SIEMENS

LRC Electronic Application 2458

VAV with BTU Compensation on OAVS – One Exhaust, One Supply

TEC-0659.08

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Overview

NOTE: Application 2458 is based on Application 2402 (Application 2402 is LRC Electronic VAV with BTU Compensation). The difference is that Application 2458 runs on an OAVS board. OAVS stands for Offboard Air Velocity Sensor. An OAVS board has no onboard AVS transducers. Instead, it has inputs for up to two AVS signals. The AVS transducers are mounted offboard in Offboard Air Modules (OAM), and each OAM sends a signal to one of the AVS inputs on the OAVS board.

Functionally, Application 2458 works the same as Application 2402, by controlling pressurization, ventilation, and room temperature in a laboratory room with one general-exhaust terminal, one single-duct supply terminal with reheat coil, and up to four sources of external exhaust flow signals (multiple flow signals must be combined using a flow averaging device). Pressurization is controlled by maintaining a selected difference between supply and exhaust airflows. See Figure 2458-1.

Application 2458 uses electronic actuators for damper control and a standard 0-10 Vdc actuator for the hot water valve. An AO-E module is mounted in an enclosure with each electronic actuator.

Temperature control is determined by input from the Room Temperature Sensor. The discharge temperature setpoint is reset in sequence with the VAV flow to control the room temperature using a BTU Compensation algorithm. The discharge temperature is then controlled using the reheat coil.

NOTE: The LRC controls pressure, ventilation, and temperature. When these functions conflict, the priorities are:

1. Pressurization
2. Ventilation (supply minimum may be overridden to maintain negative pressurization)
3. Temperature (temperature control is overridden by specified flow limits for the air terminals)

