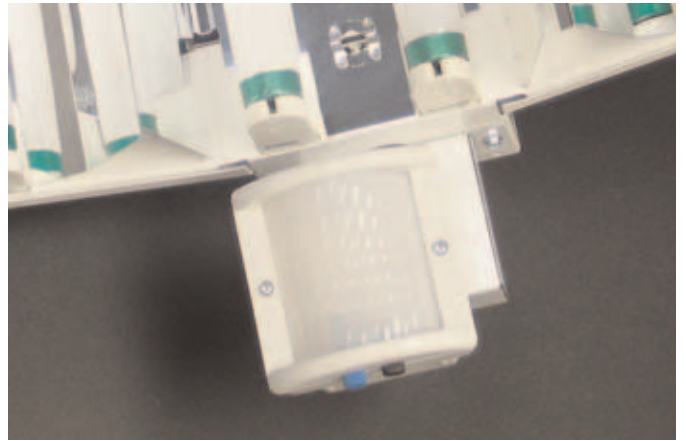


PIP-310/-311 Fluorescent Motion Sensor Installation Notes

CAUTION

- Read and understand these instructions prior to starting installation.
- **TURN THE POWER OFF** before installation. Live installation is hazardous to you and can damage the motion sensor.
- This sensor does not switch both sides of AC line voltage. 480VAC fixtures with unpowered lamps may have hazardous voltage present on the primary side of its fluorescent ballasts.
- This product must be installed in accordance with applicable electrical codes and regulations pertinent to the city of installation.
- Do not use this sensor with fluorescent loads that individually or collectively exceed 400 watts or 5 amps RMS at full power.



Wide Fixture Versatility. PIP-310/-311 motion sensors are designed for use with multiple ballast fluorescent fixtures equipped with programmed rapid start electronic ballasts. The sensor is optimized for fixtures containing four or six fluorescent lamps but can be used with other lamp configurations.

The sensors are available with (PIP-311) or without (PIP-310) fiber optic addressable networking capability. Fiber optic versions are designed to be used with Viewpoint's PSP-311 fluorescent switch packs.

Digital Networking. PIP-311's fiber optic networking is digital and offers advanced features not available with Viewpoint's earlier analog fiber optic products. Earlier analog versions required sensors to be fibered "upstream" from switch packs. Upstream devices could not respond to motion under "downstream" sensors. This limitation is removed with the PIP-311.

PIP-311s communicate bi-directionally in an aisle because the data highway is a closed loop path. Bi-directional communication allows arbitrary sequencing of motion sensors and switch packs within an aisle.

Ballast Compatibility. Don't use PIP-310/-311 products with instant start fluorescent ballasts. Shortened lamp life will result.

The PIP-310/-311 sensor is not compatible with electronic ballasts that offer low-voltage continuous dimming pins. The high-current relays used in the sensor will not reliably switch low-voltage/low-current DC signals typical of continuous-dimming pins.

The PIP-310/-311 sensor does not "dim" the fixture. It reduces the light output of the fixture by selectively de-powering the primary side of ballasts in response to aisle occupancy.

Three Independent Relay Contacts. The PIP-310/-311 sensor contains three independent relays tied to a single common wire. Each relay drives one ballast in the fixture. If the attached fixture contains only two ballasts, one relay in the sensor will remain unused.

If your fluorescent fixtures contain only one ballast, one of PIP-310/-311 primary benefits (ballast rotation) will not be accessible to you. If all of your fixtures contain one ballast, contact Viewpoint for information on lower-cost, single-relay fluorescent motion sensors.

Night-lighting and Ballast Rotation. A night-lighted fixture is one that remains partially ON with a single powered ballast when the aisle is empty. The goal of night-lighting is to provide a minimum level of safety light in an empty aisle.

In older jobsites the night-lighted ballast traditionally

bypassed the motion sensor and was fed continuously from AC mains. Night-lighted lamps reached end-of-life sooner than sensor-controlled lamps. This maintenance problem is magnified in low-activity aisles because re-lamping intervals are dictated by the continuously-powered night-light lamps.

