OPERATION MANUAL

OM 1401

JANUARY 2025

MICROTECH® UNIT CONTROLLER

FOR REBEL APPLIED™ REFRIGERATION ONLY CONTROLS

- MODEL DPSA
- R-32 REFRIGERANT

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Safety Information

Hazard Identification

⚠ DANGER

Danger indicates a hazardous situation, which will result in death or serious injury if not avoided.

⚠ WARNING

Warning indicates a potentially hazardous situations, which can result in property damage, personal injury, or death if not avoided.

⚠ CAUTION

Caution indicates a potentially hazardous situations, which can result in minor injury or equipment damage if not avoided.

NOTICE

Notice indicates practices not related to physical injury.

NOTE: Indicates important details or clarifying statements for information presented in Figures or Tables.

This manual provides operation information for Daikin Applied MicroTech for Rebel Applied ROC units.

NOTICE

Installation and maintenance are to be performed only by licensed, if required by local codes and regulations, or qualified personnel who are familiar with local codes and regulations and are experienced with this type of equipment.

⚠ DANGER

LOCKOUT/TAGOUT all power sources prior to service, pressurizing, de-pressuring, or powering down the unit. Failure to follow this warning exactly can result in serious injury or death. Disconnect electrical power before servicing the equipment. More than one disconnect may be required to denergize the unit. Be sure to read and understand the installation, operation, and service instructions within this manual.

⚠ WARNING

Electric shock hazard. Improper handling of this equipment can cause personal injury or equipment damage. This equipment must be properly grounded. Connections to and service of the MicroTech control panel must be performed only by personnel that are knowledgeable in the operation of the equipment being controlled.

⚠ WARNING

Polyolester Oil, commonly known as POE oil is a synthetic oil used in many refrigeration systems, and may be present in this Daikin Applied product. POE oil, if ever in contact with PVC/CPVC, will coat the inside wall of PVC/CPVC pipe causing environmental stress fractures. Although there is no PVC/CPVC piping in this product, please keep this in mind when selecting piping materials for your application, as system failure and property damage could result. Refer to the pipe manufacturer's recommendations to determine suitable applications of the pipe.

⚠ CAUTION

Static sensitive components. A static discharge while handling electronic circuit boards can cause damage to the components. Discharge any static electrical charge by touching the bare metal inside the control panel before performing any service work. Never unplug any cables, circuit board terminal blocks, or power plugs while power is applied to the panel.

Introduction

This manual provides information on the operation of MicroTech unit controller for systems ordered with Refrigeration Only Controls (ROC). It will assist the installer to understand which inputs and outputs are available to the field controller to control the unit.

The MicroTech unit controller with Refrigeration Only Controls is not capable of complete stand-alone operation of the packaged rooftop unit. The Refrigeration Only Control system requires analog inputs from a field installed controller to perform the desired sequence of operations. The field installed controller is responsible for proper control of the dampers to ensure unobstructed airflow.

The field installed controls will provide one or more analog inputs (user selectable 0 – 10 Vdc or 4-20 mA) to the MicroTech Unit Controller. Based on these analog inputs, the MicroTech Unit Controller will respond to meet the requested output for: cooling capacity, heating capacity, reheat capacity, return fan speed, and supply fan speed for DPSA models.

⚠ CAUTION

The third-party controller must provide sequences to operate the equipment during cold weather events to prevent damage to hot water or steam heating coils.

⚠ CAUTION

When sending command signal to the supply fan array, the third-party controller must fully open the outside air dampers to provide unobstructed airflow. This caution only applies to DOAS units without a return air path.

The user can display and modify information in the MicroTech unit controller using the controller's keypad and display. Refrigerant pressures, subcooling, and superheat can be checked with the MicroTech unit controller. Refrigerant pressure gages are not required when performing start-up of DPSA systems. Schrader fittings are for evaluation and charging purposes only except if there is a problem that would require confirmation of transducer readings.

Passwords

Various menu functions are made accessible based on the access level of the user. There are four access levels: Level 2, Level 4, Level 6, and no password. Level 2 has access to the most menu functions. Before entering a password, the user has access to basic status menu items.

The main password page is displayed when the keypad/display is first accessed, the Home Key is pressed, the Back Key is pressed multiple times, or if the keypad/display has been idle longer than the Password Timeout period (default 10 minutes). The main password page provides access to enter a password.

- A user can access the Quick Menu, view the current Unit State, access and acknowledge alarms in the alarm lists, and view information about the unit with no password.
- Entering the Level 6 password (5321) allows access to the Alarm Lists Menu, Quick Menu, and the View/Set Unit Menus group.
- Entering the Level 4 password (2526) provides access to Level 6 items and the Commission Unit Menu, Manual Control, and Service Menu groups.
- Entering the Level 2 password (6363) provides access to Level 4 items and the Unit Configuration Menu.

Quick Start Guide

Operation, Installation, and Protocol Resources (Read Before Operation)

Product Line	Installation	Operation	Protocol Info
DPSA Rebel Applied™	IM 1287	OM 1401 OM 1373	ED 19117

Unit Inspection (Perform Before Operation)

1. Visually inspect for damage inside and outside of the unit. Note any damage. Claims for freight damage must be filed by the consignee.
2. Confirm unit location meets ventilation and service clearance recommendations as stated in the installation manual for your unit type under “Unit Clearances”.
3. Confirm unit location condensate drain has been installed as stated in the installation manual for your unit type under “Unit Piping – Condensate Drain Connection”.
4. Confirm the discharge air temperature sensor is located in the supply duct for units equipped with gas or electric heat.
5. Confirm all field wiring is properly completed.

NOTICE

Remove power when making field connections. Damage to the MicroTech unit controller could occur if connections are made with the power applied.

