INSTALLATION, OPERATIONS & MAINTENANCE MANUAL

InspirAIR® FUSION Series

FOR MODELS:
RTU-5Te, RTU-7.5Te, RTU-10Te, RTU-12.5Te, RTU-15Te,
RTU-20Te, RTU-25Te

Intertek

TO BE COMPLETED BY CONTRACTOR AFTER INSTALLATION

Installer: Leave this manual for the homeowner

_____
Model

_____ _____
Installing Contractor **Telephone / Contact**

_____ _____
Serial Number **Installation Date**

REGISTER YOUR PRODUCT ONLINE AT ALDES-NA.COM

I. CAUTION

Always turn off electrical power and verify that the unit is electrically safe before performing any maintenance on the unit. This unit contains high-voltage electrical components.

This unit has moving parts. All repairs and maintenance should be performed by a qualified technician to avoid serious injuries.

II. WARNING

IMPORTANT – Read This Manual Before Installation

- Always turn **OFF** electrical power and verify that the unit is electrically safe before performing any maintenance.
- No modifications shall be made to the unit under any circumstances. The **warranty will be immediately voided**. **Do not** use this device to **exhaust steam**, flammable, or explosive gases.
- Electrical connections must be made by a **qualified electrician**.
- Airflows must comply with the **approved submittal** to ensure proper ventilation system function and **to maintain the warranty**.
- Installation must be performed in **compliance with local construction and safety codes**.
- All drawings, photos, and diagrams in this document are for **reference** only. Actual units may vary.
- ALDES reserves the right to **modify the unit and its components without prior notice**.

This unit includes a direct expansion coil designed to be integrated as a component of a refrigeration system. The Aldes RTU unit is intended to be paired with a third-party heat pump VRF system. The VRF model from the third party must meet the technical requirements—such as thermal capacity—of the Aldes RTU units. Consult a qualified professional for proper unit pairing and HVAC system design.

The instructions and installation manual provided by the VRF manufacturer must be read carefully before beginning the installation process. If you have any questions regarding the VRF product or its installation, please refer to the VRF manufacturer.

Ensure that the technical requirements of the VRF system—or any other paired device—match those of the Aldes RTU unit. Refer to both the unit's specification sheet and the project specification documents for compatibility.

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III. WARRANTY

WHAT'S INCLUDED

ALDES products are guaranteed to be defect-free for a period of (2) years from the date of purchase.

- Labor not included.
- **EC** motors are guaranteed for (1) year.

WARRANTY DOES NOT APPLY IF:

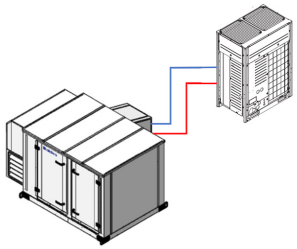
- Modifications have been made by or on behalf of the client.
- The product has been improperly installed.
- Maintenance, cleaning, and lubrication have not been performed in accordance with ALDES recommendations.

WARRANTY EXCLUSIONS:

- All installation fees and labor costs related to product repairs.
- All costs associated with loss of operations, merchandise, inventory, or equipment due to a defective ALDES product.
- All damages or defective components related to third-party VRF and it's accessories.
- All damages or defects resulting from the malfunction of third-party VRF or it's accessories.

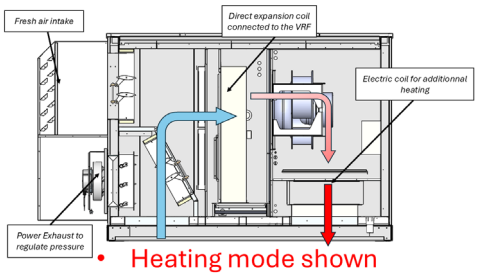
IV. GENERAL OPERATION

The Aldes RTU unit is an air handling unit that must be connected to a third-party VRF to operate properly. The selection of the VRF system to be paired with the Aldes RTU must be

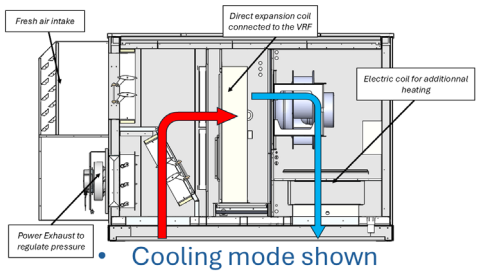


made by a professional engineer or the technical lead for your specific project. The capacity of the Aldes RTU must align with the capacity of the selected VRF system.
The following pages outline the installation steps required to ensure a compliant installation of the AHU units. For third-party VRF installation requirements and guidelines, please refer to the VRF manufacturer's installation documents.

