SIEMENS

PRC-OAVS

Pressurization Control by Differential Flow Reset, with Heating by BTU Compensation - Slow Actuation, Floating or Analog Output

Owner's Manual

125-5111

Building Technologies

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How To Use This Manual

This manual is written for the owner and user of the PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation. It is designed to help you become familiar with the Siemens Pressurization Room Controller and its applications.

This section covers manual organization, manual conventions, symbols used in the manual, and other information that will help you use this manual.

Manual Organization

This manual contains the following chapters:

- *Chapter 1 - Hardware,* describes the hardware components and the accessories that are used with the PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation.
- *Chapter 2 - Applications,* describes the control applications available in the model of the Pressurization Room Controller includes a terminal block for wireable input/output connections.
- *Chapter 3 - Point Database,* defines the point database descriptors and includes address and applications.
- *Chapter 4 – Basic Service and Maintenance,* describes basic corrective measures you can take should you encounter a problem when using the Pressurization Room Controller. For issues not covered in this chapter, consult your local Siemens Industry representative.
- The *Glossary* describes the terms and acronyms used in this manual.
- The *Index* helps you locate information presented in this manual.

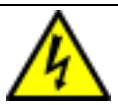
Manual Conventions

The following table lists conventions to help you use this manual in a quick and efficient manner.

Convention	Examples
Numbered Lists (1, 2, 3…) indicate a procedure with sequential steps.	1. Turn OFF power to the field panel. 2. Turn ON power to the field panel. 3. Contact the local Siemens Industry representative.
Conditions that must be completed or met before beginning a task are designated with a ▷. Intermediate results (what will happen following the execution of a step), are designated with a ⇨. Results, which inform the user that a task was completed successfully, are designated with a ⇨.	▷Composer software is properly installed. ▷A Valid license is available. 1. Select **Start** > **Programs** > **Siemens** > **GMS** > **Composer**. ⇨The Project Management window displays. 2. Open an existing project or create a new one. ⇨The project window displays.
Actions that should be performed are specified in boldface font.	Type **F** for Field panels. Click **OK** to save changes and close the dialog box.
Error and system messages are displayed in Courier New font.	The message `Report Definition successfully renamed` displays in the status bar.

Convention	Examples
New terms appearing for the first time are italicized.	The field panel continuously executes a user-defined set of instructions called the *control program*.
	This symbol signifies Notes. Notes provide additional information or helpful hints.
Cross references to other information are indicated with an arrow and the page number, enclosed in brackets: [→92]	For more information on creating flowcharts, see Flowcharts [→92].
Placeholders indicate text that can vary based on your selection. Placeholders are specified by italicized letters, and enclosed with brackets [ ].	Type **A C D H** [*username*] [*field panel #]*.

The following table lists the safety symbols used in this manual to draw attention to important information.

Symbol	Meaning	Description
NOTICE	CAUTION	Equipment damage may occur if a procedure or instruction is not followed as specified. (For online documentation, the NOTICE displays in white with a blue background.)
	CAUTION	Minor or moderate injury may occur if a procedure or instruction is not followed as specified.
	WARNING	Personal injury or property damage may occur if a procedure or instruction is not followed as specified.
	DANGER	Electric shock, death, or severe property damage may occur if a procedure or instruction is not followed as specified.

Your feedback is important to us. If you have comments about this manual, please submit them to SBT_technical.editor.us.sbt@siemens.com

Chapter 1 – Product Overview

The PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation is the Siemens Industry FLN controller used in pressure independent Variable Air Volume applications. It provides Direct Digital Control (DDC) for a number of applications.

- The controller can operate as an independent, stand-alone, DDC room controller or it can be networked with a field panel.
- The controller provides all termination, input/output, system and local communication connections.
- The controller hardware consists of the controller with cover and mounting bracket (See Figure PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation).
- The controller provides negative, positive, or neutral pressurization for laboratories (using volumetric tracking) to control airflow into or out of the laboratory from surrounding areas.
- Delivery of enough ventilation to the room to dilute air contaminants.
- Maintain the desired air temperature in the room.

The PRC is equipped with ventilation and pressurization alarms that are designed to fit into a safety program. When the ventilation system fails to function properly, the controller can detect and indicate the alarm condition throughout the facility. The controller can activate alarm devices in or near the room and broadcast that information through the Building Automation System (BAS) to the people designated to respond to the problem.

As part of a networked BAS, the PRC makes it possible for the maintenance staff to monitor, troubleshoot and adjust laboratory HVAC operation remotely. The BAS can collect and process data from the controller to generate longer-term records of laboratory operation. These records can be used as part of a building quality assurance program. Reports can also be tailored to serve as safety records, or for use in energy accounting.

To help you make the best use of your energy budget; the PRC has features that support reducing the ventilation rate during periods in which the laboratory is unoccupied.

