What Is Dual Fuel and Why Does It Matter?

A dual fuel HVAC system combines a heat pump and a gas furnace in one installation, both sharing the same blower and ductwork, and automatically uses whichever source is most efficient based on outdoor conditions. This guide covers everything HVAC professionals need to know, from system fundamentals and product-specific configurations to step-by-step setup, common mistakes, and FAQs.

Dual Fuel System Fundamentals

The heat pump handles heating and cooling during mild weather. When temperatures drop too low for the heat pump to operate efficiently, the gas furnace takes over, automatically. This handoff is the core intelligence of a dual fuel system.

⚡ Energy Efficiency

The heat pump uses electricity more efficiently than gas during mild weather, reducing energy bills for the majority of the year.

❄️ Cold-Weather Reliability

The gas furnace provides strong, reliable heat when outdoor temperatures reach extremes that challenge the heat pump.

🏠 Year-Round Comfort

One system handles both heating and cooling across all seasons, with both systems sharing the same blower and ductwork.

GREE Ultra Cold-Weather Range

GREE Ultra models operate in heating mode down to **-22°F**, well below the old field rule of switching over at 35–40°F. In most dual fuel setups, the gas furnace is a backup rather than the primary cold-weather source.

The Balance Point

The **balance point** is the outdoor temperature at which the gas furnace becomes more cost-effective than the heat pump, depends on the region, local utility rates, and whether the homeowner is burning natural gas or propane. There is no universal answer; it must be evaluated per installation.

GREE Product Selection: FLEXX Ultra vs. FLEX Eco

Choosing the right outdoor unit depends on installation region and customer budget. The operating ranges differ significantly, understanding this distinction is critical before any installation begins.

FLEXX Ultra

Operates in heating mode down to **-22°F**. Ideal for northern climates, high-altitude regions, and any application where extreme cold is a regular occurrence. The premium choice for maximum cold-weather performance.

FLEXX Eco

Operates reliably down to **5°F**. A viable option when the customer's budget doesn't allow for the Ultra. The gas furnace provides backup for temperatures below 5°F, still delivering the dual fuel redundancy they need.

GREE FXU Dual Fuel Coil: Key Specs

Available Sizes

2, 3, 4, and 5-ton

Cabinet Width (4 & 5-ton)

24.5-inch shared cabinet

Installation Orientations

4 orientations supported; ships as horizontal left / upflow

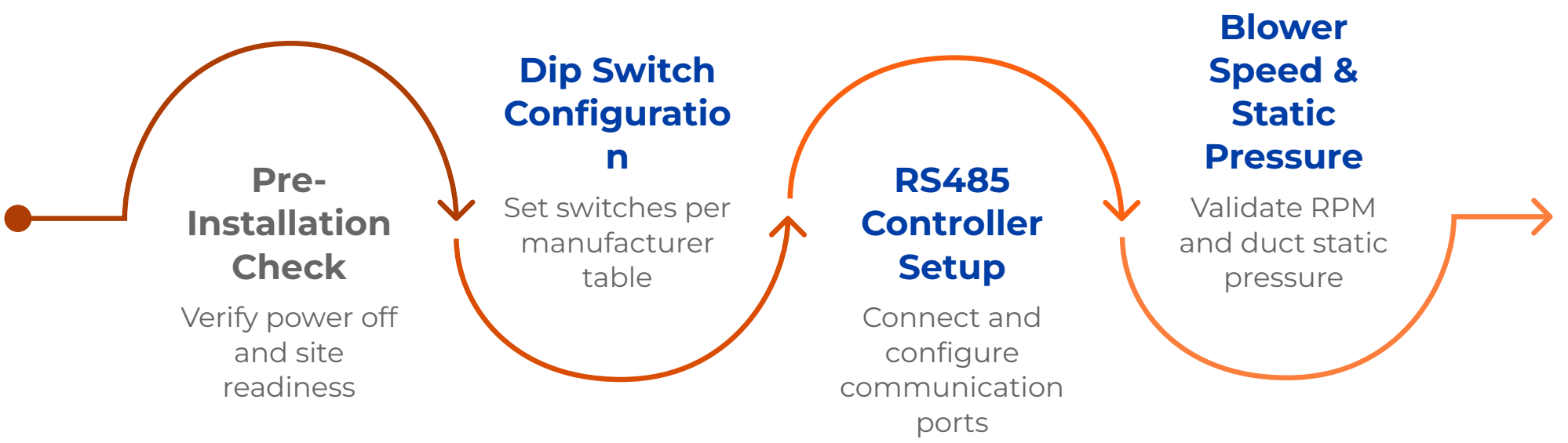
Refrigerant Safety

Built-in R32 leak detector for A2L refrigerant safety

Step-by-Step: Dual Fuel Setup & Configuration

INSTALLATION GUIDE

Follow this sequence precisely. Every step listed here has a downstream consequence if skipped or performed incorrectly. Power must be off before moving any dip switches.



Each phase must be completed in order. Dip switch settings made with power on risk damaging the control board. Controller mode changes require the unit to be in Off mode first.

