yellow LED is flashing with the door in open position. Yellow LED flashes with the door in closed position.
11	Sensor State Indicator D17 (Green LED)	Indicates whether there is a person or object in the Stanguard detection zone. When door is closed, green LED should be on. When green LED is off, no person or object is in the detection zone. When green LED is on, a person or object is in the detection zone. When green LED is flashing the sensor is initializing or retuning. When green LED stops flashing, initialization or retuning is complete. If the green LED is on and an activation signal is being sent to the door, the red LED is turned off. If no activation signal is being sent to the door, the red LED remains on.

5. PRINCIPLES OF OPERATION

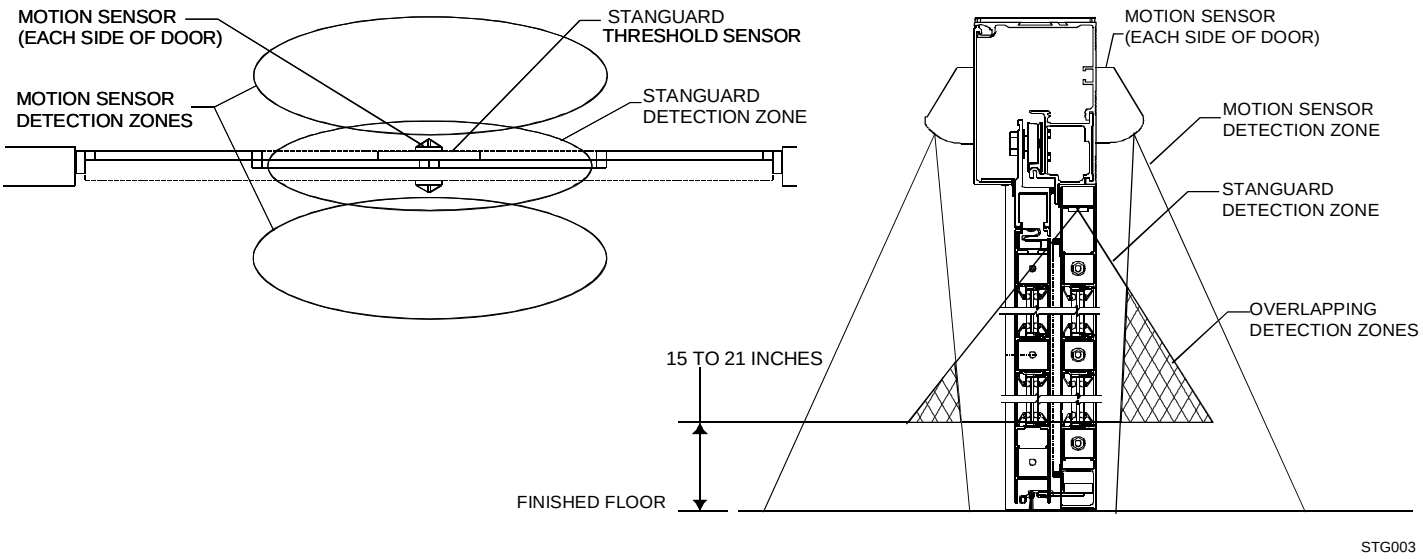
5.1 **Operating Sequence**

5.1.1 The Stanguard threshold sensor typically works in conjunction with two motion sensors—one on the entry side of the door and one on the exit side. This three-sensor system creates overlapping detection zones that provide through-the-door coverage for pedestrian traffic. Figure 3 illustrates the zone patterns for a typical three-sensor detection system.

NOTE

In applications where the door width exceeds 96 inches, two Stanguard sensors and additional motion sensors may be required. In applications where door height exceeds 96 inches, doorway holding beams are required. In push-plate applications, a time delay isolator and door position cut-off switch are required to extend the "operate" signal until the pedestrian reaches the motion sensor detection zone.

Figure 3. Typical Sensor System Overlapping Detection Zones



5.1.2 The three-sensor system operates as follows:

- As the pedestrian enters the approach zone the entry-side motion sensor detects him. An "operate" signal from the entry-side motion sensor opens the door and triggers the activation of the Stanguard threshold sensor.
- As the pedestrian moves through the motion sensor detection zone and into the Stanguard detection zone, Stanguard detects his presence via reflected infrared radiation and causes the door to stay open. The Stanguard threshold sensor remains activated and continues to hold the door open for as long as the person or object remains in the Stanguard detection zone.
- As the pedestrian leaves the Stanguard detection zone, the exit-side motion sensor detects him. Once the exit-side detection zone is clear, the exit-side motion sensor extends the "hold-open" signal for 1.5 seconds or longer, depending on the time delay setting. (The time delay is fixed at 1.5 seconds at the control box; however, longer time delays are available via the motion sensor. If a minimum time delay of 1.5 seconds is not available, an auxiliary time delay isolator must be added.)