The Laboratory Room Controller with Venturi Air Valves and OAVS can be used to control a lab room that has no supply air terminal box, or conversely, it can be used to control a lab room without a general exhaust terminal box. See your local Siemens Industry, Inc. representative for more information.

Configurations

The PRC is equipped to handle a variety of combinations of ventilation devices in one room. Each controller in your system is initially set up to cover the equipment installed at that time. Laboratory ventilation systems are known to change from time to time, usually as exhaust devices are added, or removed. This section explains various ways your PRC may be adapted to accommodate changes in the ventilation equipment. Contact your local Siemens Industry, Inc. representative for more specific information about your options.

The following applications are covered:

PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation (2931)

Hardware Inputs

Analog

Air velocity sensor (one or two depending on setup)	Application 2931
Room temperature sensor	Application 2931
Discharge temperature sensor (10K (default) or 100K Ω software selectable thermistor)	Application 2931
Differential pressure sensor (0-10 Vdc or 4-20 mA)	Application 2931

Digital

Occupancy button (option on room temperature sensor)	Application 2931
(Optional) Occupancy switch	Application 2931
(Optional) Alarm switch	Application 2931

Hardware Outputs

Analog

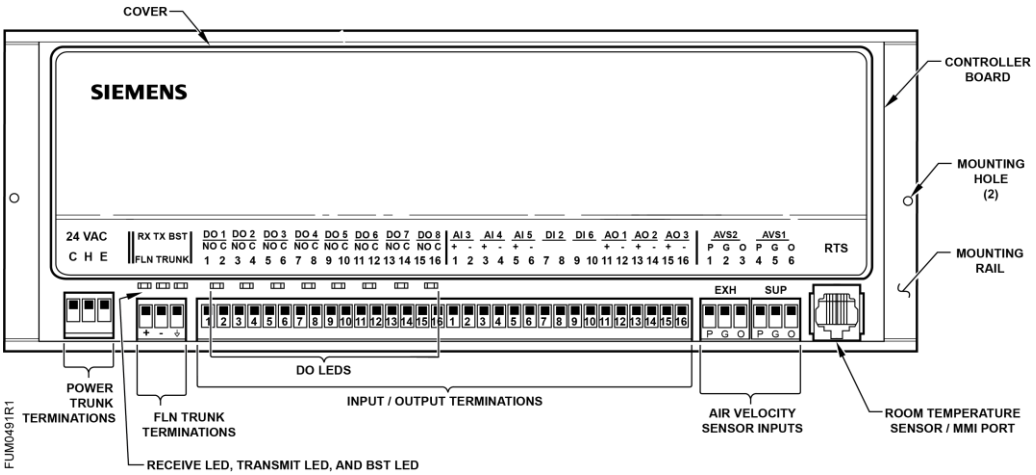
Reheat valve (default)	Application 2931
Supply damper (default)	Application 2931
Exhaust damper (default)	Application 2931

Digital

Supply damper (two DOs; DO 1/DO 2) (optional, in place of analog)	Application 2931
General exhaust damper (two DOs; DO 3/DO 4) (optional, in place of analog)	Application 2931
Autozero solenoid in Offboard Air Module (DO 8)	Application 2931
(Optional) Alarm (DO 7)	Application 2931
Reheat valve (two DOs) (optional, in place of analog)	Application 2931

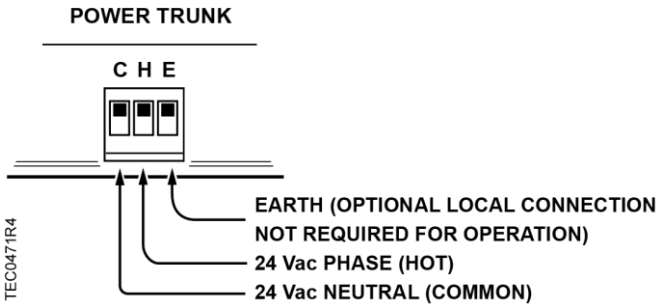
Ordering Notes

PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation	550-767HN



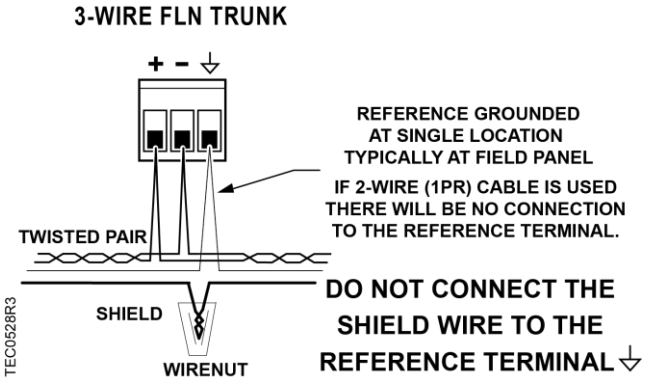
Generic Controller I/O Layout. See *Wiring Diagram* for application specific details.

