



TRANE[®]

It's Hard To Stop A Trane.[®]

TRANE
TECHNOLOGIES

A2L TRANSITION

JACKSONVILLE FLORIDA
March 28

**TRANE DEALERS ARE AS HARD
TO STOP AS A TRANE ITSELF.**



Changes to
expect

Introductions

Agenda

Housekeeping

Why are we Changing?

What are we changing?

What is Next?

Key Regulations

American Innovation & Manufacturing (AIM) Act empowered the Environmental Protection Agency (EPA) to drive an 85% reduction of the production and consumption of HFCs in the United States by 2025.

1

**Step Down in U.S.
Production of
Refrigerant**

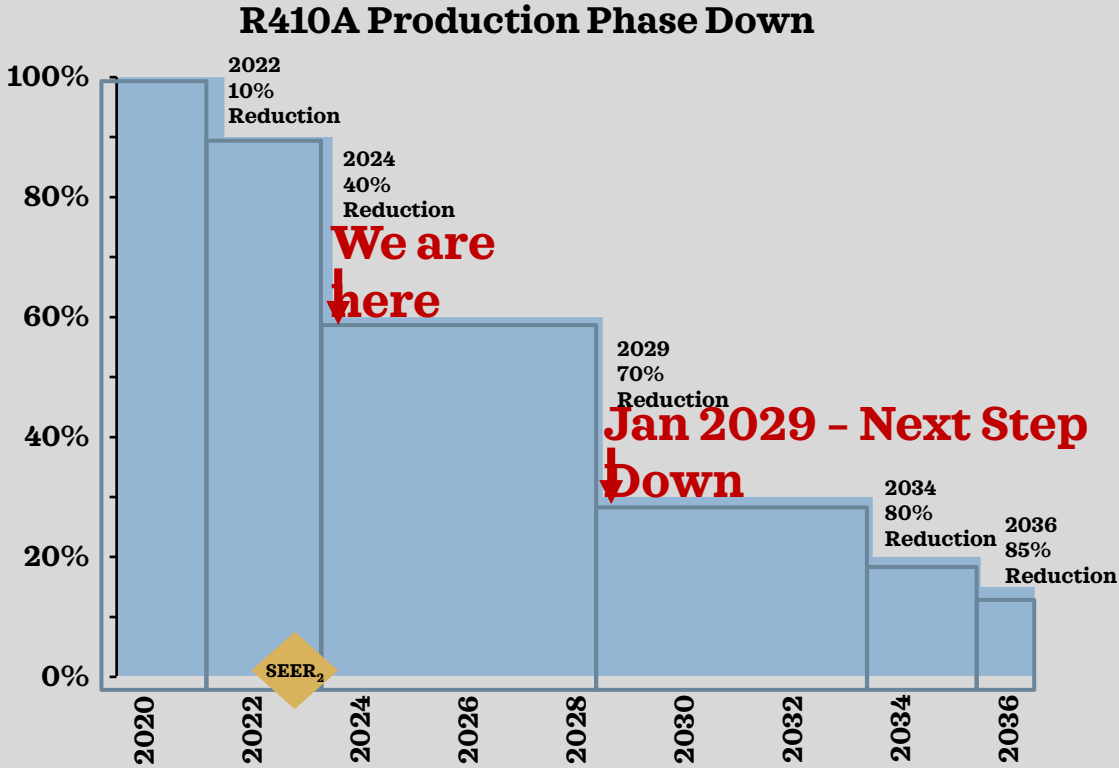
2

**Transition HVAC
equipment to designs for
refrigerant with GWP less
than 700**

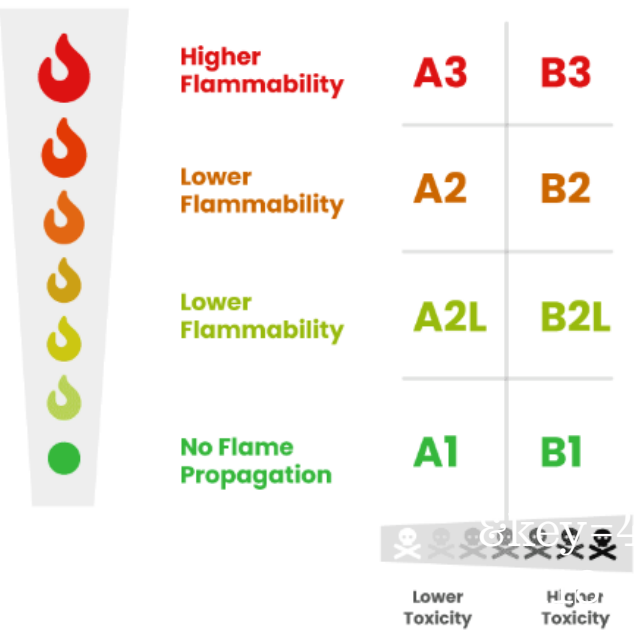
A2L

Trane will begin introducing compliant products in Q1 2024.

R-410A Phase-Down



R410 Prices Increase as Availability Goes Down



Class 3 Requirements

1. Exhibit flame propagation: 60°C & 101.3 kPa
2. LFL < 0.10 kg/m³ or HOC ≥ 19,000kJ/kg

Class 2 Requirements

1. Exhibit flame propagation @ 60°C & 101.3 kPa
2. LFL > 0.10kg/m³
3. HOC < 19,000 KJ/kg

Class 2L Requirements

1. Same as Class 2 requirements and SU < 10 cm/s

Class 1 Requirements

No Flame propagation @ 60°C & 101.3kPa



Is A2L flammable?

- o Yes, R-454B is slightly flammable, but nowhere near the flammability rating of natural gas or propane.

<https://www.youtube.com/watch?v=UrQP24rTIsU>

SuperTest Refrigerant Flammability Test



HVAC products will convert design refrigerants based on regulations from the EPA

| Category | Impacted | Enforcement Rule | Example |
|--|--|---|---|
