Sequence of Operation -- Constant Volume Heat/cool changeover OR cooling only - Pressure Independent

On power up the damper will calibrate closed for 2 minutes.

"If no SAT sensor is present, the controller assumes Cool supply air at all times"

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

**Cool supply air**: On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

**Warm supply air**: On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

**Legend**

- Factory Flow Sensor Tubing
- Factory Electrical Wiring
- Field Electrical Wiring

**Control Graph**

Continuous Fan Operation

- Max Heating
- Max Cooling
- Mln. Heating
- Mln. Cooling

Cool Air

Warm Air

Room Set point

Cool Room Condition Warm
FAN POWERED TERMINAL
CONSTANT VOLUME SERIES FLOW

Sequence of Operation – Constant Volume Heat/cool changeover OR cooling With up to 3 stage binary reheat - Pressure Independent
On power up the damper will calibrate closed for 2 minutes.
**If no SAT sensor is present, the controller assumes Cool supply air at all times**
While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.
Cool supply air: On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.
On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.
Warm supply air: On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.
On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.
Reheat Operation: On a decrease in space temperature into the heating proportional band, the 1st stage binary 24VAC reheat output will energize. Upon further decreases, the 2nd then 3rd stages of reheat (if used) will energize.

Calibration note: Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

Calibration Note: Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

Sequence of Operation – Constant Volume Heat/cool changeover OR cooling With up to 3 stage binary reheat - Pressure Independent
On power up the damper will calibrate closed for 2 minutes.
**If no SAT sensor is present, the controller assumes Cool supply air at all times**
While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

Cool supply air: On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.
On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

Warm supply air: On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.
On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

Reheat Operation: On a decrease in space temperature into the heating proportional band, the 1st stage binary 24VAC reheat output will energize. Upon further decreases, the 2nd then 3rd stages of reheat (if used) will energize.
FAN POWERED TERMINAL
CONSTANT VOLUME SERIES FLOW

Control Sequence Number 6802

CALIBRATION NOTE: Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

Legend:
- FACTORY FLOW SENSOR TUBING
- FACTORY ELECTRICAL WIRING
- FIELD ELECTRICAL WIRING

CONTROL GRAPH
Continuous Fan Operation

Sequence of Operation -- Constant Volume Heat/cool Changeover
OR Cooling With Up to 3 Stage Binary Reheat - Pressure Independent
On power up the damper will calibrate closed for 2 minutes.
**If no SAT sensor is present, the controller assumes Cool supply air at all times.**

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

Cool Supply Air: On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

Warm Supply Air: On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

Reheat Operation: On a decrease in space temperature into the heating proportional band, the 1st stage binary 24VAC reheat output will energize. Upon further decreases, the 2nd then 3rd stages of reheat (if used) will energize.

PROJECT:

ENGINEER:

CUSTOMER:

SUBMITTAL DATE: SPEC. SYMBOL:

249507 2017/08/11
Sequence of Operation -- Constant Volume Heat/cool changeover OR Cooling With Tri-State modulating HW reheat - Pressure Independent

On power up the damper will calibrate closed for 2 minutes. **If no SAT sensor is present, the controller assumes Cool supply air at all times**

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

**Cool supply air:** On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

**Warm supply air:** On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

**Reheat Operation:** On a decrease in space temperature, the heating valve is modulated to increase heat proportionally to the room demand.
FAN POWERED TERMINAL
CONSTANT VOLUME SERIES FLOW

NOTE 1: T-STAT IS WIRED WITH CAT-5 CABLE WITH MODULAR RJ-45 CONNECTORS. CABLE SUPPLIED WITH T-STAT.

NOTE 2: SEVERAL T-STAT OPTIONS AVAILABLE. (BLANK FACE, DIAL ADJUST, LCD, WIRELESS BASE, ETC.)

NOTE 3: TRANSFORMER SECONDARY COM MUST BE EARTH GROUNDED.

NOTE 4: WIRES 1-4 ARE IN PLENUM RATED CABLES FOR 24VAC POWER AND CONTROL CIRCUITS. WIRES 3-4 TO FACTORY WIRED 0-10V ANALOG (SCC) ELECTRIC HEAT MAX LOAD: 10mA (MIN INPUT IMPEDANCE: 1000 OHMS)

NOTE 5: A CAT-5 BACNET NETWORK CABLE IS PROVIDED BY PRICE WITH EACH CONTROLLER ORDERED WITH THE BACNET OPTION.

NOTE 6: DO NOT USE GAUGE TAPS.

NOTE 7: NIGHT SETBACK IS READY ON ALL PIC CONTROLLERS. SEE NIGHT SETBACK SEQUENCE (9999 Page 2 of 3) FOR DETAILS.

Sequence of Operation -- Constant Volume Heat/cool changeover OR Cooling With Analog modulating reheat - Pressure Independent
On power up the damper will calibrate closed for 2 minutes. **If no SAT sensor is present, the controller assumes Cool supply air at all times**
While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

Cool supply air: On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.
On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

Warm supply air: On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.
On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

Reheat Operation: On a decrease in space temperature, the controller modulates the 0-10VDC output to increase heat proportionally to the room demand.

Calibration note: Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

Legend:
- Factory Flow Sensor Tubing
- Factory Electrical Wiring
- Field Electrical Wiring

Control Graph:
Continuous Fan Operation

Air Val.

Max Heating

Max Cooling

Min. Heating

Min. Cooling

Room Set Point

Cool

Warm

Room Condition

(2017/08/11)

SPEC. SYMBOL:

SUBMITTAL DATE:

CUSTOMER:

ENGINEER:

PROJECT:

FAN POWERED CONSTANT VOLUME SERIES FLOW
C.V. PRESSURE INDEPENDENT HEAT/COOL C/O OR COOLING WITH ANALOG ELECTRIC HEAT FACTORY WIRED

249509

2017/08/11

REV G
**Calibration note:** Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

**Sequence of Operation -- Constant Volume Heat/cool changeover OR Cooling With Analog modulating reheat - Pressure independent**

- On power up the damper will calibrate closed for 2 minutes.
- If no SAT sensor is present, the controller assumes Cool supply air at all times.
- While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

**Cool supply air:** On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting. On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

**Warm supply air:** On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting. On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

**Reheat Operation:** On a decrease in space temperature, the controller modulates the 0-10VDC output to increase heat proportionally to the room demand.
Sequence of Operation -- Constant Volume Heat/cool changeover OR cooling only - Pressure Dependent

On power up the damper will calibrate closed for 2 minutes.

