

THERMOSTATS & CONTROLLERS

SYSTEM 350 SETPOINT CONTROLLERS

A350, W351, P352, R353 SERIES



DESCRIPTION

System 350 Setpoint Controllers can be used in conjunction with plug-in accessory modules to control a wide variety of single or multistage and proportional control applications. Plug-in modules allow for sequencing, digital displays, and reset control applications.

FEATURES

- **Proportional plus Integral (PI) control**
- **Plug-in digital display**
- **Models in °F or °C**
- **Surface or DIN rail mounting**
- **Electronic accuracy and repeatability**
- **Slave modules for reset and sequence staging**
- **Setpoint modules for alarm and control**
- **One-year warranty**

CONTROLLERS

A350A is an on/off differential temperature controller with SPDT relay output and LED indication. This control comes with one temperature sensor.

A350P is an electronic proportional or PI temperature control with proportional output of 0-10 VDC and 0-20 mA. This control comes with one temperature sensor.

A350R is an electronic temperature reverse-reset controller with an SPST (N.O.) relay, as well as LED indication, setback, and warm weather shutdown. The **A350R** raises or lowers (resets) the setpoint of the controlled variable (water or air) based on the OSA temperature. This controller comes with two temperature sensors.

A350SS is an electronic temperature reset module and is used in conjunction with stage modules. The **A350SS** has both reverse-reset and direct-reset capability for water or air. This controller comes with two temperature sensors.

W351AB is a humidity controller with an SPDT relay and LED status for control of humidification or dehumidification equipment. The **W351AB** may have a setpoint of 10% to 90% RH with an adjustable differential of 2% to 10% RH.

W351PP is a proportional or PI humidity controller with proportional outputs of 0-10 VDC and 0-20 mA for control of humidification or dehumidification equipment. The **W351PP** may have a setpoint of 10% to 90% RH.

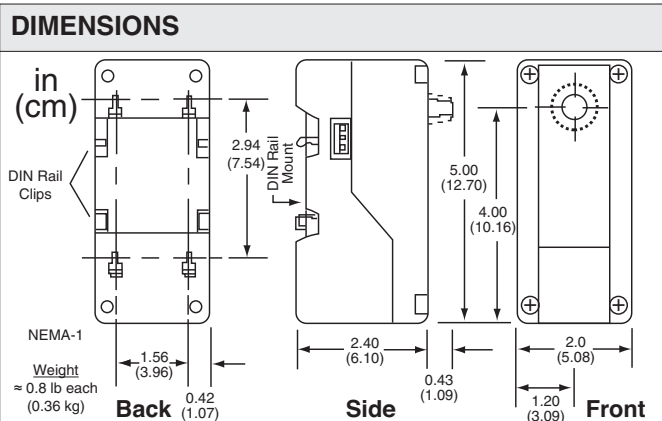
P352AB is a pressure controller with an SPST relay and LED status for control of compressor loading or pumps. The **P352AB** may have a setpoint of 90-250 psig (621-1724 kPa) with an adjustable differential of 10-100 psig (69-690 kPa) and can be direct or reverse acting.

P352PQ is a pressure proportional or PI controller with proportional output of 0-10V or 0-20 mA for duct pressure fan control. It has a setpoint of 0.5" to 5" W.C., -0.25" to 0.25" W.C., or 0.025" to 0.25" W.C., and it can be direct or reverse acting.



A350PS-1C
Temperature Control

W351AB-2C
Humidity Control



SPECIFICATIONS

| | |
|------------------|------------------|
| Enclosure | NEMA 1 |
| Weight | 0.8 lb (0.36 kg) |

ADD-ON MODULES

Y350 is a 24 VAC half-wave rectified power module required for use with all of the controllers.

S350CC is an electronic slave module with its own concealed temperature setpoint and an SPDT relay with LED status for control. This module uses the sensor from the accompanying **A350** controller.

S350PQ is an electronic proportional or PI stage module with its own differential, offset, and analog control outputs. This module uses the sensor and setpoint from the accompanying **A350** controller.