| R410A Self-Contained Units | Packaged Units Dehumidifiers | Product manufactured or imported before 1/1/25 may be installed until 1/1/28 (3 year sell through) | An R-410A packaged unit can be installed up until 1/1/28, if it was manufactured or imported into the US before 1/1/25. |
| R410A Split Systems | Split Ducted Systems Ductless Systems | Product manufactured or imported before 1/1/25 may be installed until 1/1/26 (1 year sell through) | A full system can be replaced in 2025 with an R-410A system only with components produced or imported prior to 1/1/25. |
| R410A Split System Service Components | Split Air Conditioners Split Heat Pumps Air Handlers Furnace Coils Ductless Indoor Units | Partial system for service is allowed after 1/1/25* [†] (‘Service’ label required for Manufactured/imported after 1/1/25) | A homeowner’s air conditioner compressor fails in Jan of 2025, but the furnace and coil are working properly. The air conditioner may be replaced with an R410A service air conditioner, even though it’s post 12/31/24.* [†] |
| R410 Equipment Exports | Equipment manufactured in the U.S. for export. | Split Systems: No imposed restriction Packaged/Dehumidifiers: until 1/1/28 | An R410A air conditioner manufactured in the U.S. can continue to be exported to Canada (no time limit). An R410A packaged unit and dehumidifier cannot be exported after 12/31/27. |

* Awaiting DOE guidance on if/how DOE Performance Ratings requirements will apply

[†] Installations in the state of California are subject to CARB restrictions on component replacements.

TBD what this will mean for producing R410 equipment post- Jan 2025 (how will they be rated etc TBD).