5.1.3 The two motion sensors and the Stanguard sensor each have a delay feature that causes the door to remain open for 1.5 seconds following a loss-of-activation signal. The three-sensor safety system must be tuned-in and adjusted so that the detection zones of the two motion sensors and Stanguard threshold sensor properly overlap.

6. INSTRUCTIONS

6.1 Installing the Stanguard Threshold Sensor

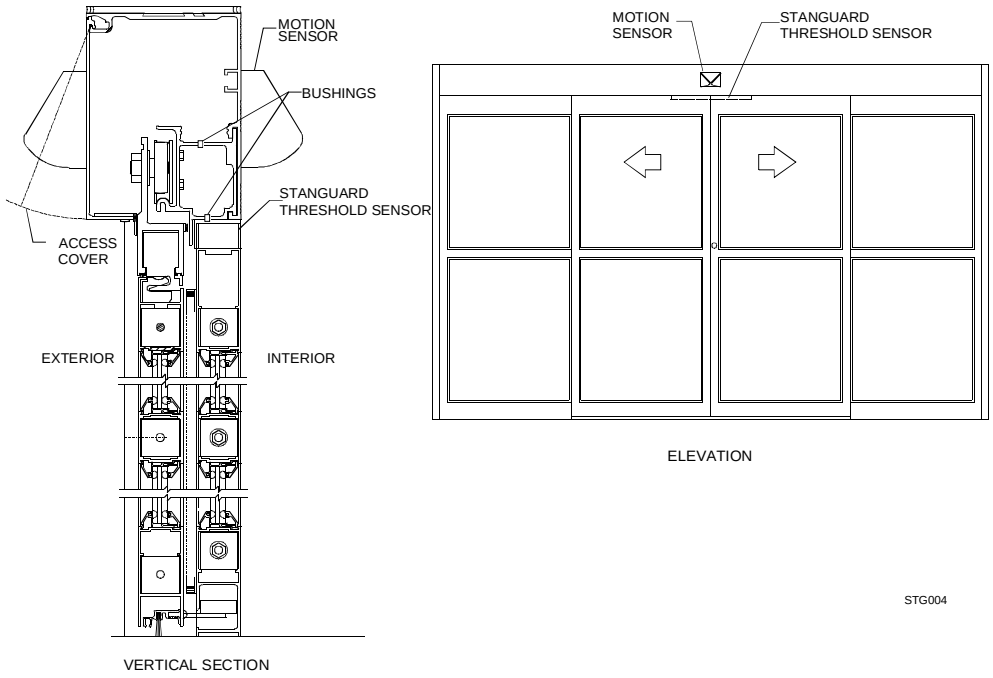
NOTE

1. On a new Dura-Glide or Diamond Series sliding door, the Stanguard is factory-installed. The instructions in this section describe installation of the Stanguard as a retrofit installation.
2. The preferred location of the Stanguard threshold sensor is on the side of the header *opposite* the cover. The sensor must be installed in the center of the *clear door opening*.

6.1.1 REMOVE end caps and lenses from sensor housing.

6.1.2 Refer to Figure 4, and at center of clear door opening width, MARK location of Stanguard mounting holes and end cap mounting holes onto header. ENSURE there is sufficient side clearance for installing lenses and end caps.

Figure 4. Stanguard Threshold Sensor Installation



6.1.3 DRILL two #28 (0.140 inch dia.) sensor mounting holes through header.

6.1.4 Using two #8 x ½ inch pan head self-tapping screws and external tooth washers, FASTEN Stanguard sensor to header, and ENSURE grounding lug is secured between washer and screw head.

6.1.5 Using the two sensor end caps as templates, DRILL four #28 (0.140 inch dia.) end cap mounting holes into header.

CAUTION

When drilling the cable clearance holes through the header, make certain that the circuit board is protected from aluminum debris. Aluminum chips can damage the circuit board.

