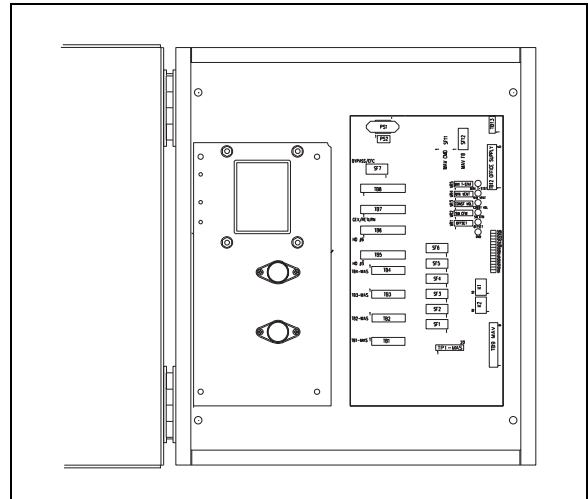


The Phoenix Controls Master Summing Panel is used to total airflows from multiple sources and generate an output.

- **Inputs**—Up to 12 flow inputs, of which six can be non-Phoenix products scaled to a CFM/volt signal.
- **Outputs**—Three flow signals: one to control a Phoenix Controls airflow control valve and two that can be scaled to control a variable speed drive or as a signal to a facilities management system (FMS).

Common applications include:

- Summing flows from multiple exhaust sources within a space and generate totalized output signal for room pressurization, exhaust fan control or as an input to a facilities management system.
- Summing flows from multiple laboratory spaces and generate a totalized output signal.



MAS212 panel (cover open)

## SPECIFICATIONS

### Dimensions

14.12" W x 12.25" H x 4.12" D (359 x 311 x 105 mm)

### Weight

19 lbs (8.3 kg)

### Operating Range

32-122 °F (0-50 °C) ambient

### Power

- Input: 100-120 Vac, 47-63 Hz or 215/230-240 Vac, 47-63 Hz (field configurable)
- Output: +15 Vdc, -15 Vdc, ±5% @ 0.8 amp
- Optional 1.5 amp and 3.0 amp available

### Flow Signals

14 inputs, 0-10 Vdc:

- 6 from Phoenix Controls valves at input scale factor
- 6 can be field scaled at input scale factor
- 1 from Phoenix Controls valve at output scale factor
- 1 from Phoenix Controls valve at inverted output scale (e.g., 13 exhaust, 1 supply)

3 outputs, 0-10 Vdc:

- 1 to control Phoenix valve
- 2 field scaled to control drive or non-Phoenix Controls device

### Panel

- 16-gauge NEMA-1 (UL listed)
- Light gray baked enamel finish
- 0.875/1.125" (22/29 mm) diameter knockouts

### FCC Compliance

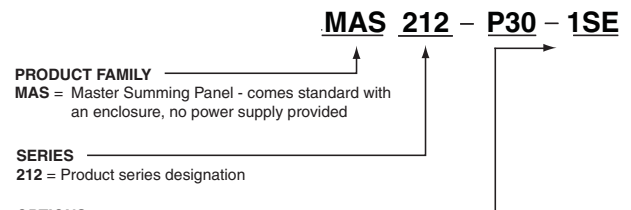
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.



See wiring diagrams

## ORDERING GUIDE



When multiple options are selected, list alphabetically first, numerically second.

- EFC** = Exhaust fan control field scalable output - may be used when all of the exhaust valves connected to the master summing panel are served by a single exhaust fan, instead of using the traditional method of static pressure control
- NEN** = No enclosure - declines standard enclosure that ships with product
- P08** = 0.8 amp power supply
- P15** = 1.5 amp power supply
- P30** = 3.0 amp power supply
- SMC** = Scaled make-up command
- ZUG** = Unity gain header added for same input to output scale factors
- Z16** = Different PCB modified with 0.16 gain for 200 to 1250 input to output scale factors

The following scalable inputs are necessary when the hood inputs into the master summing panel are un-scaled. A SE option is a scaling function module designed to convert the feedback signal from one drive into a signal at the input CFM/volt scale factor of the master summing panel. For the following options, the number of available inputs must be equal to or greater than the number of the SE selected:

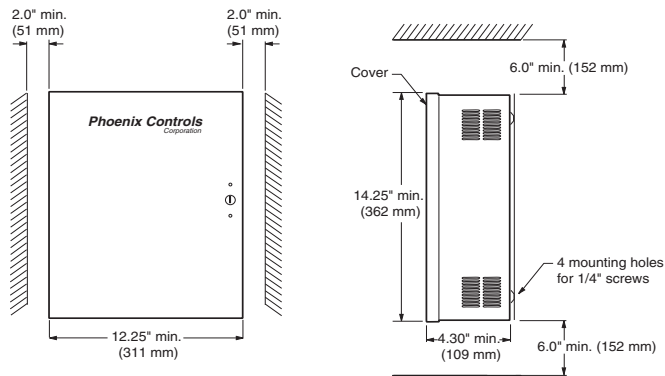
- 1SE** = One scalable input
- 2SE** = Two scalable inputs
- 3SE** = Three scalable inputs
- 4SE** = Four scalable inputs
- 5SE** = Five scalable inputs
- 6SE** = Six scalable inputs

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## INSTALLATION

**Physical**—Install the unit in an area where it will be protected from direct sunlight, rain, or moisture; corrosive gases or liquids; extreme temperatures; and vibration, airborne dust, or metallic particles.



## Electrical: Power and Grounding

**Controls electrician**—Complete all low-voltage wiring between panels and control devices as specified in the room wiring diagrams. MAS series panels have conduit knockouts pre-punched for your use. *Do not create new holes in the enclosure. This will void the product's warranty.*

**Power electrician**—Complete all high-voltage wiring between the distribution panel and the MAS as specified in the wiring diagram inside the panel. Use a dedicated circuit for each master summing panel.

If the Master Summing Panel is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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

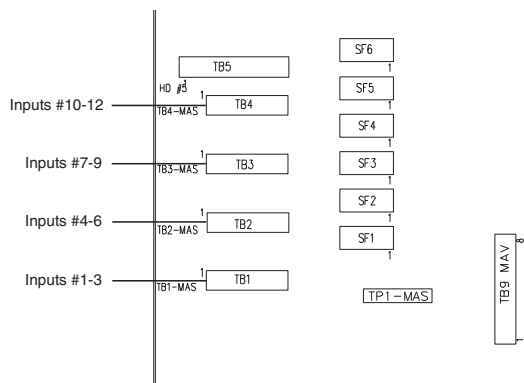
	Function	1	2	3	4	5	6	7	8
TB1	Inputs #1, 2, 3	+15 V	GND	-15 V	Input #1	Input #2	Input #3	—	—
TB2	Inputs #4, 5, 6	+15 V	GND	-15 V	Input #4	Input #5	Input #6	—	—
TB3	Inputs #7, 8, 9	+15 V	GND	-15 V	Input #7	Input #8	Input #9	—	—
TB4	Inputs #10, 11, 12	+15 V	GND	-15 V	Input #10	Input #11	Input #12	—	—
TB8		+15 V	GND	-15 V	Input #13*	—	Scaleable output	—	—
TB9		+15 V	GND	-15 V	Output	—	—	Scaleable output	—
TB12		+15 V	GND	-15 V	—	Input #14* (inverted)	—	—	—
TB13	Power input (factory-wired)	+15 V	GND	-15 V	—	—	—	—	—

**NOTE:** 1. Inputs 1-6 can be field scaled.

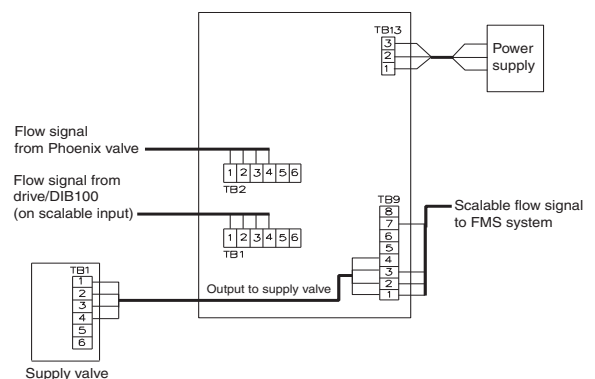
2. Inverted input #14 (TB12-5) is at the output scale factor and is typically used to combine two MAS panels for 24 inputs.

\*At output scale factor

## Board Control & Monitoring Points (partial board shown)



## Typical Wiring Diagram



## MAINTENANCE

Phoenix Controls MAS212 requires no ongoing preventative maintenance. Once the field engineer has completed setup, the unit will provide years of continuous operation. Replacement boards are available.

Replacement Part	Part Number
MAS212 board	800-210-181