Changes to expect



Florida Man Rule

Products Differences

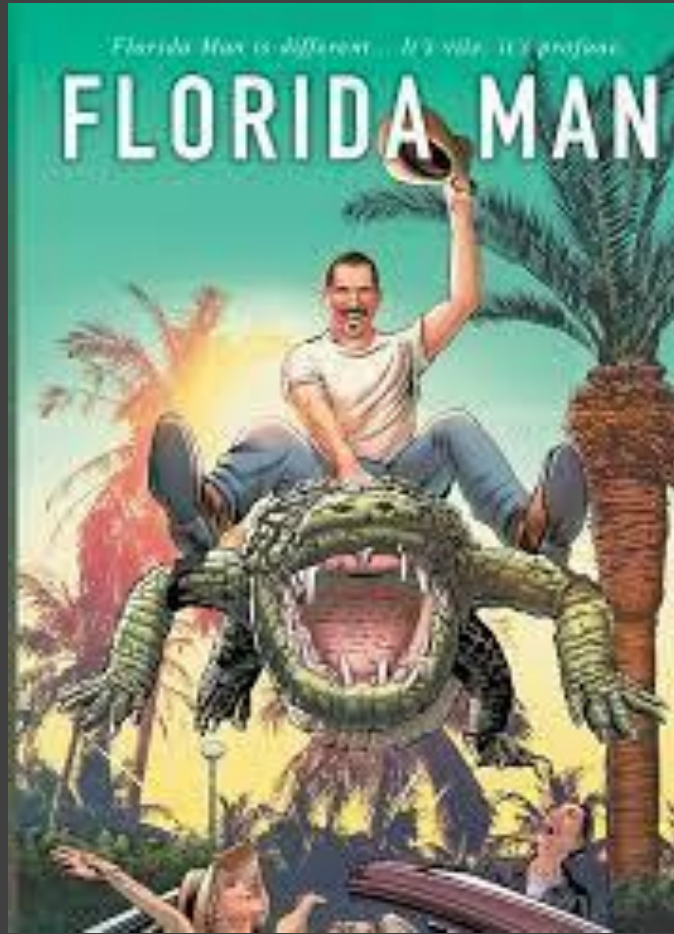
Cylinders / Line Sets

Commissioning

Mitigation

Timeline/ Transition

What is Next?



“FLORIDA MAN” RULE

*“WHAT'S THE WORSE THAT CAN HAPPEN...” –
ROBERTS.*

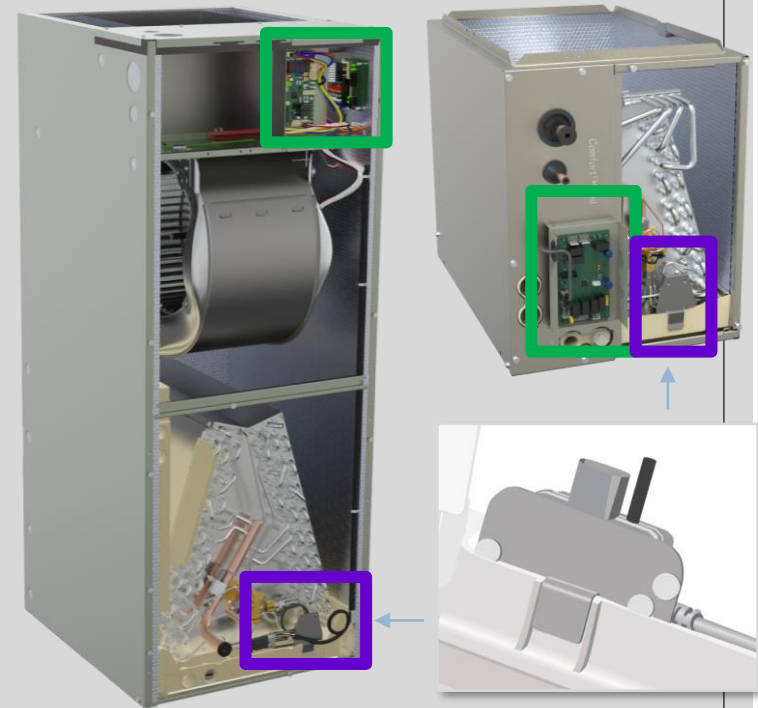
Refrigerant Detection System (RDS) – AH, Coil, Packaged

What are the new components?