**If no SAT sensor is present, the controller assumes Cool supply air at all times**

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

**Cool supply air:** On an increase in space temperature the controller regulates the actuator to open the air damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the damper position (%) is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the air damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

**Warm supply air:** On a decrease in space temperature the controller regulates the actuator to open the air damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the damper position (%) is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the air damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the damper position (%) is maintained at the pre-selected minimum setting.
FANPOWERED TERMINAL
CONSTANT VOLUME SERIES FLOW

CONTROL SEQUENCE
NUMBER 6851

NOTE 1:
T-STAT IS WIRED WITH CAT-5 CABLE WITH MODULAR RJ-45 CONNECTORS. CABLE SUPPLIED WITH T-STAT.

NOTE 2:
SEVERAL T-STAT OPTIONS AVAILABLE. (BLANK FACE, DIAL, ADJUST, LCD, WIRELESS BASE, ETC.)

NOTE 3:
TRANSFORMER SECONDARY COM MUST BE EARTH GROUNDED.

NOTE 4:
WIRES 1-6 ARE IN PLENUM RATED CABLES FOR 24VAC POWER AND CONTROL CIRCUITS. WIRES 3-5 TO FACTORY WIRED 24VAC BINARY ELECTRIC HEAT MAX 10VA PER CONTACTOR. *STAGES 2 AND 3 ARE OPTIONAL.

NOTE 5:
SUPPLY AIR TEMPERATURE (SAT) SENSOR (OPT. - REQUIRED FOR HCCD).

NOTE 6:
USE RJ-45 JACKS FOR BACNET CONNECTION, OR 3 POSITION TERMINAL BLOCK FOR 3-WIRE CONNECTION (+, -, NETCOM). NETCOM MUST BE WIRED.

NOTE 7:
FROM PREVIOUS CONTROLLER (OPT.)

TO NEXT CONTROLLER (OPT.)

BACNET MODULE (PIC-24AC)
250000-360 (OPT.)

A CAT-5 BACNET NETWORK CABLE IS PROVIDED BY PRICE WITH EACH CONTROLLER ORDERED WITH THE BACNET OPTION.

FAN 3
1ST STAGE 4
2ND STAGE 5
3RD STAGE 6
+24V HOT 1
-24V COM 2

VENTILATION
- AIRFLOW

- PIC Y3 DDC CONTROLLER/ACTUATOR 250000-115

- 24VAC BINARY OUTPUTS

- 24VAC POWER AND CONTROL CIRCUITS

- WIRES 1-6 ARE IN PLENUM RATED CABLES FOR 24VAC POWER AND CONTROL CIRCUITS. WIRES 3-5 TO FACTORY WIRED 24VAC BINARY ELECTRIC HEAT MAX 10VA PER CONTACTOR. *STAGES 2 AND 3 ARE OPTIONAL.

LEGEND:
FACTORY ELECTRICAL WIRING
FIELD ELECTRICAL WIRING

CONTROL GRAPH
Continuous Fan Operation

Heat On
Max Heating
Min. Heating

Warm Air
Max Cooling

Cold Air

Room Set point

Cool
Room Condition
Warm

Sequence of Operation -- Constant Volume Heat/cool changeover OR cooling With 3 up to stage binary reheat - Pressure Dependent
On power up the damper will calibrate closed for 2 minutes.
**If no SAT sensor is present, the controller assumes Cool supply air at all times**

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

Cool supply air: On an increase in space temperature the controller regulates the actuator to open the air damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the damper position (%) is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the air damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

Warm supply air: On a decrease in space temperature the controller regulates the actuator to open the air damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the damper position (%) is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the air damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

Reheat Operation: On a decrease in space temperature into the heating proportional band, the 1st stage binary 24VAC reheat output will energize. Upon further decreases, the 2nd then 3rd stages of reheat (if used) will energize.

PROJECT:

ENGINEER:

CUSTOMER:

SUBMITTAL DATE:

SPEC. SYMBOL:

249512

2017/08/11

REV. G

FANPOWERED CONSTANT VOLUME SERIES FLOW
C.V. PRESSURE DEPENDENT HEAT/COOL C/O OR COOLING WITH UP TO 3 STG BINARY REHEAT FACTORY WIRED

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FAN POWERED TERMINAL
CONSTANT VOLUME SERIES

Control Sequence
Number 6852

FAN POWERED CONSTANT VOLUME SERIES FLOW
C.V. PRESSURE DEPENDENT
HEAT/COOL C/O OR COOLING
WITH UP TO STG BINARY REHEAT
FIELD WIRED

FAN POWERED TERMINAL
CONSTANT VOLUME SERIES

NOTE 4:
T-STAT IS WIRED WITH CAT-5 CABLE WITH MODULAR RJ-45 CONNECTORS. CABLE SUPPLIED WITH T-STAT

NOTE 2:
T-STAT OPTIONS AVAILABLE: (BLANK FACE, DIAL ADJUST, LCD, WIRELESS BASE, ETC.)

NOTE 3:
TRANSFORMER SECONDARY COM MUST BE EARTH GROUNDED

NOTE 5:
A CAT-5 BACNET NETWORK CABLE IS PROVIDED BY PRICE WITH EACH CONTROLLER ORDERED WITH THE BACNET OPTION

NOTE 6:
NIGHT SETBACK IS READY ON ALL PIC CONTROLLERS. SEE NIGHT SETBACK SEQUENCE (9999 Page 2 of 3) FOR DETAILS.

Sequence of Operation -- Constant Volume Heat/cool changeover OR cooling With up to 3 stage binary reheat - Pressure Dependent
On power up the damper will calibrate closed for 2 minutes.
**If no SAT sensor is present, the controller assumes Cool supply air at all times**
While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

Cool supply air: On an increase in space temperature the controller regulates the actuator to open the air damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the damper position (%) is maintained at its pre-selected maximum setting. On a decrease in space temperature the controller regulates the actuator to close the air damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

Warm supply air: On a decrease in space temperature the controller regulates the actuator to open the air damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the damper position (%) is maintained at its pre-selected maximum setting. On an increase in space temperature the controller regulates the actuator to close the air damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

Reheat Operation: On a decrease in space temperature into the heating proportional band, the 1st stage binary 24VAC reheat output will energize. Upon further decreases, the 2nd then 3rd stages of reheat (if used) will energize.

