



Since 1980, PROTECH has been designing, manufacturing, and marketing Perimeter Intrusion Detection Systems (PIDS) to protect personnel, property, and assets at sensitive sites. We manufacture systems that give early warning of potential threats at the perimeter. PROTECH offers a complete range of perimeter intrusion detection systems and technologies including – G-FENCE fence-mounted intrusion detection, infrared beam technology (invisible fences), PIRAMID dual technology motions sensors and video analytic object detection and tracking. Our technology can be integrated with monitoring applications including Protech’s MAXIBUS, Smart Bridge, or Spectra.

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## PASSIVE INFRARED AND MICROWAVE MOTION DETECTOR

### DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

#### MasterFormat 2020

#### 28 31 21.23 Area and Perimeter Intrusion Detection Devices and Sensors

##### Notes to Specifier:

1. Where several alternative parameters or specifications exist, or where, the specifier has the option of inserting text, such choices are presented in **<bold text>**, where the parameter specified in [brackets] is the normal default.
2. Explanatory notes and comments are presented in *colored* text.

## **PASSIVE INFRARED AND MICROWAVE MOTION DETECTOR**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. Section includes an indoor intrusion detection system employing dual intrusion detection technologies.
- B. Product - A system which utilizes passive infrared and microwave Doppler technologies to detect an intruder and designed for indoor operation.
- C. Related Requirements
  - 1. 28 01 30 Operation and Maintenance of Security Detection, Alarm and Monitoring
  - 2. 28 06 30 Schedules for Security Detection, Alarm and Monitoring
  - 3. 28 31 31 Intrusion Detection Interfaces

#### **1.02 REFERENCES**

- A. Reference Standards
  - 1. Electromagnetic compatibility - EU EMC Directives EN 55022, EN 55024

#### **1.03 DEFINITIONS**

- A. Gated Configuration - Technologies must be activated simultaneously to create an alarm.

#### **1.04 SUBMITTALS**

- A. Product Data
  - 1. Manufacturer's printed or electronic data sheets
  - 2. Manufacturer's installation and operation manuals
- B. Shop Drawings
  - 1. Termination points and enclosures

#### **1.05 QUALIFICATIONS**

- A. Manufacturer of system shall have a minimum of five (5) years experience in the design, manufacture, and successful implementation of perimeter sensing systems.
- B. Installers shall be trained and authorized by the Manufacturer to install, integrate, test, and commission the system.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver the equipment system in the manufacturer's original, unopened, undamaged container with identification labels intact.
  - 1. Ship and store the system protected from mechanical and environmental conditions as designated by the manufacturer.

**1.07 WARRANTY**

- A. The Manufacturer shall provide a limited warranty for the system to be free of defects in workmanship and material under normal operating conditions for a period of two years from the date of product shipment.

-- END OF SECTION --

## PART 2 PRODUCT

### 2.01 EQUIPMENT

A. Manufacturer: PROTECH/Protection Technologies, Inc.  
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B. Model: PIRAMID INDOOR SENSORS

*Protech part numbers:*

*Indoor High Security: SDI-76M-HS, SDI-76M-HS1*

*Indoor Version: SDI-76-105XX , SDI-77-105XX*

*Indoor microwave only: SDI-76-MW , SDI-77-MW*

C. Alternates: None

### 2.02 GENERAL DESCRIPTION

A. The passive infrared and microwave motion detector (“detector”) shall combine stereo doppler microwave and passive infrared technologies whereby both technologies activate simultaneously to create an alarm.

B. The stereo doppler microwave portion of the detector shall activate in a gated configuration, whereby an alarm is created upon both movement of an intruder and the change in infrared radiation caused by the intruder.

C. The PIRAMID Indoor shall offer a 95%+ probability of protection and is particularly effective for slow moving, fast moving, and crawling intruders.

D. Detection range and sensitivity shall be adjustable.

E. The detector shall have bird/animal immunity settings. Except on high security model

F. The detector shall have an optional fluorescent filter option.

*Protech model FF-3*

G. High Security (HS) – The Manufacturer shall offer a higher security model providing the following features:

1. Gating option allowing the two sensor technologies to operate independently or in concert.

2. Anti-masking detecting an obstruction in front of the detector faceplate.

3. Remote self-test

4. Tamper-proof mounting.

*The PIRAMID HS offers the above high security features.*

H. Parameters of detection:

1. Direction of movement - differentiation between approaching and receding motion

2. Speed of movement from 3"/sec. to 10 mph ½"/sec
  3. Distance of movement
- I. Coverage pattern – The detector shall offer lens options to provide a minimum of the following coverage areas:
1. 50' L x 50' W (15 m x 15 m) with pet lens option
  2. 100' L x 50' W (30 m x 15 m) with pet lens option
  3. 100'L x 60' W (30 m x 18m)
- Consult factory for specific models and lens combinations.*
- J. Balanced Temperature Compensation: The detector shall maintain stable, consistent detection response when ambient temperature increases or decreases.
- K. Multiple sensors shall be compatible in the same area without mutual interference.