The ALDES AHU unit recirculates air throughout the building and heats or cools it via its direct expansion coil, which is connected to the VRF. A certain amount of fresh air can be introduced into the building through the economizer section, while the power exhaust section allows air to be vented in order to balance the supply and exhaust. This setup must be properly configured by the installer. The RTU is an exterior unit intended for rooftop installation.



• Heating mode shown



• Cooling mode shown

V. PREPARING FOR INSTALLATION

UNPACKING THE UNIT

Remove the protective wrapping from the unit, including the foam protection at each corner. Take extra care to avoid scratching the painted surfaces. Dispose of all packaging materials in accordance with local regulations and/or project-specific requirements.

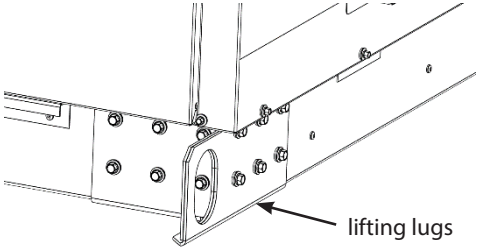
INSPECTING THE UNIT

Visually inspect the unit to ensure that no sheet metal is dented or scratched. Verify that the air intake and exhaust hoods have not been damaged during transport. Check all components for any signs of damage incurred during shipping.

Warning: Do not remove the shipping attachments until the unit has been moved to its final location.

TRANSPORT METHOD

The unit is equipped with anchors designed solely for handling purposes.
Strictly follow all applicable lifting standards when handling the unit.
Always use all anchor points simultaneously during lifting or transportation.

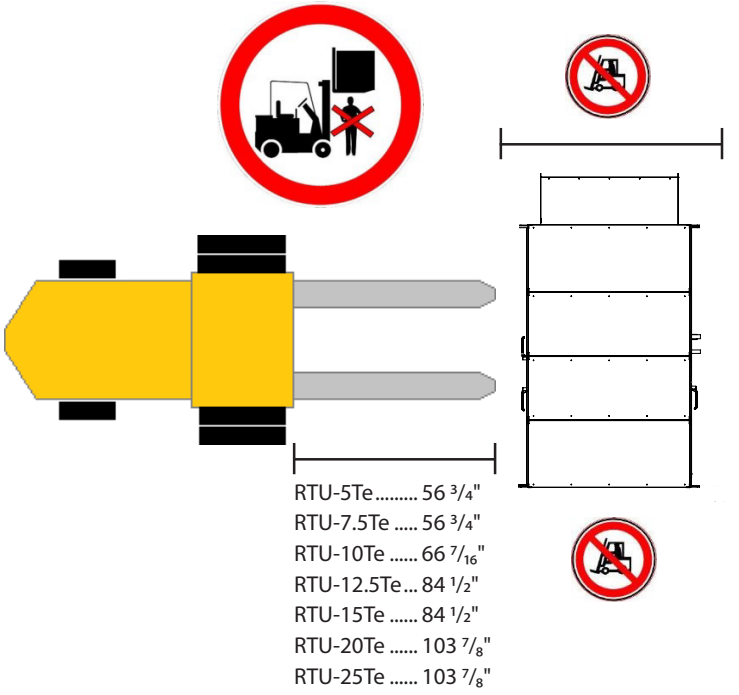


VI. DEVICE HANDLING

USING A FORKLIFT TO MOVE THE UNIT

Before using a forklift to move the unit, the following safety rules must be observed:

- The forklift's lifting capacity must exceed the weight of the unit.
- The unit must be lifted exactly as illustrated in the diagram below. This is the only method authorized by ALDES for moving the unit with a forklift.
- Only a qualified forklift operator is permitted to transport the unit.
- Ensure that the forklift forks are at least 6 inches longer than the width of the unit.