Calibration note: Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.
**FAN POWERED TERMINAL**  
**CONSTANT VOLUME SERIES FLOW**

**Control Sequence Number 6853**

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**NOTE 1:**  
T-STAT IS WIRED WITH CAT-5 CABLE WITH MODULAR RJ-45 CONNECTORS. CABLE SUPPLIED WITH T-STAT

**NOTE 2:**  
SEVERAL T-STAT OPTIONS AVAILABLE: (BLANK FACE, DIAL ADJUST, LCD, WIRELESS BASE, ETC.)

**NOTE 3:**  
TRANSFORMER SECONDARY COM MUST BE EARTH GROUNDED

**NOTE 4:**  
WIRES 1-6 ARE IN PLENUM RATED CABLES FOR 24VAC POWER AND CONTROL CIRCUITS. WIRES 3-5 TO FIELD WIRED TRI-STATE MODULATING (OPEN/CLOSE) HOT WATER VALVE.

**NOTE 5:**  
A CAT-5 BACNET NETWORK CABLE IS PROVIDED BY PRICE WITH EACH CONTROLLER ORDERED WITH THE BACNET OPTION

**NOTE 6:**  
NIGHT SETBACK IS READY ON ALL PIC CONTROLLERS, SEE NIGHT SETBACK SEQUENCE (9999 Page 2 of 3) FOR DETAILS.

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**Sequence of Operation -- Constant Volume Heat/cool changeover OR Cooling With Tri-State modulating HW reheat - Pressure Dependent**

On power up the damper will calibrate closed for 2 minutes.

**If no SAT sensor is present, the controller assumes Cool supply air at all times**

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

**Cool supply air:** On an increase in space temperature the controller regulates the actuator to open the air damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the damper position (%) is maintained at its pre-selected maximum setting. On a decrease in space temperature the controller regulates the damper to close the air damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

**Warm supply air:** On a decrease in space temperature the controller regulates the actuator to open the air damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the damper position (%) is maintained at its pre-selected maximum setting. On an increase in space temperature the controller regulates the actuator to close the air damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

**Reheat Operation:** On a decrease in space temperature, the heating valve is modulated to increase heat proportionally to the room demand.

---

**LEGEND**

- FACTORY ELECTRICAL WIRING
- FIELD ELECTRICAL WIRING

**CONTROL GRAPH**

Continuous Fan Operation

- Max Heating
- Max Cooling
- Min Heating
- Min Cooling

- Cool Air
- Warm Air

- Heat
- Cool

Room Set point

Room Condition

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**PROJECT:**

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**ENGINEER:**

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**CUSTOMER:**

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**SUBMITTAL DATE:**

**SPEC. SYMBOL:**

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Calibration note: Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

Sequence of Operation -- Constant Volume Heat/cool changeover OR Cooling With Analog modulating reheat - Pressure Dependent

On power up the damper will calibrate closed for 2 minutes.

**If no SAT sensor is present, the controller assumes Cool supply air at all times**

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

Cool supply air: On an increase in space temperature the controller regulates the actuator to open the air damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the damper position (%) is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the air damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

Warm supply air: On a decrease in space temperature the controller regulates the actuator to open the air damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the damper position (%) is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the air damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

Reheat Operation: On a decrease in space temperature, the controller modulates the 0-10VDC output to increase heat proportionally to the room demand.
FAN POWERED TERMINALS
CONSTANT VOLUME SERIES FLOW

NOTE 1:
T-STAT IS WIRED WITH CAT-5 CABLE WITH MODULAR RJ-45 CONNECTORS.
CABLE SUPPLIED WITH T-STAT.

NOTE 2:
SEVERAL T-STAT OPTIONS AVAILABLE.
(BLANK FACE; DIAL ADJUST, LCD; WIRELESS BASE, ETC.)

NOTE 3:
TRANSFORMER SECONDARY COM MUST BE EARTH GROUNDED.

NOTE 4:
WIRES 1-4 ARE IN PLENUM RATED CABLES FOR 24VAC POWER AND CONTROL CIRCUITS.
WIRE 4 TO FIELD WIRED 0-10V ANALOG MODULATING REHEAT (ANALOG HOT WATER, SCR, ETC.)
ANALOG OUT MAX LOAD: 10mA
(MIN INPUT IMPEDANCE: 1000 OHMS)

NOTE 7:
USE RJ-45 JACKS FOR BACNET CONNECTION OR 3 POSITION TERMINAL BLOCK FOR 3-WIRE CONNECTION
(*) - NETCOM
NETCOM MUST BE WIRED.

TO NEXT CONTROLLER (OPT.)
FROM PREVIOUS CONTROLLER (OPT.)

NOTE 5:
A CAT-5 BACNET NETWORK CABLE IS PROVIDED BY PRICE WITH EACH CONTROLLER ORDERED WITH THE BACNET OPTION.

NOTE 6:
NIGHT SETBACK IS READY ON ALL PIC CONTROLLERS. SEE NIGHT SETBACK SEQUENCE (9999 Page 2 of 3) FOR DETAILS.

Sequence of Operation -- Constant Volume Heat/cool changeover
OR Cooling With Analog modulating reheat - Pressure Dependent

On power up the damper will calibrate closed for 2 minutes.
**If no SAT sensor is present, the controller assumes Cool supply air at all times**

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

Cool supply air: On an increase in space temperature the controller regulates the actuator to open the air damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the damper position (%) is maintained at its pre-selected maximum setting. On a decrease in space temperature the controller regulates the actuator to close the air damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

Warm supply air: On a decrease in space temperature the controller regulates the actuator to open the air damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the damper position (%) is maintained at its pre-selected maximum setting. On an increase in space temperature the controller regulates the actuator to close the air damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the damper position (%) is maintained at the pre-selected minimum setting.

Reheat Operation: On a decrease in space temperature, the controller modulates the 0-10VDC output to increase heat proportionally to the room demand.

Calibration note: Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

LEGEND

--- FACTORY ELECTRICAL WIRING
----- FIELD ELECTRICAL WIRING

CONTROL GRAPH

Continuous Fan Operation

Max Heating
Max Cooling
Dumper Position

Room Set point

Min. Heating
Min. Cooling

Cool Air
Warm Air
Heat

Room Condition

--- Project:---

--- Engineer:---

--- Customer:---

--- Submittal Date:---

--- Spec. Symbol:---

--- Copyright E.H.Price Limited 2017---
Entering and Exiting Night Setback: There are several methods for the PIC to enter and exit night setback (unoccupied mode). All of the following methods can be enabled or disabled in software or from the T-Stat menu.

