SIEMENS

Controller Start-up for Custom Solutions Application 2429

Series Fan VAV—Option for 0-10V Fan Speed Control—with HW Reheat, Spare AIs and AOVs, Optional Night Damper, and 2 AVS

TEC-0138.08

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Before You Begin

Verify power to the controller; the BST LED (Figure 1) should flash ON/OFF once per second. If the BST LED is not flashing ON/OFF once per second, then refer to *APOGEE Automation Service Procedures* on InfoLink for troubleshooting information.

NOTES: Update each controller at the field panel immediately after you have completed the controller start-up procedures and made all other changes to the controller's point database, including balancing, tuning, etc.

If using the Controller Interface Software (CIS), the Rev. must be 2.0 or greater.

Enabling Damper Actuator

1. Verify that APPLICATION (Point 2) is set to 2480 (slave mode).
2. Display the STARTUP report.
3. Set MTR1 TIMING (Point 51) to the correct running time of the actuator. Refer to Table 1.
4. If the damper rotation angle is not 90°, set DPR1 ROT ANG (Point 56) accordingly.
5. Enable the damper actuator by setting MTR SETUP (Point 58) to 1. Verify that the damper closes completely. If it does not close completely, reverse the action of the damper actuator by setting MTR SETUP to 3.

Table 1. Damper Actuator Run Time.

Damper Actuator	Setting (seconds)	
	50 Hz	60 Hz
349-0101	106	88
GDE 131.1U	108	90
GDE 131.1P	108	90
GLB 131.1P	150	125
[1]GBB 171.1U	150	150
[2]GDE 161.1P	108	90
[2]GLB 161.1P	150	125

[1] GBB 171.1U run time is independent of Hz.
[2] Analog output 0-10V.

Note: See the Manufacturer Installed Controls (MIC) web page on iKnow (http://iknow.us.abatos.com/mic/) for specific manufacturers' damper opening details (90°/60°/etc.).

Table 2. Motor Enable/Reverse Values for MTR SETUP (Point 58).

	Motor 1 Enabled	Motor 1 Enabled and reversed	Motor 1 Not Used
Motor 2 Not Used	1	3	0
Motor 2 Enabled	5	7	4
Motor 2 Enabled and Reversed	13	15	12

If the damper still does not close completely, then the actuator has been installed or set up incorrectly. Refer to the damper actuator installation instructions, set up information, Table 2, or *APOGEE Automation Service Procedures* for more information.

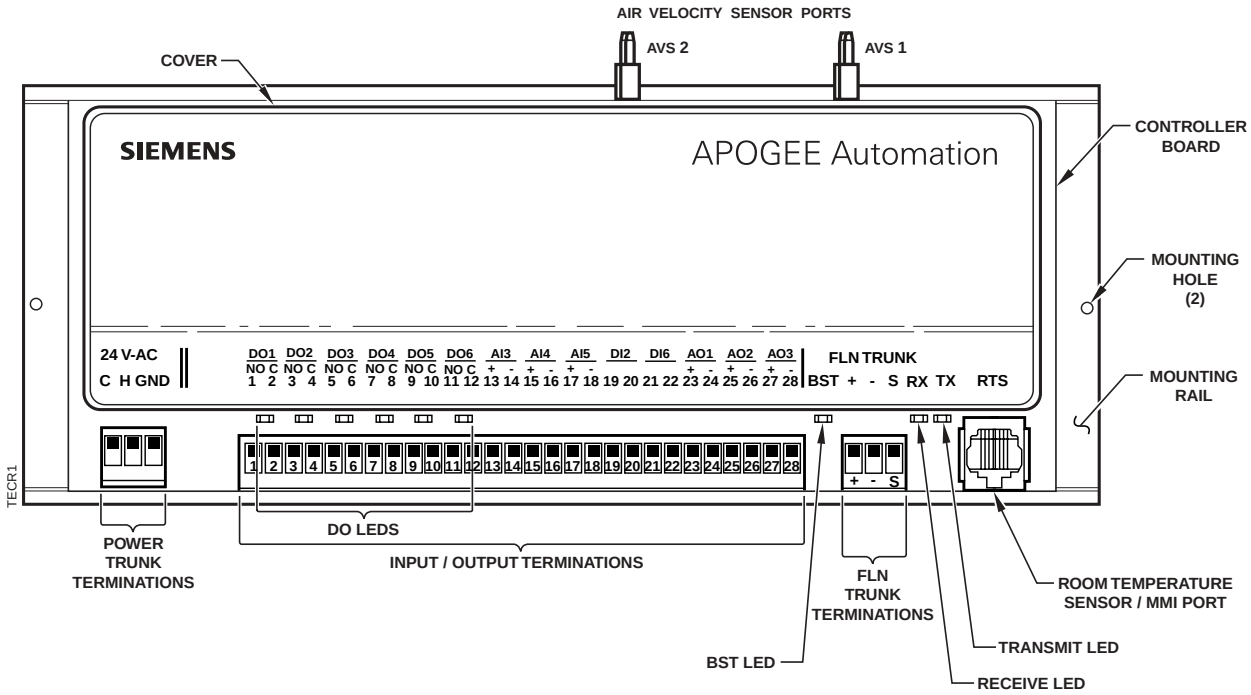

Figure 1. VAV Terminal Box Controller with HW Reheat and Extra AIs.