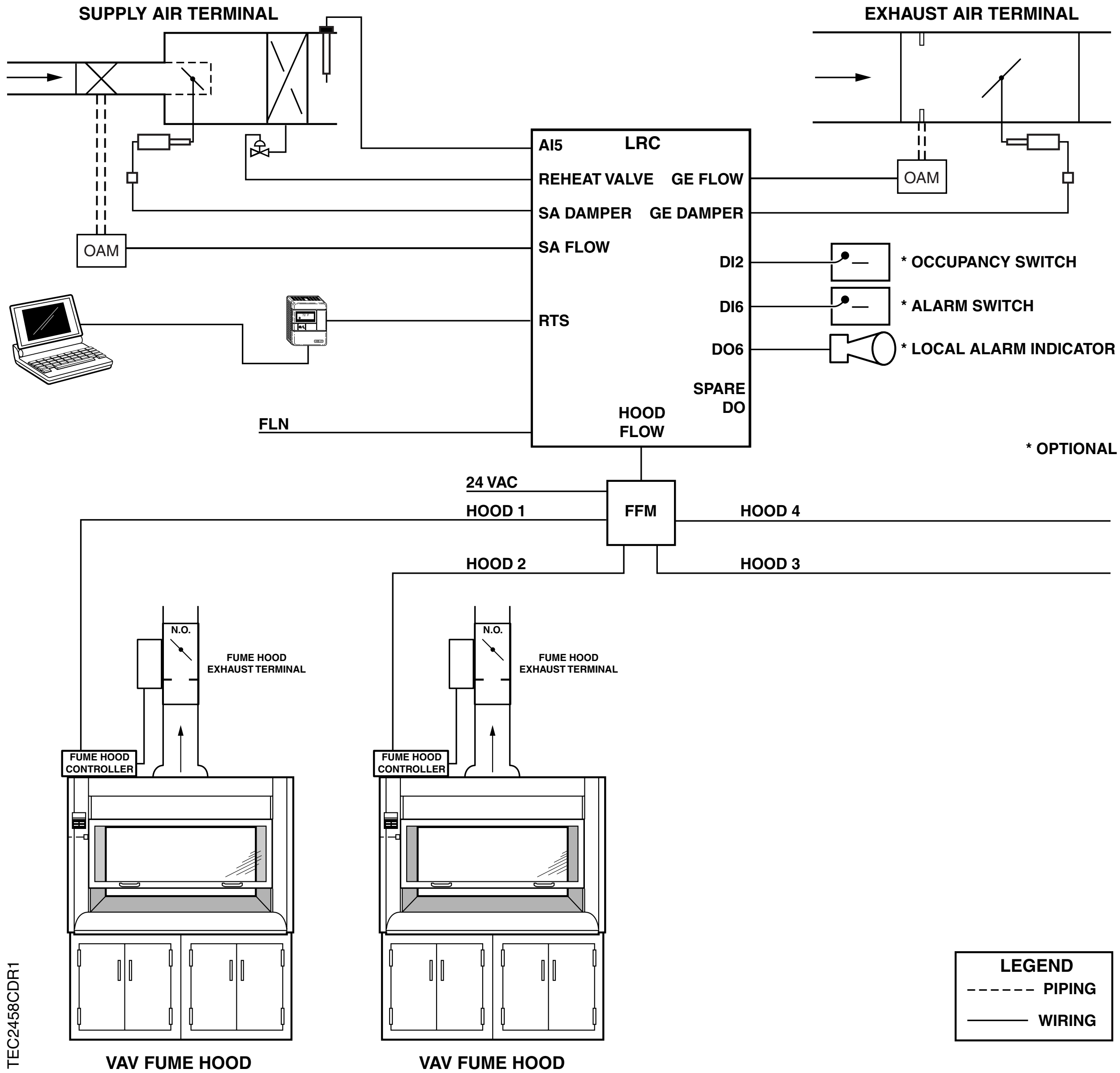


Figure 2458-1. Application 2458 Control Drawing.

Hardware Inputs

Analog

- Air velocity sensor (two required)
- Fume Hood Controller input or FFM
- Room Temperature Sensor
- Discharge Temperature Sensor

Digital

- Occupancy button (option on Room Temperature Sensor)
- Occupancy switch (optional)
- Alarm switch (optional)

Hardware Outputs

Analog

- Reheat valve

Digital

- Supply damper (two DOs)
- General exhaust damper (two DOs)
- Alarm (optional)

Ordering Notes

550-767J

Offboard Air Modules (550-818A) order separately (2 required)

Sequence of Operation

NOTE: Application 2458 is based on Application 2402 (Application 2402 is LRC Electronic VAV with BTU Compensation). The difference is that Application 2458 runs on an OAVS board. OAVS stands for Offboard Air Velocity Sensor. An OAVS board has no onboard AVS transducers. Instead, it has inputs for up to two AVS signals. The AVS transducers are mounted offboard in Offboard Air Modules (OAM), and each OAM sends a signal to one of the AVS inputs on the OAVS board.

The following paragraphs present the sequence of operation for LRC Electronic Application 2458, Variable Air Volume with BTU Compensation on OAVS – One Exhaust, One Supply.

Pressurization Control

The goal of pressurization control is to maintain a fixed difference between total supply air and total exhaust air. The controller selects supply and exhaust set points to balance flows while meeting supply air requirements. Feedback loops control the supply and exhaust flows to meet those set points.

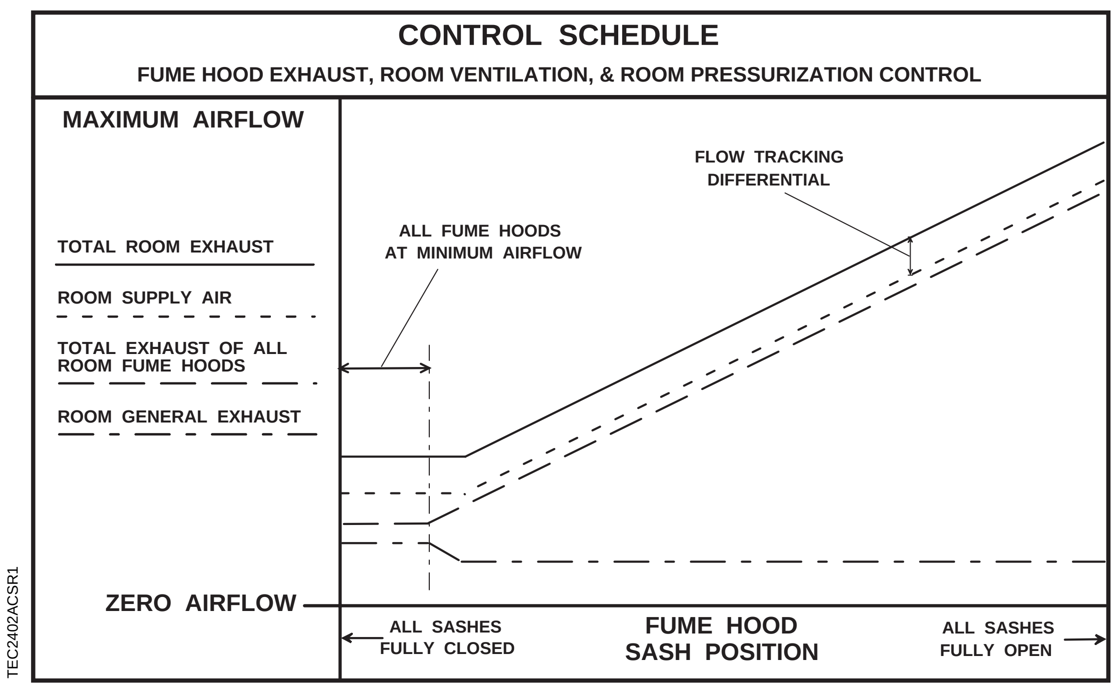


Figure 2458-2. Application 2458 Ventilation and Pressurization Control.

