

INTRODUCTION

The Refrigerant Detection System Kit ensures safe operation of residential HVAC systems equipped with low GWP refrigerant (R-454B).

The RDS mitigates the flow of refrigerant concentration and cuts power to ignition sources in the HVAC system when it detects a refrigerant leak in the indoor coil.

After refrigerant concentrations have been reduced to safe levels, the RDS allows the HVAC system to resume normal operation.

NOTE: The RDS functions similarly to other safety circuits built into an HVAC system.

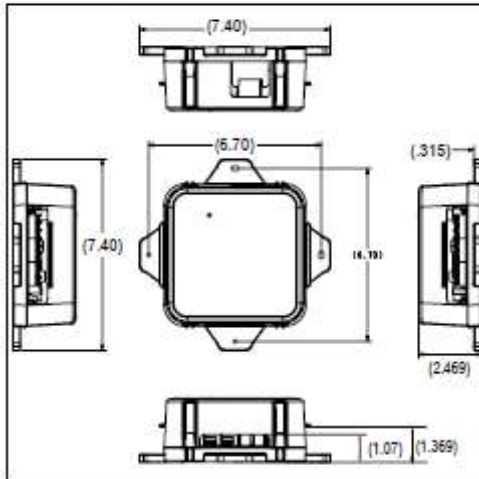
The HVAC system will resume normal functionality as long as the RDS is operational.

PRODUCT FEATURES

Detects R-454B refrigerant leaks and purges the leakage build-up from the indoor coil.

- LED communicates RDS state.
- Test/Reset button to verify RDS functionality.
- Hard-shell enclosure with mounting hardware.
- Two refrigerant detection device inputs.
- Supports standard 24V control split HVAC equipment (Single-Stage, Two- Stage, Heat Pump, Gas Furnace) See "Thermostat Compatibility" on page 11.
- Compliant with UL-80355-2-40.
- Large screw terminals for easy wiring accessibility.
- Integrated dry contacts for zoning application and external alarm.

2. Refer to below image for locating dimensions for the mounting holes.



Note: Verify Location does not cause strain on sensor cable.

3. Mount RDSC using appropriate hardware.



NOTICE



Do not strap the RDSC to existing tubing or other electrical cables.

CONTROLLER INSTALLATION

CONTROLLER OPERATING ENVIRONMENT

The Low GWP Refrigerant Detection Kit is designed to operate in the following environmental conditions.

- Operating Temperature Range: -40°F to 176°F (-40° C to 80°C).
- Shipping and Storage Temperature Range: -40° F to 185°F (-40°C to 85°C).
- Operating Humidity Range: 10% to 90% non-condensing at 104°F (40°C).

CONTROLLER MOUNTING INSTRUCTIONS

1. Locate appropriate mounting location for RDS Controller (RDSC).

Note: RDSC can be mounted to the indoor unit, plenum, a stud, or joist in an attic, crawlspace, or other unfinished area within 48 inches of the refrigerant sensor cable grommet on the coil or air handler. Drywall anchors and screws are provided for installation in finished areas, such as closets. Mount the RDS Non-Communicating Control Board in a clean, dry environment that is away from dust, water, and other contaminant accumulation.

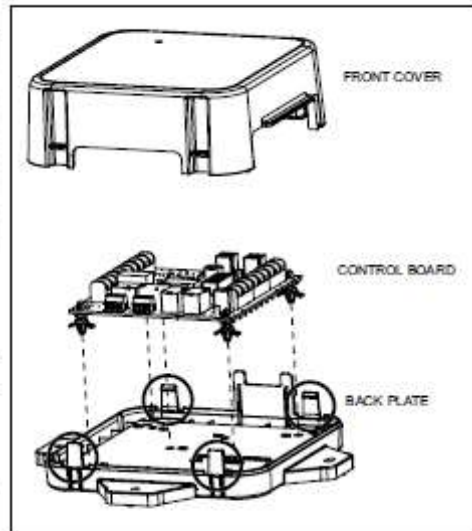
Do not place the RDSC in secondary drain pan.

Note: In confined space installations where it may be difficult to access the RDSC after it is installed, it is suggested to wire the RDSC prior to mounting.

Making the Connection

Ensure the cable is properly connected. Verify the connection is free of dust, debris, and moisture. The latch should be in place with no movement.