S35xAA is an electronic stage module with an independent differential and offset adjust from setpoint. This sequencing module has an SPDT relay with LED status for control.

D35x is a digital module with a button to display the setpoint. This module comes in many models, including temperature, humidity, and pressure.

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| SYSTEM CONFIGURATIONS | | | | | | | | |
|-----------------------|---|-----------------------------------|------------------|--------------------------------------|--|--------------------------------------|---|---|
| | Application Output | LOCKOUT | BASE SYSTEM | | APPLICATION DEPENDENT | | | Typically Required Accessories (order separately) |
| | | Module Control from OSA Temp | Basic Controller | Power Module or 24 VAC (transformer) | Stage Modules Control from Controlled Variable (CV) | Display Module (button) | Compatible Sensor Input | |
| TEMPERATURE | On/Off with SPDT relay output | | A350A | Y350R 120 VAC | S350AA, S350CC, S350PQ Up to nine stage modules with Y350R (six with a S350P) | D350 Temperature (setpoint) | A99BC-25C Strap-On RTD included with controller | (TE6001-4 Bracket T4000-2644 Cover) TE6001-2 OSA Encl. WEL11A601R Well TE6001-1 Duct bracket |
| | Proportional with 0-10 VDC and 0-20 mA output | | A350P | Y350R 120 VAC | S350AA, S350CC, S350PQ Up to four stage modules with Y350R (two with an S350P)* | D350 Temperature (setpoint) | A99BC-25C Strap-On RTD included with controller | (TE6001-4 Bracket T4000-2644 Cover) TE6001-2 OSA Encl. WEL11A601R Well TE6001-1 Duct bracket |
| | Reset reverse with SPDT relay output | S350CC SPDT, D350 OAT (Set Point) | A350R | Y350R 120 VAC | S350AA, S350CC, S350PQ Up to nine stage modules with Y350R (six with an S350P) | D350 Temperature (calc. setpoint) | 2-A99BC-25C Strap-On RTD included with controller | (TE6001-4 Bracket T4000-2644 Cover) TE6001-2 OSA Encl. WEL11A601R Well TE6001-1 Duct bracket |
| | Reset requires stage modules for outputs | S350CC SPDT, D350 OAT (Set Point) | A350SS | Y350R 120 VAC | S350AA, S350CC, S350PQ Up to nine stage modules with Y350R (six with an S350P) | D350 Temperature (calc. setpoint) | 2-A99BC-25C Strap-On RTD included with controller | (TE6001-4 Bracket T4000-2644 Cover) TE6001-2 OSA Encl. WEL11A601R Well TE6001-1 Duct bracket |
| HUMIDITY | On/Off with SPDT relay output | | W351 | Y350R 120 VAC | S351 Up to five stage modules with Y350R* | D351 Humidity (setpoint) | GEH2S Room GEH2D Duct order separately | BAM-1000 DIN rail BAM End stop |
| | Proportional with 0-10 VDC and 0-20 mA output | | W351P | Y350R 120 VAC | S351 Up to four stage modules with Y350R* | D351 Humidity (setpoint) | GEH2S Room GEH2D Duct order separately | BAM-1000 DIN rail BAM End stop |
| PRESSURE | On/Off with SPDT relay output | | P352(A/P) | Y350R 120 VAC | S352 Up to five stage modules with Y350R* | D352 Pressure (setpoint) | P399 Water Pipe order separately | BAM-1000 DIN rail BAM End stop |
| | Proportional with 0-10 VDC and 0-20 mA output | | P352PQ | Y350R 120 VAC | No additional stages | D352 Pressure (setpoint) | DPT-2640 Air Duct order separately | BAM-1000 DIN rail BAM End stop |
| SEQUENCING | Sequencing with SPDT relay output | | R353 | Y350R 120 VAC | S353 Up to five stages with Y350R* | | Input Only 0-10 VDC 0-20 mA 0-2 VDC 135-10 kΩ Slidewire | BAM-1000 DIN rail BAM End stop |