Enabling Valve 1 Actuator

1. Set MTR2 TIMING (Point 55) to the correct running time of the valve 1 actuator. Refer to Table 3.

Table 3. Valve Actuator Run Time.

Valve Actuator	Setting (seconds)	
	50 Hz	60 Hz
SSB81U (Powermite – MZ Series)	180	150
SQS 82	155	130
SQS 65U (analog output 0 to 10V)	35	30
SQS 65.5U (analog output 0 to 10V)	35	30
SSB 61U (analog output 0 to 10V)	N/A	150

2. Enable the valve 1 actuator by changing MTR SETUP (Point 58) as follows:
   - If a damper actuator is present and is enabled (MTR SETUP = 1), enable the valve 1 actuator by changing MTR SETUP to 5.
   - If a damper actuator is present, enabled, and reverse acting (MTR SETUP = 3), enable the valve 1 actuator by changing MTR SETUP to 7.

3. Verify that valve 1 closes and remains closed. If the valve does not close, reverse the action of the valve 1 actuator by changing MTR SETUP as follows:
   - If the damper actuator is enabled, change MTR SETUP to 13.
   - If the damper actuator is enabled and reverse acting, change MTR SETUP to 15.

Configuring for Fan-Speed Control

If the fan will be run off of DO 6, and will **not** be connected to AO 1, skip this section and go to *Setting Application*.

If the fan runs off a variable fan-speed control device connected to AO 1, then FAN SPD AO1 (Point 81) must be unbundled at the field panel and PPCL code must be written to shut down the speed control device and turn OFF the fan at the beginning of the calibration sequence, and then release it to normal control once calibration ends. An example of this PPCL (in pseudo code form) follows here:

```
100   IF (CAL AIR .EQ. YES .AND. FAN .EQ. OFF) THEN close device.
      ELSE Release device to normal control.
```

It is recommended that the PPCL be up and running in the field panel before proceeding further with the Start-up.

Setting Application

NOTE: If you are going to enter an LCTLR point at the field panel, then keep track of the application, override time, controller address, duct shape, and duct dimensions you enter at the portable operator's terminal. You will be required to enter these values again at the field panel.

1. Set APPLICATION (Point 2) To 2429. (After you set the application, the controller will go through a shut-down/load sequence as it switches from slave mode to the application selected. After the application loads, the OVERVIEW report appears and the calibration cycle begins.)

2. Wait for Air Velocity Sensor Calibration. (The air velocity sensor calibration cycle takes from 2 to 5 minutes to complete. At the start of the cycle, CAL AIR (Point 94) is set to YES. Both the hot water valve (if used) and the supply damper will be commanded closed during calibration. You must wait for the end of calibration (CAL AIR is set to NO) before continuing with this start-up procedure.

Configuring Automatic Calibration

The air velocity sensor must be calibrated at least once every 24 hours. Make sure that the sensor has been calibrated before balancing takes place as this will affect the balancer's results.

1. Display the first report in the REPORTS selection box. The report will be named “VAV app”, where app is a description of the particular application you are using.

2. Select the automatic calibration option desired from Table 4 that best meets your job requirements.

3. Set CAL SETUP to the desired value.

Table 4. CAL SETUP Options.

CAL SETUP Options	Description
0	Calibration occurs ONLY when CAL AIR (Point 94) is set to YES.
1	Calibration occurs when the field panel commands a day/night mode changeover. Actual calibration is subject to a time delay of 0, 1, 2, or 3 minutes. This delay is determined by CTLR ADDRESS (Point 1) divided by 4 and the remainder is the time delay in minutes. **Example:** If CTLR ADDRESS = 11, then the controller will wait 3 minutes (11 ÷ 4 = 2 **R3**) after it receives the day/night mode changeover command before beginning the calibration routine.
2	Calibration occurs immediately after the override switch is depressed.
4 (factory default value)	Calibration occurs on the time interval set in CAL TIMER (Point 96). For example, if CAL TIMER = 12, then the calibration period is 12 hours. Actual calibration is subject to a time delay based on the value of CTLR ADDRESS. Refer to the example in Option 1.

NOTE: Options can be combined by summing their numbers. For example, to calibrate as in Options 1 and 2, set CAL SETUP to **3**.