Power Wiring



Communication Wiring

The controller connects to the field panel by means of a Floor Level Network (FLN) trunk. Communication wiring connects to the three screw terminals on the controller labeled “+” (positive), “-“ (negative), and “⏚ ” (reference).



Temperature Sensors

Temperature sensors used with the PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation include an electronic room temperature sensor and an optional duct temperature sensor.

Room Temperature Sensor

The controller room temperature sensor connects to the controller by means of a cable terminated at both ends with a six-conductor RJ-11 plug-in connector.

See the Ordering Notes section for the location of the room temperature sensor/Human Machine Interface (HMI) port.

NOTE:
When using a Series 2000 Room Thermostat:
During **unoccupied mode**, you cannot change the Room Setpoint using a Siemens Industry Series 2000 thermostat. Any attempt to change Room Setpoints during unoccupied mode using a Series 2000 stat will be ignored.

During **occupied mode**, the Room Setpoint can be changed using a Series 2000 stat, but if it is, then the controller initial values should be uploaded to the field panel. Otherwise the controller will not keep the adjusted Room Setpoint value upon return from a power failure.

Duct Temperature Sensor

An optional duct temperature sensor provides duct air temperature sensing inputs to the controller.

For more information about temperature sensors, contact your local Siemens Industry representative.

Discharge Temperature Sensor

An optional discharge temperature sensor provides BTU compensation sensing to the controller.

Actuators

Actuators used with the PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation include electronic damper motor. This actuator is controlled by the controller to position the damper or air valve.

Related Equipment

- Offboard Air Modules
- Duct temperature sensor (10K Ω thermistor) (optional)
- Discharge temperature sensor (10K Ω thermistor) (required for Application 2931 room temperature sensor)
- Venturi air valves
- Room temperature sensor

Contact your local Siemens Industry representative for product numbers and more information.

Chapter 2 – Applications

Basic Operation

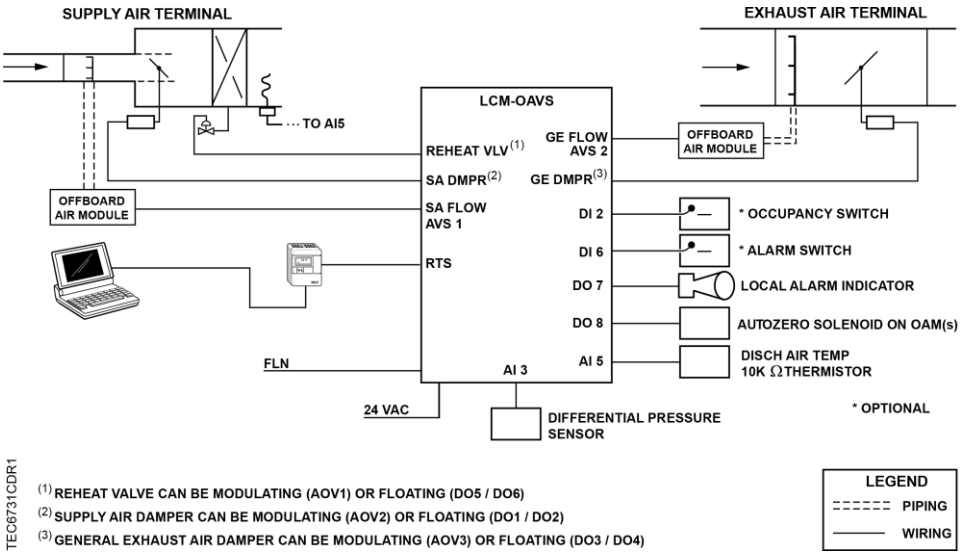
The PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation provides Direct Digital Control (DDC) technology for pressure independent Variable Air Volume (VAV) and Constant Volume (CV) laboratory room applications.

Application 2931 PRC-OAVS with Pressurization Control

The controller controls pressurization, ventilation, and room temperature in a laboratory room served by one single-duct supply terminal with a reheat coil, and one general exhaust terminal. The room differential pressure is maintained by a PID loop that varies the difference between the supply and exhaust airflows. Once the proper airflow difference is determined, airflow is then controlled by other PID loops that maintain the selected difference between supply and exhaust airflows.

This version of the PRC uses low speed supply and exhaust actuation rather than high speed actuation. Therefore, it should be used only where rapid room response to pressurization changes are not required.

This application allows the user to individually select floating or analog actuation for the supply, exhaust, and reheat actuators.



Application 2931 Control Diagram.

Application 2997 Slave Mode

Application 2997 is the slave mode application for the Pressurization Room Controller (see Ordering Notes for product numbers). Slave mode is the default application that comes up when power is first applied to the controller. Slave mode provides no control. Its purpose is to allow the operator to perform equipment checkout before a control application is put into effect and to set some basic controller parameters (CTLR ADDRESS, APPLICATION, etc.).