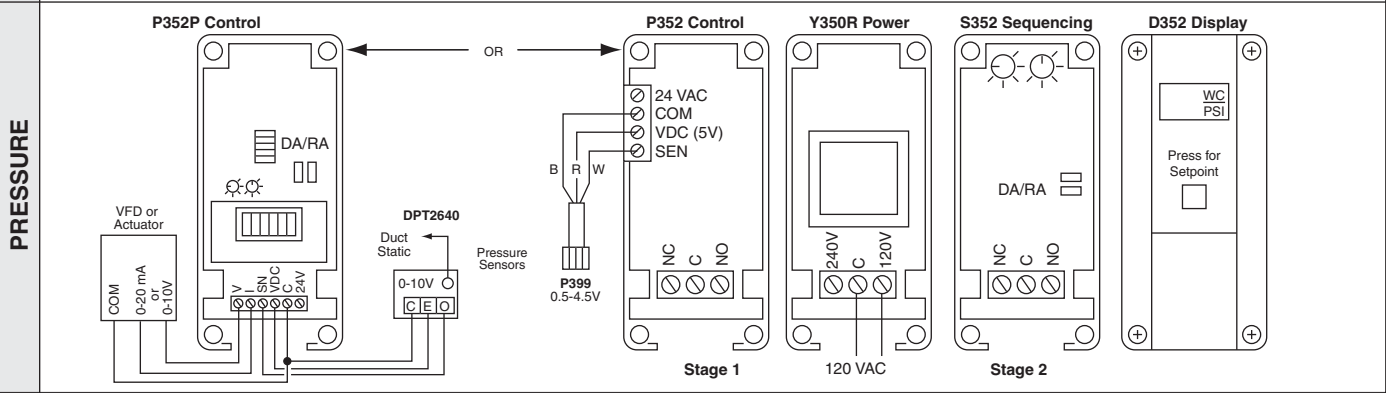
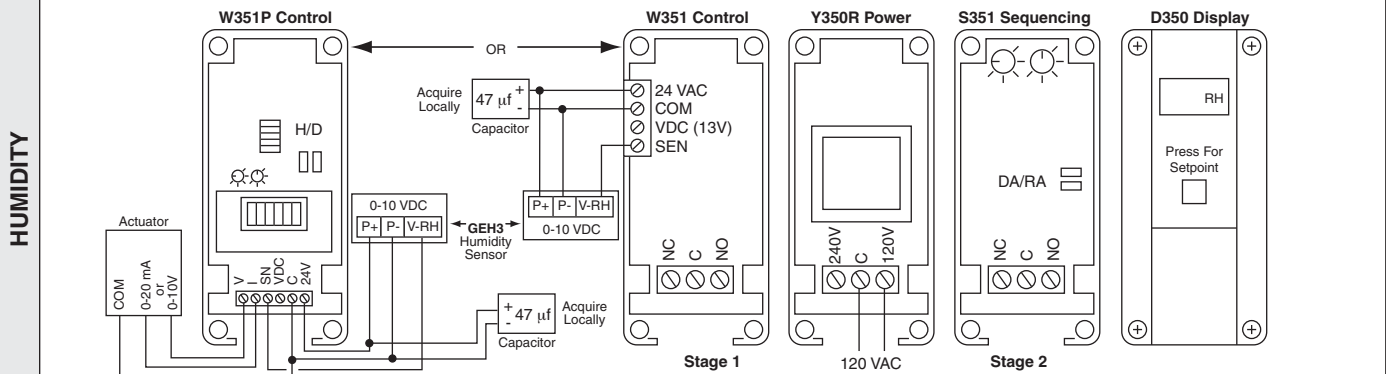
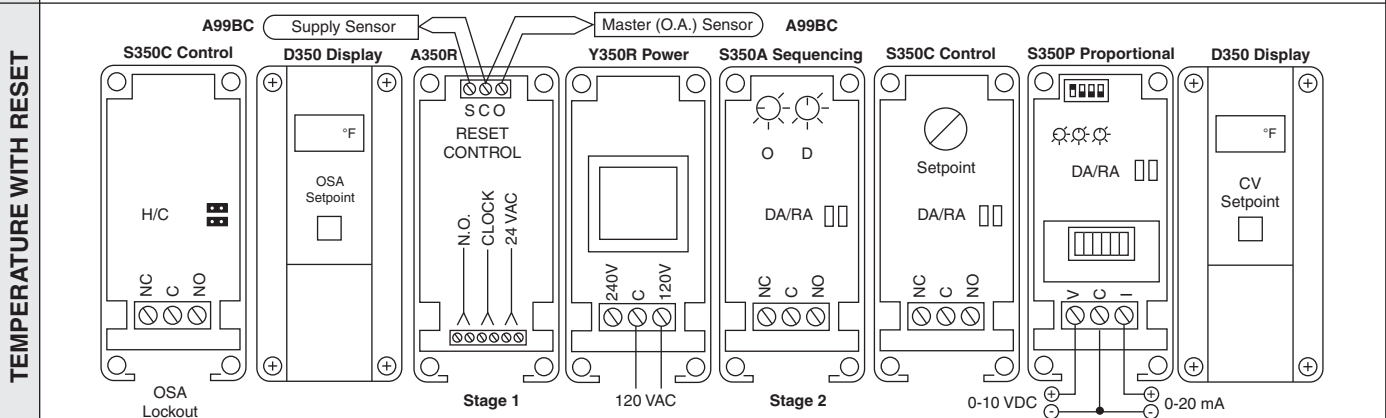