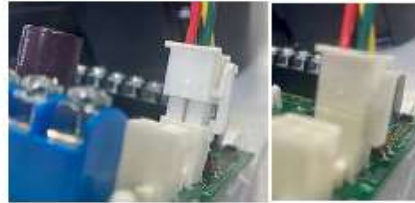
1. Remove the front cover of the enclosure by releasing the four locking tabs.



2. Plug in the sensor cable into the "Sensor 1" position.



3. Ensure that the latch is locked and the connection is secure. The latch should be in place with no movement.



4. Reinstall front cover of the enclosure.

5. Check that cover is secured by 4 locking tabs.

DIP SWITCH SETTINGS

Adjust the DIP switch settings to the sensor configuration. Failure to do so will cause faults on power-up.

Each DIP switch corresponds to a sensor position (i.e., DIP switch 1 to sensor 1; DIP switch 2 to sensor 2). The default factory switch positions are set to OFF. The RDSC software reads the OFF position as active. Setting the switch to ON disables the sensor position. The following table shows all possible configurations.

Configurations other than the ones shown below will cause a servicing fault.

Configuration	DIP1	DIP2
Two sensors expected; in connector 1, 2.	OFF	OFF
One (1) sensor expected; in connector 1	OFF	ON

TABLE 1. DIP SWITCH SETTINGS

LED FLASH CODES

The RDSC is equipped with a light emitting diode (LED) found within its enclosure. The LED signals the state of the RDSC. See Table 2 and Table 3 to review the flash codes.

State	LED Flash Code	Action
Initializing	Flashing green ¹	N/A
Monitoring	Solid green with blue flash ²	N/A
Mitigating (Leak Detected)	Flashing blue	Check coil tubes for leak. Repair the issue and restart the equipment.
Fault / Service	Solid blue, interrupted by issue code	Refer to Alert Codes and Troubleshooting Table.

TABLE 2. LED FLASH CODES

¹⁾ A rapid flash indicates the RDSC is in the process of sensor enumeration.

²⁾ A blue flash indicates the mitigation process has previously occurred.

Red Flash	Per Sensor	Issue	Action
1	Yes	Sensor Fault	Replace the Sensor
2	Yes	N/A	N/A
3	Yes	Incompatible sensor type	Replace with compatible sensor
4	Yes	Sensor communication issue	Check sensor connection. Ensure connection is clean and tight.
5	No	Bad relay/ bad wiring	Check for 24VAC power connection to the R terminal inputs on the RDSC. R-inputs must be energized for the RDSC to function.
6	No	Invalid configuration of sensor count	Verify the Dip switch setting is correct and matches the number of sensors being used.

TABLE 3. RED LED FLASH CODES / TROUBLESHOOTING

TEST BUTTON FUNCTIONALITY

The RDSC is equipped with a Test/Reset button. The Test button can be used to complete several functions, depending on the mode of operation of the RDSC. Table 4 lists the functions of the Test button during each mode of operation.

Mode of Operation	Press the Test Button to...
Normal	Trigger a leak detection response. Verify all equipment is wired correctly in to the RDSC (after installation).
Leak Detected	Reset the RDSC to a normal mode of operation after a previous leak has been detected and purged from the HVAC system.
Fault	Reset the RDSC after troubleshooting and resolving a fault condition. If the fault is not resolved, the RDSC will enter the Fault mode again.

TABLE 4. TEST BUTTON FUNCTIONALITY

ADDITIONAL FUNCTIONS OF THE TEST BUTTON

Table 5 lists the additional functions of the Test Button while the RDSC is functioning within the states of Initializing, Monitoring, Mitigating, Servicing and Fault.

STATE	PRESS	ACTION
Initializing	Short	If sensor enumeration is complete, skip remaining pre-purge.
Initializing	Long	Reset Control Board
Monitoring	Short	Clear purge-counter if prior mitigation has occurred; test mitigation
Monitoring	Long	Reset control
Mitigating	Short	If testing mitigation, end test.
Servicing	Short	Re-evaluate fault condition—if cleared return to monitoring, otherwise update indicator.
Servicing	Long	Reset control
Fault	Short	Re-evaluate fault condition—if cleared return to monitoring, otherwise update indicator.
Fault	Long	Reset control

TABLE 5. ADDITIONAL TEST BUTTON FUNCTIONS

THERMOSTAT AND CONTROLLER COMPATIBILITY

The following types of thermostats and controllers are compatible with the RDSC:

- Thermostats equipped with non-volatile memory
- Battery-powered thermostats
- Analog thermostats
- Smart thermostats
- Late-model programmable thermostats
- Hylex™ ACU (MXD-U001XN) with standard 24VAC thermostat or Samsung communicating wired controller (refer to Hylex™ ACU supporting documents for communicating wired controller compatibility)

MODES OF OPERATION

The modes of operation for the RDSC are Initializing, Normal, Leak Detected, and Fault.