Confirm Main Power Supply Connections, Phase Imbalance, and Clockwise Rotation

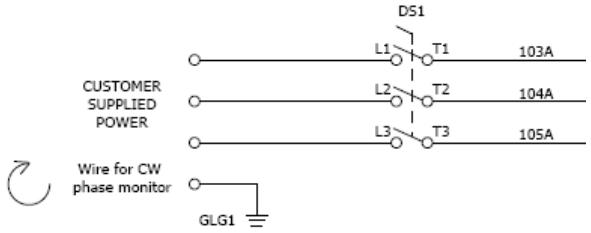
1. Confirm that the electrical power wiring lugs are tight. Check for proper voltage as per submittal and the wiring diagram included with the unit.

NOTICE

Incoming power phase imbalance must not exceed 2% of voltage.

Using a phase sequencing tester confirm power source (or sources if multiple) are all phased correctly for clockwise rotation.

Figure 1: Customer Supplied Power Schematic



Field Installed Sensors

Units equipped with refrigeration only controls ship with a limited number of sensors to protect the compressors by operating within their design performance envelope and to limit auxiliary heating temperature rise. The field installer must provide, install, and connect necessary sensors to control the airflow and conditioned air temperature and humidity.

Sequence of Operations from Field Controller

The field provided controller will must provide the sequence of operation required by the building to meet heating and cooling loads to the MicroTech unit controller via various inputs and outputs related to the unit’s operating state. OM 1373 may be referenced to understand how the MicroTech full controls version controls airflow, building pressure, and discharge air conditions.

Refrigeration Only Control (ROC) Input and Output Descriptions

The following pages provide descriptions of the various input and output contacts available on the Refrigeration Only Controls MicroTech unit control. Some contacts listed below will not be present on the unit as they depend on specific unit selection and configuration.

Verify all the following input and output connections are properly wired to the field controller based on the unit selection and field controller provided sequences.

NOTICE

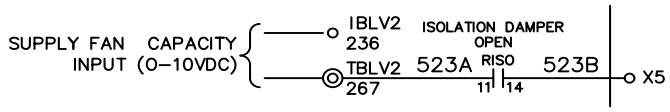
Remove power when making field connections. Damage to the MicroTech unit controller could occur if connections are made with the power applied.

1. Supply Fan Operation and Supply Fan Start / Stop Input

The field provided controller shall send supply fan control signals to the MicroTech unit controller. The field controller must supply a 0-10 VDC signal to the appropriate input terminal depending on the specific unit type. The signal type can be changed to 4-20 mA in the MicroTech unit controller.

An input of 0 V (4 mA) is no fan movement, an input of 10 V (20 mA) is maximum fan output. The signal will control the speed of all supply fans simultaneously.

Figure 2: Supply Fan Capacity Input Schematic



⚠ CAUTION

The supply fan must have unobstructed airflow before sending a signal to command the fan speed to avoid damage. For 100% outside air (OA) units, the OA dampers must be fully actuated to the Open position by the field supplied controller. Not opening the dampers for unobstructed airflow will cause damage to the unit by over pressurizing the cabinet.

NOTICE

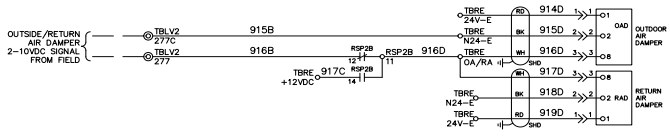
Daikin Applied is not responsible for damage to the unit due to improper control of the dampers.

2. Outside Air Damper Operation (Non-DOAS)

The field provided controller shall send an Outside Air Damper control signal to the MicroTech unit controller. The field controller must supply a 2-10 VDC signal to the appropriate input terminal depending on the specific unit type. The signal type can be changed to 4-20 mA in the MicroTech unit controller. See page 5 of unit wiring diagram for details.

An input of 0 VDC (4 mA) sets the outside air damper to the CLOSED position, and an input of 10VDC (20 mA) sets the outside air damper to the 100% OPEN position.

Figure 3: Outside Air Damper Operation (Non- DOAS) Schematic

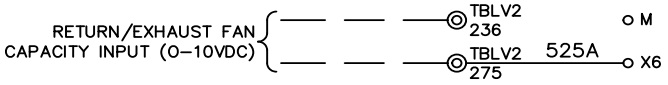


3. Return or Exhaust Fan Operation and Stop / Start Input

The field provided controller shall send return/exhaust fan control signals to the MicroTech unit controller. The field controller must supply a 0-10VDC signal to the appropriate input terminal depending on the specific unit type. The signal type can be changed to 4-20 mA in the MicroTech unit controller.

An input of 0 VDC (4 mA) is no fan movement, an input of 10 VDC (20 mA) is maximum fan output. See page 5 of unit wiring diagram for details.

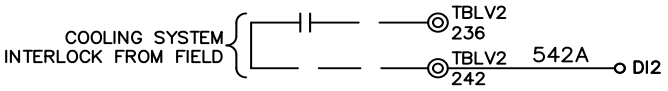
Figure 4: Return or Exhaust Fan Capacity Schematic



4. Cooling System Interlock Input

This input can be used to prevent compressor operation based on external system safeties (an airflow proving switch for example). When this input is Open, compressor operation is disabled.

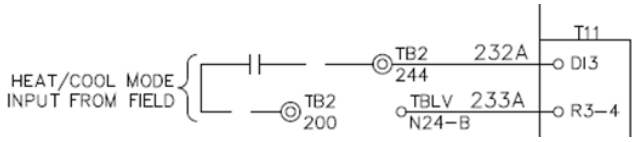
Figure 5: Return or Exhaust Fan Capacity Schematic



5. Heat Pump Models Only - Compressor Cooling or Heating Selection Input

The digital input can be used to open or close the heat pump reversing valve. The normally open contact can be closed by a field digital output to reverse the four way valve and enable compressorized heating. The digital input will be ignored if the unit has entered defrost.