When using PIP-310/-311 sensors, all of the ballasts in night-lighted fixtures are controlled by the sensor. The sensor, based on a set-up parameter in its configuration memory, leaves one ballast powered when the aisle is empty. Each time the aisle activity drops, the sensor rotates the choice of night-lighted ballast to equalize the operating hours of the lamps in the fixture.

For fixtures which are not night-lighted (i.e. they go fully dark when there is no activity in the aisle) PIP-310/-311's multi-relay architecture provides no lamp life extension over single relay sensors.

However, a triple-relay sensor used with every fixture--night-lighted or not--reduces spare parts inventory and simplifies provisioning of fixtures at time of installation.

Sensor Mounting. Viewpoint offers several metal brackets that permit PIP/PSP products to be mounted directly on the ends of popular linear high-bay fixtures. These brackets include a 6-pin connectorized electrical interface.

Several fixture manufacturers offer plug 'n' go versions of their fixtures that directly accept PIP-310/-311 sensors. These fixtures require no drilling or modification and they include internal wire harnesses that are compatible with PIP-310/-311's electrical connector.

Viewpoint will provide customized wire harnesses with connectors to you or a fixture vendor of your choosing. These harnesses replace the fixture wiring on the AC line side of the ballasts.

Home-brew mounting methods. For users who prefer to devise their own sensor-to-fixture mounting Viewpoint offers a "barebones" PIP-310/-311 with an unconnectorized pigtail wire harness. This product ships without a mounting bracket.

Any user-designed mounting configuration must place the sensor sufficiently low on the fixture to avoid blocking the sensor's field of view. But don't mount it too low: strong UV light emitted by the fluorescent lamps will discolor the enclosure of a nearby sensor.

Mounting the sensor remotely from the fixture: Does Viewpoint offer a version with a long STOW cord?

Possibly. Viewpoint's UL-approved strain relief where the cord enters the PIP is currently limited to four wires, not five. Four wires would be sufficient if you plan to switch only two ballasts in the attached fixture.

IR Sensitivity Adjustment. The RANGE setting is factory-preset at half scale and is appropriate for most applications. Sensor range is influenced by the temperature of the floor below the sensor. A warm floor reduces IR contrast and range. A lower RANGE setting is indicated if motion in adjacent aisles motion false-triggers the sensor. Higher RANGE settings give better IR sensitivity but may result in false-triggering from ceiling-mounted HVAC blowers.

PROGRAMMING CONFIGURATION MEMORY

Non-volatile flash memory in the PIP-311 sensor stores four configuration parameters permanently. This memory can be configured by Viewpoint to your specific jobsite requirements prior to shipping. Alternatively, installers can program the memory when the sensor is mated to the fixture.

PIP-311 FLASH MEMORY

| Parameter | Meaning | Values |
|-------------|-------------------|-----------|
| BALLAST# | # of Ballasts | 1, 2 or 3 |
| PRESENT | is fiber present? | 0 or 1 |
| ADDRESS# | node address | 1-31 |
| PARENT LIST | who controls me? | up to 8 |

The *only* method for field programming PIP-311s is to use the VPT-001 Programming Tool. This low-cost hand tool "talks" to the PIP using its fiber optic ports. The programming tool has a digital display and keypad to speed the entry of programmed data.

(See the VPT-001's owners manual for instructions on programming parameters associated specifically with the fiber optic PIP devices.)

JVO: insert picture here later of VPT-001 programmer tool.

VPT-001 Programming tool

PIP-310 sensors are not equipped with fiber optic ports and cannot be configured with the programmer tool. Fortunately, PIP-310 has only one configurable parameter: the number of ballasts in the fixture. The available choices are 1, 2 or 3.

BALLAST=1 makes all three relay contacts close in the presence of motion and open when the aisle is inactive. Choose BALLAST=1 if you have only one ballast. Choose BALLAST=1 if you have two or three ballasts per fixture but do not want "night-lighting". BALLAST=1 causes the attached fixture to go entirely dark when the aisle is empty.