Chapter 3 – Point Database

Chapter 3 presents a description of the PRC-OAVS with Pressurization Control by Differential Flow Reset, Slow Actuation, Floating or Analog Output and Heating by BTU Compensation point database, including point descriptors, point addresses, and a listing of applications in which each point is found.

Descriptor	Address[1]	Application	Description
CTLR ADDRESS	01	All	Identifies the controller on the FLN trunk.
APPLICATION	02	All	Identification number of the program running in the controller.
TEMP OFFSET	03	All	Room temperature offset is a user-adjustable offset that will compensate for deviations between ROOM TMP and CTL TEMP.
ROOM TEMP	{04}[2]	All	Actual reading from the room temperature sensor.
RM PRESSURE	{05}	2931	Actual reading from the room pressure sensor.
PRESS I GAIN	06	2931	Integral feedback gain used to tune the room pressure control.
RM STPT MIN	07	2931	The minimum temperature setpoint, in degrees, that the controller can use from the setpoint dial. This overrides any temperature set point from the set point dial that falls below this minimum.
RM STPT MAX	08	2931	The maximum temperature setpoint in degrees that the controller can use from the setpoint dial. This overrides any temperature setpoint from the setpoint dial that falls above this maximum.
TEMP CTL VOL	{09}	2931	Amount of supply airflow that the temperature control sequence determines is necessary to regulate the room temperature.
PRESS STPT	{10}	2931, 2997	The room pressure setpoint in inches water column that the room will control to.
PRESS ALM	{11}	2931	Alarm point indicates improper room pressure control.
OCC ENA	12	2931	An analog point that determines if and what occupancy button is enabled.
ROOM STPT	{13}[2]	All	The temperature setpoint in degrees from the room temperature sensor (not available on all temperature sensor models).
AI 4	{14}	All	Spare analog input (0-10V or 4-20 mA).
RM PRESS AI3	{15}	2931	Room pressure sensor input (0-10V or 4-20 mA).
AI 3	{15}	2997	Spare analog input (0-10V or 4-20 mA).
VENT ALM DEL	16	2931	Delay period that prevents “nuisance alarms” on the air change rate.
ALARM ENA	17	2931	An analog point that determines if and what alarm activates ALARM DO7.
PRESS P GAIN	18	2931	Proportional feedback gain used to tune the room pressure control.

Descriptor	Address[1]	Application	Description
OCC BUTTON	{19}[2]	All	Actual indication of the status of the override switch (not physically available on all temperature sensor models) at the room temperature sensor. ON indicates that the switch is being pressed. OFF indicates that the switch is released. Valid input: ON or OFF.
OCC.UNOCC	{21}	All	Indicates the mode that the controller is operating in with respect to the override switch. NIGHT indicates that the switch has not been pressed and the override timer is not active. DAY indicates that the switch has been pressed and the override timer is active. The controller then uses a day mode temperature setpoint. This point is only in effect when DAY.NGT indicates night mode.
VOL DIF ALM	{22}	2931	Alarm point. ON means room pressurization may not be adequate.
NET ALM CMD	{23}	2931, 2997	The alarm data sent in to PRC from the network.
OCC SWIT DI2	{24}	2931, 2997	Actual status of a contact connected to the controller at DI 2 (screw terminals 15 and 16). ON indicates that the contact is closed; OFF indicates that the contact is open. If a wall switch is used, it is connected to DI 2.
DI 2	{24}	2997	Actual status of a contact connected to the controller at DI 2. ON indicates that the contact is closed; OFF indicates that the contact is open.
BUTTON CMD	{25}[2]	All	Actual status of a contact connected to the controller at DI 3/AI 3 (screw terminals 13 and 14). ON indicates that the contact is closed; OFF indicates that the contact is open. When a contact is connected at DI 3, AI 3 is not available.
GEX P GAIN	26	2931	Feedback gain. Used to tune general exhaust flow control loop.
ALM SWIT DI6	{27}	2931	Set the controller to Supply Tracks Exhaust (negative pressurization) or Exhaust Tracks Supply (positive pressurization).
DI 6	{27}	2997	Actual status of a contact connected to the controller at DI 6. ON indicates that the contact is closed; OFF indicates that the contact is open.
TRACK MODE	28	2931	An occupancy input. This value comes to the LCM from the network or from a schedule.
NET OCC CMD	{29}	2931	Indicates the mode in which the controller is operating. Occupied temperature setpoints will be used in DAY mode. Unoccupied temperature setpoints will be used in NGT mode. This point is normally set by the field panel.
GEX AIR VOL	{30}	2931, 2997	Measured value of the airflow from the room through the general exhaust terminal.
AIR VOLUME 2	{30}	2997	Measured value of airflow in cfm (lps).
OCC SUP MAX	{31}	2931	The maximum amount of air in cfm (lps) to be supplied to the space during occupied periods.
OCC SUP MIN	{32}	2931	The minimum amount of air in cfm (lps) to be supplied to the space during occupied periods
OCC GEX MAX	{33}	2931	The maximum amount of exhaust in cfm (lps) to be supplied to the space during occupied periods.

