

**ARCHITECTURAL AND ENGINEERING SPECIFICATIONS  
DUAL TECHNOLOGY MOTION DETECTOR  
OUTDOOR PASSIVE INFRARED/MICROWAVE "AND GATE"  
PROTECH PIRAMID XL-HS SERIES**

PART I      GENERAL

1.01      PURPOSE

- A.      The intent of these specifications is to describe the equipment and functional requirements of an outdoor intrusion detection sensor.

1.02      QUALIFICATIONS

- A.      Brand names and catalog numbers included in the equipment or material specifications are used to establish standards of quality and performance characteristics, not for the purpose of limiting competitive bidding.

1.03      DESCRIPTION

- A.      Outdoor motion detectors shall use dual technologies, passive infrared and microwave sensors and shall also be configured so that both technologies must detect an intruder before an alarm is generated.
1. Microwave Sensor: The microwave sensor shall use the "Doppler" principle of transmitting a field of microwave energy into surveillance area so that an intruder's motion disturbs the field, causing the reflected signal to change. The microwave sensor portion shall contain two receiving channels and use the "Stereo Doppler" technique, whereby the two received signals shall be compared to determine whether motion is moving toward or away from the sensor. An intruder moving a short distance (dependent on the sensitivity setting) in one direction shall cause an alarm; however, incidental vibration or fluctuating movement of trees, bushes, swinging signs, etc. shall be rejected by the sensor's circuitry. The 10-position digital *Sensitivity Control Switch* shall adjust the microwave sensor detection sensitivity in 2" (5 cm) increments.

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2. Passive Infrared Sensor: The passive infrared sensor portion shall use a dual element pyro-electric detector. The dual elements shall sense infrared energy, and the voltage output of the dual elements shall be of opposite polarity and combined into a single output. An intruder crossing the sensor field of view will be detected by causing a large voltage swing, first in one polarity and then in the other. However, large area changes in background infrared radiation shall result in a signal of minimum voltage amplitude (and no detection), with the opposite outputs for the dual element detector canceling each other. The *Sensitivity Control Switch* shall not adjust the passive infrared detection sensitivity. Passive Infrared Sensor shall maintain single edged detection at all sensitivity levels.

alarms. B. Sensor's relay shall change state in response to intrusion, tamper, and component failure

1.04

**SYSTEM CRITERIA**

- A. Detection range shall be adjustable.
- B. Detection sensitivity shall be adjustable, enabling the selection of distance an intruder is required to move in one direction before causing an alarm.
- C. Sensor shall have the ability to ignore flying birds.
- D. Balanced Temperature Compensation: Sensor shall maintain stable, consistent detection response when ambient temperature rises above 85 degrees F.
  - 1. Sensitivity of passive infrared portion shall increase substantially as temperature increases.
  - 2. Sensitivity of microwave portion shall remain the same as temperature increases and decreases.
- E. Sensor shall have an adaptive signal processing for extreme environmental conditions. Circuit supervision shall cause a lock-in alarm condition with failure of a major component. System shall not function as a single technology unit.
- F. Multiple sensors shall be usable in the same area without mutual interference.
- G. Sensor shall be equipped with Walk-Test and Environmental Caution Indicator lights with internal disable switch.
- H. Sensor shall be equipped with externally accessible receptacle for plugging-in a sounder during set-up and walk-test.
- I. Sensor shall be equipped with Form C Relay with terminal connections.

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- J. Sensor shall have remote self-test capability to enable sensor to be tested from a remote location in the same manner as if physically walk-tested.
- K. Sensor shall have infrared anti-masking capability which will cause an overall sensor alarm condition when infrared masking is detected.
- L. Sensor shall have remote RF power shut-off capability to enable the microwave radiation to be shut-off from a remote location.
- M. Sensor shall be equipped with housing tamper with terminal connections.
- N. Housing shall be metal, heavy-duty, and vandal resistant. Housing shall be equipped with weather shroud to keep rain and melting snow away from the sensor face. Weather shroud shall also minimize direct sunlight on the IR lens.
- O. Mounting shall be swivel type with 180 degree horizontal and 90 degree vertical adjustment.

**PART II.      SPECIFICATIONS**

**2.01          DESCRIPTION**

A.	Operation	Alarm Output changes state when an intruder moves within protection pattern.
	Standard Protection Patterns	SDI-76XL-HS - 50 ft. x 50 ft. SDI-77XL-HS - 100 ft. x 10 ft.
	Power	8.5-20 VDC, 12 VDC Nominal
	Current	150 mA @ 12 VDC (LED's Off)
	Temperature	-30 to 130 degrees F(-34 to 54 degrees C)
	Humidity	0 to 100% Relative Humidity
	Conduit Knockout	for ½" conduit fitting (equipped with 90degree liquid tight elbow)
	Microwave Frequency Range	10,525 MHz    USA International frequencies upon request
	Relay	Form C, Solid State Relay
	Relay Contact Rating	.1A, 50 V
	Tamper	Contacts closed in normal condition.