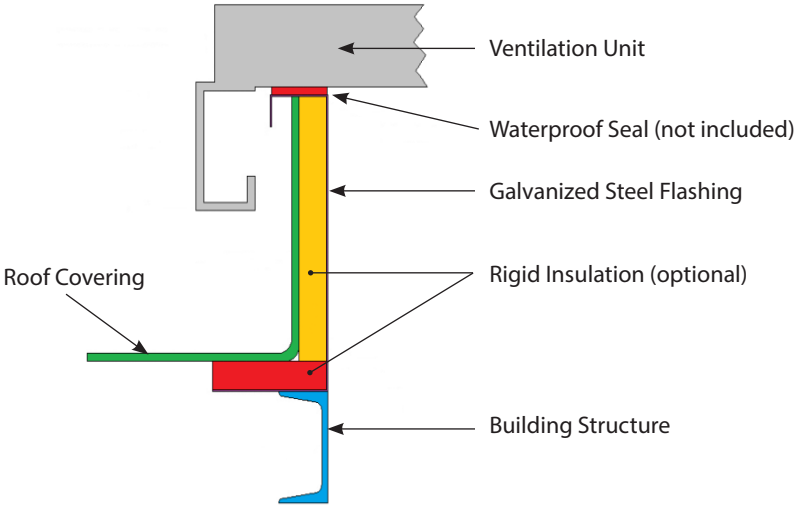
RTU-5Te..... 50 3/4"
RTU-7.5Te ..... 50 3/4"
RTU-10Te ..... 60 7/16"
RTU-12.5Te... 78 1/2"
RTU-15Te ..... 78 1/2"
RTU-20Te ..... 97 7/8"
RTU-25Te ..... 97 7/8"

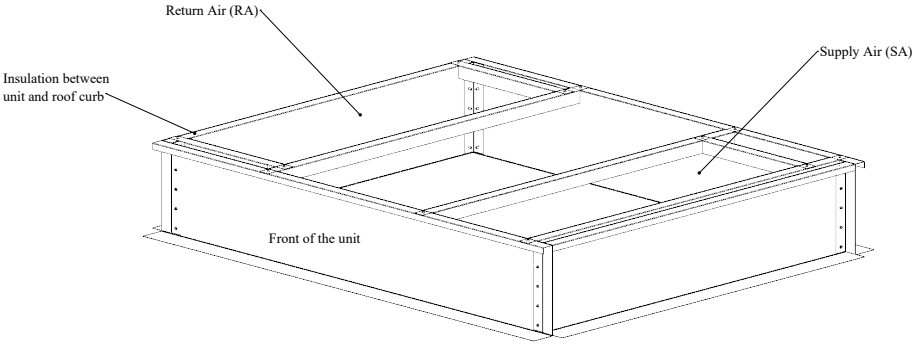
RTU-5Te..... 56 3/4"
RTU-7.5Te ..... 56 3/4"
RTU-10Te ..... 66 7/16"
RTU-12.5Te... 84 1/2"
RTU-15Te ..... 84 1/2"
RTU-20Te ..... 103 7/8"
RTU-25Te ..... 103 7/8"

VII. INSTALLATION

ROOF CURB INSTALLATION (Outdoor Installation Only)

Install the roof curb according to the instructions provided in the accompanying documentation.





DANGER

This device contains high-voltage electrical components. All maintenance must be performed by a qualified technician to prevent serious injuries or death. Installation must comply with all applicable local building and safety codes.

UNIT COMPONENTS

Simplified installation
thanks to pre-wiring and retrofit roof curb

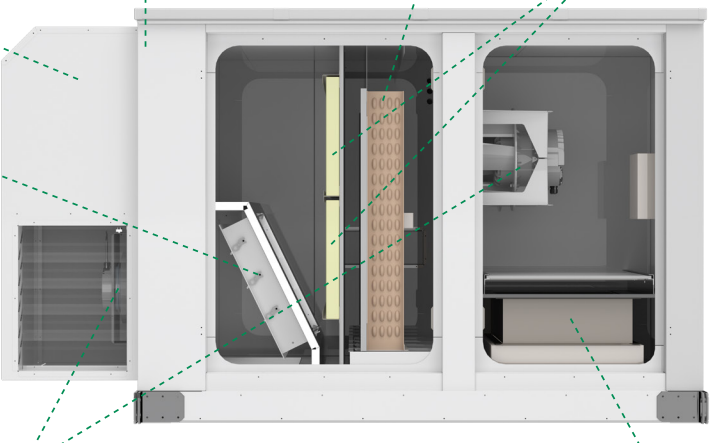
Direct expension coil (connected to the VRF) to maximize the high efficiency of the VRF

Frost-control strategy for optimal climate compatibility

Double wall construction for a durable, high-quality product

Standard MERV 8 filter offering high-quality filtration

Economizer section for free cooling applications and energy savings



Insulated aluminium louver for a tightly sealed unit of superior quality

EC motor offers variable speed control and reduced operating costs by maximizing system efficiency

Auxiliary electrical heater for reliability in cold climate

Easy access to the filters, motors, coils and electrical components for effortless cleaning and maintenance

VIII. ELECTRICAL CONNECTIONS

DANGER

This device contains high-voltage electrical components. All maintenance must be performed by a qualified technician to prevent serious injuries or death. Installation must comply with all applicable local building and safety codes.