Room Airflow Balance

The difference between total supply flow and total exhaust flow is the room airflow balance as shown in these calculations:

VOL DIFFRNC = TOTL EXHAUST – TOTL SUPPLY

or

VOL DIFFRNC = (HOOD VOL + GEX AIR VOL + OTHER EXH) –
(SUP AIR VOL + OTHER SUP)

The controller uses these calculations to maintain VOL DIFFRNC (Point 83) at the value of VOL DIF STPT (Point 88).

NOTE: Because of this definition, VOL DIFFRNC and VOL DIF STPT are positive numbers in a room that is negatively pressurized, and negative numbers in a room that is positively pressurized.

Calculating Exhaust Flow Set Point

To calculate GEX FLO STPT (Point 85), the LRC determines the general exhaust flow needed to pressurize the room, assuming the supply flow is set to the value required for temperature control, TEMP CTL VOL (Point 9). If TEMP CTL VOL is less than the supply minimum, then the LRC uses SUP MIN (Point 77). If GEX FLO STPT exceeds the exhaust minimum or maximum, the controller will be limited to the GEX MIN (Point 75) or GEX MAX (Point 74) values instead.

Calculating Supply Flow Set Point

To calculate the supply flow set point, SUP FLO STPT (Point 93), the LRC determines the supply flow value that pressurizes the room based on the values of HOOD VOL (Point 51), VOL DIF STPT, OTHER EXH (Point 89), OTHER SUP (Point 61), and GEX FLOW STPT (Point 85). If the value of SUP FLO STPT is greater than SUP MAX (Point 76), then SUP FLO STPT is set to the value of SUP MAX.

External Flow Values

There may be other airflows not connected to the LRC that must be considered when pressurizing the room, including snorkels, canopies, and other supplies such as offices within the lab space controlled by constant volume controllers.

Since these inputs are not connected to the LRC, the combination of their values must be entered by the user into OTHER SUP and OTHER EXH so that the LRC can properly control the lab space.

Ventilation

The supply minimum is used to ensure that the room always receives enough supply air for proper ventilation. If necessary, the LRC raises the general exhaust flow to keep the supply flow from dropping below the minimum. See *Calculating Exhaust Flow Set Point* for more information.

Ventilation Setback

Ventilation setback allows the minimum and maximum flows (air change rate) for each VAV terminal to be specified separately based on occupied and unoccupied modes (OCC.UNOCC, Point 21). This allows several options for reducing the ventilation for unoccupied periods, including:

- Lowering the minimum supply flow, which allows a lower air change rate, but maintains cooling control.
- Lowering the maximum flow, which limits the air change rate, and reduces cooling capacity.
- Closing the general exhaust, which lowers airflow but completely disables cooling.

Occupancy

The controller keeps track of the occupancy status of the room and uses that information to select minimum and maximum flow rates for each air terminal. Occupancy status also affects the airflow level that triggers the ventilation alarm. The occupancy status is also indicated by OCC.UNOCC (Point 21). A digital room thermostat can read this point and display its value. It is not possible to override this point. If the occupancy status of the room is to be set manually, it is necessary to work through the command options described below.

The controller works in the occupied mode whenever at least one of the following occupancy signals indicates occupancy:

- Commands from a field panel, NET OCC CMD (Point 29)
- A dry contact switch in the room, OCC SWIT DI2 (Point 24)
- A push button on the thermostat, OCC BUTTON (Point 19)
- The airflow through the fume hoods, HOOD VOL (Point 51)

If all of the occupancy signals used in the lab indicate vacancy, then the controller works in the unoccupied mode.

NET OCC CMD (Point 29) – The NET OCC CMD may be set from a field panel by OCC and UNOCC commands to the LCTLR point. The commands may come from a time-of-day schedule, a PPCL program, or operator commands. These commands work on the LCTLR without unbundling.

NOTE: The displayed OCC/UNOCC status of the LCTLR point does not always match the occupancy status of the controller. To get an actual indication of occupancy status, OCC.UNOCC (Point 21) must be used.

If network commands are not required and occupancy will be set by sources in the room, set NET OCC CMD to UNOCC. If it is set to OCC, the controller will stay in occupied mode.

OCC SWIT DI2 (Point 24) – The occupancy switch (dry contact switch in the room) can be an output from an occupancy detection sensor, an extra contact on a light switch, or any other device that closes the switch when the room is occupied. The controller uses this input for occupancy if the setup point OCC SWIT ENA (Point 18) is set to YES. If it is set to NO, OCC SWIT DI2 will not affect occupancy.

