

Phoenix Controls Zone Presence Sensor® (ZPS®) detects the presence of personnel in front of a fume hood. When an operator is present, the ZPS signals the fume hood system into the standard, higher flow, mode. When operators are absent, the ZPS signals the fume hood system into the standby, lower flow, mode, thereby maximizing energy savings and system diversity.

## FEATURES

- Used in variable air volume and two-position applications
- Interfaces to Phoenix Controls fume hood monitor to initiate standard and standby operation
- ZPS and Phoenix Controls airflow control valves provide less than one-second response time for full-range flow change
- System fail-safe configured for highest flow set point

## SPECIFICATIONS

### General

- Mounting height field adjustment from 6-12' (1.8-3.7 m) above the floor surface [factory default mounting height setting of 7' (2.1 m) for a six-foot wide hood]
- One ZPS for fume hoods up to 8' or 2.4 m. Consult factory for larger fume hoods.
- Detection zone extends approximately 20" (50 cm) from front of fume hood (adjustable)

### Dimensions

8.875" W x 2.75" H x 1.75" D (225 x 70 x 44 mm)

### Enclosure

Dustproof (NEMA 1, IP21)  
Color—White

### Operating Range

32-122 °F (0-50 °C)  
8202' (2500 m) altitude

### Power Requirements

24 Vac, ±15%, 50-60 Hz, 3 VA  
+15 Vdc, ±15%, 50-60 Hz, 120 mA

### Light Requirements

50-150 foot candles

### Detection Time

<1 second

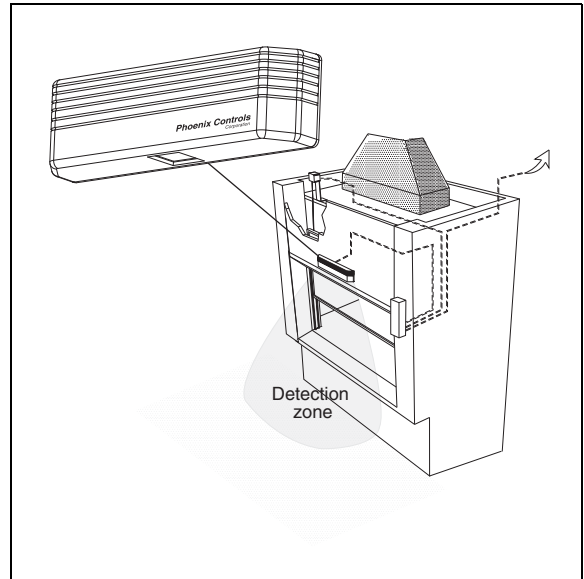
### Setback Time

Adjustable



See wiring diagrams

If the Zone Presence Sensor (ZPS) is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



VAV system using a Zone Presence Sensor.

To detect the presence and motion of fume hood users, the redesigned ZPS uses Charge-Coupled Device (CCD) image sensing technology. CCD arrays are most commonly used in image processing devices. The ZPS does not store, transmit or otherwise make available any optical images.

To detect movement, the ZPS cycles through a three-step process, 10 times each second:

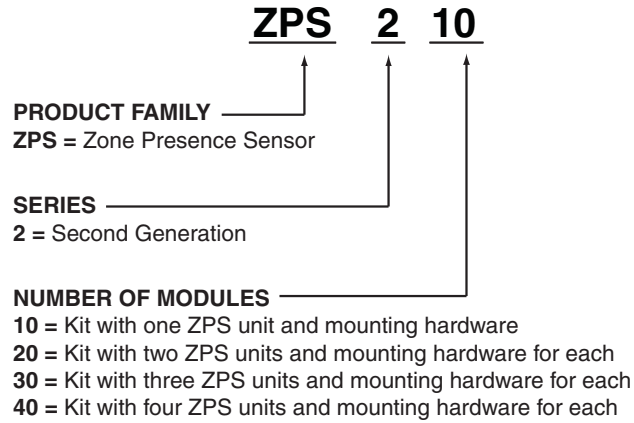
1. The ZPS converts the detection zone image into counts of black and white pixels.
2. The ZPS comparator circuit monitors for differences between the previous counts of pixels and the present counts of pixels.
3. If the pixel count differences are greater than an adjustable sensitivity threshold, the ZPS determines that movement has occurred and the fume hood is then commanded to a higher face velocity set point.

The use of a CCD array is strictly for achieving a high resolution pixel count of the detection area in front of the fume hood.