HOW TO OPEN THE EXTERIOR PANEL

- Use the appropriate Allen key as shown in the image above.
- Turn the handles downward, following the direction indicated by the red arrow at the bottom of the image.

Note: Always ensure power to the unit is disconnected before opening the panel to avoid electrical hazards.

DANGER

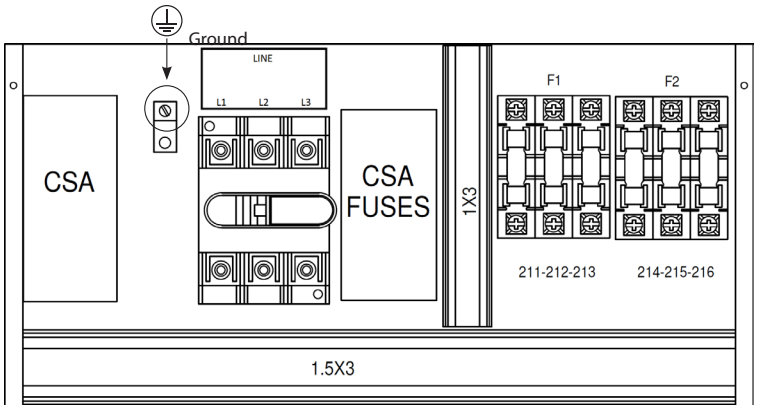
This device contains high-voltage electrical components. All maintenance must be performed by a qualified technician to prevent serious injuries or death. Installation must comply with all applicable local building and safety codes.

Prior to connecting the power supply and control wiring, power must be safely de-energized and locked out in accordance with applicable safety procedures.

Connect the unit to the power grid using a disconnect switch. This connection must be performed by a certified electrician in accordance with the applicable electrical code. Also connect the Ground wire of the main power to the location indicated on the figure below.

208V / 3PH / 60Hz - 460V / 3PH / 60Hz - 575V / 3PH / 60Hz

The electrician must refer to the unit's electrical diagram to confirm the required voltage. Units must be connected only to the main voltage specified in the electrical diagram.



Note: The unit's control panel may vary. Image is for reference only.

Depending on your project, the VRF system may be powered by the Aldes RTU unit. If this is the case, it will be indicated in the project specifications and on the wiring diagram. When the VRF is powered by the Aldes RTU, its power line must be connected to the Aldes RTU power supply line (refer to the image above and electrical diagram of the specific project delivered with the RTU unit).

Control Wires: The Aldes RTU control wires are factory-connected. However, the electrical connection to the VRF must be completed on site by a licensed electrician. To properly wire the third-party VRF to the Aldes RTU, refer to the VRF installation manual. Consult the Aldes RTU electrical diagram for available inputs and outputs, as these are specified for each project.

Appendix 1 outlines the typical inputs and outputs available for a VRF control connection.

DANGER

This device contains high-voltage electrical components. All maintenance must be performed by a qualified technician to prevent serious injuries or death. Installation must comply with all applicable local building and safety codes.

- Measure the voltage at the main circuit breaker and record the values.
- This measurement must be performed by a certified electrician in compliance with the applicable electrical codes.

L1 - L2 : _____

L1 - L3:_____

L2 - L3:_____

L1 - G: _____

L2 - G: _____

L3 - G: _____

A maximum deviation of ±5% is acceptable.

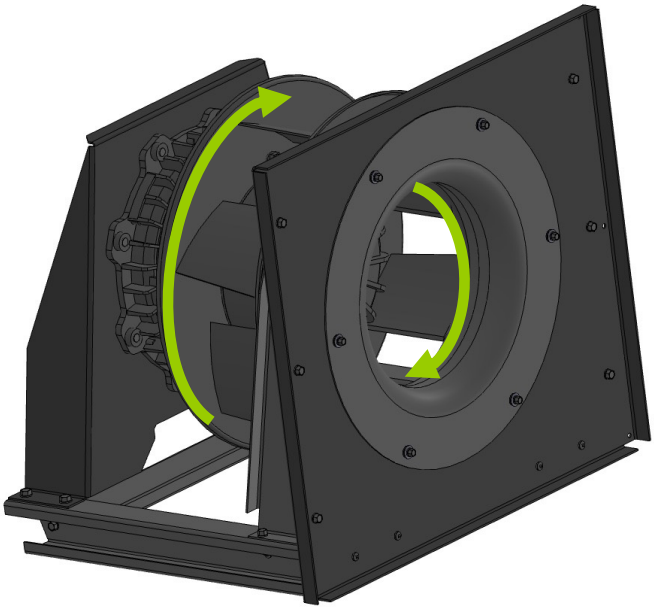
- Use the electrical wiring diagram (supplied separately) as a reference to close the "Start/Stop" and "Occupancy Control" dry contacts.
- Close the main disconnect switch; the unit will start.