Figure 6: Heat/Cool Mode Input Schematic



6. Compressor Cooling or Heating Capacity Input

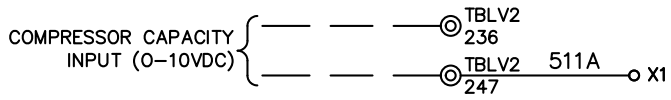
The field provided controller shall send control signal to the MicroTech unit controller which will control the fixed speed and inverter compressors if so equipped. The field controller must supply a 1-10 VDC signal to the appropriate input terminal depending on the specific unit type. The signal type can be changed to 4-20 mA in the MicroTech unit controller.

An input of 1 VDC (4 mA) requests the minimum cooling or heating capacity and an input of 10 VDC (20 mA) requests the maximum cooling or heating output.

Cooling and Heating can only be initiated if both of the following conditions are met:

- An active supply fan signal is detected
- Cooling or heating enabled interlock is closed on Digital Input 2 (DI2)

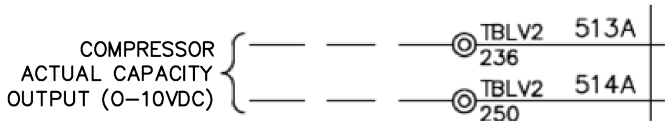
Figure 7: Compressor Capacity Input Schematic



7. Actual Compressor Cooling or Heating Capacity Output

The current cooling/heating capacity being produced of the unit is output as a 0-10 VDC signal on the X2 on terminals 236 & 250.

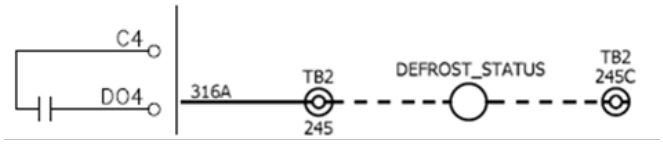
Figure 8: Compressor Actual Capacity Output Schematic



8. Defrost Status (Heat Pump Only) Output

Digital output indicates if defrost status is enabled. The contact will be closed when defrost is enabled, otherwise this contact will be open.

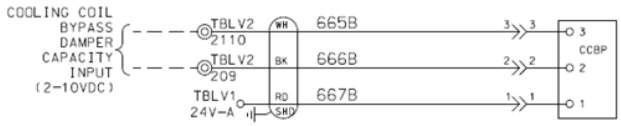
Figure 9: Defrost Status Schematic



9. Direct Expansion Coil (DX) Bypass Damper Input

A 0-10 VDC analog output will be provided from the field to modulate the DX coil bypass damper position.

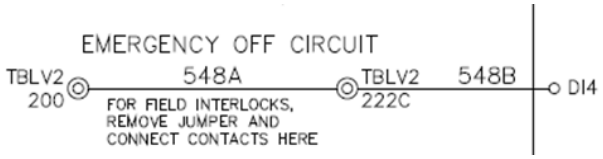
Figure 10: Cooling Coil Bypass Damper Input Schematic



10. Emergency Shut Down Input

If the field controller needs to disable cooling on an emergency sequence, the field controller must open Digital Input 4 (DI4) terminals 200 and 222C.

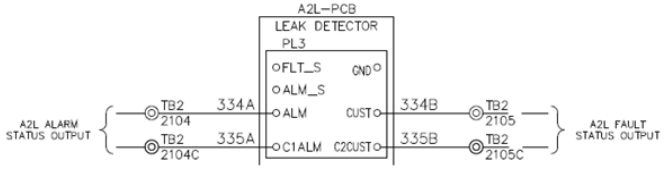
Figure 11: Emergency Shut Down Schematic



11. A2L Refrigerant Leak Alarm Input

In the event of an A2L refrigerant leak detection, the MicroTech unit controller will override the analog inputs while taking steps to mitigate the leak by turning compressors off. The supply fan will be controlled via the MicroTech unit controller to operate at a predetermined speed to meet a minimum airflow to dilute the leaked refrigerant. A digital output will be provided directly from the leak detection system if a refrigerant leak or a faulty refrigerant sensor is detected. The normally open contact will be wired to a terminal strip and close the contact if either of the alarms are detected.

Figure 12: A2L Refrigerant Leak Alarm Schematic



12. Auxiliary Heat Operation Input

The field provided controller shall send an auxiliary heating control signal to the MicroTech unit controller. The field controller must supply a 0-10 VDC signal to the appropriate input terminal depending on the specific unit type. The signal type can be changed to 4-20 mA in the MicroTech unit controller.

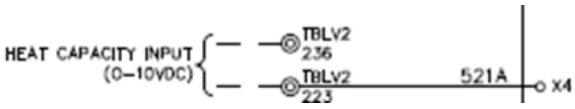
An input of 0.5 VDC (4.8 mA) requests the minimum heating capacity and an input of 10 VDC (20 mA) requests the maximum heating output. See page 5 of unit wiring diagram for details. An input below 0.2 VDC (4.3 mA) will turn the furnace off.

The MicroTech unit controller will only operate the furnace if airflow is confirmed to be on and it may override the capacity input signal to limit the maximum temperature rise.

Heating can only be initiated if the following condition is met:

— An active supply fan signal is detected.

Figure 13: Auxiliary Heat Operation Input Schematic



13. Hot Water or Steam Heat Operation Input

For units equipped with Hot water or Steam heat coils, the field controller shall send valve control signals for hot water or steam heating directly to the control valve or to terminals 222 and 209.

⚠ CAUTION

Refrigeration only controls does not have an emergency operation sequence in the event of cold weather. To prevent damage to the coil, the field provided controls must provide a sequence to operate the water coils in a manner which prevents damage to the coil.

NOTICE

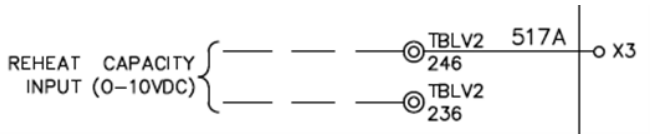
Daikin Applied is not responsible for damage to the unit due to improper control of the heater.