## 2.03 DETAILED SPEIFICATIONS

### A. Electrical

1. Sensors:
  - a. Microwave
    - 1) Operating frequency: 10.525 GHz +/- 25 MHz
    - 2) Radiated power: 25 dBm
    - 3) Number of channels: 5
    - 4) RF Power density 120 µW/cm<sup>2</sup> maximum (at device face)
    - 5) Doppler characteristics continuous wave
  - b. Passive Infrared
    - 1) Detector: dual element pyro-electric
    - 2) Lenses: replaceable Fresnel
  - c. Adjustments: range control, sensitivity, bird/animal immunity
    - 1) Range adjustment: 10% - 100% of stated range
    - 2) Sensitivity adjustment 1-10 multiplier switch
    - 3) bird/animal immunity on/off (not included on HS)
    - 4) and/or switch and/or (only on HS)
2. Output relay: Form C, solid state, 100 mA @ 50 V
3. Power: 10.5 – 28 VDC , 100 mA @12 VDC
  - a. Indicator: Power on.
4. External connections: Removable terminal strip
5. LEDs:
  - a. Testing: Walk Test LED

*The Protech XL-MiniSOUNDER audible tester is recommended in addition to the LED.*

  - b. Power on

B. Alarm Conditions

1. Intrusion
2. Power failure
3. Microwave antenna failure
4. Tamper

C. Mechanical

- a. Housing: aluminum, vandal-resistant
  - 1) Fitting: standard ½" conduit liquid-tight elbow fitting
- b. Mounting: swivel-type with 180° horizontal and 90° vertical adjustment.

*Protech offers optional pole mounts for all models or ceiling mount (except HS)*

c. Dimensions:

- 1) Housing: **<6.70"(L) x 5.4"(W) x 3.5" H (14.9cm x 13.7 cm x 8.9cm)>**  
**<13.2"(L) x 5.4"(W) x 9.4"(H) (33.5cm x 13.7cm x 23.4cm)>**

*The PIRAMID HS is the larger unit.*

D. Environmental

1. Operating Temperature: -40°F to +158°F (-40°C and +70°C)
2. Operating Humidity: 0 – 100% relative humidity

-- END OF SECTION --

## **PART 3 EXECUTION**

### **3.01 INSTALLERS**

- A. The Contractor's installers and technicians shall be factory trained and certified to install, service, and maintain the system.
- B. Contractor personnel shall comply with all applicable state and local licensing requirements.

### **3.02 PREPARATION**

- A. Contractor shall insure that all products to be installed have been verified.

### **3.03 INSTALLATION**

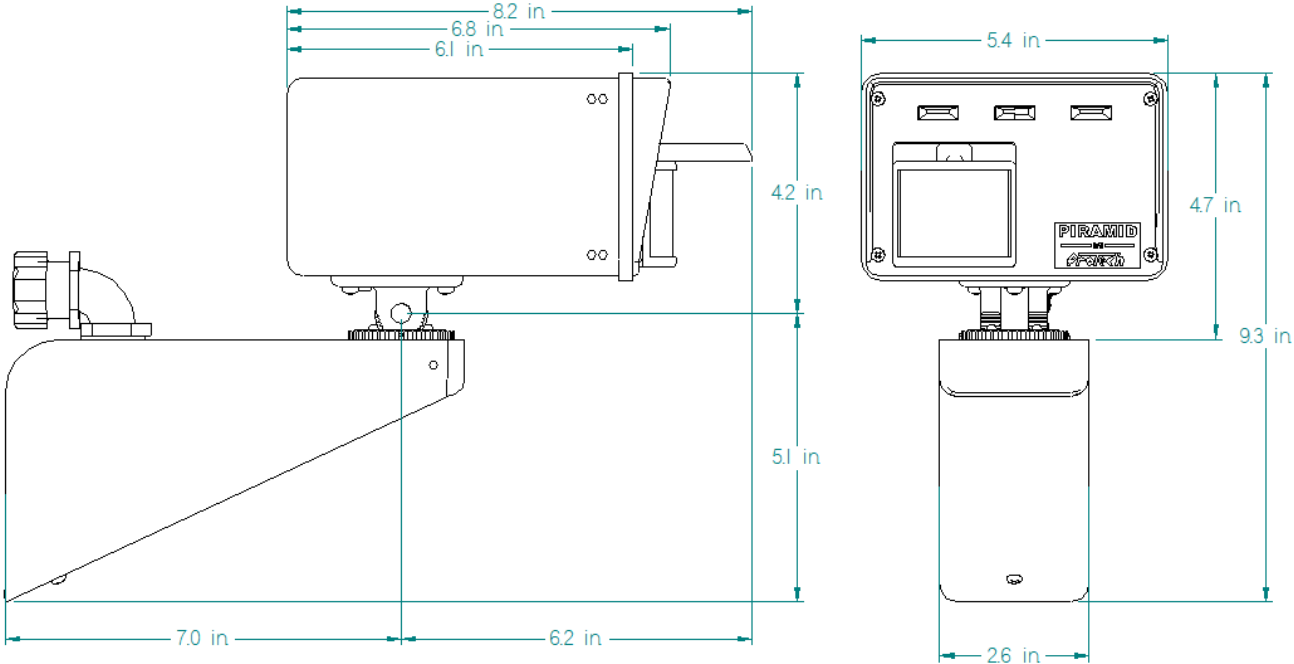
- A. The Contractor shall adhere to all Manufacturer's published installation procedures, diagrams, and guidance.

- END OF SECTION -

**Attachment A**

**Exterior dimensions:**

- **Indoor High Security**



- **Dual Sensor and Microwave only**