WARNING: From this point onward, the unit is no longer electrically safe.

DANGER

This device contains high-voltage electrical components. All maintenance must be performed by a qualified technician to prevent serious injuries or death. Installation must comply with all applicable local building and safety codes.

- Verify that the motors are rotating in the correct direction.



DANGER

This device contains moving parts.
All repairs must be performed by a qualified technician to prevent serious injury.

RECOMMENDATION

Before turning on your new device, inspect the condition of the ventilation ducts. Clean the ducts thoroughly prior to startup.
If building construction is still ongoing, we recommend waiting until all work is complete before starting the device. Excessive dust in the air can clog the filters and potentially damage the motors.

Make sure all diffusers are fully open before powering on the device. It is normal to notice a faint burning smell during the initial startup.

- Refer to the VRF's installation manual for pipe connection instructions when installing with an AHU.
- The required refrigerant type and charge quantity will be specified by the VRF manufacturer's selection software.
- The DX coil material is copper, and standard brazing/welding methods should be performed by a qualified refrigeration technician.
- The direct expansion coil inside the ALDES unit is delivered pre-charged with 10 psi of nitrogen to prevent humidity infiltration.

CAUTION

This device should be installed and balanced by a specialized contractor in ventilation services.

WARNING

Electrical current can remain in the capacitors for up to 5 minutes after the circuits have been disconnected. The following electrical components may not be electrically safe immediately after power is cut:

- Variable Frequency Drive (VFD) for the blower motors.

IX. OPTIONS GLOSSARY

IMPORTANT

The options listed below may not be included with your device.
Please refer to the specification sheet provided with your unit for detailed information.

DEFROST STRATEGY

Fan Defrost Cycles:

- The unit continuously monitors the outside air temperature (OAT). If the OAT drops below the programmed setpoint, the defrost cycle will activate:
- The supply air fan will reduce to minimum speed.
- The supply air damper will close and remain closed for a specified duration, depending on the OAT.

The defrost cycle is preprogrammed in the control board. Once the outside air temperature rises above the setpoint, the unit will automatically return to normal supply mode and resume normal fan speed.

UNIT FEATURES

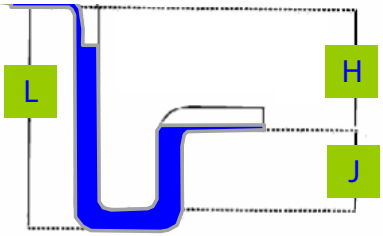
Roof Curb:

- 14 inches in height
- Available in insulated or non-insulated versions
- Constructed from 18-gauge galvanized steel

Piping Connection for Drain Pan:

- Always consult a licensed plumber for drain pan connections. A properly sized P-trap is typically required. For outdoor installations, the P-trap may be removed to prevent frozen condensation.

P-TRAP DIMENSIONS NEGATIVE PRESSION



Use the submittal sheet as a reference to calculate dimensions H, J, and L:

H = 1" for each 1" of maximum negative static pressure + 1"

J = ½ of H

L = H + J + pipe diameter + insulation thickness

X. MAINTENANCE

CAUTION
Always disconnect electrical power before performing any maintenance.
This device contains high-voltage electrical components.

Every 3 Months:

- Inspect the condition of the filters and replace them if necessary.
- Check the condition of the ventilators and clean them if needed.

Every 12 Months:

- Clean the energy recovery cores using a vacuum.
- Vacuum the interior of the unit thoroughly.
- Clean the Mistop with a vacuum.
- Gently clean the direct expansion (DX) coil fins with a damp towel, if required.