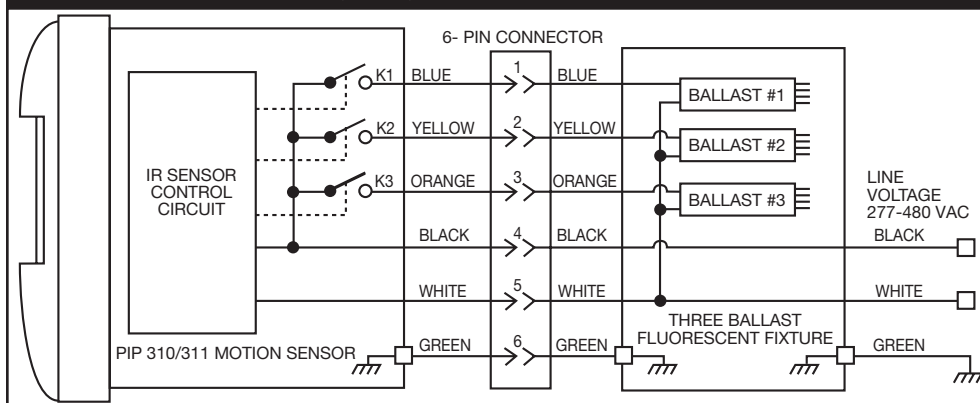
For BALLAST=2 the relay associated with the ORANGE output wire will never close, regardless of aisle activity. Rotated two-ballast night-lighting will be implemented between the yellow and blue outputs.

Selecting BALLAST=3 will implement rotated night-lighting between all three ballasts. This is the factory-default setting.

Pocket Magnet Programming of PIP-310. PIP-310 programming requires a strong pocket magnet to be placed near the TEST SWITCH HERE dot *before* power is applied to the sensor. It is not necessary that the sensor be



Wiring Diagram for 3-Ballast Fixture



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PIP-310/-311 Installation Notes Continued

attached to a live fixture, although the sensor itself must be powered by some external means.

When sensor power is applied with a magnet already present, the red diagnostic LED will begin blinking a repeating burst pattern signaling the current number of ballasts. On an all-new sensor, the pattern will be three closely-spaced blinks per burst repeated every two seconds corresponding to the default BALLAST=3 setting.

If the magnet persists for more than ten seconds the pattern will change to two blinks per burst (BALLAST=2). Ten seconds later it will change again to one blink per burst (BALLAST=1).

The configuration memory "freezes" at the point where the magnet is removed. Store-to-memory is confirmed by leaving the programming mode and returning to the normal operating mode that blinks the LED according to aisle activity.

Verifying BALLAST=x configuration. Attach the sensor to a powered fixture. Bring a pocket magnet near the TEST SWITCH HERE dot *after* power is applied. The sensor will cycle endlessly between the occupied and unoccupied aisle states. If all ballasts turn on and off in unison, BALLAST=1. For BALLAST=2 or BALLAST=3 the attached fixture will evidence rotation between two or three ballasts, respectively.

Blinking Red Diagnostic Lamp. The sensor contains a red LED behind the Fresnel lens that blinks three diagnostic patterns during normal 'no-magnet' operation:

| DIAGNOSTIC LED BLINK PATTERNS | | |
|-------------------------------|-----------------|---------------|
| Pattern | Motion Observed | Fixture State |
| Single | No | Low Power |
| Double | No | High Power |
| Triple | Yes | High Power |

IR Range Adjustment. The RANGE setting is factory-preset at half scale and is appropriate for most applications. Sensor range is influenced by the temperature of

the floor below the sensor. A warm floor reduces IR contrast and range. A lower RANGE setting is indicated if motion in adjacent aisles motion false-triggers the sensor. Higher RANGE settings give better IR sensitivity but may result in false-triggering from ceiling-mounted HVAC blowers.

FIBER OPTIC NETWORKING NOTES

What unique features are offered by the fiber optic PIP-311? The fiber allows the sensors to communicate with each other and with PSP-301 fiber optic switch packs to create control zones within aisles.