Descriptor	Address[1]	Application	Description
OCC GEX MN	{34}	2931	The minimum amount of exhaust in cfm (lps) to be supplied to the space during occupied periods
SUP AIR VOL	{35}	2931	Measured value of the supply airflow.
AIR VOLUME 1	{35}	2997	Measured value of airflow in cfm (lps).
SUP FLO COEF	36	2931	Calibration factor for airflow.
FLOW COEFF 1	36	2997	Calibration factor for airflow.
REHEAT AO1	{37}	2931	The control signal for the Reheat Valve (0-10V).
AO 1	{37}	2997	Analog output (0-10 Vdc) optional control.
DIF ALM DBD	38	2931	Setting for the controller's alarm; should be set lower than VOL DIF STPT to avoid losing pressurization completely.
DIF ALM DEL	39	2931	Alarm delay point to prevent "nuisance alarms" on the flow difference.
AVS FAIL MODE	40	2931	Indicates the desired position of the dampers if the airflow sensor(s) fail. Valid input: CLOSED or OPEN.
DO 1	{41}	All	Digital output 1 controls a 24 Vac load with an ON or OFF status. If Motor 1 is enabled, then DO 1 is coupled with DO 2 to control an actuator.
DO 2	{42}	All	Digital output 2 controls a 24 Vac load with an ON or OFF status. If Motor 1 is enabled, then DO 2 is coupled with DO 1 to control an actuator.
DO 3	{43}	All	Digital output 3 controls a 24 Vac load with an ON or OFF status. If Motor 2 is enabled, then DO 3 is coupled with DO 4 to control an actuator.
DO 4	{44}[2]	All	Digital output 4 controls a 24 Vac load with an ON or OFF status. If Motor 2 is enabled, then DO 4 is coupled with DO 3 to control an actuator.
TRACK METHOD	45	2931	Determines whether the controller uses FLOW or STPT flow tracking. When the value is STPT, the supply flow follows the GEN EXH STPT. When the value is FLOW, the supply flow follows GEN EXH VOL.
DO 5	{46}	All	Digital output 5 controls a 24 Vac load with an ON or OFF status. If Motor 3 is used, this point is coupled with DO 6.
ALARM DO 7	{47}	2931	The value to which the cold duct damper motor is commanded in percent of full travel.
DO 7	{47}	2997	Digital output 7 controls a 24 Vac load with an ON or OFF status.
AUTOZERO DO8	{48}	2931	Drives the Offboard Air Module(s) in order to calibrate the flow sensor(s). Do not use or manually set this point.
DO 8	{48}	2997	Digital output 8 controls a 24 Vac load with an ON or OFF status.
REHEAT CMD	{49}	2931	The value to which the reheat valve is commanded in percent of full travel.
GEX DMP CMD	{50}	2931	The value to which the general exhaust damper motor is commanded in percent of full travel.
DISCH MIN	51	2931	Minimum discharge temperature setting.

Descriptor	Address[1]	Application	Description
MTR SETUP	52	2931	Sets the presence or absence of a motor and its direction of travel.
TOTL EXHAUST	{53}	2931	This value is the sum of the measured value of the airflow from the room through the general exhaust terminal, the airflow through the fume hoods, and any exhaust flows not connected to the PRC.
GEX FLO COEF	54	2931	The calibration parameter for airflow sensor.
FLOW COEFF 2	54	2997	Calibration parameter for airflow sensor.
SUP DMP AO2	{55}	2931	Control signal for Venturi Supply Valve (0 - 10V).
AO 2	{55}	All	Control signal for Venturi Supply Valve (0 - 10V).
GEX DMP AO3	{56}	2931	Control signal for Venturi General Exhaust Valve (0 - 10V).
AO 3	{56}	2997	Analog output (0-10 Vdc) optional control.
VOL DIF MIN	57	2931	The minimum volume differential setpoint used to control the room pressure.
VOL DIF MAX	58	2931	The maximum volume differential setpoint used to control the room pressure.
DISCH MAX	59	2931	Maximum discharge temperature setting.
GEXDUCT AREA	60	2931, 2997	Area, in square feet (square meters), of duct where the air velocity sensor is located. This value is calculated by the portable operator's terminal or by the field panel depending on duct shape and size. It is used in calculating all points in units of cfm, CF, lps, and L.
OTHER SUP	{61}	2931	The value of any supply airflows not connected to the PRC. Must be entered to the controller to account for flows it cannot detect.
SUP DMP CMD	{62}	2931	The commanded position of the supply damper.
ROOM P GAIN	63	2931	Proportional feedback gain used to tune the room temperature control.
ROOM I GAIN	64	2931	Integral feedback gain used to tune the room temperature control.
HI PRESS ALM	{65}	2931	Highest differential pressure alarm level.
LO PRESS ALM	{66}	2931	Lowest differential pressure alarm level
UOC GEX MAX	{67}	2931	Maximum exhaust in unoccupied mode.
UOC GEX MIN	{68}	2931	Minimum exhaust in unoccupied mode.
TOTL SUPPLY	{69}	2931	This is the measured value of the airflow delivered to the room by the supply terminal, plus the value of any supply airflows not connected to the PRC.
SUP P GAIN	70	2931	Feedback gain. Used to tune supply flow control.
UOC SUP MAX	{71}	2931	Maximum supply in unoccupied mode.
UOC SUP MIN	{72}	2931	Minimum supply in unoccupied mode.
CTL STPT	{73}	2931	The actual setpoint value being used as input for the active temperature control loop.
HI PRES RNG	74	2931	The highest value that the sensor connected to RM PRES AI3 will read.
DISH STPT	{75}	2931	The discharge temperature setpoint volume.