14. Modulating Hot Gas Reheat Operation Input

The field provided controller shall send a Reheat control signal to the MicroTech unit controller. The field controller must supply a 0-10V dc signal to the appropriate input terminal depending on the specific unit type. The signal type can be changed to 4-20mA in the MicroTech unit controller.

Reheat Capacity: The modulating reheat valve will be controlled by a 0-10VDC capacity input signal. For units with both MHGRH and MLSC coils, the first 0-5VDC signal controls the subcooling coil, and any signal above 5VDC controls the HGRH valve position.

Figure 14: Reheat Capacity Input Schematic



15. Smoke Detector Outputs

A relay output will be provided when the unit is equipped with a factory installed supply or return smoke detector. This output can be used by the third-party controller to either shut down unit operation or enable smoke purge sequence.

Figure 15: Smoke Detector Output Schematics

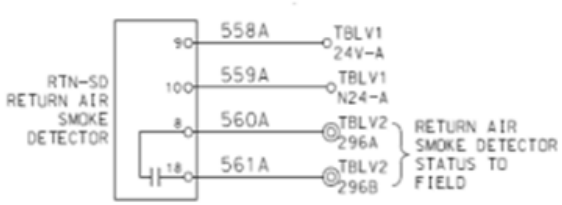
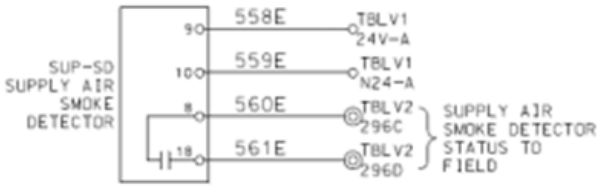


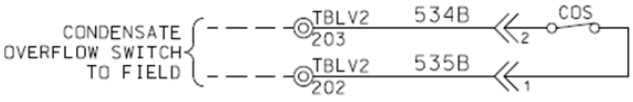
Figure 16: Smoke Detector Output Schematics



16. Condensate Overflow Switch Output

A dry contact will be provided to the field to indicate the state of the condensate overflow switch. The circuit will open when condensate level rises.

Figure 17: Condensate Overflow Switch Output Schematic



17. Dirty Filter(s)

A dry contact is provided across the filter switch. The contacts will open when a dirty filter is recognized.

Figure 18: Main Filter Pressure Switch Schematic

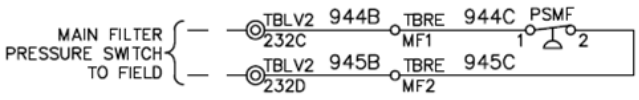
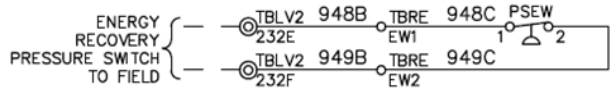


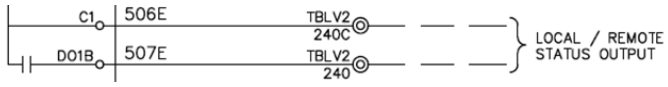
Figure 19: Energy Recovery Pressure Switch Schematic



18. Local/Remote Status

A digital output will be provided to indicate the System Mode status. This output will be on when the System Mode parameter is set to Remote (can only be set to remote at the unit for servicing). Otherwise, this output will be off.

Figure 20: Local Remote Status Schematic



19. Energy Recovery Wheel

A digital output will be provided from the field to enable energy recovery. This will enable the energy recovery wheel VFD to receive a 0-10 V speed signal from the field to control rotation speed of the wheel. Units equipped with a bypass damper on the ERW will require a digital output from the field to open the damper.

Figure 21: Energy Recover Wheel Schematic

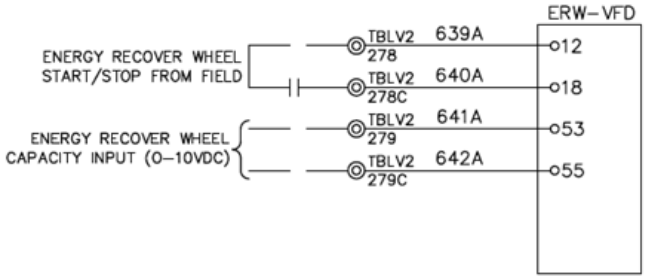
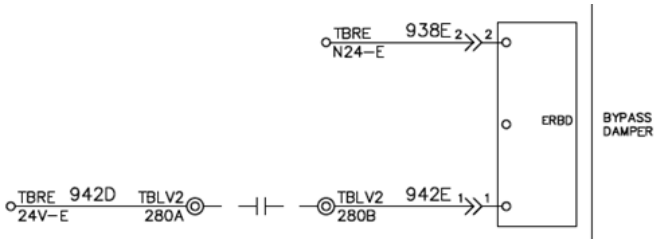


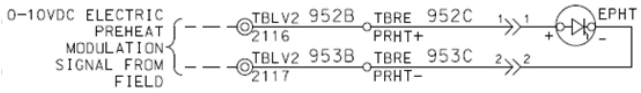
Figure 22: Bypass Damper Schematic



20. Energy Recovery Preheat

A 0-10 VDC output from the field will modulate the SCR preheater located in the Outside Air (OA) hood.

Figure 23: Energy Recovery Preheat Schematic



⚠ CAUTION

Refrigeration only controls does not limit the temperature rise of the pre-heater. The field provided controls are responsible for controlling the temperature rise to avoid damage to other components.

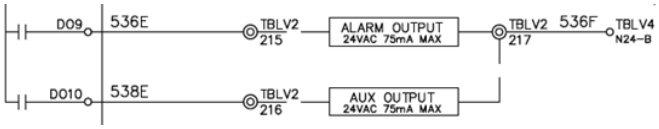
NOTICE

Daikin Applied is not responsible for damage to the unit due to improper control of the heater.