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## ORDERING GUIDE

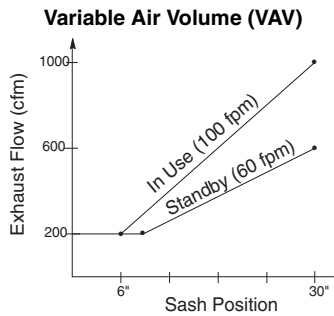


Note: One ZPS for fume hoods up to 8',  
contact Phoenix Controls for larger fume hoods

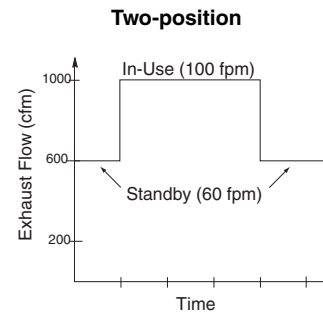
## APPLICATIONS

### Fume Hood Containment

**Face Velocity Control:** The standard FV set point ranges from 60 fpm to 100 fpm (0.3-0.5 m/s). The most common set point is 100 fpm. Fumes can be contained at a reduced FV (e.g., 60 fpm) after an operator has vacated the hood area (please consult your environmental, health and safety specialist).



This graph shows the reduction in flow of a typical VAV fume hood using the ZPS. With no operator present, reductions in airflow are realized throughout the range of sash opening.



This graph shows the reduction in flow of a typical two-state fume hood using the ZPS. With no operator present, the airflow is reduced to a safe standby level—regardless of sash position. The fume hood would require a bypass.

## INSTALLATION

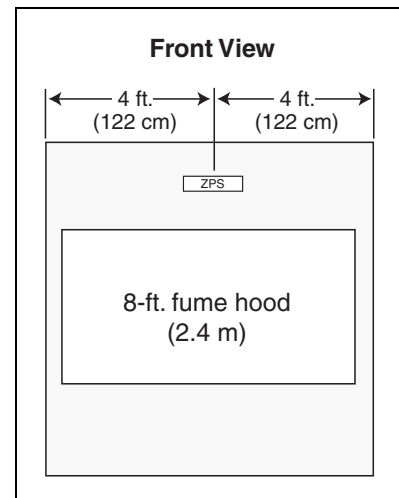
Zone Presence Sensors are surface mounted on the hood by the hood manufacturer or the field controls electrician.

### Physical Installation

Materials required:

- Two sheet metal screws per ZPS (provided)
- Level (*not provided by Phoenix*)

1. Mark a point from 6-12' (1.8-3.7 m) above the finished floor centered laterally on the hood.
2. Remove the ZPS cover and hold the ZPS assembly centered, just above the mark, level to the floor.
3. Using the assembly as a template, mark the mounting holes at both ends and the cable hole onto the hood panel. Be certain the ZPS assembly is oriented as indicated in the ZPS mounting assembly figure on the following page. Set ZPS aside.
4. Drill pilot holes at the marked mounting holes (recommended sizes are from .128" to .148", or 0.325 to 0.375 cm). Drill a 3/4" (2 cm) hole for the cable.
5. Install ZPS assembly using two sheet metal screws.



ZPS position on an 8-foot (2.4-m) hood.

### Retrofit Installation

Materials required:

- Two sheet metal screws per ZPS (provided)
- Level (*not provided by Phoenix*)

1. Remove the older model of the ZPS.
2. Remove the ZPS cover from the new unit and hold the ZPS assembly centered over the old mounting spot.
3. Follow steps 3-5 above.

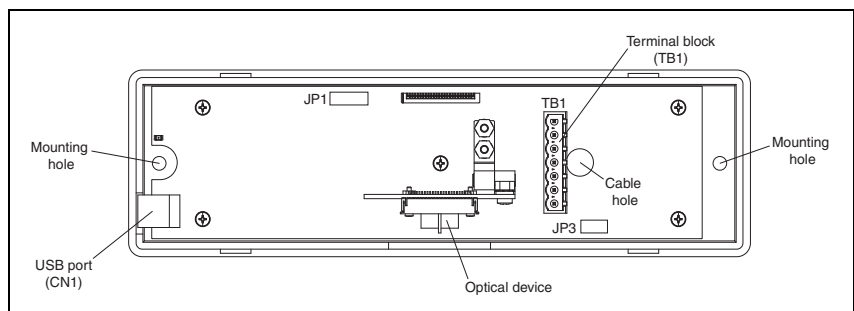
**NOTE:** Because the ZPS110 had a larger footprint, previous holes may need to be filled for aesthetic purposes. Phoenix Controls offers a plastic barbed plug (white) to fill the holes.