1. Airflow Failure: (Disabled by default) If using a Pressure Independent day sequence (with the PIC-VAV module), the controller will enter night setback when minimal airflow is sensed in the duct. The controller does this based on Day Flow Trip and Night Flow Trip (adjustable). Day Flow Trip is enabled when the controller sees more than 1/2 of its minimum airflow - i.e. mln airflow = 132 cfm, Day Flow Trip = 66 cfm. Night Flow Trip is enabled when the controller sees less than 1/2 of its day flow trip value - i.e. 33 cfm.

2. Motion Sensor: (Disabled by default) If a motion sensor T-Stat is used, the controller can enter night setback if no motion has been detected in the space for a specified period of time (default: 4 hours).

3. Contact Closure: (Disabled by default) Connecting the two contact closure inputs together using a dry contact will cause the controller to enter night setback. The controller will exit night setback once the contacts are released.

4. T-Stat Button: The T-Stat button allows the user to exit night setback. Pressing any button on the T-Stat will cause the controller to exit night setback for the override time period. (default: 4 hours). Occupancy override by T-Stat button is always enabled and cannot be disabled.

Sequence of Operation -- FAN POWERED CONSTANT VOLUME SERIES FLOW - PIC CONTROLLER - NIGHT SETBACK

During night setback, the controller will respond to its night heat setpoint and its night cool setpoint. While the room temperature is between the two night setpoints, by default the controller will maintain the damper position at 25% open (adjustable). All outputs (Fan, Heat, etc.) will go to their OFF or IDLE states.

Room temperature below Night Heat Setpoint:
Fan Operation: On a decrease in space temperature into the heating proportional band, the unit fan will energize.

Reheat Operation: On a decrease in space temperature into the heating proportional band, the reheat outputs (if used) are energized proportionally.

Cool supply air: On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. The airflow is maintained at the pre-selected minimum setting.

Warm supply air: On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.

Room temperature above Night Cool Setpoint:
Fan Operation: On an increase in space temperature into the cooling proportional band, the unit fan typically will not energize. It is possible to configure the controller to energize the fan if using cooling coils.

Cooling Output Operation: On an increase in space temperature into the cooling proportional band, the cooling outputs (if used) are energized proportionally.

Cool supply air: On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.

Warm supply air: On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. The airflow is maintained at the pre-selected minimum setting.

PROJECT:

ENGINEER:

CUSTOMER:

SUBMITTAL DATE:

SPEC. SYMBOL:

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FAN POWERED DIGITAL CONTROLS

Control Sequence Number 5800

NOTE 2:
WIRE 1-3 ARE PLENUM RATED CABLES FOR 24VAC POWER AND CONTROL CIRCUITS
MAX 10VA PER CONTACTOR

NOTE 1:
TRANSFORMER SECONDARY COM MUST BE EARTH GROUNDED

PAC - PRICE ANALOG CONTROLLER
PAC - 250000-400

NOTE 3:
DO NOT USE GAUGE TAPS

FLOW SENSOR

PAC THERMOSTAT

PAC DIAL STAT 250055-100

AIR FLOW

SUPPLY AIR TEMPERATURE (SAT) SENSOR
(OPT. - REQUIRED FOR HCCD)
250000-250

Sequence of Operation – Constant Volume Heat/cool changeover
OR cooling only - Pressure Independent
On power up the damper will calibrate closed for 2 minutes.
**If no SAT sensor is present, the controller assumes Cool supply air at all times**
While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

Cool supply air: On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.

Warm supply air: On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

Warm supply air: On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

LEGEND

FACTORY FLOW SENSOR TUBING
FACTORY ELECTRICAL WIRING
FIELD ELECTRICAL WIRING

CONTROL GRAPH
Continuous Fan Operation

MAX HEATING
MAX COOLING
MIN HEATING
MIN COOLING

Room Condition

Cool
Room Set point
Warm

PROJECT:

ENGINEER:

CUSTOMER:

SUBMITTAL DATE: SPEC. SYMBOL:

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**Calibration note:** Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

**Legend:**
- **Factory Flow Sensor Tubing**
- **Factory Electrical Wiring**
- **Field Electrical Wiring**

**Control Graph:**
Continuous Fan Operation

**Sequence of Operation -- Constant Volume Heat/cool changeover OR cooling With up to 3 stage binary reheat - Pressure Independent**
On power up the damper will calibrate closed for 2 minutes. 
**"If no SAT sensor is present, the controller assumes Cool supply air at all times"**
While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

**Cool supply air:** On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting. On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

**Warm supply air:** On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting. On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

**Reheat Operation:** On a decrease in space temperature into the heating proportional band, the 1st stage binary 24VAC reheat output will energize. Upon further decreases, the 2nd then 3rd stages of reheat (if used) will energize.
**Calibration note:** Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

**Sequence of Operation:** Constant Volume Heat/cool changeover OR Cooling With Analog modulating reheat - Pressure Independent

On power up the damper will calibrate closed for 2 minutes.

**Cool supply air:** On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

**Warm supply air:** On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

**Reheat Operation:** On a decrease in space temperature, the controller modulates the 0-10VDC output to increase heat proportionally to the room demand.
Sequence of Operation -- Constant Volume Heat/cool changeover
OR cooling With up to 3 stage binary reheat - Pressure Independent

On power up the damper will calibrate closed for 2 minutes.

**If no SAT sensor is present, the controller assumes Cool supply air at all times.**

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

**Cool supply air:** On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

**Warm supply air:** On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

**Reheat Operation:** On a decrease in space temperature into the heating proportional band, the HW valve is modulated to increase heat proportionally to room demand.

**Calibration note:** Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

**FACTORY FLOW SENSOR TUBING**

**FACTORY ELECTRICAL WIRING**

**FIELD ELECTRICAL WIRING**

**LEGEND**

**CONTROL GRAPH**

Continuous Fan Operation

- **Max Heating**
- **Max. Cooling**
- **Min. Heating**
- **Min. Cooling**

- **Heat On**
- **Cool On**

- **Room Set point**

**NOTE 1:**
TRANSFORMER SECONDARY COM MUST BE EARTH GROUNDED

**NOTE 2:**
Wires 1-6 are plenum rated cables for 24VAC power and control circuits.
Max 10VA per contactor.
*Stages 2 and 3 are optional.

**NOTE 3:**
Do not use gauge taps!

**FACTORY ELECTRICAL WIRING**

**FIELD ELECTRICAL WIRING**

**LEGEND**

**PRICE INDUSTRIES LIMITED 2014**
**Sequence of Operation -- Constant Volume Heat/cool changeover**

**OR Cooling With Analog modulating reheat - Pressure Independent**

On power up the damper will calibrate closed for 2 minutes.