6.1.6 On terminal block end of sensor, DRILL $^{33}/_{64}$-inch (0.516 inch dia.) entrance and exit cable clearance holes through top and bottom of header.

6.1.7 INSTALL bushings into entrance and exit cable clearance holes in header.

NOTE

To ease routing the four-conductor cable into the header, insert a large drinking straw through the cable clearance hole bushing and then push the cable through the straw.

6.1.8 ROUTE four-conductor cable through cable clearance hole and adjacent to header wiring harness.

6.1.9 Using tie-wraps or wire clamps SECURE cable in header.

6.1.10 Refer to Technical Manual 203728, "Dura-Glide™ 2000-, 3000-, and 5000-Series; Dura-Guard™ 2000 and 3000-Series; Dura-Storm™ 3000-Series; and Diamond Series™ 2000- and 3000-Series Microprocessor Control Box Quick-Reference Guide," and CONNECT Stanguard wiring.

6.2 **Initializing and Tuning-In the Stanguard Threshold Sensor**

NOTE

In most cases, traffic can be permitted through the door during initialization; however, with highly reflective floors (such as white linoleum) it is better to keep the area clear of people and objects.

6.2.1 DEENERGIZE electrical power to Stanguard sensor.

6.2.2 REMOVE sensor end caps.

6.2.3 SLIDE lenses as necessary to access DIP switch S3 and receiver gain potentiometer.

6.2.4 SET DIP switch S3 as follows:

NOTE

1. A narrow detection zone setting is recommended for a slide opening less than 48 inches wide. A wide detection zone setting is recommended for a slide opening 48 inches or wider.
2. A 5-minute retune waiting time is recommended. A 1-minute retune waiting time may be required in high-traffic areas with frequently changing environmental conditions.
3. A normal sensitivity setting is recommended for a door 7 feet tall or less. A high sensitivity setting is recommended for a door taller than 7 feet.

- SET position 1 to ON (narrow detection zone) or OFF (wide detection zone) as required.
- SET position 2 to OFF (triggered operation).
- SET position 3 to OFF (5-minute retune waiting time) or ON (1-minute retune waiting time) as required.
- SET position 4 to OFF (normal sensitivity) or ON (high sensitivity) as required.

6.2.5 ROTATE receiver gain potentiometer fully counterclockwise to minimum gain.

6.2.6 IF two Stanguard threshold sensors are in use, INSTALL frequency selector jumper S1.

6.2.7 SET door function switch to "AUTO."

NOTE

1. When power is applied to the sensor, the sensor microprocessor initializes the system by running an automatic tune-in routine. With a properly functioning door, the initialization should last approximately 25 seconds and the door should open and close once.
2. The gain potentiometer should be set at a point where the yellow LED just comes on when the door is fully open and no one is in the detection zone. Setting gain too high results in excessive sensitivity and causes the door to remain open and the yellow LED to flash.

6.2.8 SET door power switch to "ON."

6.2.9 ADJUST receiver gain potentiometer as necessary to achieve optimum operation.

6.2.10 SET door function switch to "HOLD OPEN," and VERIFY that green LED is *not* flashing.

6.2.11 IF green LED is flashing, PERFORM the following:

a. WAIT approximately 30 seconds until green LED stops flashing.

b. IF green LED continues to flash, ROTATE receiver gain potentiometer counterclockwise to reduce gain.

6.2.12 While standing outside the detection zone, OBSERVE yellow LED, and PERFORM the following:

- IF yellow LED is on, ALLOW receiver gain potentiometer to remain set at minimum.
- IF yellow LED is *not* on, ROTATE receiver gain potentiometer clockwise gradually until yellow LED goes on.

NOTE

The sensor lenses slightly weaken the transmitted and received infrared light. Sensor operation must be verified with the lenses in place.

