

E68 Series Integral Sensor Valve



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E68 Series Integral Sensor Valve

Product Description

The E68 Series Integral Sensor Valve (ISV) from Eaton's electrical sector is a complete Zero Pressure Accumulation (ZPA) sensing and control solution. This system solves the problem of product damage and mishandling caused by mechanical sensor rollers on outdated ZPA conveyors.

A Complete, Pre-Engineered Solution

The ISV comes complete with all needed components including sensors, air valves, pre-measured connectors, power supplies and accessories. These components simply snap together to provide reliable conveyor control without the need to invest costly engineering time. The compact power supply, designed specifically for our ZPA products, includes an integral junction box to eliminate additional mounting enclosures.

Fast, Low Cost Installation and Retrofit

The unique ISV reduces installation costs by integrating the sensor, valve and control logic into one device. Only one device needs to be installed to provide a full zone's worth of control. Connections between zones are also included, eliminating the need to run any additional wiring. Wiring is optimized for an exact fit, eliminating unsightly cable loops that could be snagged and damaged.

Features

- Self-contained package includes sensor, logic, air valve, and wiring
- Non-contact, true Zero Pressure Accumulation
- Multiple algorithms available to provide the exact functionality you require
- Multiple wiring options available—including NEMA 4

- Low installation costs
- Integrated "beam status" contact available to allow direct integration into AC or DC control systems
- One-touch air fittings for quick installation
- Low-profile package allows easy integration into conveyor side-channel
- System designed with sub-4A 24 Vdc wiring for safety and reduced installation costs
- Easily interfaced to external control systems for singulated discharge and/or slug release
- Highly optimized, low-cost power supply
- Custom brackets and sensor/bracket assemblies available

Standards and Certifications

- UL Listed, E166051
- UL tested to Canadian safety standards
- RoHS Compliant



⚠ DANGER

THIS SENSOR IS NOT A SAFETY DEVICE AND IS NOT INTENDED TO BE USED AS A SAFETY DEVICE. This sensor is designed only to detect and read certain data in an electronic manner and perform no use apart from that, specifically no safety-related use. This sensor product does not include self-checking redundant circuitry, and the failure of this sensor product could cause either an energized or de-energized output condition, which could result in death, serious bodily injury, or property damage.

For the most current information on this product, visit our Web site: www.eaton.com

For Customer Service in the U.S. call 1-877-ETN CARE (386-2273), in Canada call 1-800-268-3578.
For Application Assistance in the U.S. and Canada call 1-800-426-9184.

Product Overview

High Reliability and Flexibility

ISV sensors are available in both polarized reflex and diffuse reflective sensing modes. Polarized sensors eliminate detection errors caused by shiny targets and provide the highest level of high sensing reliability when used at common conveyor widths.

Diffuse reflective models can be installed in low lift-height locations and other areas on the conveyor where it may not be possible to mount a polarized reflex sensor and reflector. These models have an extremely narrow field of view to allow for mounting below the level of the conveyor rollers in certain cases where necessary.

Choose a Sensor to Meet Your Specific Needs

To provide an ideal solution for a wide variety of Zero Pressure Accumulation needs, ISV sensors are available in two different embedded logic modes:

- The Basic Logic Series offers high-throughput smart Zero Pressure Accumulation control. This logic results in singulation and Zero Pressure Accumulation. Each sensor checks the status of the downstream zone and each zone always runs except when both the current and downstream zones are full
- The Progressive Logic Series offers even higher throughput than the Basic Logic. This logic does not singulate product, but does result in Zero Pressure Accumulation. Each zone always runs until all of the zones downstream are full, allowing maximum efficiency.

E68 Series System Components

Sensor



The ISV sensor has been specially designed with upstream communication abilities and internal logic to implement Zero Pressure Accumulation (ZPA) control. When combined with the following components, a complete ZPA conveyor control system can be literally snapped into place on your conveyor. Two versions are available depending upon the control you require: Basic Logic and Progressive Logic (described on this page).