Descriptor	Address[1]	Application	Description
VOLUME STATE	76	2931	Determines type of control, VAV or CV, during occupied and unoccupied modes.
DO 6	{77}	2931	Digital output 6 controls a 24 Vac load with an ON or OFF status. If Motor 3 is enabled, then DO 5 is coupled with DO 6 to control an actuator.
CTL TEMP	{78}	2931, 2997	The temperature used as input for the temperature control loops. This value will be the same as the value in ROOM TEMP, unless it is overridden.
TEMP LOOPOUT	{79}	2931	The value calculated by the room temperature PID algorithm. It indicates the thermal load on the room.
DISCH P GAIN	80	2931	Proportional feedback gain used to tune the discharge temperature control.
DISCH I GAIN	81	2931	Integral feedback gain used to tune the discharge temperature control.
DMPR STATUS	{82}	2931	Indicates whether or not the damper positions are being recalculated.
VOL DIFF	{83}	2931	The difference between measured airflow into the room, and measured airflow out.
DISCH TEMP	{84}	2931	Discharge temp sensor input.
GEX FLO STPT	{85}	2931	The desired value of the general exhaust. The controller selects the lowest value that will lead to adequate supply flow, and correct pressurization.
FAIL LIMIT	86	2931	The error threshold of the Supply or Exhaust (depending on TRACK MODE) above which the FLOW MODE switches from STPT to FLOW after the time in FAIL TIME has expired.
LO PRES RNG	87	2931	The lowest value that the sensor connected to RM PRES AI3 will read.
VOL DIF STPT	{88}	2931	The desired value for the flow difference. This value can be selected and adjusted to achieve room pressurization
OTHER EXH	{89}	2931	The value of any exhaust airflows not connected to the LCM. Must be entered to the controller to account for flows it cannot detect.
OC V ALM LVL	90	2931	Low Ventilation alarm level (cfm/lps) for occupied mode.
UC V ALM LVL	91	2931	Low Ventilation alarm level (cfm/lps) for unoccupied mode.
VENT ALM	{92}	2931	Alarm point indicates inadequate air change rate.
SUP FLO STPT	{93}	2931	The desired value of the supply flow, chosen by the controller, to achieve the correct flow difference for the room.
CAL AIR	{94}	2931, 2997	YES commands the controller to go through calibration sequence for the air velocity transducers. YES is also displayed when the calibration sequence is started automatically. CAL AIR automatically returns to NO after the calibration sequence is completed. Valid input: YES or NO
CAL SETUP	95	2931, 2997	The configuration setup code for the calibration sequence options.
CAL TIMER	96	2931, 2997	Time interval, in hours, between the calibration sequence initiations if a timed calibration option is selected in CAL SETUP.