XI. SERVICE REQUESTS

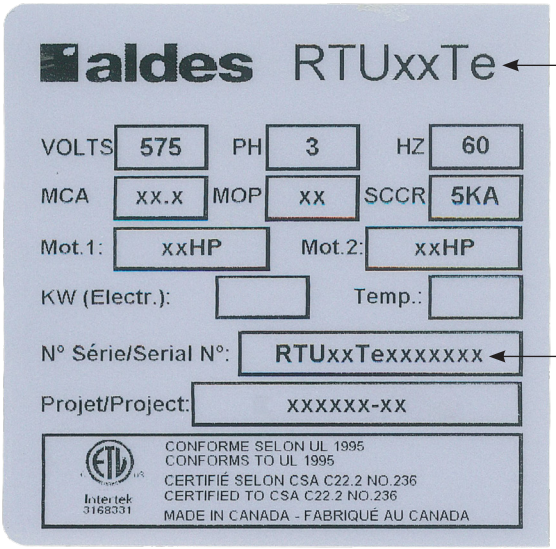
Please read before placing a service call
Before requesting service, ensure you have the following information readily available:

- Device serial number
- Model number

This information is essential to help us address your issue as quickly and accurately as possible.
You can find these details on the specification card located on your device (see photo below).

CAN: 1-800-262-0916

USA: 1-800-255-7749



XII. APPENDIX 1

TYPICAL CONTROL POINTS (RTU UNITS)

The following indicates the typical control points on the controller of the RTU units. The programming might have been modified according to your specific project needs. ***Please refer to the Control sheet and electrical plan delivered with the unit before performing any modification to the code or control wiring.*** Programming logic, inputs and outputs may vary from what is presented below.

The control points and a basic programming are supplied by Aldes, but a professionnal HVAC technician must perform the installation and ensure that the system is working properly.

Point Index	Point Name	Display Name	Description	Point Type AI	DI	AO	DO	Signal Type
				9	7	5	6	
UI1	G	G	Start contact		X			Digital
UI2	Y1	Y1	Cooling contact		X			Digital
UI3	Y2	Y2	Emergency cooling contact		X			Digital
UI4	W1	W1	Heating contact		X			Digital
UI5	W2	W2	Emergency heating contact		X			Digital
UI6	ExternalSupplyVariableSpeedControl	ExternalSupplyVariableSpeedControl	Supply Variable Speed Control	X				0-10V
UI7	ExternalExhaustVariableSpeedControl	ExternalExhaustVariableSpeedControl	Exhaust Variable Speed Control	X				0-10V
UI8	SupplyDamperInputSignal	SupplyDamperInputSignal	Supply Damper Input Signal	X				0-10V
UI9	CoolingInputSignal	CoolingInputSignal	Cooling Input Signal	X				0-10V
UI10	HeatingInputSignal	HeatingInputSignal	Heating Input Signal	X				0-10V
UI11	S10OutsideAirTemp	S10OutsideAirTemp	S10 Outside Air Temp	X				10K Type II
UI12	S21AfterDX	S21AfterDX	S21 After DX	X				10K Type II
UI13	S22SupplyAirTemp	S22SupplyAirTemp	S22 Supply Air Temp	X				10K Type II
UI14	S30ReturnAirTemp	S30ReturnAirTemp	S30 Return Air Temp	X				10K Type II
UI15	Supply1ECMConfirmation	Supply1ECMConfirmation	Supply motor 1 ECM Confirmation		X			Digital
UI16	Supply2ECMConfirmation	Supply2ECMConfirmation	Supply motor 2 ECM Confirmation		X			Digital

Point Index	Point Name	Display Name	Description	Point Type AI	DI	AO	DO	Signal Type
DI101	Overheat	Overheat	Coil Overheat		X			Digital
DI102	HeatPump1Fault	HeatPump1Fault	HeatPump1Fault		X			Digital
DI103	HeatPump1CompressorConfirm	HeatPump1CompressorConfirm	HeatPump1CompressorConfirm		X			Digital
DI104	HeatPump1BlowerDemand	HeatPump1BlowerDemand	HeatPump1BlowerDemand		X			Digital
DI105	HeatPump1DefrostStatus	HeatPump1DefrostStatus	HeatPump1DefrostStatus		X			Digital
DI106	HeatPump2Fault	HeatPump2Fault	HeatPump2Fault		X			Digital
DI107	HeatPump2CompressorConfirm	HeatPump2CompressorConfirm	HeatPump2CompressorConfirm		X			Digital
DI108	HeatPump2BlowerDemand	HeatPump2BlowerDemand	HeatPump2BlowerDemand		X			Digital
DI109	HeatPump2DefrostStatus	HeatPump2DefrostStatus	HeatPump2DefrostStatus		X			Digital
DI110	HeatPump3Fault	HeatPump3Fault	HeatPump3Fault		X			Digital
DI111	HeatPump3CompressorConfirm	HeatPump3CompressorConfirm	HeatPump3CompressorConfirm		X			Digital
DI112	HeatPump3BlowerDemand	HeatPump3BlowerDemand	HeatPump3BlowerDemand		X			Digital
DI113	HeatPump3DefrostStatus	HeatPump3DefrostStatus	HeatPump3DefrostStatus		X			Digital
DI114								
DI115								
DI116								