Sensor with Integrated Beam Status Output

These ISV Sensors are the same as standard units in all respects, with the exception of a special output connector that is added to the sensor body. This allows you to conveniently access the beam status output of any zone by simply substituting a special sensor of this type in place of a standard unit. This is useful, for example, at the infeed end of a section of conveyor where a lane full signal is required, as a separate photo-eye need not be mounted.

Power Supply

A 4A Power Supply designed for use with the Conveyor Sensor systems. A single power supply can normally operate up to 50 zones. For more information, see **Page V8-T6-23**.

Power Supply Cable

This cable allows the power supply to be connected to any zone, while allowing use of that zone.

Release Cable

This cable is normally connected to the last zone and is tied to your external control to allow release of product from the conveyor system. The system can be wired to the power supply to enable either singulated product release or slug/train release from the conveyor's discharge end.

Buss Harness (Not required with Daisy-chained models)



The Buss Harness distributes power, slug release signals and provides communications links for Multi-drop versions of the ISV. Made from flat ribbon cable, it is available in 10, 50 and 100 ft lengths and is connectorized at intervals to match your zone length (18 to 60 inches in 6 inch increments). A buss link accessory can be used to join multiple sections together, while a zone jumper accessory may be used to skip unused zones. This harness is only required for Multi-drop connection versions of the ISV (described on this page).

It's So Easy to Get Started, All That's Needed Is ...

- Your conveyor zone length(s)
- Preferred ZPA algorithm
- Preferred connection style (see below)


Daisy-chained connection with NEMA 4 sealed micro-connectors




Product Selection

Basic Logic Sensors

Polarized Reflex ^①


| | Sensing Range | Optimum Range | Field of View | Connection Type | Operate Mode ^② | Option | Standard Catalog Number |
|--|---------------|-------------------------------|--|------------------------|---------------------------|----------------------|-------------------------|
|  E68-SVSPR3-B_ | 10 ft (3m) | 0.1 to 8 ft (0.03 to 3.6m) | 3 in (76 mm) diameter at 12 ft (3.6m) | Daisy-chain— NEMA 4 | Air to drive | — | E68-SVSPR3-BLP |
| | | | | | | Isolated beam output | E68-SVSPR3-BLP-B |
| | | | | | Air to brake | — | E68-SVSPR3-BDP |
| | | | | | | Isolated beam output | E68-SVSPR3-BDP-B |

Diffuse Reflective ^③


| | Sensing Range | Optimum Range | Field of View | Connection Type | Operate Mode ^② | Option | Standard Catalog Number |
|--|---------------|-------------------------------|---|------------------------|---------------------------|----------------------|-------------------------|
|  E68-SVSSD1-B_ | 3 ft (1m) | 0.2 to 2 ft (0.06 to 0.6m) | 0.2 in (5 mm) diameter at 2 in (51 mm) 6 in (152 mm) diameter at 5 ft (1.5m) | Daisy-chain— NEMA 4 | Air to drive | — | E68-SVSSD1-BLP |
| | | | | | | Isolated beam output | E68-SVSSD1-BLP-B |
| | | | | | Air to brake | — | E68-SVSSD1-BDP |
| | | | | | | Isolated beam output | E68-SVSSD1-BDP-B |

Progressive Logic Sensors

Polarized Reflex ^①

| | Sensing Range | Optimum Range | Field of View | Connection Type | Operate Mode ^② | Option | Standard Catalog Number |
|--|---------------|-------------------------------|--|------------------------|---------------------------|----------------------|-------------------------|
|  E68-SVSPR3-P_ | 10 ft (3m) | 0.1 to 8 ft (0.03 to 3.6m) | 3 in (76 mm) diameter at 12 ft (3.6m) | Daisy-chain— NEMA 4 | Air to drive | — | E68-SVSPR3-PLP |
| | | | | | | Isolated beam output | E68-SVSPR3-PLP-B |
| | | | | | Air to brake | — | E68-SVSPR3-PDP |
| | | | | | | Isolated beam output | E68-SVSPR3-PDP-B |