Descriptor	Address[1]	Application	Description
SUPDUCT AREA	97	2931, 2997	Area, in square feet (square meters), of the duct where the air velocity sensor is located. This value is calculated by the field panel depending on duct shape and size. It is used in calculating all points in units of cfm, CF, lps, and L.
LOOP TIME	98	2931	The time, in seconds, between control loop calculations.
ERROR STATUS	{99}	2931, 2997	The status code indicating any errors detected during controller power up. A status of 0 indicates there are no problems.
REHEAT CLOSD	102	2931	The value of REHEAT AO1 that closes the reheat valve completely.
REHEAT OPEN	103	2931	The value of REHEAT AO1 that opens the reheat valve completely.
STAT SUPV	{104}	2931, 2997	Room unit configuration point, values are additive.
PRESS D GAIN	105	2931	Differential feedback gain used to tune the room pressure control.
MODHTG FLO	106	2931	The minimum flow in feet per minute needed for safety purposes when using electric reheat.
DO DIR.REV	107	2931, 2997	Reverses the output state for selected non-motor digital outputs.
RM RH	{108}	2931, 2997	Room humidity when room unit is provided with humidity sensing.
FAIL TIME	109	2931	Indicates when the air volume is too far away from setpoint for too long.
PRES ALM DEL	110	2931	Delay period that prevents “nuisance alarms” on the room pressure control alarm.
SUP DMP POS	{111}	2931	The current position of the supply damper motor in percent of full travel. This value is calculated based on motor run time.
MTR1 TIMING	112	2931	The time required for the Motor 1 actuator to travel from full closed to the full open position.
MTR1 ROT ANG	113	2931	The angle that Motor 1 rotates from fully closed to fully open.
GEX DMP POS	{114}	2931	The current position of the exhaust damper motor in percent of full travel. This value is calculated based on motor run time.
MTR2 TIMING	115	2931	The time required for the Motor 2 actuator to travel from full closed to the full open position.
MTR2 ROT ANG	116	2931	The angle that Motor 2 rotates from fully closed to fully open.
MTR3 TIMING	117	2931	The status code indicating any errors detected during controller power up. A status of 0 indicates there are no problems.
RM CO2	{118}	2931, 2997	A point can be unbundled in the controller for monitoring purposes. This point may be used in a control strategy as occupancy increases (CO2 levels increase) in the room being controlled.
REHEAT POS	{119}	2931	The current position of the reheat valve in percent of full travel. This value is calculated based on motor run time.
SUP DMP CLOS	120	2931	The value of SUP DMP AO2 that closes the damper all the way.

Descriptor	Address[1]	Application	Description
SUP DMP OPEN	121	2931	The value of SUP DMP AO2 that open the damper all the way.
GEX DMP CLOS	122	2931	The value of GEX DMP AO3 that closes the damper all the way.
GEX DMP OPEN	123	2931	The value of GEX DMP AO3 that open the damper all the way.
NO PR VOL DF	125	2931	The value in CFM that the room is controlled to if the room pressure sensor fails.
PPCL STATE	{127}	2931, 2997	An indicator that customized programming has been added in addition to the normal control strategy of the application being used. This point is read as LOADED or EMPTY. A status of LOADED indicates that there is PPCL programming in the controller, and it is providing unique control to meet a customer's job specification. A status of EMPTY indicates that no unique programming is present.

1) Points not listed are not used in this application.

2) Point numbers that appear in brackets { } may be unbundled at the field panel.

Chapter 4 – Basic Service and Maintenance

This chapter describes corrective measures you can take should you encounter a problem when using a Pressurization Room Controller.

You are not required to do any controller troubleshooting. You may want to contact your local Siemens Industry representative if a problem occurs or you have any questions about the controller.

NOTE:
When troubleshooting, record the problem and what actions were performed immediately before the problem occurred. Being able to describe the problem in detail is important should you need assistance from your local Siemens Industry representative.

Basic Service Information

Always remove power to the Pressurization Room Controller when installing or replacing it. Since the controller does not have a power switch, the recommended method of removing power to a locally powered controller is to turn OFF the power to the 24 Vac transformer. The recommended method of removing power to a controller on a power cable (even to service a single controller) is to turn OFF the power at the transformer.

NOTE:
When removing power to a controller to perform maintenance or service, make sure that the person in charge of the facility is aware of this and that appropriate steps are taken to keep the building in control.

Never remove the cover from the Pressurization Room Controller. There are no serviceable parts inside. If a problem is found with this device, contact your local Siemens Industry representative for replacement. An anti-static wrist strap is recommended when installing or replacing controllers.

Preventive Maintenance

Most controller components are designed so that, under normal circumstances, they do not require preventive maintenance. Periodic inspections, voltage checks, and point checks are normally not required. The rugged design makes most preventive maintenance unnecessary. However, devices that are exposed to dusty or dirty environments may require periodic cleaning to function properly.

Safety Features

The controller board stores the controller's address, applications, and point values. In the event of a power failure or a reset, these values are retrieved from the controller's permanent memory and are used by the controller unless overridden by a field panel. If one of the following conditions occurs, the controller will activate safety features present in its fail-safe mode.

- Sensor failure.
- Loss of power. Upon controller power loss, communication with the controller is also lost. The controller will appear as failed (*F*) at the field panel.

Glossary

This glossary contains the collected terms and acronyms that are used in Siemens BACnet PTEC and TEC Controllers. For definitions of point database descriptors, see Chapter 3 - Point Database, in this manual.

airflow

Rate at which a volume of air moves through a duct. Usually expressed in cubic feet per minute (cfm) or liters per second (lps).

algorithm

Mathematical formula and control logic that uses varying inputs to calculate an output value.