Pre-Installation Checklist

Dual Fuel Thermostat

A standard thermostat will not work. A dual fuel thermostat is a wiring and commissioning requirement, not optional.

Furnace Airflow Capacity

The gas furnace must deliver **350–400 CFM per ton**. Pull the blower chart and verify before installation.

No Transformer Needed

There is no transformer inside the FXU coil or outdoor unit. The entire system runs on **24V power supplied by the gas furnace transformer**.

Dip Switch Configuration

Location	Switch	Required Setting	Purpose
Indoor FXU Coil Board	SA1 #1	ON	Identifies A-coil to outdoor unit
Outdoor Unit	SA1 #1	ON	Signals 24V / A-coil communication mode
Outdoor Unit	SA1 #2	Flipped (for GREE A-coil)	Optimizes communication; improves response time and efficiency
Indoor FXU Coil Board	Sensor switches	Factory ON	Leave in factory position for standard dual fuel

For third-party air handlers or A-coils, SA1 switch #2 does not need adjustment — the default is sufficient. However, SA1 #1 must still be set

Operating Modes, Defrost & Coil Orientation

Configure these on the outdoor unit with power off. Select the mode appropriate for the installation region.

Operating Modes

- **Standard:** Factory default; suitable for most installations
- **Strong:** Increases capacity output rapidly; for extreme highs or lows
- **Energy Saving:** Reduces load range to minimize consumption
- **Self-Adaption:** Adjusts automatically to conditions; 24V mode only

Defrost Modes

- **Standard:** Factory default
- **Snowy:** For extreme cold (North Dakota, Canada); more aggressive defrost
- **Humid Cooling:** High-humidity cooling climates
- **Dry Cooling:** Low-humidity cooling environments

Defrost and Dual Fuel: Defrost cycles on these units last ~2 minutes, not long enough for the gas furnace ignition sequence to complete. By the time the furnace runs through prep purge, inducer startup, igniter warmup, and fires the burner, the outdoor unit has already exited defrost. The system resumes heat pump operation without the furnace ever engaging.

FXU Coil Orientation Conversions

Horizontal Right Conversion

Remove cover screws and open the electrical compartment. Remove coil mounting bracket screws and top bracket screw. Remove the two downflow cover panel screws and set aside. Slide the coil out, flip the drain pan to the opposite side, slide the coil back in. Move the control box to the pre-drilled holes on the other side, the wiring harness reaches either side. Flip the box cover so labeling reads correctly.

Downflow Conversion

Swap the inlet and outlet temperature sensors, that is the **only** change required. In upflow position, the outlet sensor sits at the top and inlet at the bottom. Because airflow reverses in downflow, these sensors must be physically moved. Loosen the retaining nut with an adjustable wrench and slide each sensor out. Both are **20K thermistors** and cannot be reassigned on the control board.

⚠️ Always Install on Supply Side

The coil must always be placed on the supply side, **never the return**. Installing on the return causes condensation on the heat exchanger and disrupts proper airflow velocity and static pressure.

Blower Speed, Static Pressure & Fault Codes

Airflow is the most common source of problems in dual fuel installations. Every fault code below has airflow as a probable root cause. Get this right before closing up the installation.

350–400

CFM per Ton

Target blower airflow — must be verified during a Y-call, not just a G-call

0.3

inWC Ideal Static

Total external static pressure target

0.5

inWC Maximum

Maximum acceptable static pressure before performance degrades

0.9

inWC — Act Now

Ductwork remediation required: add return/supply vents or increase duct sizing

Fault Code Reference

Code	Meaning	Primary Cause in Dual Fuel
H4	Compressor Overload	Low airflow in heating mode overloads the inverter board and drives compressor amperage too high
09	Oil Return Cycle	Insufficient airflow: takes 4–5 min to complete; repeated 09 codes = airflow/ductwork problem
08	Defrost Cycle	Normal operation: ~2 min duration; distinguish from 09
E8	Overheat Protection	Sensors not swapped for downflow conversion, or heat pump + furnace running simultaneously
E2	Freeze Protection	Low airflow in cooling mode

Variable Speed Blower Note: Some furnaces only run the blower at 50% on a G-call alone. Confirm the furnace delivers the full target CFM during a **Y-call**. If a variable speed blower is set for 1,200 CFM on a 3-ton system, that full 1,200 CFM must be reached while the heat pump is operating. GREE does not control how other manufacturers' boards manage blower speed, this is the installing contractor's responsibility.

Common Mistakes to Avoid

These errors are the most frequently encountered issues on GREE dual fuel installations. Each one has a specific consequence, understanding the failure mode helps avoid it in the field.

1

Not Swapping Sensors for Downflow

Leaving sensors in the upflow position during a downflow installation causes the board to read an artificially high inlet temperature, triggering an **E8 overheat fault** or preventing the heat pump from running. EEV adjustment will be erratic.

2

Running Both Systems Simultaneously

The heat pump and gas furnace running at the same time overheats the FXU coil and triggers a protection shutdown. A **dual fuel thermostat is required**, this is not an optional upgrade.