Diffuse Reflective ^③

| | Sensing Range | Optimum Range | Field of View | Connection Type | Operate Mode ^② | Option | Standard Catalog Number |
|--|---------------|-------------------------------|--|------------------------|---------------------------|----------------------|-------------------------|
|  E68-SVSSD1-P_ | 3 ft (1m) | 0.2 to 2 ft (0.06 to 0.6m) | 0.2 in (5 mm) diameter at 2 in (51mm) 6 in (152 mm) diameter at 5 ft (1.5m) | Daisy-chain— NEMA 4 | Air to drive | — | E68-SVSSD1-PLP |
| | | | | | | Isolated beam output | E68-SVSSD1-PLP-B |
| | | | | | Air to brake | — | E68-SVSSD1-PDP |
| | | | | | | Isolated beam output | E68-SVSSD1-PD |

Notes

- ① Ranges based on a 3 in diameter retroreflector.
- ② "Air to drive" refers to a conveyor system where air pressure must be supplied to air cylinders to cause the conveyor to run.
"Air to brake" is just the opposite where air pressure must be supplied to air cylinders to cause the conveyor to stop.
- ③ Sensors will detect a 90% reflectance white card at this range.

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Conveyor Sensor Systems

E68 Series Integral Sensor Valve

Accessories

Cables

Sensor Output Cables

| Length | Description | Used with Sensors | Catalog Number |
|---------------------------------|---|-------------------|----------------|
| Beam Status Output Cable | | | |
| 1m | Wires from the beam status output connector on the sensor to a remote PLC or other controller | E68....-xyz-B | E68-SVABEAM-1 |



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Power Supply Cables

| Length | Description | Used with Sensors | Catalog Number |
|------------------------------------|---|-------------------|----------------|
| Power Supply "T" Connection | | | |
| 2m | This cable allows the power supply to be connected between any two zones, while allowing use of those zones. For best results, the power supply cable should be connected at the center of the zones being powered. Tinned leads on power supply end. | E68....-xyC | E68-SVAPWR-C2 |
| | | E68....-xyP | E68-SVAPWR-P02 |
| | 12 mm DC-key connector on power supply end. | E68....-xyP | E68-SVAPWR-P2 |
| Power Supply | | | |
| — | 27 Vdc, 100W; short-circuit, overload and overvoltage protection (cycle power to reset). Power supply can normally power up to 50 ISV zones. See V8-T6-24 for more details. | E68.... | PS256B-01B1 |



Release Cables

| Length | Description | Used with Sensors | Catalog Number |
|---|---|-------------------|----------------|
| Release Cable—With Release Connection Only | | | |
| 2m | This cable is connected to the last zone and allows singulate or slug discharge control from an external system. Release connections only are provided. | E68....-xy | BUS266REL-01B1 |



Zone Extensions and Jumpers

Zone Extension Cable

| Length | Description | Used with Sensors | Catalog Number |
|---------------|------------------------------------|-------------------|----------------|
| E68-SVAEXT-P1 | 1m Used for zone lengths >36 in | E68....-xyP | E68-SVAEXT-P1 |



Power Jumper

| Length | Description | Used with Sensors | Catalog Number |
|----------------|---|-------------------|----------------|
| E68-SVAJMP1-P5 | 5m Used to slave an asynchronous ZPA chain—does not pass accumulation signals. | E68....-xyP | E68-SVAJMP1-P5 |



Power Isolation Cable

| Length | Description | Used with Sensors | Catalog Number |
|--------------|--|-------------------|----------------|
| E68-SVAISO-P | 2 ft (0.6m) Used to isolate parallel power supplies on an extended ZPA chain. | E68....-xyP | E68-SVAISO-P |



Slug Isolation Cable

| Length | Description | Used with Sensors | Catalog Number |
|---------------|--|-------------------|----------------|
| E68-SVASLUG-P | 2 ft (0.6m) Used to break a slug release signal to affect closer control of product release. Insert between any two zones, and a slug release signal is isolated from all upstream zones. | E68....-xyP | E68-SVASLUG-P |



Power Curve Delay Module

| Length | Description | Used with Sensors | Catalog Number |
|---------|--|-------------------|----------------|
| 1451BS_ | Allows ZPA through a powered curve that is not divided into ZPA controlled zones. Installed adjacent to the sensor at the powered curve infeed. All required wiring is included. | E68....-xy | 1451BSR1216 |
| | | E68....-xyC | 1451BSC1216 |
| | | E68....-xyP | 1451BSP1216 |