AVS

Air Velocity Sensor. An electronic device that converts differential pressure from a pilot tube or multi-point pickup to an analog rate of fluid flow (air velocity in fpm, m/s) to provide calculations of air volume rate (cfm, lps) in a duct. The air velocity sensor may be an external device or an internal component of a controller.

centralized control

Type of control offered by a controller that is connected by means of Field Level Network (FLN).

cfm

Cubic Feet per Minute.

Chilled Beam

A cooling device that provides a cooling system by taking care of both the sensible and latent heat gains of a room in a single package by a series of chilled water coils mounted near or in the ceiling. Coupled with a CV or VAV terminal ventilation system, a chilled beam induces air movement over the coil in the way that it discharges fresh air into the room. This allows for both fresh air and cooling to be taken care of at the same time.

control loop

An algorithm, such as PI or PID, that is used to control an output based on a setpoint and an input reading from a sensor.

CO_2

Carbon dioxide, a naturally occurring chemical compound composed of two oxygen atoms and a single carbon atom. Among other production sources, carbon dioxide is produced as the result of breathing of humans and animals and can therefore be an indirect indication of the concentration of humans in a zone.

CV

Constant air volume. Ventilation system that provides a fixed air volume supplied to and exhausted from the rooms served. The fixed volume may be different during occupied and unoccupied times

Demand Control Ventilation

A control algorithm that provides for the control or reduction of outdoor air intake below design rates when the actual occupancy of spaces served by the system is at less than design occupancy.

DCV

Demand Control Ventilation.

DDC

Direct Digital Control.

Direct digital control

The automated control of a condition or process by a digital device (computer).

DO

Digital Output. Physical output point that sends a two-state signal (ON/OFF, OPEN/CLOSED, YES/NO).

English units

The foot-pound-second system of units for weights and measurements.

equipment controller

FLN device, such as a BACnet PTEC or ATEC, that provides individual room or mechanical equipment control or additional point capacity to a field panel.

field panel

A DDC control device containing a microprocessor for centralized control and monitoring of system components and equipment controllers.

Floating Control

The combination of a modulating controlled device with the use of a pair of two position outputs. The control signal will either activate one or the other outputs to drive the controlled device towards its open or closed position. When both outputs are off, the controlled device maintains its last position. Also referred to as tri-state control.

FLN

Field Level Network. Network consisting of equipment controllers, FLN end devices, fume hoods, etc.

lps

Liters per Second.

loopout

Output of the control loop expressed as a percentage.

Heat pump

An HVAC device used for both space heating and space cooling. When a heat pump is used for heating, it employs the same basic refrigeration-type cycle used by an air conditioner but in the opposite direction, releasing heat into the conditioned-space rather than the surrounding environment. In this use, heat pumps generally draw heat from the cooler external air or from the ground.

HMI

Human Machine Interface. Terminal and its interface program that allows you to communicate with a field panel or equipment controller.

Occupancy sensor

A control device that detects presence of people in a space by using infrared or ultrasonic technology. Occupancy sensors are used to save energy by controlling lighting and temperature and, along with CO2 sensors, to provide control input of demand control ventilation (DCV) algorithms.

override switch

Button on a room temperature sensor that an occupant can press to change the status of a room from unoccupied to occupied (or from night to day) for a predetermined time.

pressure dependent

Variable Air Volume (VAV) room temperature control system in which the temperature drives a damper such that the air volume delivered to the space at any damper position is dependent on the duct static pressure.

pressure independent

Variable Air Volume (VAV) room temperature control system in which the temperature drives an airflow setpoint such that the air volume delivered to the space is independent of variations in the duct static pressure.

PID

Proportional, Integral, Derivative.

RTS

Room Temperature Sensor.

setpoint

Data point that stores a value such as a temperature setting. In contrast, points that monitor inputs, such as temperature, report actual values.

SI units

Systeme International d'Unites. The international metric system.

slave mode

Default application that displays when power is first applied to an equipment controller. No control action is initiated in the slave mode. Input and output points in the slave application can be monitored or controlled by a field panel (or by PPCL in a BACnet PTEC controller).

stand-alone control

Type of control offered by a controller that is providing independent DDC control to a space.

Terminal Equipment Controller

Siemens Industry, Inc. product family of equipment controllers that house the applications software used to control terminal units, such as heat pumps, VAV terminal boxes, fan coil units, unit ventilators, etc.

UI

Universal Input. Can be used as an AI or DI. An AI input is a point receiving a signal that represents a condition that has more than two states. A DI input is a physical input point that receives a two-state signal.

unbundle

Term used to describe the entering of a point that resides in a controller's database into the field panel's database so that it can be monitored and controlled from the field panel.

VAV

Variable air volume. Ventilation system that changes the amount of air supplied to and exhausted from the rooms served.

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