21. Alarm Status Output

This output will be ON when there is one or more active alarms and OFF when there are no active alarms.

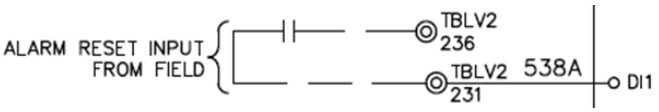
Figure 24: Alarm Status Output Schematic



22. Alarm Reset

When this input changes from OFF to the ON state, the current active alarms will be cleared. The input must then change from ON to OFF and then back on to initiate another reset command.

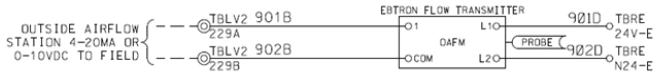
Figure 25: Alarm Reset Input Schematic



23. Outside Air Flow Monitor

A 0-10 VDC output from the Ebtron air flow monitoring transmitter will be provided to monitor the outside air flow.

Figure 26: Outside Air Flow Schematic



24. Supply Fan Air Flow Monitor

A 0-10 VDC output from the piezo ring on the supply fan(s) will be provided to monitor the supply fans air flow.

Figure 27: Supply Fan Air Flow Schematic

25. Return and Exhaust Fan Air Flow Monitor

A 0-10 VDC output from the piezo ring on the return or exhaust fan(s) will be provided to monitor the return or exhaust fans air flow.

Figure 28: Exhaust Fan Air Flow Schematic

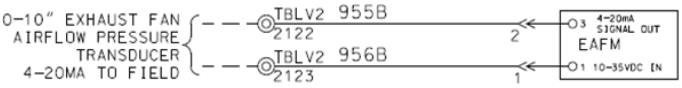
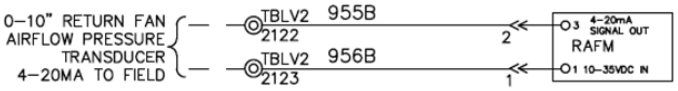


Figure 29: Return Fan Air Flow Schematic



A2L Detection and Mitigation

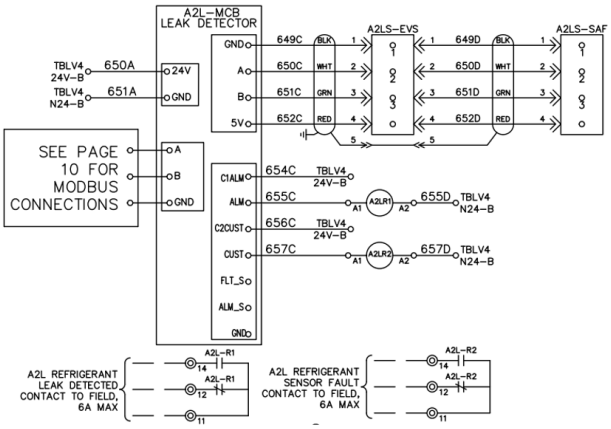
A2L Leak Detection System

Daikin Applied Rooftop units that use an A2L refrigerant have a factory installed leak detection system. The A2L leak detection system consists of the following parts:

- Refrigerant Sensor(s) (quantity 1 – 8)
  Part Number: 910419801
- A2L Leak Detection Control Board (quantity 1)
  Part Number: 910419225

The sensors, if more than one, are wired in a daisy chain configuration and terminated at the mitigation board. The A2L Main Control board communicates the leak detection system status to the MicroTech controller via Modbus. The MicroTech controller will communicate alarms based on this system status in the same way as any other alarm. In addition, 2 alarm relays are provided for the field to connect to directly, as an alternative method to receive the alarm status. See schematic example shown in Figure 30.

Figure 30: A2L Leak Detector Schematic Sample



Alarms

- Refrigerant Leak:
  - The leak detection control board will trigger a leak alarm when at least 1 sensor detects a refrigerant concentration above 15% of the refrigerant Lower Flammability Level (LFL).
  - Upon detection of a leak, the A2L-R1 and A2L-R2 contactors are energized and the alarm is communicated via Modbus to the MicroTech unit controller.
- Refrigerant Sensor Fault:
  - The leak detection control board will trigger a fault alarm when any connected sensor is determined to be faulty (self-test failure, loss of communications, etc.).
  - Upon detection of a sensor fault, the fault is communicated via Modbus to the MicroTech unit controller.

A2L Leak Mitigation

The MicroTech controller performs the following mitigation sequences to maintain safe operation in the event of an alarm condition:

Refrigerant Leak Detected

1. When unit is enabled:

   Upon notification from the leak detection system that a leak was detected, the MicroTech controller continues to operate the unit normally (conditioning the air: heating, cooling, humidifying, ventilating, and cleaning) with the following exceptions:

   - Refrigerant leak alarm is triggered and will remain on until manually cleared.
   - All compressors are deactivated and locked-out.
   - Supply fan minimum speed controls are overridden to prevent the fan from operating below a predetermined speed to maintain adequate airflow through the system to dilute any of the leaked refrigerant.
   - If the unit state is off, the unit will start up in the typical unoccupied mode of operation.
   - Manual Control operation is disabled.
   - The gas or electric heat Cold Start feature is disabled.
   - Specific Refrigeration Only Controls (ROC):
     - The field compressor cooling/heating control signal is ignored.
     - Compressors are deactivated and locked-out.
     - Supply fan minimum speed controls are overridden to prevent the fan from operating below a predetermined speed to maintain adequate airflow through the system to dilute any of the leaked refrigerant.
     - The field supplied outside air damper signal on a DOAS unit without a return air opening is ignored and the dampers are overridden to 100%.
     - The field controls are responsible for opening any isolation dampers to allow for airflow through the system.
     - The field controls are responsible for sending cooling and heating capacity signals.
   - The mitigation controls continue to monitor the refrigerant sensors in the system and notifies the MicroTech unit controller when no refrigerant has been detected for five minutes, allowing the unit to resume normal operation. Although, the leak detection alarm will continue to be active and keep the refrigeration system locked out until the alarm is manually cleared.
2. When unit is disabled (see Table 1 on page 11 for typical causes of disabled units):

   Upon notification from the leak detection system that a leak was detected, the MicroTech controller performs the following tasks:

   - Refrigerant leak alarm is triggered and will remain on until manually cleared.