OCC BUTTON (Point 19) – Some Siemens Building Technologies thermostats include a momentary switch with a push button. The controller can use this button as a source of occupancy commands if the setup point BUTTON ENA (Point 12) is set to YES.

NOTE: The controller will not use both the occupancy switch and the room sensor button. If the switch is enabled, then the room sensor button is ignored.

The controller interprets a push of the room sensor button as a request to change the occupancy status of the room. If the room is unoccupied, it changes to occupied. If it is occupied, it *may* switch to unoccupied, depending on the states of the other occupancy sources. The current request status of the room sensor button is indicated by BUTTON CMD (Point 25). This point is used to investigate the room sensor button's effect on the occupancy status of a room. OCC BUTTON does not provide that information because it is connected to a momentary switch.

It is also possible to relate occupancy status to the opening of fume hoods. If the hood is open, the room is occupied; if it is closed, the room *may* be unoccupied. "Open" means the flow is greater than HOOD OCC VOL (Point 55). "Closed" means the flow is less than HOOD UOC VOL (Point 56). The two levels should be used to set up a dead band so the room does not fluctuate between occupied and unoccupied operation. If you do not want to base occupancy on the fume hood sashes, set HOOD OCC VOL to zero. This disables the feature.

NOTE: If there are several hoods combined together with an FFM, it may be impossible to determine if any one hood is open because the FFM combines and averages the fume hood inputs.

Airflow Control

Supply flow and general exhaust are controlled by feedback loops that operate control dampers so that the measured flows maintain their set points. The feedback gains SUP P GAIN (Point 70) and GEX P GAIN (Point 26) are adjustable.

The damper command points (SUP DMPR CMD, Point 81 and GEX DMPR CMD, Point 82) indicate the rate at which the dampers move. The points **do not** indicate damper position. A value of:

- 100% indicates that the damper is being opened as quickly as possible.
- 10% indicates that the damper is being opened slowly.
- 0% indicates that the damper does not move at all.
- A negative number indicates that the damper is closing at a corresponding rate. For example, a value of –100% means the damper is closing at full speed.

Each damper may be set up for normally open or normally closed operation.

When the flow is slightly below the set point, the LRC sets the damper command to a small positive number to open the damper gradually. If the flow is far below the set point, the damper command is set to a large positive value to open the damper quickly. The feedback gains SUP P GAIN (Point 70) and GEX P GAIN (Point 26) are adjusted to tune the flow loops. The sample time for the flow loops is fixed at 0.2 seconds. I and D gain are inherent in the system and do not need adjustment.

NOTE: Set VOL DIF STPT (Point 88) to 0 while tuning the flow loops.

Electronic actuators receive voltage signals from the AO-E modules to accomplish damper motion. The modules extend or retract the actuators, corresponding to the DOs that are pulsed according to damper command and direction.

Temperature Control Loops

Room Temperature Loop – The room temperature loop operates in both heating and cooling modes. This loop reads the room temperature point (ROOM TEMP, Point 4) and then controls the room temperature to the value of ROOM STPT (Point 13) by generating TEMP LOOPOUT (Point 79), which is then used in the BTU calculations to reset the supply temperature set point in sequence with the VAV flow set point required for temperature control. Refer to *BTU Calculations*.

Supply Temperature Loop – The supply temperature loop is a heating loop which operates at all times. The heating loop generates the point VALVE CMD (Point 49) which drives the heating valve in order to maintain the discharge temperature set in DISCH STPT (Point 3). Refer to *BTU Calculations*.

BTU calculations

The controller adjusts the supply airflow and the supply air temperature set point as necessary to maintain ROOM TEMP (Point 4) at ROOM STPT (Point 13). The room temperature PID loop calculates the value of TEMP LOOPOUT (Point 79). This value is used to sequence the cooling flow and the supply air temperature set point as shown in *Figure 2458-3*. The loop is tuned by adjusting the values of the feedback gain points, ROOM P GAIN (Point 63), ROOM I GAIN (Point 64), and ROOM D GAIN (point 65), and the sample interval point, LOOP TIME (Point 98).

The output of the room temperature loop, TEMP LOOPOUT, reflects the load requirements. The value of TEMP LOOPOUT is a supply air temperature expressed as “degrees above or below the room temperature set point if the supply flow is at 100%”. If the supply flow is less than 100%, DISCH STPT is adjusted to an amount greater than TEMP LOOPOUT by a corresponding percentage.