### Electrical Installation

Materials required:

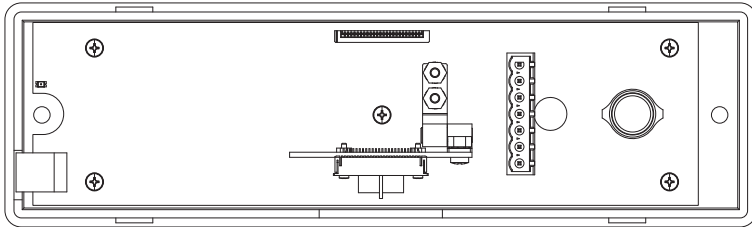
- Phoenix Controls submittal wiring diagrams
- Three cable mounts (provided)
- Cable (*not provided by Phoenix*)

1. Wire ZPS unit(s) as indicated on wiring diagram (see the following page).
2. Attach one cable mount behind the ZPS assembly's mounting surface near the cable hole to secure cable and act as a strain relief.
3. Use the other cable mounts to secure the cable so that the sash will not hit the cable when raised.
4. Reinstall the cover.



ZPS mounting assembly.

**POINTS & WIRING** (see submittal wiring diagram for project-specific details)



ZPS210 board.

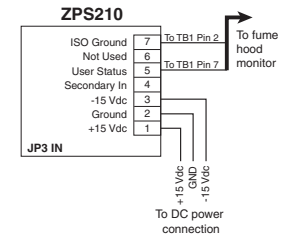
**COMPONENTS**

Device	Function
JP1	Flash programming port
JP3	Jumper: <ul style="list-style-type: none"> <li>IN for last ZPS in chain</li> <li>OUT for all others</li> </ul>
CN1	USB port
TB1	7-pin terminal block

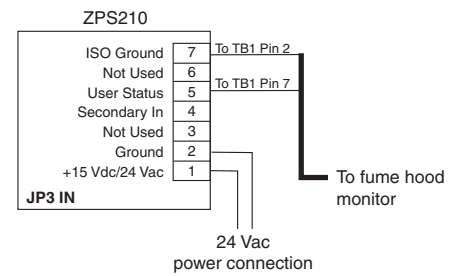
**TERMINAL BLOCK POINTS**

	1	2	3	4	5	6	7
<b>TB1</b>	Volts DC/AC	Ground	—	Secondary In	User Status	—	Isolated (ISO) Ground

**Wiring Detail for ZPS210  
Powered by DC Voltage**



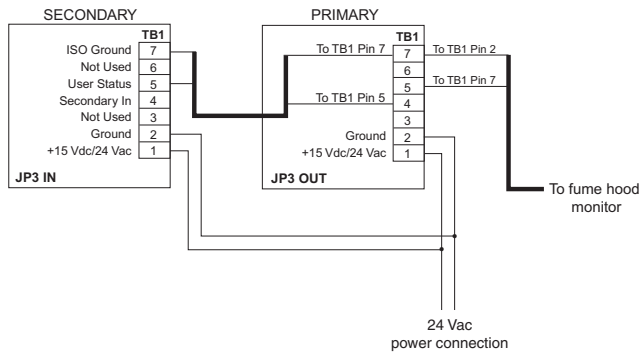
**Wiring Detail for ZPS210  
Powered by AC Voltage**



Wiring for ZPS210.

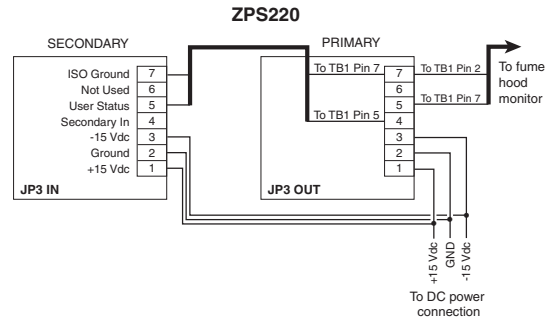


**Wiring Detail for ZPS220  
Powered by AC Voltage**



Wiring for ZPS220.