- Compressor operation remains locked-out.
- Supply fan is turned on and supply fan minimum speed controls are overridden to prevent the fan from operating below a predetermined speed to maintain adequate airflow through the system to dilute any of the leaked refrigerant.
- Outside air damper will continue to be closed, with the exception of a DOAS unit without a return air path.
- The outside air damper in a DOAS unit without a return air path will be opened to 100%.
- Manual Control operation is disabled.
- Fan operation digital output closes.
- VAV box digital output opens (to open boxes).
- Heating and cooling are disabled.

Exceptions (MicroTech will not activate mitigation steps):

- If unit is disabled due to supply fan alarm, the fan will not operate.
- E-Stop circuit is open. E-Stop takes priority over A2L leak alarm.
- High Discharge or Return Air temperature (>170°F) alarms are triggered.

The mitigation controls continue to monitor the refrigerant sensors in the system and notifies the MicroTech unit controller when no refrigerant has been detected for five minutes, allowing the unit to revert to previous Disabled operation

Table 1: Typical Causes for Disabled Units

Unit Status Enumeration	Description	Conditions
0	Enabled	Conditions for Unit Status Enumerations 1-7 are all false.
1	OffMan	Control Mode is set to Off.
2	OffManCtrl	ManCtrActv flag is true.
3	Off Net	Both of the following are true: • Control Mode is set to Auto. • NetApplicMode is set to Off.
4	OffAlm	A fault alarm is active.
5	OffRetry	Fan Retry flag is true.
6	OffPassVnt	PassVentActv flag is true.
7	OffSnsrCfg	All of the following are true: • CtlrTempSrc is set to Space. Either of the following is true: • QMX sensor configuration is in progress. • EffSpcTRel is false. • Control Temperature fault is inactive.

Leak Detection Board Detects a Sensor Fault

A fault can be caused by a leak sensor malfunctioning or being disconnected, an A2L board malfunction or a loss of Modbus communication between the MicroTech unit controller and the A2L board.

1. When unit is enabled:

   Upon notification from the leak detection system that a sensor fault is detected, the MicroTech controller continues to operate the unit normally (conditioning the air: heating, cooling, humidifying, ventilating, and cleaning) with the following exceptions:

   - Refrigerant Sensor Fault alarm is triggered and will remain on until manually cleared
   - Supply fan minimum speed controls are overridden to prevent the fan from operating below a predetermined speed to maintain adequate airflow through the system to dilute any of the leaked refrigerant.
   - If the unit state is off, the unit will start up in the typical unoccupied mode of operation.
   - The gas or electric heat Cold Start feature is disabled.
   - Specific Refrigeration Only Controls (ROC):
     - Supply fan minimum speed controls are overridden to prevent the fan from operating below a predetermined speed to maintain adequate airflow through the system to dilute any of the leaked refrigerant.
     - The field supplied outside air damper signal on a DOAS unit without a return air opening is ignored and the dampers are overridden to 100%.
     - The field controls are responsible for opening any isolation dampers to allow for airflow through the system.
     - The field controls are responsible for sending cooling and heating capacity signals.

   The mitigation controls will continue until the fault is remedied and the alarm is manually cleared.

2. When unit is disabled:

   Upon notification from the leak detection system that a sensor fault was detected, the MicroTech unit controller performs the following tasks:

   - Refrigerant Sensor Fault alarm is triggered and will remain on until manually cleared
   - Compressor operation remains locked-out.
   - Supply fan is turned on and supply fan minimum speed controls are overridden to prevent the fan from operating below a predetermined speed to maintain adequate airflow through the system to dilute any of the leaked refrigerant.
   - The outside air damper will continue to be closed, with the exception of a DOAS unit without a return air path.
   - The outside air damper in a DOAS unit without a return air path will be opened to 100%.
   - Fan operation digital output closes.
   - VAV box digital output opens (to open boxes).
   - Heating and cooling are disabled.

   Exceptions (MicroTech will not activate mitigation steps):

   - If unit is disabled due to supply fan alarm, the fan will not operate.
   - E-Stop circuit is open. E-Stop takes priority over A2L Sensor Fault.
   - High Discharge or Return Air temperature (>170°F) alarms are active.
   - Control Mode is set to Off.
   - Duct High Limit Alarm is active.
   - Freeze-stat alarm is active (DOAS units only).

The mitigation controls will continue until the fault is remedied and the alarm is manually cleared.

A2L Leak Detection Sensor and Board Service

- The sensors are not considered “Limited Life Sensors” and therefore, under normal operation, are not expected to be replaced within the life expectancy of the unit.
- The sensors have self-reporting diagnostics, which are monitored by the mitigation board. In the event that the sensor fails, the mitigation board will trigger a “Fault” alarm.
- There are no servicing nor maintenance requirements for the sensor(s) and board.

A2L Leak Detection Sensor and Board Troubleshooting and Diagnostics

At power up, the Leak Detection Control Board display shows what sensors are detected (SX = 1 , sensor X is active and communicating), and what sensors are not detected (SX = 0, sensor X is not communicating or inactive). Where X, is the sensor number (from 1 to 8).

By pressing and holding the push button for:

- *Less than 2 seconds*
  The Leak Detection Control Board display shows the last 10 sensor faults (can be loss of communication or faulted state reported by a specific sensor). General configuration fault (Flt CFG) is also shown when the expected number of sensors does not match the number of sensors detected online.
- *More than 2 seconds and less than 5 seconds*
  The display shows sensor(s) status info:
  - The current LFL level.
  - Loss of communication or faulted state reported by a specific sensor.
- *More than 5 seconds and less than 10 seconds*
  The Leak Detection Control Board starts a mitigation test. The board will go into alarm mode and the MicroTech controller will begin the mitigation sequence. The mitigation test will last approximately 5 minutes.
- *More than 10 seconds*
  The display shows all the GID values supported by the sensor board as shown in Table 1 on page 11.