**If no SAT sensor is present, the controller assumes Cool supply air at all times**

While the space is occupied, the unit fan operates continuously supplying a constant volume of supply air.

**Cool supply air:** On an increase in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of cool air. On an increase of space temperature greater than the cooling proportional band, the airflow is maintained at its pre-selected maximum setting.

On a decrease in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of cool air. If the space temperature decreases to less than the cooling proportional band, the airflow is maintained at the pre-selected minimum setting.

**Warm supply air:** On a decrease in space temperature the controller regulates the actuator to open the VAV damper and increase the flow of warm air. On a decrease of space temperature greater than the heating proportional band, the airflow is maintained at its pre-selected maximum setting.

On an increase in space temperature the controller regulates the actuator to close the VAV damper and reduce the flow of warm air. If the space temperature increases above the heating proportional band, the airflow is maintained at the pre-selected minimum setting.

**Reheat Operation:** On a decrease in space temperature, the controller modulates the 0-10VDC output to increase heat proportionally to the room demand.

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**Calibration note:** Suitable min and max heating flows must be selected in order to maintain flow through energized electric coils of at least 200 fpm and at least 70 cfm/kW throughout the entire operating range.

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**Legend:**
- FACTORY FLOW SENSOR TUBING
- FACTORY ELECTRICAL WIRING
- FIELD ELECTRICAL WIRING

**Control Graph**

Continuous Fan Operation

- Cool Air
- Warm Air
- Min. Heating
- Max. Heating
- Min. Cooling
- Max. Cooling
- Air Vol.

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**Notes:**
1. **NOTE 1:** Transformer secondary COM must be earth grounded.
2. **NOTE 2:** Wires 1-4 are plenum rated cables for 24VAC power and control circuits. Max 10VA per contactor. Analog output max: 10mA.
3. **NOTE 3:** Do not use gauge taps!

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Sequence of Operation -- Constant volume, continuous fan, pressure independent, normally open, direct acting cooling application. HW reheat is optional.

The unit fan operates continuously.
An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting.
A decrease in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 8 psi or less, the VAV box damper is maintained at the pre-selected minimum flow setting.
At thermostat output pressures between 8 & 13 psi the VAV damper modulates between minimum & maximum flow settings.
At thermostat output pressures below 8 psi the minimum flow setting is maintained, and the thermostat may control an optional reheat coil.

Normally Open Damper: On failure of the main air supply the damper will fail to the open position.
Sequence of Operation -- Constant volume, continuous fan, pressure independent, normally open, direct acting cooling application with electric reheat coil.

The unit fan operates continuously.

An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 8 psi or less, the VAV box damper is maintained at the pre-selected minimum flow setting.

At thermostat output pressures between 8 & 13 psi the VAV damper modulates between minimum & maximum flow settings.

At thermostat output pressures below 8 psi the minimum flow setting is maintained, and the thermostat will control the electric reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

_Normally Open Damper:_ On failure of the main air supply the damper will fail to the open position.
**Sequence of Operation** -- Constant volume, continuous fan, pressure independent, normally closed, direct acting cooling application. HW reheat is optional.

The unit fan operates continuously.

An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 8 psi or less, the VAV box damper is maintained at the pre-selected minimum flow setting.

At thermostat output pressures between 8 & 13 psi the VAV damper modulates between minimum & maximum flow settings. At thermostat output pressures below 8 psi the minimum flow setting is maintained, and the thermostat may also control an optional reheat coil.

**Normally Closed Damper:** On failure of the main air supply the damper will fail to the closed position.
Sequence of Operation — Constant volume, continuous fan, pressure independent, normally closed, direct acting cooling application with electric reheat coil.

The unit fan operates continuously.

An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 8 psi or less, the VAV box damper is maintained at the pre-selected minimum flow setting.

At thermostat output pressures between 8 & 13 psi the VAV damper modulates between minimum & maximum flow settings.

At thermostat output pressures below 8 psi the minimum flow setting is maintained, and the thermostat will control the electric reheat coil.

Normally Closed Damper: On failure of the main air supply the damper will fail to the closed position.
Sequence of Operation -- Constant volume, fan interlock, pressure independent, normally open, direct acting cooling application with primary damper close-off. HW reheat is optional.

Day Operation: The unit fan starts and runs continuously when primary air static pressure is sensed at the CP200 controller.

An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures below 8 psi, the minimum flow setting is maintained, and the thermostat may also control an optional reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

Night Operation: When no primary air static pressure is sensed at the CP200 controller the VAV damper is driven to the closed position and the unit fan is off.

On a continued decrease in space temperature the thermostat will energize the unit fan and control an optional reheat coil to maintain the thermostat setting.

Normally Open Damper: On failure of the main air supply the damper will fail to the open position.
FAN POWERED PNEUMATIC CONTROLS

Control Sequence Number 5007

Sequence of Operation -- Constant volume, fan interlock, pressure independent, normally open, direct acting cooling application with electric reheat coil and primary damper close-off.

**Day Operation:** The unit fan starts and runs continuously when primary air static pressure is sensed at the CP200 controller.

An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures below 8 psi, the minimum flow setting is maintained, and the thermostat will also control the electric reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

**Night Operation:** When no primary air static pressure is sensed at the CP200 controller the VAV damper is driven to the closed position and the unit fan is off.

On a continued decrease in space temperature the thermostat will energize the unit fan and control an electric reheat coil to maintain the thermostat setting.

**Normally Open Damper:** On failure of the main air supply the damper will fail to the open position.

---

NOTES:

1. TOTAL AIR CONSUMPTION 0.025 SCFM.

LEGEND

FACTORY PNEUMATIC TUBING

FIELD PNEUMATIC TUBING

CONTROL GRAPH

Continuous Fan Operation (Day)

Fan on (Night)

Reheat On

Max. Cooling

Air Vol.

Min. Cooling

CLOSE

Open

Set Point Room Condition

COOL

WARM

PROJECT:

ENGINEER:

CUSTOMER:

SUBMITTAL DATE:

SPEC. SYMBOL:

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**NOTES:**
1. TOTAL AIR CONSUMPTION 0.038 SCFM.