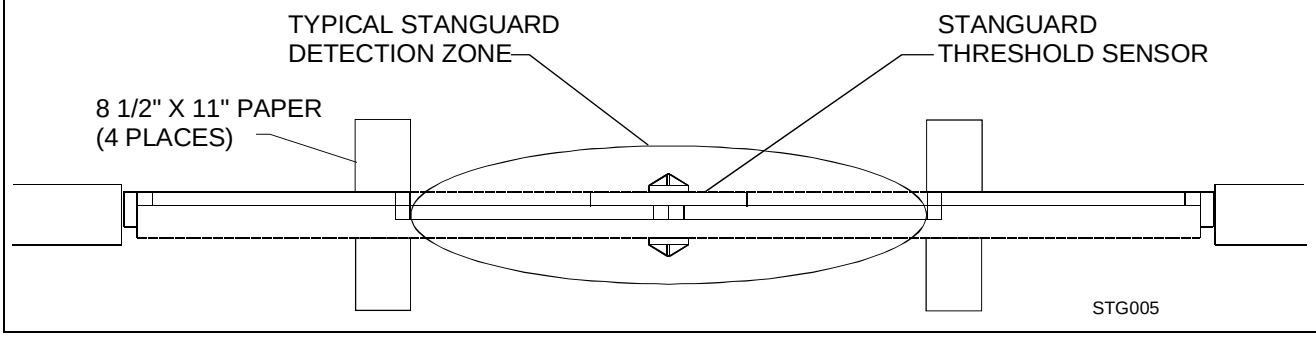
6.2.13 VERIFY sensor operation throughout clear door opening width as follows:

a. SLIDE sensor lenses in place.

b. SET door function switch to "HOLD OPEN."

c. Refer to Figure 5, and POSITION an $8^1/_2$″ x 11″ piece of paper in each of the four outer edge locations shown.

Figure 5. Verifying the Stanguard Detection Zones



NOTE

The ANSI requirement for detection is a minimum of 28 inches from the floor. Detection between 15 and 21 inches from the floor is preferred. If the detection occurs lower than 15 inches, the door may stay open and retune frequently because of reflection from floor. In this case receiver gain may be too high.

d. At each of the four locations, HOLD paper at approximately chest-high level and PERFORM the following:

- Slowly LOWER paper vertically and VERIFY that detection occurs (red LED goes off) between 15 and 21 inches from the floor.

e. IF the paper is *not* detected between 15 and 21 inches from the floor at the clear door opening width, PERFORM the following:

1) IF DIP switch S3 position 1 is set to ON (narrow detection zone) SET switch to OFF (wide detection zone) and REPEAT step 6.2.13.
2) *Slightly* ROTATE receiver gain potentiometer clockwise to increase gain.
3) SET power switch to "OFF," then "ON," and WAIT approximately 30 seconds for sensor processor to initialize.
4) WHEN 30-second initialization is complete, REPEAT step 6.2.13.

f. SET power switch to "OFF," then "ON," and WAIT approximately 30 seconds for sensor processor to initialize.

g. SET door function switch to "AUTO."

h. Refer to Section 6.3, and ENSURE operation of the entire sliding door sensor system complies with ANSI requirements.