Initializing

The RDSC is establishing connection with the refrigerant detection sensor and is completing an initial (5) minute purge sequence.

Normal

The HVAC system is functioning normally. The RDSC has not detected a refrigerant leak.

Leak Detected

The mitigation process begins when the RDSC detects a refrigerant leak:

1. The RDSC Detects a leak
2. The RDSC shuts off the AC power to the thermostat, which de-energizes the outdoor unit compressor and heat sources, such as gas and/or electric strip heat. No heating or cooling demands will be met.
3. The RDSC activates the blower. The blower purges refrigerant from the plenum and ductwork. After the RDSC determines the refrigerant levels are below the alarm threshold, the blower will continue to function for an additional seven (7) minutes.
4. After the blower sequence is complete, the HVAC system resumes normal operation.

NOTE: The HVAC system may not maintain a cooling or heating setpoint if a significant leak exists. Any refrigerant leaks that remain unaddressed for an extended time may cause the HVAC system to shut down on low refrigerant pressure limit condition.

NOTE: When a Hylex ACU is connected, any thermostats or wired controllers connected to the ACU will remain powered, and the indoor fan will continue to operate. The ACU will turn off the condensing unit and all outputs to electric heat or furnace heat will be de-energized.

Fault

When a fault is detected within the RDSC, the furnace blower engages and remains engaged at a constant output until the RDSC is replaced.

START UP TEST PROCEDURE

The RDSC is equipped with a Test/Reset button, see "Test Button Functionality" on page 10. After the RDSC has been mounted and wired, restore power to the HVAC system. The system will then run through a purge sequence for (5) minutes. After the purge sequence is complete, proceed to testing cooling demand and heating demand.

Cooling Demand

1. Prompt a cooling demand at the thermostat.
2. Press the Test button on the RDSC. The system then executes a leak detection response.
3. Observe the following sequence:
 - a. The LED indicator flashes the sequence for leak detection (flashing blue).
 - b. The blower powers up.
 - c. The outdoor compressor powers down.
4. Press the Test button to terminate the simulated Leak Detection mode upon test completion.

Heating Demand

1. Prompt a heating demand at the thermostat.
2. Observe the following sequence:
 - a. The LED indicator flashes the sequence for leak detection (flashing blue).
 - b. The blower powers up.
 - c. The gas burners power down.
 - d. The outdoor compressor powers down.

The installation of the RDSC is complete after both sequences are successfully completed.

ADDITIONAL APPLICATIONS

In zoned applications, all dampers will remain open when the RDSC is in Fault or Leak Detected mode. Normal heating and cooling demands are permissible, but the blower will remain engaged until the fault condition is addressed.

Zone HVAC System

If the RDSC is installed in a zone HVAC system, the RDSC will open all zone dampers if a leak is detected.

Note: Proper wiring of the zone panel to the RDSC is required for all zone dampers to open.

After the purge sequence is complete, the zone system will resume normal operation.

External Alarm

(For applications with external alarms wired directly to the RDSC)

The RDSC triggers the external alarm system when it enters the Leak Detected mode.

⚠ WARNING ⚠

When installing a float switch in a Hylex™ system, the float switch must be connected to the float switch input on the Hylex™ ACU (MXD-U001XN). Refer to the ACU installation manual for float switch connection and configuration details. Do not install the float switch between the RDS and the ACU, Furnace, or Air Handler. The RDS control must be continuously powered.

WIRING DIAGRAMS

The cable designated for connecting the sensor is provided with the sensor. Wires required for the RDS controller installation are field supplied.

The Refrigerant Detection System Controller supports all split gas furnace installations. Wiring diagrams are provided for several common split furnace system configurations to identify exact wire types and terminal locations.

For additional wiring diagrams for accessories, zoning, and other system types please refer to supporting documents on the Hylex™ downloads web page.

⚠ NOTICE ⚠

When connecting to Hylex™ systems, connect the indoor unit to the blue colored terminals on the RDS controller. The outdoor unit and thermostat or communicating wired controller are to be connected to the Hylex™ ACU (MXD-U001XN).