**LEGEND**
- FACTORY PNEUMATIC TUBING
- FIELD PNEUMATIC TUBING

**CONTROL GRAPH**
Continuous Fan Operation (Day)
- OPEN
- Fan on (Night)
- Max. Cooling
- Primary Air
- Air Val
- Min. Cooling
- Close

**Sequence of Operation -- Constant volume, fan interlock, pressure independent, normally closed, direct acting cooling application with primary damper close-off. HW reheat coil is optional.**

**Day Operation:** The unit fan starts and runs continuously when primary air static pressure is sensed at the CP100 controller. An increase in space temperature decreases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting. A decrease in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures below 8 psi, the minimum flow setting is maintained, and the thermostat may also control an optional reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

**Night Operation:** When no primary air static pressure is sensed at the CP100 controller the VAV damper is driven to the closed position and the unit fan is off. On a continued decrease in space temperature the thermostat will energize the unit fan and control an optional reheat coil to maintain the thermostat setting.

**Normally Closed Damper:** On failure of the main air supply the damper will fail to the closed position.

**PROJECT:**

**ENGINEER:**

**CUSTOMER:**

**SUBMITTAL DATE:**

**SPEC. SYMBOL:**

231766

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Sequence of Operation – Constant volume, fan interlock, pressure independent, normally closed, direct acting cooling application with electric reheat coil and primary damper close-off.

**Day Operation:** The unit fan starts and runs continuously when primary air static pressure is sensed at the CP100 controller. An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting. A decrease in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures below 8 psi the minimum flow setting is maintained, and the thermostat will also control the electric reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

**Night Operation:** When no primary air static pressure is sensed at the CP100 controller the VAV damper is driven to the closed position and the unit fan is off. On a continued decrease in space temperature the thermostat will energize the unit fan and control an electric reheat coil to maintain the thermostat setting.

**Normally Closed Damper:** On failure of the main air supply the damper will fail to the closed position.
Sequence of Operation — Constant volume, Day-Night Fan, pressure independent, normally open, direct acting cooling application with optional HW reheat.

Day Operation: The unit fan starts and runs continuously when the pneumatic signal from the central control system is at 0 psi. An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting. A decrease in space temperature decreases the thermostat output pressure. When the thermostat output pressure decreases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. A thermostat output pressures below 8 psi the minimum flow setting is maintained, and the thermostat may also control an optional reheat coil. Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

Night Operation: The unit fan is off when the pneumatic signal from the central control system is at 20 psi. On a continued decrease in space temperature the thermostat will energize the unit fan and control an optional reheat coil to maintain the thermostat setting.

Normally Open Damper: On failure of the main air supply the damper will fail to the open position.
Sequence of Operation — Constant volume, Day-Night Fan, pressure independent, normally open, direct acting cooling application with electric reheat coil.

Day Operation: The unit fan starts and runs continuously when the pneumatic signal from the central control system is at 0 psi. An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting. A decrease in space temperature decreases the thermostat output pressure. When the thermostat output pressure decreases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures below 8 psi the minimum flow setting is maintained, and the thermostat will control the electric reheat coil. Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

Night Operation: The unit fan is off when the pneumatic signal from the central control system is at 20 psi. On a continued decrease in space temperature the thermostat will energize the unit fan and control an electric reheat coil to maintain the thermostat setting.

Normally Open Damper: On failure of the main air supply the damper will fail to the open position.

NOTES:
1. TOTAL AIR CONSUMPTION 0.0295 SCFM.

LEGEND
----- FACTORY PNEUMATIC TUBING
----- FIELD PNEUMATIC TUBING

CONTROL GRAPH

Continuous Fan Operation (Day)

<table>
<thead>
<tr>
<th>Fan on (Night)</th>
<th>Repeat Qn</th>
<th>Primary Air</th>
<th>Air Vol</th>
<th>Max. Cooling</th>
<th>OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Stg. HI</td>
<td>2nd Stg. HI</td>
<td>2nd Stg. HI</td>
<td>1st Stg. HI</td>
<td>Set Point</td>
<td>Room Condition</td>
</tr>
</tbody>
</table>

PROJECT:

ENGINEER:

CUSTOMER:

SUBMITTAL DATE: SPEC. SYMBOL:

REV A
FAN POWERED PNEUMATIC CONTROLS

Sequence of Operation -- Constant volume, Day-Night Fan, pressure independent, normally closed, direct acting cooling application with optional HW reheat.

**Day Operation:** The unit fan starts and runs continuously when the pneumatic signal from the central control system is at 0 psi. An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting. A decrease in space temperature decreases the thermostat output pressure. When the thermostat output pressure decreases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures below 8 psi the minimum flow setting is maintained, and the thermostat may also control an optional reheat coil. Airflow is held constant at any given thermostat output pressure regardless of changes in the inlet duct static pressure.

**Night Operation:** The fan is off when the pneumatic signal from the central control system is at 20 psi. On a continued decrease in space temperature the thermostat will energize the unit fan and control an optional reheat coil to maintain the thermostat setting.

**Normally Closed Damper:** On failure of the main air supply the damper will fail to the closed position.

NOTES:
1. TOTAL AIR CONSUMPTION 0.0265 SCFM.

LEGEND
- FACTORY PNEUMATIC TUBING
- FIELD PNEUMATIC TUBING

CONTROL GRAPH
Continuous Fan Operation (Day)

(Open - Reg. 75% - Cool)

Air Vol.

Min. Cooling
CLOSE

Set Point
Room Condition

Cool

Max. Cooling
OPEN

Primary Air

Fan on (Night)
Sequence of Operation -- Constant volume, Day-Night Fan, pressure independent, normally closed, direct acting cooling application with electric reheat coil.

**Day Operation:** The unit fan starts and runs continuously when the pneumatic signal from the central control system is at 0 psi. An increase in space temperature increases the thermostat output pressure. When the thermostat output increases to 13 psi or more, the VAV box damper is maintained at the pre-selected maximum flow setting. A decrease in space temperature decreases the thermostat output pressure. When the thermostat output pressure decreases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures below 8 psi the minimum flow setting is maintained, and the thermostat will control an electric reheat coil. Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

**Night Operation:** The unit fan is off when the pneumatic signal from the central control system is at 20 psi. On a continued decrease in space temperature the thermostat will energize the unit fan and control an electric reheat coil to maintain the thermostat setting.

**Normally Closed Damper:** On failure of the main air supply the damper will fail to the closed position.
Sequence of Operation — Constant volume, continuous fan, pressure independent, reverse acting, normally open cooling application. HW reheat coil is optional.

The unit fan operates continuously.