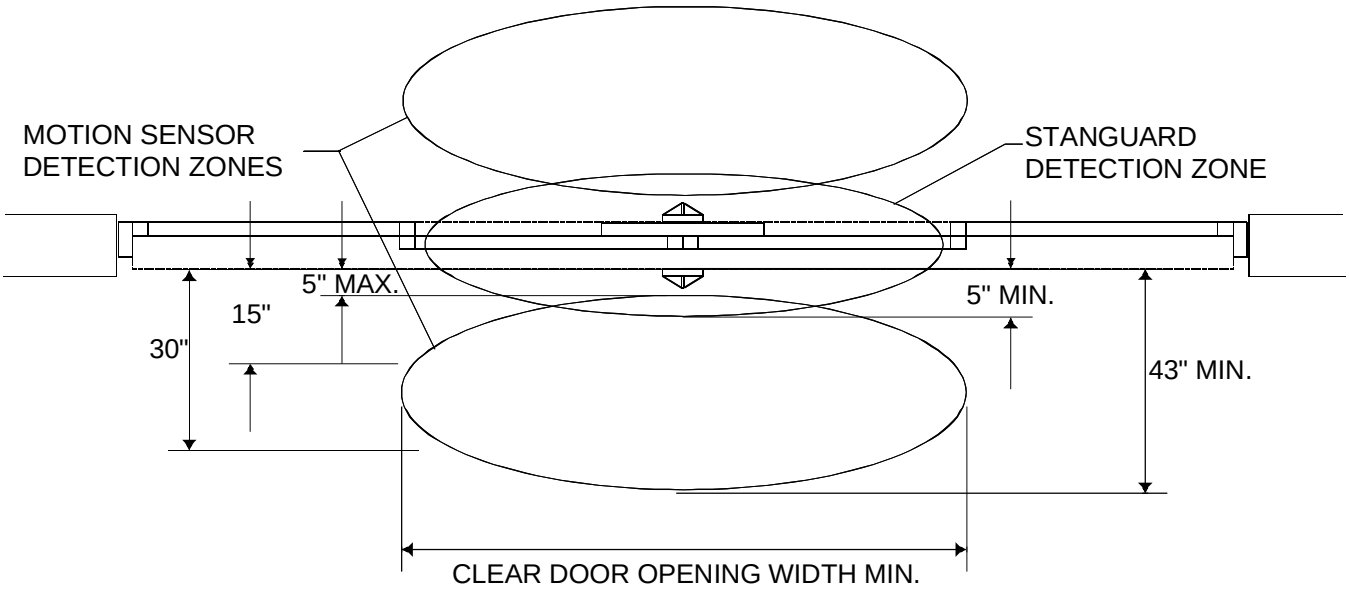
6.3 Tuning-In the Motion Sensors

6.3.1 Refer to Technical Manual 203957, “SU-100 Motion Sensor Installation and Operation,” and TUNE-IN motion sensors.

6.3.2 Refer to Figure 3, and ADJUST motion sensors so that motion sensors and Stanguard threshold sensor detection zones overlap as shown.

6.3.3 Refer to Figure 6, and ENSURE proper adjustment of sensors as follows:

Figure 6. Typical Sensor Detection Zone Requirements



NOTE
DETECTION ZONE REQUIREMENTS APPLY TO BOTH SIDES OF DOOR.

STG006

a. Moving at a speed of 6 inches per second or slower, APPROACH door as it is closing, and VERIFY proper operation from the following angles:

- At approximately the width of the door opening, measured 15 inches out from face of door (both left and right sides).
- At approximately the width of the door opening, measured 30 inches out from face of door (both left and right sides).
- Straight forward at center approximately 43 inches out from face of door.
- Straight forward at center approximately 5 inches out from face of door.

b. IF door(s) do *not* reopen, ADJUST motion sensor angle and sensitivity as necessary.

NOTE

The microprocessor control box provides a fixed factory-set time delay. If a longer hold-open time delay is needed, adjust the motion sensor(s) time delay or install an additional time delay isolator.

c. ADJUST hold-open time delay as required.

6.3.4 WHEN all Stanguard and motion sensor adjustments are complete, INSTALL lenses and end caps onto Stanguard sensor and FASTEN end caps to header.

6.3.5 VERIFY proper operation of sensors.

Attachment 1
Documents, Definitions, Tools, Equipment, Materials, and Consumables
(Sheet 1 of 1)

Documents

- American National Standards Institute (ANSI) Standard A156.10, "American National Standard for Power Operated Doors"
- Technical Manual 203728, "Dura-Glide™ 2000-, 3000-, and 5000-Series; Dura-Guard™ 2000 and 3000-Series; Dura-Storm™ 3000-Series; and Diamond Series™ 2000- and 3000-Series Microprocessor Control Box Quick-Reference Guide"
- Technical Manual 203957, “SU-100 Motion Sensor Installation and Operation”

Definitions

- Clear Door Opening Width: For sliding or folding doors, in the fully opened position the clear opening is measured from the edge of the leading stile to the jamb or jamb stop if present. For a pair of sliding or folding doors, in the fully opened position the clear opening is measured between the edges of the leading stiles of the two doors.
- DIP Switch: (Dual In-Line Package switch) A switch or group of switches that control system parameters or configurations.
- Gain: The measure of receiver sensitivity.
- IR: Infrared
- LED: Light-emitting diode
- Motion Sensor: A sensor designed to detect the movement of a person or object in the vicinity of the doorway and send a control signal to the power-operated door.
- Presence Sensor: A sensor designed to detect the presence of a person or object in the vicinity of the doorway and send a control signal to the power-operated door.
- Time Delay (hold open): The additional time a door stays open after the activating signal is removed. This time can be adjusted.
- Tune-In: Manual reprogramming of the system by a trained individual.

Tools and Equipment (including, but not limited to)

- Electric drill and drill bit set
- Multimeter
- Screwdriver kit
- Wire stripper

Materials (including, but not limited to)

- Stanguard kit

Consumables (including, but not limited to)

- Clean rags
- Paper (8 ½″ x 11″), four pieces
- Degreaser
- Tiewraps, wire clamps (assorted sizes)
- Large drinking straw (for routing sensor wiring)