UO1	SupplyBlowerOutput	SupplyBlowerOutput	Supply Blower Output				X	Digital
UO2	SupplyVariableSpeedSignal	SupplyVariableSpeedSignal	Supply Variable Speed Signal			X		0-10V
UO3	ExhaustVariableSpeedSignal	ExhaustVariableSpeedSignal	Exhaust Variable Speed Signal			X		0-10V
UO4	SupplyModulatingDamperSignal	SupplyModulatingDamperSignal	Supply Modulating Damper Signal			X		0-10V
UO5	HeatPump1Start	HeatPump1Start	HeatPump1 Start				X	Digital
UO6	HeatPump2Start	HeatPump2Start	HeatPump2 Start				X	Digital
UO7	HeatPump3Start	HeatPump3Start	HeatPump3 Start				X	Digital
UO8	HeatPumpsSignal	HeatPumpsSignal	HeatPumps 0-10V Signal			X		0-10V
UO9	PostHeatSignal	PostHeatSignal	PostHeat 0-10V Signal			X		0-10V
UO10	AlarmRelayOutput	AlarmRelayOutput	Alarm Relay Output				X	Digital
UO11	HeatCoolSelection	HeatCoolSelection	Heat-Cool Selection				X	Digital
UO12								
UO13								
UO14								

UI1-G: Digital signal, ON/OFF ventilation request (from third party thermostat or Building controls).

UI2-Y1: Digital signal, cooling stage 1 (from third party thermostat or Building controls).

UI3-Y2 : Digital signal, cooling stage 2 (from third party thermostat or Building controls).

UI4-W1: Digital signal, heating stage 1 (from third party thermostat or Building controls).

UI5-W2: Digital signal, heating stage 2 (from third party thermostat or Building controls).

UI6-ExternalSupplyVariableSpeedControl: Analog signal to modulate the main motorized impeller speed (from Building controls).

UI7-ExternalExhaustAnalogControl:
Scenario 1 (RTU units with power exhaust fan): Analog signal to modulate the power exhaust motorized impeller speed (from Building controls).

Scenario 2 (RTU units with relief damper): Analog signal to modulate the exhaust damper (from Building controls).

UI8-SupplyDamperInputSignal: Analog signal to modulate the supply damper (from Building controls).

UI9-CoolingInputSignal:
Scenario 1 (RTU unit without auxiliary heater): Analog cooling signal to modulate the VRF (from Building controls).

**Free cooling (Economizer section) can be controlled with this input from Building Controls

Scenario 2 (RTU unit with auxilary heater): Analog signal to modulate the VRF, heating or cooling, (from Building controls).

UI10-HeatingInputSignal:
Scenario 1 (RTU unit without auxiliary heater): Analog heating signal to VRF and auxiliary heating (from Building controls).

Scenario 2 (RTU unit with auxiliary heater): Analog signal to modulate the auxiliary heating signal demand (from Building controls).

UI11-S10OutsideAirTemp: Thermistor 10k type II, monitoring the Outside Air Temperature (OAT). If the OAT is cold/warm enough to avoid cooling or heating from the VRF, the free cooling mode will be enabled. If the OAT is cooler than 50F the free cooling will start. An integrated PID control will modulate the supply damper accordingly.

**An Outside Air Temperature detection of -4 F on OAT will activate lock-out status from the VRF.

UI12-S21AfterDX : Thermistor 10k type II, measuring temperature downstream the DXcoil. If the Supply air setpoint value is not met, the auxiliary heating signal will activate/increase to compensate in order to reach sufficient supply air temp.

UI13 S22SupplyAirTemp : Thermistor 10k type II, measuring the actual supply air temperature (downstream both the DXcoil and the auxiliairy heating). This Supply Air temp value will be compared to the set point and the unit will react accordingly (increase or decrease the heating/cooling signal sent to the VRF or auxiliairy heating)

UI14 S30ReturnAirTemp: Thermistor 10k type II, measuring the current return air temperature to monitor the building temperature.