An increase in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 3 psi or less, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature increases the thermostat output pressure. When the thermostat output increases to 8 psi or more, the VAV box damper is maintained at the pre-selected minimum flow setting.

At thermostat output pressures between 3 & 8 psi the VAV damper modulates between minimum & maximum flow settings.

At thermostat output pressures above 8 psi the minimum flow setting is maintained, and the thermostat may control an optional reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

**Normally Open Damper:** On failure of the main air supply the damper will fail to the open position.
**Sequence of Operation** — Constant volume, continuous fan, pressure independent, normally open, reverse acting cooling application with electric reheat coil.

The unit fan operates continuously. An increase in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 3 psi or less, the VAV box damper is maintained at the pre-selected maximum flow setting. A decrease in space temperature increases the thermostat output pressure. When the thermostat output increases to 8 psi or more, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures between 3 & 8 psi the VAV damper modulates between minimum & maximum flow settings. At thermostat output pressures above 8 psi the minimum flow setting is maintained, and the thermostat will control the electric reheat coil. Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

**Normally Open Damper**: On failure of the main air supply the damper will fail to the open position.
Sequence of Operation – Constant volume, continuous fan, pressure independent, reverse acting, normally closed cooling application. HW reheat coil is optional.

The unit fan operates continuously.

An increase in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 3 psi or less, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature increases the thermostat output pressure. When the thermostat output increases to 8 psi or more, the VAV box damper is maintained at the pre-selected minimum flow setting.

At thermostat output pressures between 3 & 8 psi the VAV damper modulates between minimum & maximum flow settings.

At thermostat output pressures above 8 psi the minimum flow setting is maintained, and the thermostat may control an optional reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

Normally Closed Damper: On failure of the main air supply the damper will fall to the closed position.
Sequence of Operation -- Constant volume, continuous fan, pressure independent, normally closed, reverse acting cooling application with electric reheat coil.

The unit fan operates continuously.

An increase in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 3 psi or less, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature increases the thermostat output pressure. When the thermostat output increases to 8 psi or more, the VAV box damper is maintained at the pre-selected minimum flow setting.

At thermostat output pressures between 3 & 8 psi the VAV damper modulates between minimum & maximum flow settings.

At thermostat output pressures above 8 psi the minimum flow setting is maintained, and the thermostat will control the electric reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

Normally Closed Damper: On failure of the main air supply the damper will fail to the closed position.
FAN POWERED PNEUMATIC CONTROLS

Sequence of Operation -- Constant volume, fan interlock, pressure independent, normally closed, reverse acting cooling application with primary damper close-off. HW reheat coil is optional.

**Day Operation:** The unit fan starts and runs continuously when primary air static pressure is sensed at the CP100 controller. An increase in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 3 psi or less, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature increases the thermostat output pressure. When the thermostat output increases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures above 8 psi, the minimum flow setting is maintained, and the thermostat may also control an optional reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

**Night Operation:** When no primary air static pressure is sensed at the CP100 controller the VAV damper is driven to the closed position and the unit fan is off. On a continued decrease in space temperature the thermostat will energize the unit fan and control an optional reheat coil to maintain the thermostat setting.

**Normally Closed Damper:** On failure of the main air supply the damper will fail to the closed position.

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**PROJECT:**

**ENGINEER:**

**CUSTOMER:**

**SUBMITTAL DATE:** 2011/11/07

**SPEC. SYMBOL:** 231778

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**NOTES:**

1. TOTAL AIR CONSUMPTION 0.038 SCFM.

**LEGEND**

--- FACTORY PNEUMATIC TUBING

--- FIELD PNEUMATIC TUBING

**CONTROL GRAPH**

Continuous Fan Operation (Day)
Sequence of Operation -- Constant volume, fan interlock, pressure independent, normally closed, reverse acting cooling application with electric reheat coil and primary damper close-off.

**Day Operation:** The unit fan starts and runs continuously when primary air static pressure is sensed at the CP100 controller.

An increase in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 3 psi or less, the VAV box damper is maintained at the pre-selected maximum flow setting.

A decrease in space temperature increases the thermostat output pressure. When the thermostat output increases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures above 8 psi, the minimum flow setting is maintained, and the thermostat may also control the electric reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

**Night Operation:** When no primary air static pressure is sensed at the CP100 controller the VAV damper is driven to the closed position and the unit fan is off.

On a continued decrease in space temperature the thermostat will energize the unit fan and control an electric reheat coil to maintain the thermostat setting.

**Normally Closed Damper:** On failure of the main air supply the damper will fail to the closed position.
Sequence of Operation -- Constant volume, Day-Night fan, pressure independent, normally open, reverse acting cooling application. HW reheat coil is optional.

**Day Operation:** The unit fan starts and runs continuously when the pneumatic signal from the central control system is at 20 psi. An increase in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 3 psi or less, the VAV box damper is maintained at the pre-selected maximum flow setting. A decrease in temperature increases the thermostat output pressure. When the thermostat output increases to 8 psi the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures above 8 psi the minimum flow setting is maintained, and the thermostat may also control an optional reheat coil.

Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

**Night Operation:** The unit fan is off when the pneumatic signal from the central control system is at 0 psi. On a continued decrease in space temperature the thermostat will energize the unit fan and control an optional reheat coil to maintain the thermostat setting.

**Normally Open Damper:** On failure of the main air supply the damper will fail to the open position.
FAN POWERED
PNEUMATIC CONTROLS

Control Sequence
Number 5023

Sequence of Operation -- Constant volume, Day-Night fan, pressure independent, normally closed, reverse acting cooling application with electric reheat coil.

Day Operation: The unit fan starts and runs continuously when the pneumatic signal from the central control system is at 20 psi. An increase in space temperature decreases the thermostat output pressure. When the thermostat output decreases to 3 psi or less, the VAV box damper is maintained at the pre-selected maximum flow setting. A decrease in space temperature increases the thermostat output pressure. When the thermostat output increases to 8 psi, the VAV box damper is maintained at the pre-selected minimum flow setting. At thermostat output pressures above 8 psi the minimum flow setting is maintained, and the thermostat may control the electric reheat coil. Airflow is held constant at any given thermostat output pressure regardless of changes in inlet duct static pressure.

Night Operation: The unit fan is off when the pneumatic signal from the central control system is at 0 psi. On a continued decrease in space temperature the thermostat will energize the unit fan and control an electric reheat coil to maintain the thermostat setting.

Normally Closed Damper: On failure of the main air supply the damper will fail to the closed position.

NOTES:
1. TOTAL AIR CONSUMPTION 0.017 SCFM.