**Wiring Detail for ZPS220  
Powered by DC Voltage**



## Phoenix Recommended Cabling

Cable Type	Plenum Rated	Function	Wire Gauge	Primary Vendor/Part #	Alternate Vendor/Part #	Color Code	Notes
2C Round	No	24 Vac power to LOSEA or Pneumatic (110' max at load <sup>1,2</sup> )	18	Belden 9409		1: Red 2: Black	Must be stranded
		24 Vac power to HiSea (288' max at load <sup>1,2</sup> )	14	Belden 9411			
2C Round	Yes	24 Vac power to LOSEA or Pneumatic (110' max at load <sup>1,2</sup> )	18	Belden 82740	Windy City NP002360	1: Red 2: Black	Must be stranded
		24 Vac power to HiSea (288' max at load <sup>1,2</sup> )	14	Windy City NP007960			
TP	No	FTT-10 (4500') TP1250 (425')	22	Windy City 107500	Connect Air W221P-1002	1: White/Blue stripe 2: Blue/White stripe	For more alternatives visit: <a href="http://eche-lon.com">eche-lon.com</a>
		FTT-10 (8800')	16	Windy City 109600			
TP	Yes	FTT-10 (4500') TP1250 (425')	22	Windy City 105500	Connect Air W221P-2001	1: White/Blue stripe 2: Blue/White stripe	For more alternatives visit: <a href="http://eche-lon.com">eche-lon.com</a>
		FTT-10 (8800')	16	Windy City 109500			
3C Round	No	Signal	22	Belden 8443		1: Red 2: Black 3: Green	Must be stranded
3C or 4C Round	Yes	Signal	22	Belden 88444	Windy City 004380	1: Red 2: Black 3: Green 4: White (not used as 3C)	Must be stranded
4C Round	No	Signal	22	Belden 8444	Manhattan M13304	1: White 2: Green 3: Black 4: Red	Must be stranded
5C Round	No	Signal	22	Belden 8445	Manhattan M13305	1: White 2: Brown 3: Black 4: Red 5: Green	Must be stranded
8C	No	Signal	22	Belden 9421	Manhattan M13308	1: White 2: Orange 3: Black 4: Red 5: Green 6: Yellow 7: Blue 8: Brown	No substitutes
8C	Yes	Signal	22	Comtran 4956		1: White 2: Orange 3: Black 4: Red 5: Green 6: Yellow 7: Blue 8: Brown	No substitutes

Cable Type	Plenum Rated	Function	Wire Gauge	Primary Vendor/Part #	Alternate Vendor/Part #	Color Code	Notes
3C MS/TP	No	Shielded	22	Belden 3106A (120 ohm)		1: White with Orange stripe 2: Orange with White stripe 3: Blue with White stripe	Shielded with drain
4C MS/TP	Yes	Armored Shielded	22	Belden 1269A (100 ohm)		1: Red 2: Blue 3: Black 4: Yellow	Foil and braided shield with drain
4C MS/TP	Yes	Armored Shielded	22	Belden 123107A (100 ohm)		1: White with Blue stripe 2: Blue with White stripe 3: White with Orange stripe 4: Orange with White stripe	Foil and braided shield with drain
4C MS/TP	Yes	Armored Shielded	24	Belden 82842 (100 ohm)		1: White with Blue stripe 2: Blue with White stripe 3: White with Orange stripe 4: Orange with White stripe	Foil and braided shield with drain Low smoke
4C MS/TP	Yes	Shielded	24	Belden 82729 (100 ohm)		1: White with Blue stripe 2: Blue with White stripe 3: White with Orange stripe 4: Orange with White stripe	Shield with drain
4C MS/TP	Yes	Shielded	24	Belden 88102 (100 ohm)		1: White with Blue stripe 2: Blue with White stripe 3: White with Orange stripe 4: Orange with White stripe	Shield with drain

## MAINTENANCE

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Phoenix Controls Zone Presence Sensors require no ongoing preventive maintenance. Once the field engineer has completed the field setup, the monitors will provide years of continuous operation. Replacement parts are available.

Item	Part Number
ZPS assembly (includes entire assembly and optical device)	889-270-001
Enclosure cover	250-270-013
Plastic barbed plug to fill hole from ZPS110 footprint (white only)	049-500-004

If you use the ZPS Commissioning Software to adjust settings on the ZPS, you will also need to purchase a USB cable to connect your laptop computer to the ZPS. The type of cable you will need is an A-to-B, Male-to-Male Cable Assembly. These cables are available from any store that carries electronic accessories.

The recommended cable length is 10 feet or less. If cables are too long, signal degradation and communication loss can occur.

Detailed instructions for using the ZPS Commissioning Software are available in the *Zone Presence Sensor (ZPS) User's Manual*.

## TROUBLESHOOTING

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In the event of a circuit failure within the ZPS, indication of user status will be at the fume hood monitor. A trained facilities person may troubleshoot the system using the guide below.

Problem	Possible Cause/Solution
Hood does not go into standby operation after operator leaves zone.	A. ZPS cable break or wires have been disconnected. Check cable and termination. B. ZPS has been miscalibrated. Check the calibration settings.