3

Incorrect Static Pressure

Low airflow from undersized ductwork causes oil return cycles (code 09) and efficiency loss. Measure and confirm total static pressure is at or below **0.5 inWC** before completing installation.

4

Skipping Transitions on Mismatched Widths

A sheet metal transition is required whenever the furnace outlet and coil widths differ. Skipping it blocks airflow through part of the coil and can damage the furnace heat exchanger.

5

Incorrect Line Set Sizing

Use **3/8" × 3/4"** refrigerant line sets. 7/8" suction line produces audible vibration and has no GREE charging chart. 1-1/8" suction line is not acceptable and risks inadequate oil return and equipment damage.

6

Directing UV Lights at EEV

Do not point UV lights at the electronic expansion valve or the coil wiring. UV exposure deteriorates the EEV stepper motor, and the coil wiring may not be rated for UV exposure.

RS485 & H1/H2 Diagnostic Connections

What H1/H2 Provides

When H1 and H2 are connected to the outdoor unit, the RS485 controller displays:

- Compressor frequency
- EEV step position
- Outdoor unit fan speed

Note: Indoor fan speed is not available, the furnace is a separate manufacturer's equipment and does not communicate via H1/H2.

H1/H2: Optional, But Valuable

Connecting H1 and H2 is optional. Even in 24-volt operation, the RS485 connection provides diagnostic data from the outdoor unit and indoor coil sensors — valuable for commissioning and troubleshooting.

On **R32 Flex units**, H1/H2 also delivers a performance benefit: the R32 FXU coil has inlet, outlet, and coil temperature sensors that feed data to the outdoor board. This gives the outdoor unit additional information to **optimize compressor ramp rate** beyond what the pressure transducer alone can provide.

Without H1/H2 connected, the system relies solely on the pressure transducer for ramp control, similar to how the 410A models operated.

Thermostat Requirements & Wiring Stages

A dual fuel thermostat is not optional: it is a hard wiring and commissioning requirement. Running the heat pump and gas furnace simultaneously overheats the FXU coil. The outlet temperature sensor detects the abnormal heat rise and the system opens the W circuit to protect equipment. The dual fuel thermostat prevents this by shutting off the heat pump any time the gas furnace is called.

Any brand works, GREE controller, Honeywell, Ecobee, or White-Rodgers, as long as it is **configured for dual fuel operation** and interlocks the heat pump and gas furnace so they never run simultaneously.

Required Thermostat Stages by Furnace Type

Single-Stage Gas Furnace

2 stages of heat required:

- Y: Heat pump
- W2: Gas heat

1 stage of cooling only, the inverter-driven outdoor unit modulates capacity on its own.

Two-Stage Gas Furnace

3 stages of heat required:

- Y: Heat pump
- W2: First-stage gas
- W3 or AUX3: Second-stage gas

1 stage of cooling only.

Key Takeaways & Quick Reference

Cold-Weather Operating Range

Flex Ultra: down to **-22°F**. Flex Eco: down to **5°F**. Select based on installation climate and customer budget.

Dip Switch Rule

SA1 #1 to **ON** on both indoor coil and outdoor unit (power off), then switch RS485 controller to **24-volt mode** via Installer Setup.

Airflow Is Everything

Target **350–400 CFM per ton**. Verify during a Y-call. Some furnaces only run blower at 50% on a G-call alone. Static pressure max: **0.5 inWC**.

Downflow Sensor Swap

For downflow conversion, physically swap the inlet and outlet temperature sensors. Both are **20K thermistors**, they cannot be reassigned on the board.

Fault Code Cheat Sheet

Code **09** = oil return (airflow issue). **H4** = compressor overload. **E8** = overheat protection. **E2** = freeze protection. Code **08** = defrost (normal).

Coil Always on Supply Side

The FXU coil must be installed on the **supply side only**. Installing on the return causes condensation and disrupts airflow velocity and static pressure.

MultiPRO Update: Dual fuel MultiPRO coils are in development but were not yet available as of this training (January 2026).

Frequently Asked Questions

Is there a transformer in the GREE FXU Dual Fuel Coil?

No. Neither the FXU coil nor the outdoor unit contains a transformer. The system uses the **24-volt power supplied by the gas furnace transformer**.

Do you have to connect H1 and H2?

No. H1 and H2 are optional. Connecting them enables diagnostic data display and, on R32 Flex units, provides a compressor ramp optimization benefit. The system operates without them.

Does the gas furnace run during defrost?

No. The defrost cycle lasts ~2 minutes — not long enough for the furnace ignition sequence to complete. The system simply returns to heat pump operation when defrost ends.

What does fault code 09 mean?

Code 09 indicates an **oil return cycle**, not defrost (code 08). Oil return takes 4–5 minutes and is triggered by insufficient airflow. Repeated 09 codes point to a ductwork problem.

Can a UV light be installed in the FXU coil area?

GREE advises against it. UV light deteriorates the EEV stepper motor, and coil wiring may not be rated for UV exposure.

Is the FXU Coil compatible with MultiPRO systems?

Not yet. Dual fuel MultiPRO coils are in development but were not available as of January 2026.