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Conveyor Sensor Systems

E68 Series Integral Sensor Valve

Connector Covers

E68-SVAUSC-P



Upstream Connector Cover

| Description | Used with Sensors | Catalog Number |
|--|-------------------|----------------|
| Used to seal the upstream micro-connector on the most infeed sensor. | E68....-xyP | E68-SVAUSC-P |

E68-SVADSC-P



Downstream Connector Cover

| Description | Used with Sensors | Catalog Number |
|--|-------------------|----------------|
| Used to seal the downstream micro-connector on the discharge sensor (if a release cable is not connected). | E68....-xyP | E68-SVADSC-P |

Mounting Brackets

6161AS0285



Mounting Bracket

| Description | Used with Sensors | Catalog Number |
|---|-------------------|----------------|
| Mounting bracket for E68 sensor family. Can be used to mount E68 sensor to conveyor side channel. Can also be used to mount 3 in retroreflector (6200A-6506). | E68.... | 6161AS0285 |

Dimensions, see **Page V8-T6-11**.

Technical Data and Specifications

E68 Series Integral Sensor Valve

| Description | Specification |
|-------------------------------------|---|
| Input voltage | 18–30 Vdc |
| Power dissipation | 1.35W at 27 Vdc |
| Indicator LED | Red LED: Lights steady when air valve open |
| Response time | 25 ms maximum to 90% air flow. 18.2 Hz maximum operation |
| Air to drive/Air to brake operation | Specified by catalog number |
| Beam status output (optional) | Solid-state relay; 400V isolation; 132 Vac/dc maximum switching voltage; 100 mA current switching capacity; 10 mA maximum off-state leakage; 25W maximum on-state resistance. Output protected (current limited) for loads less than 32V. ① |
| Temperature range | Operating: 14° to 131°F (–10° to 55°C); Storage: –13° to 158°F (–25° to 70°C) |
| Material of construction | Lens: polycarbonate; cable jacket: polyvinylchloride; body: structural polyurethane foam; muffler: brass; fittings: brass, polybutylene terephthalate, polyacetel, BUNA-N; label overlay: polyester. ② |
| Mounting | Mount with two #8 fasteners (not included). Torque to between 12 and 14 in-lbs |
| Connectors | Multi-drop models: Insulation-displacement connectors, factory installed Daisy-chain NEMA 4 models (sealed): 4-pin, DC-key micro-connectors Beam status output: 3-pin male nano-connector |
| Vibration and shock | Vibration: 30g over 10 Hz to 2 kHz; shock: 100g for 3 ms 1/2 sine wave pulse |
| Sunlight immunity | 10,000 ft-candles |
| Enclosure ratings | Sealed Daisy-chain models: NEMA 4 ③ |
| Operations | 100 million operations over 5 years. Warranty: 3 years (maximum 60 million operations) |
| Valve type | Three-way, vent to atmosphere |
| Valve specifications | Cv = 0.03; 0 to 75 psi operation ④ |
| Valve fittings | 1/4 in “one-touch” fittings. ⑤ |
| Product packaging | Sensors are bulk packaged. Maximum 10 sensors per bag. |

Optical Performance

All optical specifications are guaranteed to be the minimum performance under clean conditions of any product delivered from stock. Typical performance may be higher.

Dirt in the environment will affect optical performance by reducing the amount of light the control receives.

For best results, sensors should be used at distances where excess gain is higher than 1.5 (1.5 times the amount of sensing power required to detect an object under ideal conditions). Higher excess gain will allow the sensor to overcome higher levels of contamination on the lens.