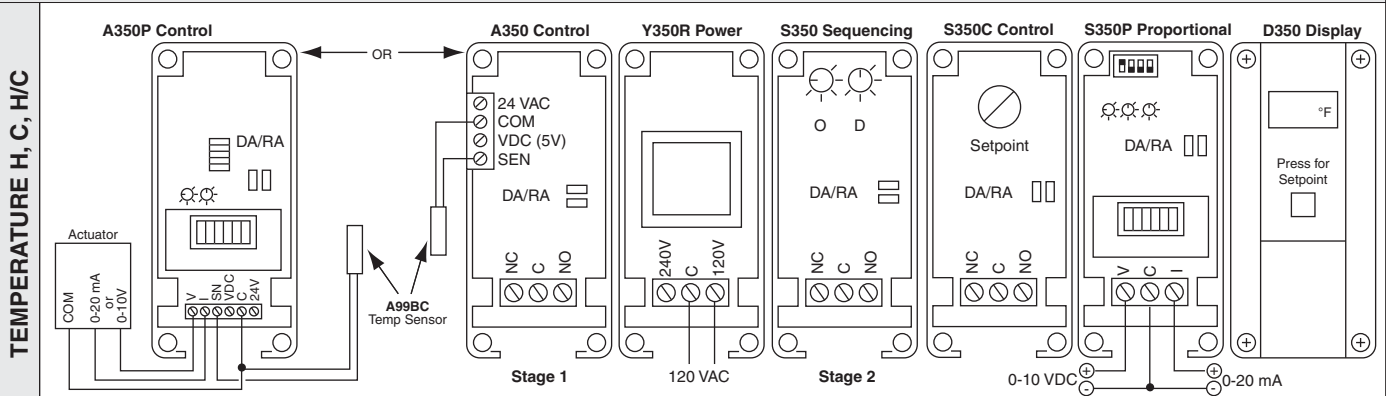
* With a 24VAC/40 VA transformer, nine slave modules can be added (eight if an S350P is used).