Table 2: GID Descriptions

GID id	Name	Min Limit	Max Limit	Default	Description
1	Number of Sensors	1	8	2	Number of sensors configured.
2	LFL Fault Threshold	1	10000	500	LFL Threshold for setting a fault.
3	LFL ALARM Threshold	1	1000	150	LFL Threshold setting an alarm. 150 = 15%.
4	USB Baud Rate	19200	115200	115200	Baud Rate used for communicating with an external terminal.
5	MODbus Client Baud	19200	38400	38400	Baud Rate used for communicating with the sensors.
6	MODbus Server Baud	9600	115200	19200	Baud Rate used for communicating with an external controller.
7	Test Mitigation Time	10	300	300	Test Mitigation time in seconds.
8	Sensor Warm Up Time	5	180	30	Sensor warm up time during power up in seconds.
9	Mitigation Time	120	1200	300	Mitigation time in seconds after LFL alarm has disappear.
10	Num of Sensors Online	1	8	1	Number of sensors detected online.
11	A2L State	0	5	0	A2L System State. Value = 1, A2L State is "run."
12	Last Fault	0	2	0	Recent Fault, Fault_Codes_e.
13	Modbus Server Address	1	10	9	A2L Modbus Address used in Modbus Server Network.
14	Sensor Addr Min	45	50	48	Minimum address assigned to a recent discovered sensor.
15	EETbl Save Now	0	1	0	Command to save data on non volatile memory.
16	System Test	0	1	0	System Test Mitigation Request.
17	Display LFL	0	1	0	Display LFL Levels.
18	EETbl LoadDefaults	0	1	0	Load Defaults values for those non volatile parameters.
19	EETbl Rev	1	1	1	EE Table Revision.
20	Sensor 1 Address	GID14	GID14 + 7	0	Sensor 1 Address.
21	Sensor 1 Level	0	65535	0	Sensor 1 LFL reported value. For instance value = 200, then LFL is 20%.
22	Sensor 1 State	1	65535	0	Sensor 1 current state. Value = 2, then state is "run."
23	Sensor 1 Faults	0	65535	0	Sensor 1 internal faults reported. For instance value = 0, then no faults.
24	Sensor 1 Temperature	-400	940	0	Sensor 1 Temperature reported value. For instance value = 250, then Temp = 25 C.
25	Sensor 1 Humidity	0	1000	0	Sensor 1 Humidity reported value. For instance value = 400, then Humidity = 40%.
26	Sensor 1 Pressure	0	4000	0	Sensor 1 Pressure reported value. Not available for now.
27	Sensor 2 Address	GID14	GID14 + 7	0	Sensor 2 Address.
28	Sensor 2 Level	0	65535	0	Sensor 2 LFL reported value. For instance value = 200, then LFL is 20%.
29	Sensor 2 State	1	65535	0	Sensor 2 current state. Value = 2, then state is "run".
30	Sensor 2 Faults	0	65535	0	Sensor 2 internal faults reported. For instance value = 0, then no faults.
31	Sensor 2 Temperature	-400	940	0	Sensor 2 Temperature reported value. For instance value = 250, then Temp = 25 C.
32	Sensor 2 Humidity	0	1000	0	Sensor 2 Humidity reported value. For instance value = 400, then Humidity = 40%.
33	Sensor 2 Pressure	0	4000	0	Sensor 2 Pressure reported value. Not available for now.
34	Sensor 3 Address	GID14	GID14 + 7	0	Sensor 3 Address.
35	Sensor 3 Level	0	65535	0	Sensor 3 LFL reported value. For instance value = 200, then LFL is 20%.
36	Sensor 3 State	1	65535	0	Sensor 3 current state. Value = 2, then state is "run".
37	Sensor 3 Faults	0	65535	0	Sensor 3 internal faults reported. For instance value = 0, then no faults.
38	Sensor 3 Temperature	-400	940	0	Sensor 3 Temperature reported value. For instance value = 250, then Temp = 25 C.
39	Sensor 3 Humidity	0	1000	0	Sensor 3 Humidity reported value. For instance value = 400, then Humidity = 40%.
40	Sensor 3 Pressure	0	4000	0	Sensor 3 Pressure reported value. Not available for now.
41	Sensor 4 Address	GID14	GID14 + 7	0	Sensor 4 Address.
42	Sensor 4 Level	0	65535	0	Sensor 4 LFL reported value. For instance value = 200, then LFL is 20%.