Polarized Reflex

| Description | Specification |
|---------------|---------------------|
| Source | Visible red, 680 nm |
| Maximum range | 10 ft |
| Optimum range | 0.1 to 8 ft |
| Field of view | 3 in dia. at 12 ft |

Diffuse Reflective

| Description | Specification |
|---------------|---|
| Source | Infrared |
| Maximum Range | 3 ft |
| Optimum Range | 3 in to 2 ft |
| Field of View | 0.2 in dia. at 2 in; 6 in dia. at 5 ft |

Notes

- ① Output will reset automatically when short is removed (there is no visual indication of a short-circuit condition).
- ② Do not expose to concentrated acids, alcohols or ketones.
- ③ These products conform to NEMA tests as indicated, however, some severe washdown applications can exceed these NEMA test specifications.
- ④ Dry or lubricated shop air, filtered to less than 5 micrometers required.
- ⑤ Fittings must be tightened to 10.6–17.7 in-lbs.

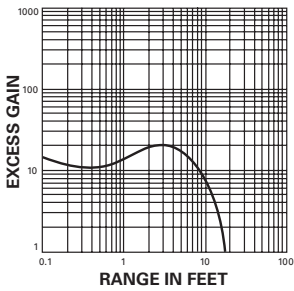
6.1

Conveyor Sensor Systems

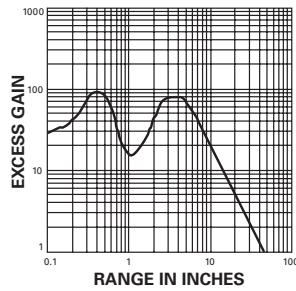
E68 Series Integral Sensor Valve

Excess Gain

Polarized Reflex (3 in diameter retroreflector)



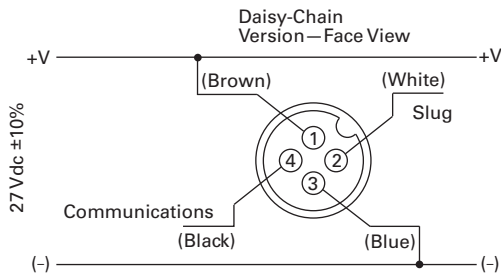
Diffuse Reflective (90% reflectance white card)



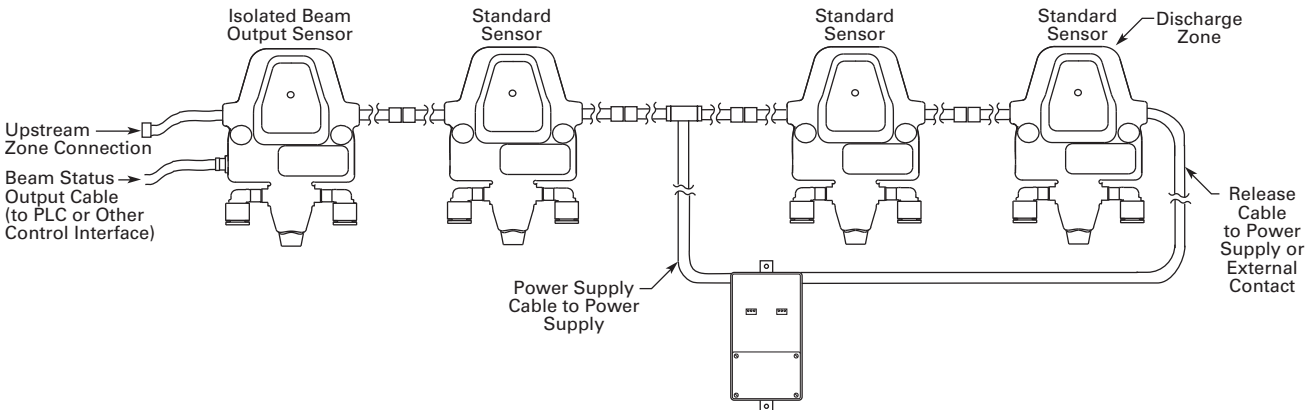
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Wiring Diagrams