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WIRING



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ORDERING INFORMATION AND SPECIFICATIONS

Each **System 350** requires one control module and one power supply. Other modules may be selected per the application requirements.

| CONTROL MODULE | CONTROL | POWER | RANGE (available in C°) | DIFFERENTIAL | THROTTLING RANGE (TR) | INPUT SENSOR | OUTPUT |
|-------------------|-----------|------------------|---|--------------|-----------------------|---------------|-------------------------|
| Y350R-1C | System | 350 Power Supply | | | | 120/240VAC | 24 VAC @ 10 VA 50/60Hz |
| A350AA-1C* | Temp | 24 VAC, 1.5 VA | -30° to 130°F | 1° to 30°F | ----- | Si RTD | SPDT, 10A (120/240V) |
| A350AA-2C* | Temp | 24 VAC, 1.5 VA | 90° to 250°F | 1° to 30°F | ----- | Si RTD | SPDT, 10A (120/240V) |
| A350EA-4C* | Temp | 24 VAC, 1.5 VA | 10° to 65°F | 1° to 30°F | ----- | Si RTD | SPDT, 10A (120/240V) |
| A350PS-1C* | Temp | 24 VAC, 3.2 VA | -30° to 130°F | ----- | 2° to 30°F | Si RTD | 0-10V, 0-20 mA @600Ω |
| A350PS-2C* | Temp | 24 VAC, 3.2 VA | 90° to 250°F | ----- | 2° to 30°F | Si RTD | 0-10V, 0-20 mA @600Ω |
| A350RS-1C* | R/Reset | 24 VAC, 3.2 VA | 50° to 160°F min with reset ratio adjust 1:5 to 3:1 | | | 2-Si RTDs | SPDT, 4A (24V) |
| A350SS-1C* | D/R Reset | 24 VAC, 2.5 VA | 30° to 90°F min with reset ratio adjust 1:5 to 10:1 | | | 2-Si RTDs | No Output (S. Mod. Req) |
| A350SS-2C* | D/R Reset | 24 VAC, 2.5 VA | 30° to 90°F min with reset ratio adjust 1:30 to 1:1 | | | 2-Si RTDs | No Output (S. Mod. Req) |
| W351AB-2C | Humidity | 24 VAC, 1.8 VA | 10% to 90%RH | 2% to 10% RH | ----- | 0-10V | SPDT, 10A (120/240V) |
| W351PP-1C | Humidity | 24 VAC, 3.2 VA | 10% to 90%RH | ----- | 2% to 20% RH | 0-10V | 0-10V, 0-20 mA @600Ω |
| P352AB-3C | Pressure | 24 VAC, 3.2 VA | 90-240 psig | 10-100 psig | ----- | Pipe 0.5-4.5V | SPDT, 10A (120/240V) |
| P352PN2C | Pressure | 24 VAC, 3.2 VA | 0-100 psig | ----- | 5-50 psig | Pipe 0.5-4.5V | 0-10, 0-20 mA @600Ω |
| P352PQ1C | Pressure | 24 VAC, 3.2 VA | 0.5" to 5" W.C. | ----- | 0.5" to 5" W.C. | Duct 0.5-4.5V | 0-10V, 0-20 mA @600Ω |
| P352PQ2C | Pressure | 24 VAC, 3.2 VA | 0.025" to 0.25" W.C. | ----- | 0.025"-0.25"W.C. | Duct 0.5-4.5V | 0-10V, 0-20 mA @600Ω |
| R353AA-1C | Sequencer | 24 VAC, 3.2 VA | 0% to 75% | 1% to 7% | ----- | VDC, mA, Ω | SPDT, 10A (120/240V) |

*Sensors are included with each temperature control module.

| STAGE MOD | CONTROL | POWER | OFFSET | DIFFERENTIAL | ACTION (N.O.) | INPUT | OUTPUT |
|------------------|-----------|-------|---------------------|-----------------|---------------|-------|----------------------|
| S350AA-1C | Temp | 1 VA | ± 1° to 30°F | 1° to 30°F | DA or RA | A350 | SPDT, 10A (120/240V) |
| S350PQ-1C | Temp | 1 VA | ± 0° to 30°F | 2° to 30°F (TR) | DA or RA | A350 | 0-10V, 0-20 mA @600Ω |
| S350CC-1C | Temp | 1 VA | -30° to 130°F Setpt | 1° to 30°F | DA or RA | A350 | SPDT, 10A (120/240V) |
| S351AA-1C | Humidity | 1 VA | ± 2% to 30% RH | 2% to 10% RH | DA or RA | W351 | SPDT, 10A (120/240V) |
| S352AA-2C | Pressure | 1 VA | ± 1-60 psig | 10% to 100 psig | DA or RA | P352 | SPDT, 10A (120/240V) |
| S353AA-1C | Sequencer | 1 VA | 0% to 75% | 1% to 7% | DA or RA | R353 | SPDT, 10A (120/240V) |