GID id	Name	Min Limit	Max Limit	Default	Description
43	Sensor 4 State	1	65535	0	Sensor 4 current state. Value = 2, then state is "run."
44	Sensor 4 Faults	0	65535	0	Sensor 4 internal faults reported. For instance value = 0, then no faults.
45	Sensor 4 Temperature	-400	940	0	Sensor 4 Temperature reported value. For instance value = 250, then Temp = 25 C.
46	Sensor 4 Humidity	0	1000	0	Sensor 4 Humidity reported value. For instance value = 400, then Humidity = 40%.
47	Sensor 4 Pressure	0	4000	0	Sensor 4 Pressure reported value. Not available for now.
48	Sensor 5 Address	GID14	GID14 + 7	0	Sensor 5 Address.
49	Sensor 5 Level	0	65535	0	Sensor 5 LFL reported value. For instance value = 200, then LFL is 20%.
50	Sensor 5 State	1	65535	0	Sensor 5 current state. Value = 2, then state is "run."
51	Sensor 5 Faults	0	65535	0	Sensor 5 internal faults reported. For instance value = 0, then no faults.
52	Sensor 5 Temperature	-400	940	0	Sensor 5 Temperature reported value. For instance value = 250, then Temp = 25 C.
53	Sensor 5 Humidity	0	1000	0	Sensor 5 Humidity reported value. For instance value = 400, then Humidity = 40%.
54	Sensor 5 Pressure	0	4000	0	Sensor 5 Pressure reported value. Not available for now.
55	Sensor 6 Address	GID14	GID14 + 7	0	Sensor 6 Address.
56	Sensor 6 Level	0	65535	0	Sensor 6 LFL reported value. For instance value = 200, then LFL is 20%.
57	Sensor 6 State	1	65535	0	Sensor 6 current state. Value = 2, then state is "run."
58	Sensor 6 Faults	0	65535	0	Sensor 6 internal faults reported. For instance value = 0, then no faults.
59	Sensor 6 Temperature	-400	940	0	Sensor 6 Temperature reported value. For instance value = 250, then Temp = 25 C.
60	Sensor 6 Humidity	0	1000	0	Sensor 6 Humidity reported value. For instance value = 400, then Humidity = 40%.
61	Sensor 6 Pressure	0	4000	0	Sensor 6 Pressure reported value. Not available for now.
62	Sensor 7 Address	GID14	GID14 + 7	0	Sensor 7 Address.
63	Sensor 7 Level	0	65535	0	Sensor 7 LFL reported value. For instance value = 200, then LFL is 20%.
64	Sensor 7 State	1	65535	0	Sensor 7 current state. Value = 2, then state is "run."
65	Sensor 7 Faults	0	65535	0	Sensor 7 internal faults reported. For instance value = 0, then no faults.
66	Sensor 7 Temperature	-400	940	0	Sensor 7 Temperature reported value. For instance value = 250, then Temp = 25 C.
67	Sensor 7 Humidity	0	1000	0	Sensor 7 Humidity reported value. For instance value = 400, then Humidity = 40%.
68	Sensor 7 Pressure	0	4000	0	Sensor 7 Pressure reported value. Not available for now.
69	Sensor 8 Address	GID14	GID14 + 7	0	Sensor 8 Address.
70	Sensor 8 Level	0	65535	0	Sensor 8 LFL reported value. For instance value = 200, then LFL is 20%.
71	Sensor 8 State	1	65535	0	Sensor 8 current state. Value = 2, then state is "run".
72	Sensor 8 Faults	0	65535	0	Sensor 8 internal faults reported. For instance value = 0, then no faults.
73	Sensor 8 Temperature	-400	940	0	Sensor 8 Temperature reported value. For instance value = 250, then Temp = 25 C.
74	Sensor 8 Humidity	0	1000	0	Sensor 8 Humidity reported value. For instance value = 400, then Humidity = 40%.
75	Sensor 8 Pressure	0	4000	0	Sensor 8 Pressure reported value. Not available for now.
76	DF Saving Time	15	120	15	Data Flash saving time in minutes. How frequent data is saved on non volatile memory.
77	Nominated Sensor Addr	48	55	55	Sensor address to be reset to the default value.
78	Sensor Reset Command	0	1	0	Command to invoke sensor function reset, value = 1 then this command is invoked.
79	Sen Func Reset Result	0	1	0	Final result of the sensor reset function operation. Value = 0, the operation was successful.

Limited Product Warranty

DAIKIN APPLIED AMERICAS INC.
LIMITED PRODUCT WARRANTY
(**United States and Canada**)

WARRANTY

Daikin Applied Americas Inc. dba Daikin Applied ("Company") warrants to contractor, purchaser and any owner of the product (collectively "Owner") that, subject to the exclusions set forth below Company, at its option, will repair or replace defective parts in the event any product manufactured by Company, including products sold under the brand name Daikin and used in the United States or Canada, proves defective in material or workmanship within twelve (12) months from initial startup or eighteen (18) months from the date shipped by Company, whichever occurs first. Authorized replacement parts are warranted for the remainder of the original warranty. All shipments of such parts will be made FOB factory, freight prepaid and allowed. Company reserves the right to select carrier and method of shipment. In addition, Company provides labor to repair or replace warranty parts during Company normal working hours on products with rotary screw compressors or centrifugal compressors. Warranty labor is not provided for any other products.

Company must receive the Registration and Startup Forms for products containing motor compressors and/or furnaces within ten (10) days of original product startup, or the ship date and the startup date will be deemed the same for determining the commencement of the warranty period and this warranty shall expire twelve (12) months from that date. For additional consideration, Company will provide an extended warranty(ies) on certain products or components thereof. The terms of the extended warranty(ies) are shown on a separate extended warranty statement.

No person (including any agent, sales representative, dealer or distributor) has the authority to expand the Company's obligation beyond the terms of this express warranty or to state that the performance of the product is other than that published by Company.

EXCLUSIONS

1. If free warranty labor is available as set forth above, such free labor does not include diagnostic visits, inspections, travel time and related expenses, or unusual access time or costs required by product location.
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3. This warranty shall not apply to products or parts : (a) that have been opened, disassembled, repaired, or altered, in each case by anyone other than Company or its authorized service representative; (b) that have been subjected to misuse, abuse, negligence, accidents, damage, or abnormal use or service; (c) that have not been properly maintained; (d) that have been operated or installed, or have had startup performed, in each case in a manner contrary to Company's printed instructions; (e) that have been exposed, directly or indirectly, to a corrosive atmosphere or material such as, but not limited to, chlorine, fluorine, fertilizers, waste water, urine, rust, salt, sulfur, ozone, or other chemicals, contaminants, minerals, or corrosive agents; (f) that were manufactured or furnished by others and/or are not an integral part of a product manufactured by Company; or (g) for which Company has not been paid in full.
4. This warranty shall not apply to products with rotary screw compressors or centrifugal compressors if such products have not been started, or if such startup has not been performed, by a Daikin Applied or Company authorized service representative.

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