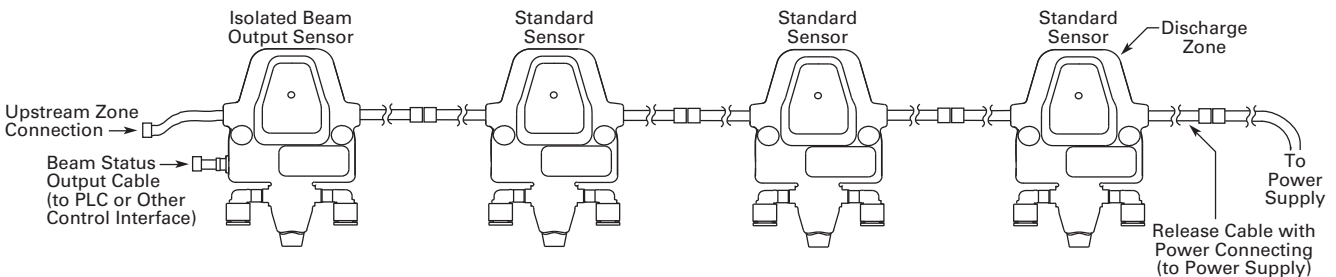
E68 Series Integral Sensor Valve



Typical "Daisy-Chain" Wiring Example—Center Tap Arrangement



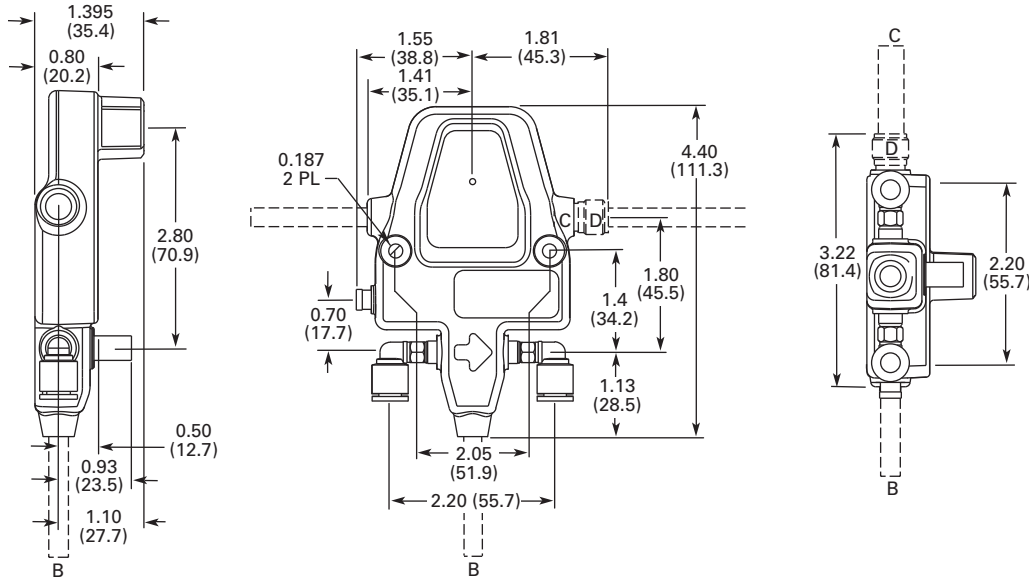
Typical "Daisy-Chain" Wiring Example—End Tap Arrangement



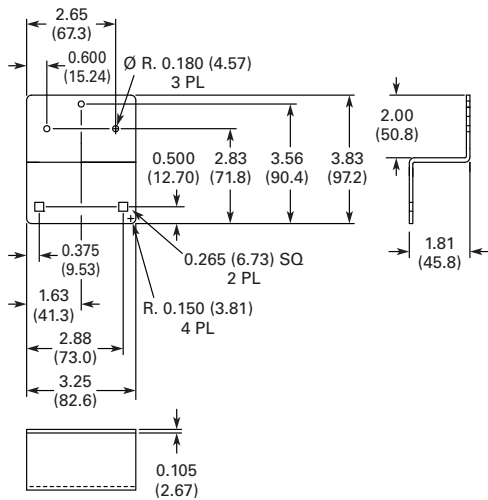
Dimensions

Approximate Dimensions in Inches (mm)

E68 Series Integral Sensor Valve ①



Mounting Bracket



Note

- ① Above dimension diagrams display the following three models of the E68:
- A + D = Daisy-chain NEMA 4 sealed;
 - B = Multi-drop buss harness (legacy products only).