Setting Room Temperature Set Points

1. Display the SETPOINTS report.

2. If the room temperature sensor has a set point dial, and if RM STPT DIAL (Point 13) is to be used by the controller, then set STPT DIAL (Point 14) to YES; otherwise, set STPT DIAL to NO.

NOTE: If STPT DIAL is set to YES, then DAY HTG STPT (Point 7) and DAY CLG STPT (Point 6) will not be used. Instead, the value of RM STPT DIAL will be used.

3. If there is no set point dial on the room temperature sensor, then verify that STPT DIAL is set to NO.

4. Set the following points to the appropriate values:
   - DAY CLG STPT (Point 6)
   - DAY HTG STPT (Point 7)
   - NGT CLG STPT (Point 8)
   - NGT HTG STPT (Point 9)
5. If the room temperature sensor has a set point dial and the set point dial is to be used, then set RM STPT MIN (Point 11) and RM STPT MAX (Point 12) for the minimum and the maximum allowable room temperature set point values, respectively. Valid values range from 55° to 95°F (13° to 35°C). Common values for these points are 65°F (18°C) for RM STPT MIN and 80°F (27°C) for RM STPT MAX.

Setting Override Time

1. Display the STARTUP report.
2. If using night override, set OVRD TIME (Point 20) to the number of whole hours that an override should last. If set at zero (default), night override is disabled.

Setting Controller Address

Set CTLR ADDRESS (Point 1) to the appropriate number. Each controller requires a unique address. Normal values are 00 to 31, but the controller will accept values as high as 98.

Setting Supply and Discharge Duct Areas

1. Display the Duct Dimensions Menu.
2. Select and enter the supply duct shape.
3. Enter the supply duct dimensions.
4. Select and enter the discharge duct shape.
5. Enter the discharge duct dimensions.

Setting Flow Coefficients

Supply Flow Coefficient:

1. Display the BALANCING report.

2. Set SUP FLO COEFF (Point 36) to the appropriate value found in Table 5. This value is a starting point for the air balancer.

Table 5. Box Manufacturer Flow Coefficients.

Box Manufacturer	Sensor Type	Flow Coefficient
Anemostat	2-pipe sensor without orifice 2-pipe sensor with orifice Spider sensor without orifice Spider sensor with orifice	0.79 0.59 0.73 0.39
Carnes	2-pipe sensor Flow cross	0.66 0.59
Carrier		0.59
Continental Air Products		0.79
E.H. Price		0.78
Environmental Technologies		0.79
Hart & Cooley/Tuttle & Bailey	Flow cross Orifice	0.59 0.73
Krueger		0.68
Metal Aire		0.72
Nailor Industries		0.69
Redd-I-Inc.		0.59
Tempmaster		0.73
Titus		0.60
Trane		0.66

3. To fine tune the flow coefficient use the following formula:

new flow coefficient = (actual volume ÷ TEC volume) × old flow coefficient

The actual volume is the actual value obtained from the balancer's measurements. The TEC volume is the value obtained from SUP AIR VOL (Point 35). If the TEC volume is not within 5% of the actual volume, then repeat the procedure until it is within 5%.

Discharge Flow Coefficient:

1. Display the BALANCING report.

2. Set DIS FLO COEF (Point 28) to the appropriate value found in Table 5. This value is a starting point for the air balancer.

3. To fine tune the flow coefficient use the following formula:

new flow coefficient = (actual volume ÷ TEC volume) × old flow coefficient

The actual volume is the actual value obtained from the balancer's measurements. The TEC volume is the value obtained from DIS AIR VOL (Point 35). If the TEC volume is not within 5% of the actual volume, then repeat the procedure until it is within 5%.

Setting MIN and MAX Airflow Set Points

NOTE: The maximum flow must be greater than or equal to the minimum flow.

1. Set CLG FLOW MIN (Point 31) to the desired minimum cooling airflow set point.
2. Set CLG FLOW MAX (Point 32) to the desired maximum cooling airflow set point.
3. Set HTG FLOW MIN (Point 33) to the desired minimum heating airflow set point.
4. Set HTG FLOW MAX (Point 34) to the desired maximum heating airflow set point.

Enabling the Wall Switch

If a wall switch is used for day/night control, enable it by setting WALL SWITCH (Point 18) to YES.

Setting NITE DAMPER

If NITE DAMPER (Point 3) is set to CLOSE, the supply damper will be shut during the night mode. If NITE DAMPER is set to CONTRL (default), then the supply damper will be controlled normally during night mode.

Set NITE DAMPER to the desired value.

The start-up is complete.

NOTE: Update each controller at the field panel immediately after you complete the controller start-up procedures, and have made all other changes to the controller's point database (including balancing, tuning, etc.).