Examples (the point ROOM STPT (Point 13) = 70°F):

If TEMP LOOPOUT (Point 79) =	and SUP AIR VOL (Point 35) =	then DISCH STPT (Point 3) =	Formula for DISCH STPT: ROOM STPT + (TEMP LOOPOUT × 100% ÷ SUP AIR VOL)
10°F	SUP MAX (Point 76)	80°F	70° + (10° × 100% ÷ 100%)
10°F	0.5 × SUP MAX	90°F	70° + (10° × 100% ÷ 50%)
–5°F	0.25 × SUP MAX	50°F	70° + (–5° × 100% ÷ 25%)
0°F	any flow	70°F	70° + (0° × 100% ÷ x%)

While the actual number of BTUs is not explicitly calculated, DISCH STPT varies as the supply flow varies in order to maintain a constant quantity of heat entering the room.

This module also limits TEMP LOOPOUT to values that generate supply air temperature set points that are less than DISCH MAX (Point 14).

As the demand for heating decreases (TEMP LOOPOUT drops), DISCH STPT eventually reaches DISCH MIN (Point 11). If TEMP LOOPOUT drops further, then the value of TEMP CTL VOL (Point 9) begins to rise from SUP MIN (Point 77) to SUP MAX (Point 76) to provide more cool air to the space. If this value is compatible with correct room pressurization, then it is used as the supply flow set point (SUP FLOW STPT, Point 93). If not, the actual set point may be higher or lower than TEMP CTL VOL.

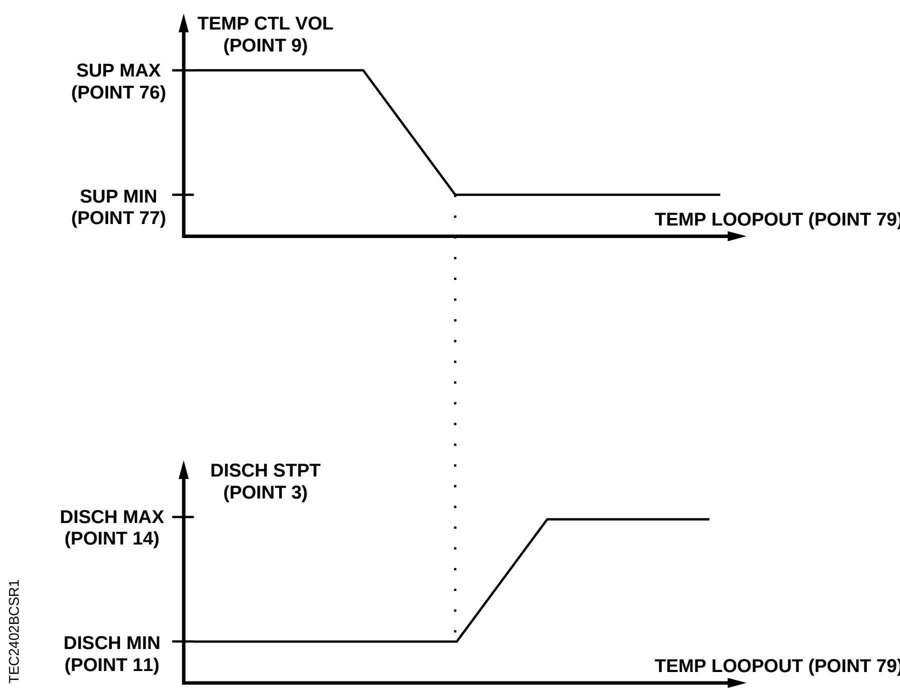


Figure 2458-3. Temperature Control Sequence.

Alarms

The LRC is equipped with ventilation and pressurization alarms. It does not contain temperature alarms. The alarms can be annunciated locally and/or broadcast across a network. Alarms are designed to support the following functions:

- Inform room occupants of hazards.
- Inform building operation personnel that the system is not functioning correctly.
- Supply data for documenting laboratory safety records through trending.

Ventilation Alarm

The ventilation alarm point, VENT ALM (Point 92), indicates that there is not enough supply airflow to the room. There is an adjustable alarm level that may vary with the occupancy status of the room. An adjustable delay timer prevents nuisance alarms.

When TOTL SUPPLY (Point 69) is below the alarm level for a time greater than VENT ALM DEL (Point 16), the alarm turns ON. The alarm turns OFF when the TOTL SUPPLY stays above the alarm level for a time greater than the alarm delay. If VENT ALM is set to zero, the ventilation alarm never turns ON.

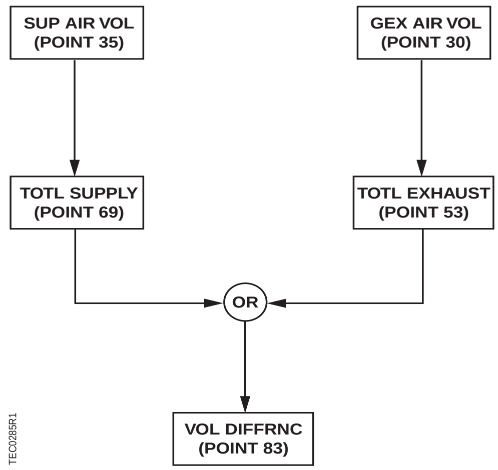
The alarm level depends on whether the room is occupied or unoccupied (OCC.UNOCC, Point 21). During occupied mode, OC V ALM LVL (Point 90) is used. During unoccupied mode, UC V ALM LVL (Point 91) is used. The two alarm levels may be the same or different. Setting either level to zero disables the ventilation alarm during that mode.