Why is plastic optical fiber better than low-voltage copper wiring used in controls systems offered by other manufacturers? Fiber can be used in retrofit jobsites without conduit. The optical fiber can be secured to the outside of conduit using ordinary wire ties. Optical fiber is non-conductive and provides a safe method for networking high voltage fixtures wired to different AC phases.

Why are PIP's fiber connectors color coded? The black connector receives signals from upstream devices. The blue connector transmits signals to downstream devices. Simply stated, blue connectors "talk" to black connectors. Two blue connectors or two black connectors should never be fibered to each other.

Is there a limitation on the maximum number of PIP fiber devices in each aisle? No. Each fiber optic zone must have at least one motion sensor. A zone may include any number of switch packs—even zero. The signal emitted by a blue connector is regenerated at full intensity and clarity compared to the attenuated signal arriving at the black connector, hence there is no maximum aisle length.

However, the spacing between PIP devices is limited to 200 feet—possibly less if you are a sloppy fiber terminator. (See comments below about clean fiber termination.)

Can my eye see the light on the optical fiber? Yes. It's ordinary red light you can see by peering into the end of the fiber. It is visible in short bursts. If you can't see it red bursts, it's probably too weak for the PIP/PSP device to see it either.

What is the dummy plug inserted in the black fiber connector? As shipped from the factory, the

black connector is plugged with a removable white plastic pin to facilitate testing. Without a fiber or pin inserted in the black connector, a PIP-311 may give erratic behavior due to stray light.

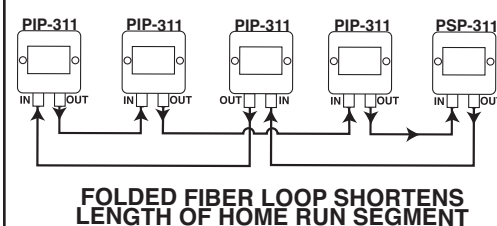
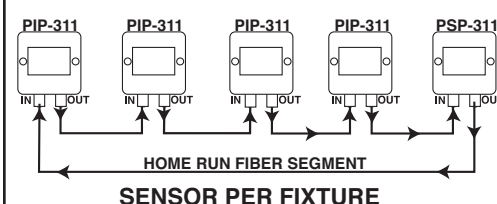
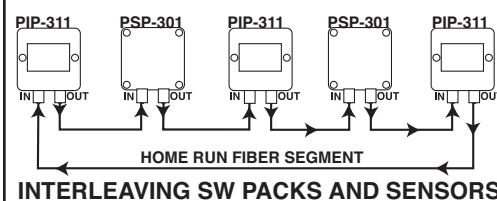
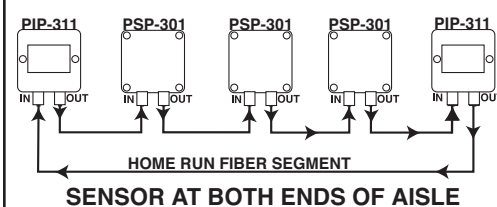
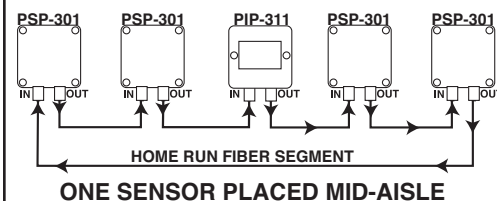
Where can I purchase plastic optical fiber? What are its characteristics? The plastic optical fiber is manufactured by Mitsubishi Rayon under the trade names SUPER ESKA and PREMIER ESKA:

www.pofeska.com/pofeskae/pofe/pofe.htm

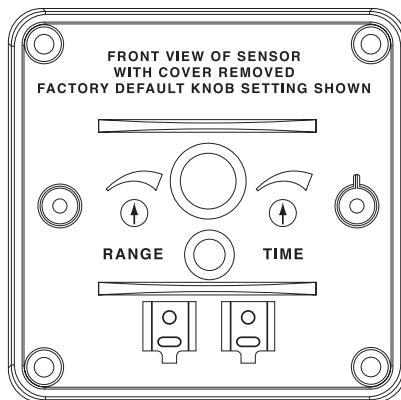
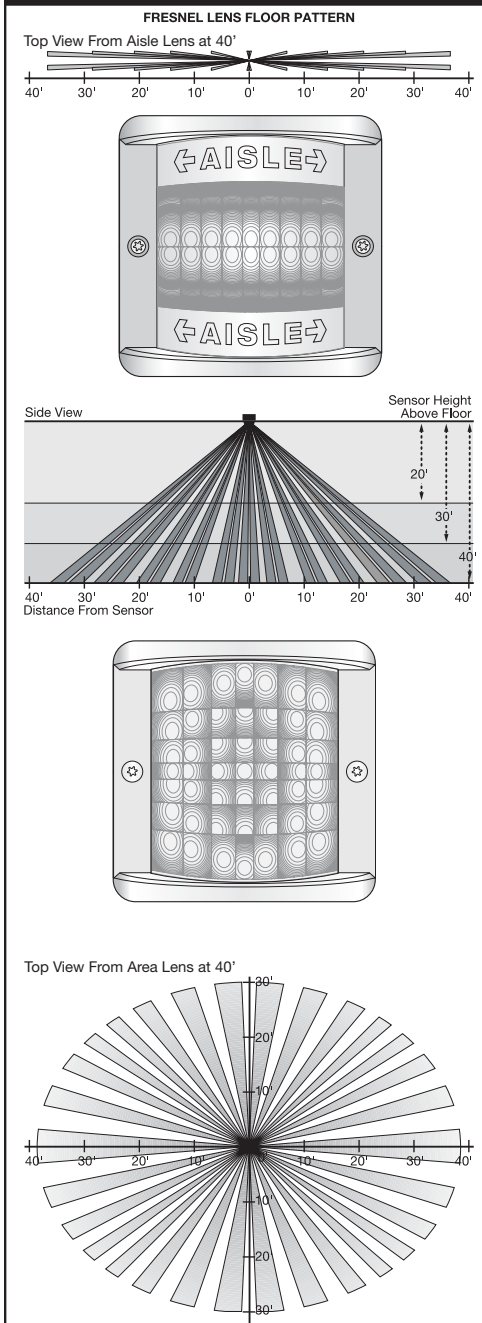
As of 2004 the cheapest version of ESKA suitable for PIP applications is Mitsubishi part number SH4001 with an attenuation of 0.2 db per meter.

This fiber is available in 500 and 1000 meter reels.

Examples of Fiber Optic Networks



Fresnel Lens Floor Pattern



PIP-310/311 SPECIFICATIONS

| | |
|--|---|
| Fixture Compatibility | Multiple-ballast fluorescent |
| Power Reduction Method | Relay-switching of ballast AC mains |
| Ballast Compatibility | Programmed Rapid Start |
| Sensor Switching Rating | 5 amps RMS/400 Watts total |
| Number of Internal Relays | 3 |
| Fixture Line Voltage Compatibility | 240/277/347/480VAC |
| Sensor Power Consumption | 3 watts maximum |
| Usable PIR range | 50 feet on axis at 25°C floor temp |
| Fresnel Lens Pattern/Aisle | Area (PIP-310/311) |
| Ambient Temperature Range | 0-50° C non-condensing |
| Motion-Observed ON time | 0-15 minutes (user adjustable) |
| Maximum No. of Fixtures per Zone | 30 |
| Installation/Debug Assists | Magnetic Test Switch and Blinking LED |
| Mounting Options | 1/2" NPT nipple |
| Mounting Bracket | 1/2"NPT-to-1/2"NPT steel transition plate |
| Wire Harness | 2 Conductor 18AWG stranded copper STOW |
| Wire Harness Length | 48 inches |
| Harness Termination | Bare wire leads or fixture-specific connector |
| Off-center Weight | 22 ounces without optional counterweight |
| Shipping Weight | 2 lbs. |
| Enclosure Dimensions (including mounting nipple) | 7" x 3.25" x 3.25" |
| UL File Number/Category | FNFT File No. E234927 |