| DISPLAY MOD | CONTROL | DISPLAY | DIGITS | DISPLAY RANGE | SETPOINT RANGE | INPUT | DISPLAY/PUSH BUTTON |
|------------------|----------|---------|---------|-------------------|-------------------|-------|---------------------------|
| D350AA-1C | Temp | °F | 3.5 LCD | -30° to 250°F | -30° to 250°F | A350 | Control Variable/Setpoint |
| D351AA-1C | Humidity | %RH | 3.5 LCD | 10% to 90% RH | 10% to 90% RH | W351 | Control Variable/Setpoint |
| D352AA-1C | Pressure | psig | 3.5 LCD | 0-435 psig | 90-250 psig | P352A | Control Variable/Setpoint |
| D352CA-1C | Pressure | " W.C. | 3.5 LCD | 0" to 9.99" W.C. | 0" to 9.99" W.C. | P352P | Control Variable/Setpoint |
| D352CA-2C | Pressure | " W.C. | 3.5 LCD | 0" to 0.999" W.C. | 0" to 0.999" W.C. | P352P | Control Variable/Setpoint |

| SENSOR | CONTROL | CONTROLLER | RANGE | SIGNAL | ACCURACY | MOUNTING | WIRING |
|---|----------------|------------|-----------------|-------------|----------|----------------|------------------|
| A99BC | Temp | A350 | -30° to 250°F | Resistive | ±1% | Raw/Strap on | 2 Twist Shielded |
| GEH2S | Hum. Room | W351 | 0% to 100% RH | 0 to 10V | ±2% | Room | 3 Twist Shielded |
| GEH2D | Hum. Duct | W351 | 0% to 100% RH | 0 to 10V | ±2% | Duct | 3 Twist Shielded |
| P399BAA-1C requires WHA-P399-200C | Pressure | P352AB-3C | 0-500 psig | 0.5 to 4.5V | ±1% | Pipe Direct | 3 Twist Shielded |
| P399AAA1C requires WHA-P399-400C | Pressure | P352(A/P) | 0-100 psig | 0.5 to 4.5V | ±1.5% | Pipe Direct | 3 Twist Shielded |
| DPT-2640-010D | Diff. Pressure | P352PQ-1C | 0" to 10" W.C. | 0 to 5V | ±1% | Duct, 1/4 poly | 3 Twist Shielded |
| DPT-2640-0R5D | Diff. Pressure | P352PQ-2C | 0" to 0.5" W.C. | 0 to 5V | ±1% | Duct, 1/4 poly | 3 Twist Shielded |

| ACCESSORY | USED WITH | DESCRIPTION | APPLICATION |
|----------------------|--------------------------|--|---|
| BAM-1000 | 350 Module | DIN rail | DIN rail mounting |
| ADP11A-600R | 350 Module | EMT conduit adapter | Conduit specified |
| TE-6001-4 | A99BC (Si RTD) | Room clip plate (cover required) | Room } (both required per location) |
| T-4000-2644 | A99BC (Si RTD) | Room cover (plate required) | |
| TE-6001-2 | A99BC (Si RTD) | Outside air housing | Room |
| WEL11A-601R | A99BC (Si RTD) | Well and connector | Immersion |
| TE-6001-1 | A99BC (Si RTD) | Holder for duct sensor | Duct |
| WHA29A-600R | D35x Module | 3' cable for remote display | Splice cable for remote display |
| WHA-P399-200C | P399 Pressure Transducer | Wire harness, 6 1/2 ft (2.0 m.) length with pigtails | Wire harness For P399 Pressure Transducer |
| WHA-P399-400C | P399 Pressure Transducer | Wire harness, 13 ft (4.0 m.) length with pigtails | Wire harness For P399 Pressure Transducer |

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