Pressurization Alarm

The pressurization alarm point, VOL DIF ALM (Point 22), indicates that the required difference between supply and exhaust flow is not being maintained or that the LRC cannot calculate the flow difference because it is not receiving airflow inputs. There is an adjustable alarm limit and an adjustable delay timer to prevent nuisance alarms.

VOL DIF ALM is ON if VOL DIFFRNC (Point 83) indicates “failed.” This happens whenever one of the input points that is used to calculate VOL DIFFRNC fails (See *Room Airflow Balance* and *Figure 2458-4*). The pressurization alarm will also turn ON if VOL DIFFRNC is below the alarm level (DIF ALM LVL, Point 38) for a time greater than or equal to DIF ALM DEL (Point 39).

The pressurization alarm point is OFF if VOL DIFFRNC indicates “normal” and the flow differential is greater than or equal to the alarm level for a time greater than or equal to the alarm delay.



VOL DIFFRNC will fail if any of the points leading up to it fails.
If these points are normal, VOL DIFFRNC is normal.

Figure 2458-4. VOL DIFFRNC Status.

Local Annunciation

ALARM DO6 (Point 46) is used to operate a local alarm annunciation device such as a light or horn in or near the room. Inputs can be set up to annunciate alarms from any combination of the following sources:

- The ventilation alarm point, VENT ALM (Point 92)
- The pressurization alarm point, VOL DIF ALM (Point 22)
- The DI connected to a switch in the room, ALM SWIT DI6 (Point 27)
- The network alarm point, NET ALM CMD (Point 23)

ALARM DO6 turns ON if any of the enabled alarm sources indicates an alarm. This point cannot be overridden.

To connect the VOL DIF ALM to DO6, set DIF ALM ENA (Point 37) to **YES**. VENT ALM ENA (Point 17) and ALM SWIT ENA (Point 28) enable VENT ALM and ALM SWIT DI6 respectively for local annunciation when they are set to **YES**. NET ALM CMD is always enabled for local annunciation.

NET ALM CMD is used to send an alarm state from the field panel. This makes it possible to program unique alarm criteria and annunciate alarms in rooms.

Network Annunciation

If the LRC is connected to a field panel, alarms can be reported using Insight®, or using a printer set up in a building manager's office to receive alarms. Points in the LRC must be entered in a field panel's point database (referred to as *unbundling*) and defined as alarmable points.

For example, if the room pressurization alarm VOL DIF ALM is unbundled in a field panel and a pressurization alarm is triggered, the alarm will be displayed at the selected locations.

Fail-safe Operation

If any of the LRC inputs fail, then a failure mode sequence is initiated.

Air velocity sensors – If one or both of the LRC air sensor signals (GEX AIR VOL, SUP AIR VOL) are out of range (for example, tubing not connected or connected backward), the supply damper either holds its current position or closes immediately depending on the value of FAIL MODE (Point 40). The general exhaust damper will hold its current position (regardless of FAIL MODE) because closing it might over pressurize the room and opening it might upset other exhaust devices on the system. Once GEX AIR VOL and SUP AIR VOL are normal, the supply damper and general exhaust damper return to normal operation.

Fume Hood Flow – If the LRC does not receive a valid fume hood flow signal (greater than 1 Vdc), the room maintains user defined pressurization, and the supply and exhaust loops operate as if the hood exhaust value is 0 CFM. If VOL DIF ALM, VOL DIFFRNC, or TOTL EXHAUST are unbundled in a field panel and characterized as alarmable, an alarm will be annunciated across the network.

If the FHC loses power or loses its flow sensor, then HOOD VOL, TOTL EXHAUST and VOL DIFFRNC will fail. If VOL DIFFRNC is unbundled and alarmable, there will be an alarm printout.

Room Temperature Sensor – If the room temperature sensor fails, ROOM TEMP (Point 4) displays as failed and temperature control is suspended at the current value of TEMP LOOPOUT (Point 79). If ROOM TEMP is unbundled in a field panel and made alarmable, then an alarm is sent across the network and printed out on a dedicated alarm printer.

Discharge Temperature Sensor – Temperature control is lost and BTU calculations cease if DISCH TEMP (Point 80) fails. This is because the temperature loop stops updating and the discharge loop stops operating.