LEGEND
--- FACTORY PNEUMATIC TUBING
- - - - FIELD PNEUMATIC TUBING

CONTROL GRAPH

Continuous Fan Operation (Day)

Fan On (Night)
Reheat On
Air Vol
Max. Cooling
Primary Air
Min. Cooling
CLOSE

Set Point
Cool
Room Condition
Warm

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SPEC. SYMBOL:

REV A

FPC8 / FPCE8 / FPCQ8
Kreuter CP-101
Ctg., Electric Reheat Coil
Constant Vol., Day-Night Fan
Pressure Independent
R.A. T-Stair, N.C. Damper

SUBMITTAL DATE: 231781
2011/11/07

ENGINEER:

CUSTOMER:
FAN POWERED
PNEUMATIC CONTROLS

Control Sequence
Number 5700

AIR FLOW
FLOW SENSOR
HI
LO
GAUGE TAPS

NORMALLY OPEN
FA DAMPER

5-10 PSI
PNEUMATIC
ACTUATOR

NOTE 1:
SET DESIRED
CONSTANT VOLUME
WITH "LO" DIAL

TO COOLING COIL
N.C. 3-15 PSI COOLING VALVE

DIRECT ACTING
1 OHM 2 PIPE
THERMOSTAT
(PNEUMATIC THERMOSTAT
PROVIDED BY OTHERS)

TO REHEAT COIL
N.O. 3-4 PSI HEATING VALVE
ON-P.E. SWITCH
SEE WIRING DIAGRAM

(PNEUMATIC CONTROL VALVES
PROVIDED BY OTHERS)

LEGEND

FACTORY PNEUMATIC TUBING
FIELD PNEUMATIC TUBING

NOTES:
1. TOTAL AIR CONSUMPTION 0.017 SCFM.

CONTROL GRAPH

Fresh Air Damper Position
Continuous Fan Operation
User Selected Constant Volume
ECM Motor

Set point
Cool Room Condition Warm

Sequence of Operation -- Constant Volume, pressure independant fresh Air, continuous fan, normally open, direct acting heating/cooling application.

Operation:
The unit fan runs continuously.
An increase in space temperature increases the thermostat output pressure. When the thermostat output increases from 8 PSI or more, the CV valve is modulated open.
A decrease in space temperature decreases the thermostat output pressure. When the thermostat output pressure decreases from 6 PSI or less, the CW valve is closed and the HW valve is modulated open or PE switches activate one or more stages of electric reheat.
Fresh air volume is held constant at any given thermostat output pressure regardless of changes in thermostat pressure.

Normally Open Damper:
On failure of the main air supply the fresh air damper will fail to the open position.

PROJECT:

ENGINEER:

CUSTOMER:

SUBMITTAL DATE: SPEC. SYMBOL:

SPEC SYMBOL:

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REV 0
FAN POWERED
PNEUMATIC CONTROLS
Control Sequence
Number 5701

NOTE 1:
SET DESIRED
CONSTANT VOLUME
WITH "LO" DIAL.

LEGEND
FACTORY PNEUMATIC TUBING
FIELD PNEUMATIC TUBING

NOTES:
1. TOTAL AIR CONSUMPTION 0.0251 SCFM.

CONTROL GRAPH

Day Operation:
The unit fan starts and runs continuously when the pneumatic signal from the central control system is 0 PSI.

An increase in space temperature increases the thermostat output pressure. When the thermostat output increases from 8 PSI or more, the CW valve is modulated open.

A decrease in space temperature decreases the thermostat output pressure. When the thermostat output pressure decreases from 8 PSI or less, the CW valve is closed and the HW valve is modulated open or PE switches activate one or more stages of electric reheat.

Fresh air volume is held constant at any given thermostat output pressure regardless of changes in thermostat pressure.

Night Operation:
The unit fan is off when the pneumatic signal from the central control system is at 20 PSI.

On a continued decrease in space temperature the thermostat will energize the unit fan and control the reheat coil to maintain the thermostat setting. The CW valve is disabled.

Normally Open Damper:
On failure of the main air supply the fresh air damper will fall to the open position.

PROJECT:  
ENGINEER:  
CUSTOMER:  
SUBMITTAL DATE:  
SPEC. SYMBOL:  

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Sequence of Operation -- Constant Volume, pressure independant fresh Air, continuous fan, normally open, direct acting heating/cooling application.

Operation:
The unit fan runs continuously.

An increase in space temperature increases the thermostat output pressure. When the thermostal output increases from 6 PSI or more, the CW valve is modulated open.

A decrease in space temperature decreases the thermostat output pressure. When the thermostat output pressure decreases from 6 PSI or less, the CW valve is closed and the HW valve is modulated open or PE switches activate one or more stages of electric reheat.

Fresh air volume is held constant at any given thermostat output pressure regardless of changes in thermostat pressure.

Normally Closed Damper:
On failure of the main air supply the fresh air damper will fail to the closed position.
FAN POWERED PNEUMATIC CONTROLS

Control Sequence
Number 5703

Sequence of Operation -- Constant Volume, pressure independant fresh Air, day/night fan, normally open, direct acting heating/cooling application.

Day Operation:
The unit fan starts and runs continuously when the pneumatic signal from the central control system is 0 PSI.

An increase in space temperature increases the thermostat output pressure. When the thermostat output increases from 8 PSI or more, the CW valve is modulated open.

A decrease in space temperature decreases the thermostat output pressure. When the thermostat output pressure decreases from 8 PSI or less, the CW valve is closed and the HW valve is modulated open or PE switches activate one or more stages of electric reheat.

Fresh air volume is held constant at any given thermostat output pressure regardless of changes in thermostat pressure.

Night Operation:
The unit fan is off when the pneumatic signal from the central control system is at 20 PSI.

On a continued decrease in space temperature the thermostat will energize the unit fan and control the reheat coil to maintain the thermostat setting. The CW valve is disabled.

Normally Closed Damper:
On failure of the main air supply the fresh air damper will fall to the closed position.

LEGEND

- FACTORY PNEUMATIC TUBING
- FIELD PNEUMATIC TUBING

NOTES:
1. TOTAL AIR CONSUMPTION 0.2591 SCFM.

CONTROL GRAPH

Fresh Air Damper Position
Continuous Fan Operation (DAY)
ECM Motor

Set point:
Cool
Room Condition
Warm

PROJECT:

ENGINEER:

CUSTOMER:

SUBMITTAL DATE:

SPEC. SYMBOL:

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