UI15 Supply1ECMConfirmation: Digital proof signal from the ECM first main motorized impeller. Closed contact = motor On, Opened contact = motor OFF

UI16 Supply2ECMConfirmation: Digital proof signal from the ECM second main motorized impeller. Closed contact = motor On, Opened contact = motor OFF

DI101Overheat: Digital signal from the overheat contact located in the unit.

DI102 HeatPump1Fault: Digital alarm signal from the first VRF. If the VRF is in alarm, the VRF locked out state is assumed and the RTU unit will manage its heating/cooling demand, ignoring the first VRF.

DI103 HeatPump1CompressorConfirm: Digital proof signal from the first VRF compressor. If the RTU unit is ordered with an interlock between the VRF and the auxiliary heater, the auxiliary heater will be disabled.

DI104 HeatPump1BlowerDemand: Digital signal to confirm that the first VRF is ready to heat/cool. A closed contact signal is used at start or to confirm the end of a defrost period. It is used to indicates a VRF lock-out if the contact is open.

DI105 HeatPump1DefrostStatus: Digital signal to confirm that the defrost mode is active for the first VRF. If the first VRF is in defrost mode, the RTU unit will activate other VRF to continue heating mode.

DI106 HeatPump2Fault: Digital alarm signal from the second VRF. If the VRF is in alarm, the VRF locked out state is assumed and the RTU unit will manage its heating/cooling demand, ignoring the second VRF.

DI107 HeatPump2CompressorConfirm: Digital proof signal from the second VRF compressor. If the RTU unit is ordered with an interlock between the VRF and the auxiliary heater, the auxiliary heater will be disabled.

DI108 HeatPump2BlowerDemand: Digital signal to confirm that the second VRF is ready to heat/cool. A closed contact signal is used at start or to confirm the end of a defrost period. It is used to indicates a VRF lock-out if the contact is open.

DI109 HeatPump2DefrostStatus: Digital signal to confirm that the defrost mode is active for the second VRF. If the second VRF is in defrost mode, the RTU unit will activate other VRF to continue heating mode.

DI110 HeatPump3Fault: Digital alarm signal from the third VRF. If the VRF is in alarm, the VRF locked out state is assumed and the RTU unit will manage its heating/cooling demand, ignoring the second VRF.

DI111 HeatPump3CompressorConfirm: Digital proof signal from the third VRF compressor. If the RTU unit is ordered with an interlock between the VRF and the auxiliary heater, the auxiliary heater will be disabled.

DI112 HeatPump3BlowerDemand: Digital signal to confirm that the third VRF is ready to heat/cool. A closed contact signal is used at start or to confirm the end of a defrost period. It is used to indicates a VRF lock-out if the contact is open.

DI113 HeatPump3DefrostStatus: Digital signal to confirm that the defrost mode is active for the third VRF. If the third VRF is in defrost mode, the RTU unit will activate other VRF to continue heating mode.

UO1 SupplyBlowerOutput: Digital signal to Start or Stop the main motorized impeller. Open contact = OFF, Close contact = ON

UO2 SupplyVariableSpeedSignal: Analog signal to control the ECM main motorized impeller speed.

UO3 ExhaustAnalogSignal:
Scenario 1 (RTU units with power exhaust fan): Analog signal to modulate the power exhaust motorized impeller speed.

Scenario 2 (RTU units with relief damper exhaust): Analog signal to modulate the exhaust damper.

UO4 SupplyModulatingDamperSignal: Analog signal to control the opening or closing of the fresh supply air damper.

UO5 HeatPump1Start: Digital signal sent to the first VRF. Open contact = OFF, Close contact = ON

UO6 HeatPump2Start: Digital signal sent to the second VRF. Open contact = OFF, Close contact = ON

UO7 HeatPump3Start: Digital signal sent to the third VRF. Open contact = OFF, Close contact = ON

UO8 HeatPumpSignal: Analog signal modulating cooling or heating command sent to the VRFs. The signal is sent to all the VRFs in parallel.

UO9 PostHeatSignal: Analog signal modulating the auxiliary heating coil (electric or other)

UO10 AlarmRelayOutput: Digital alarm signal sent to the Building Control System.

UO11 HeatCoolSelection: Digital signal confirming the heating or cooling state to the VRF. Open contact = Cooling, Close contact = heating

MAINTENANCE PERFORMED	DATE

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