AO-E Module – Failure of an AO-E module produces no direct indication. Typically, flow control is lost and alarms are triggered.

Upon loss of power or control signal to the AO-E module, the electronic actuator will fail based on the related DIP switch (SW2-4) position. (See the *Start-up* document for switch settings.) If set to *Fail Retracted* (default), the actuator fully retracts on power failure. If set to *Fail Last Position*, the actuator maintains the last position commanded.

Laboratory Room Controller – If the LRC power fails, all actuators default to their user-defined fail-safe states. Since there is no power to the controller, no LEDs are available.

Point Database

Table 2458-1. Application 2458 Point Database.

Point Number	Descriptor	Factory Default (SI Units)	Engr Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	CTLR ADDRESS	99	--	1	0	--	--
02	APPLICATION	2380	--	1	0	--	--
{03}	DISCH STPT	60.0 (15.656)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
{04}	ROOM TEMP	74.0 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48.0(8.88888)	--	--
05	DISCH P GAIN	2.0 (3.6)	--	0.05 (0.09)	0.0	--	--
06	DISCH I GAIN	0.02 (0.036)	--	0.0002 (0.00036)	0.0	--	--
07	DISCH D GAIN	0.0 (0.0)	--	0.1 (0.18)	0.0	--	--
08	DISCH BIAS	0.0	PCT	0.4	0.0	--	--
{09}	TEMP CTL VOL	4000 (1887.6)	CFM (LPS)	4 (1.8876)	0	--	--
11	DISCH MIN	55.0 (12.856)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
12	BUTTON ENA	NO	--	--	--	YES	NO
{13}	ROOM STPT	74.0 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48.0(8.88888)	--	--
14	DISCH MAX	120.0 (49.256)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
{15}	HOOD SIG AI3	0.0	VOLTS	0.04	0.0	--	--
16	VENT ALM DEL	30	SEC	1	0	--	--
17	VENT ALM ENA	NO	--	--	--	YES	NO
18	OCC SWIT ENA	NO	--	--	--	YES	NO
{19}	OCC BUTTON	OFF	--	--	--	ON	OFF
21	OCC.UNOCC	OCC	--	--	--	UNOCC	OCC
{22}	VOL DIF ALM	OFF	--	--	--	ON	OFF
{23}	NET ALM CMD	OFF	--	--	--	ON	OFF
{24}	OCC SWIT DI2	OFF	--	--	--	ON	OFF
{25}	BUTTON CMD	OCC	--	--	--	UNOCC	OCC
26	GEX P GAIN	0.05	--	0.001	0.0	--	--
{27}	ALM SWIT DI6	OFF	--	--	--	ON	OFF
28	ALM SWIT ENA	NO	--	--	--	YES	NO
{29}	NET OCC CMD	OCC	--	--	--	UNOCC	OCC

1. Points not listed are not used in this application.
2. A single value in a column means that the value is the same in English units and in SI units.
3. Point numbers that appear in brackets { } may be unbundled at the field panel.

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Table 2458-1. Application 2458 Point Database.

Point Number	Descriptor	Factory Default (SI Units)	Engr Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
{30}	GEX AIR VOL	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
31	OCC SUP MAX	3400 (1604.46)	CFM (LPS)	4 (1.8876)	0	--	--
32	OCC SUP MIN	340 (160.446)	CFM (LPS)	4 (1.8876)	0	--	--
33	OCC GEX MAX	1100 (519.09)	CFM (LPS)	4 (1.8876)	0	--	--
34	OCC GEX MIN	600 (283.14)	CFM (LPS)	4 (1.8876)	0	--	--
{35}	SUP AIR VOL	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
36	SUP FLO COEF	1.0	--	0.01	0.0	--	--
37	DIF ALM ENA	NO	--	--	--	YES	NO
38	DIF ALM LVL	100 (47.19)	CFM (LPS)	4 (1.8876)	-8000(-3775.2)	--	--
39	DIF ALM DEL	30	SEC	1	0	--	--
40	FAIL MODE	HOLD	--	--	--	CLOSE	HOLD
{41}	SUP EXTN DO1	HOLD	--	--	--	EXTN	HOLD
{42}	SUP RETC DO2	RETC	--	--	--	HOLD	RETC
{43}	GEX EXTN DO3	HOLD	--	--	--	EXTN	HOLD
{44}	GEX RETC DO4	RETC	--	--	--	HOLD	RETC
{45}	AUTOZERO DO5	OFF	--	--	--	ON	OFF
{46}	ALARM DO6	OFF	--	--	--	ON	OFF
{48}	REHEAT AO1	0.0	VOLTS	0.01	0.0	--	--
{49}	VALVE CMD	0.0	PCT	0.4	0.0	--	--
{50}	AI 4	0.0	PCT	0.4	0.0	--	--
{51}	HOOD VOL	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
52	MAX HOOD VOL	4000 (1887.6)	CFM (LPS)	4 (1.8876)	0	--	--
{53}	TOTL EXHAUST	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
54	GEX FLO COEF	1.0	--	0.01	0.0	--	--
55	HOOD OCC VOL	600 (283.14)	CFM (LPS)	4 (1.8876)	0	--	--
56	HOOD UOC VOL	100 (47.19)	CFM (LPS)	4 (1.8876)	0	--	--
57	VALVE CLOSED	10.0	VOLTS	0.01	0.0	--	--

1. Points not listed are not used in this application.
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3. Point numbers that appear in brackets { } may be unbundled at the field panel.

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Table 2458-1. Application 2458 Point Database.

Point Number	Descriptor	Factory Default (SI Units)	Engr Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
58	VALVE OPEN	1.0	VOLTS	0.01	0.0	--	--
59	GEX DMPR DIR	NOPEN	--	--	--	NCLOS E	NOPEN
60	GEXDUCT AREA	1.0 (0.09292)	SQ. FT (SQ M)	0.025 (0.002323)	0.0	--	--
{61}	OTHER SUP	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
62	SUP DMPR DIR	NOPEN	--	--	--	NCLOS E	NOPEN
63	ROOM P GAIN	2.0	--	0.05	0.0	--	--
64	ROOM I GAIN	0.001	--	0.0001	0.0	--	--
65	ROOM D GAIN	0	--	1	0	--	--
66	ROOM BIAS	0.0 (0.0)	DEG F (DEG C)	0.1 (0.0556)	-100.0(-55.6)	--	--
67	UOC GEX MAX	1000 (471.9)	CFM (LPS)	4 (1.8876)	0	--	--
68	UOC GEX MIN	500 (235.95)	CFM (LPS)	4 (1.8876)	0	--	--
{69}	TOTL SUPPLY	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
70	SUP P GAIN	0.05	--	0.001	0.0	--	--
71	UOC SUP MAX	2200 (1038.18)	CFM (LPS)	4 (1.8876)	0	--	--
72	UOC SUP MIN	220 (103.818)	CFM (LPS)	4 (1.8876)	0	--	--
73	DO DIR.REV	0	--	1	0	--	--
{74}	GEX MAX	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
{75}	GEX MIN	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
{76}	SUP MAX	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
{77}	SUP MIN	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
{78}	CTL TEMP	74.0 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48.0(8.88888)	--	--
{79}	TEMP LOOPOUT	0.0 (0.0)	DEG F (DEG C)	0.1 (0.0556)	-100.0(-55.6)	--	--
{80}	DISCH TEMP	74.0 (23.496)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
{81}	SUP DMPR CMD	-100	--	1	-100	--	--
{82}	GEX DMPR CMD	-100	--	1	-100	--	--
{83}	VOL DIFFRNC	0 (0.0)	CFM (LPS)	4 (1.8876)	-8000(-3775.2)	--	--
84	TRACK METHOD	STPT	--	--	--	FLOW	STPT

1. Points not listed are not used in this application.
2. A single value in a column means that the value is the same in English units and in SI units.
3. Point numbers that appear in brackets { } may be unbundled at the field panel.

continued on next page…

Table 2458-1. Application 2458 Point Database.

Point Number	Descriptor	Factory Default (SI Units)	Engr Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
{85}	GEX FLO STPT	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
86	GEX FAIL LMT	40 (18.876)	CFM (LPS)	4 (1.8876)	0	--	--
87	GEX FAIL TIM	60	SEC	2	0	--	--
{88}	VOL DIF STPT	400 (188.76)	CFM (LPS)	4 (1.8876)	-8000(-3775.2)	--	--
{89}	OTHER EXH	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
90	OC V ALM LVL	40 (18.876)	CFM (LPS)	4 (1.8876)	0	--	--
91	UC V ALM LVL	160 (75.504)	CFM (LPS)	4 (1.8876)	0	--	--
{92}	VENT ALM	OFF	--	--	--	ON	OFF
{93}	SUP FLO STPT	0 (0.0)	CFM (LPS)	4 (1.8876)	0	--	--
{94}	CAL AIR	NO	--	--	--	YES	NO
95	CAL SETUP	4	--	1	0	--	--
96	CAL TIMER	12	HRS	1	0	--	--
97	SUPDUCT AREA	1.0 (0.09292)	SQ. FT (SQ M)	0.025 (0.002323)	0.0	--	--
98	LOOP TIME	5	SEC	1	0	--	--
{99}	ERROR STATUS	0	--	1	0	--	--

1. Points not listed are not used in this application.
2. A single value in a column means that the value is the same in English units and in SI units.
3. Point numbers that appear in brackets { } may be unbundled at the field panel.