- Leak sensor
- Mitigation Control Board (MCB)
- Wire Harnesses → *field connection required between Furnace & Coil*


What is an RDS & why is it needed?


- Required to detect refrigerant leaks when using A2L refrigerant → *customer safety*
- Factory mounted in most common orientation for Air Handlers, Cased Coils, Packaged Units → *ease of installation*
- Same RDS installed on all Air Handlers, Cased Coils, Package Units → *simplify serviceability*



Understanding Leaks and Leak Alerts

IN THE EVENT A LEAK IS DETECTED

- 1.** The RDS shuts down the compressor and other electrical devices

- 2.** The indoor fan energizes to disperse the refrigerant

- 3.** Indoor fan continues operation for 5 minutes after leak is no longer sensed, then system returns to non-mitigation state


TRANE LINK™ COMMUNICATING SYSTEMS

- 1.** An LED light will blink on the mitigation control board
- 2.** Leak detection alerts on the smart thermostat, in the technician app, and in the Diagnostics portal
- 3.** In cooling mode, the system will no longer blow cold air due to the mitigation sequence

24V SYSTEMS

- 1.** An LED light will blink on the mitigation control board
- 2.** In cooling mode, the system will no longer blow cold air due to the mitigation sequence

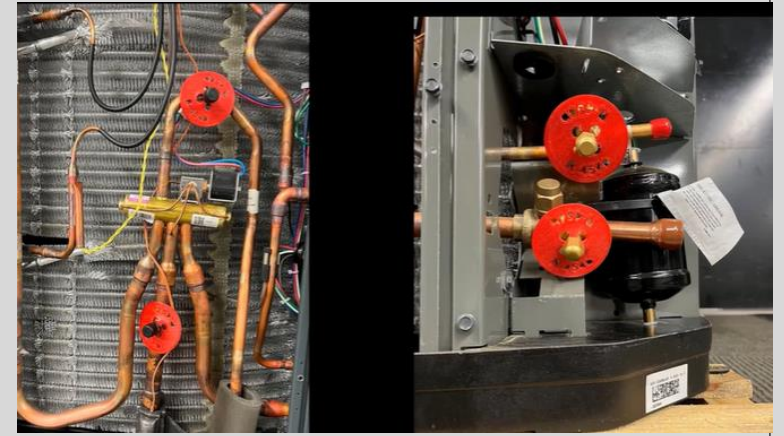
Furnace and electric heat operation continue to operate as normal during refrigerant leak mitigation activities.

Low GWP Product Differences

- Red refrigerant ID tags located on all service ports
 - Visual reminder of A2L content

- Refrigerant Weight Labeling
 - Total system charge must be recorded on the equipment label (in lb/oz)

- Refrigerant Line Sizing
 - R454b works best with smaller line sets
 - Line set reuse is permissible with proper purging
 - *VSPD: some models may have reduced line set lengths (or other performance limitations, see installers guide for details)*



Refrigerant Weight Labeling

| | |
|--|---|
| ⚠ WARNING RISK OF FIRE AUXILIARY DEVICES WHICH MAY BE IGNITION SOURCES SHALL NOT BE INSTALLED IN THE DUCTWORK, OTHER THAN AUXILIARY DEVICES LISTED FOR USE WITH THE SPECIFIC APPLIANCE. SEE INSTRUCTIONS. | ⚠ ADVERTENCIA RIESGO DE FUEGO NO DEBEN INSTALARSE DISPOSITIVOS AUXILIARES QUE PUEDAN SER FUENTES DE IGNICIÓN EN LAS TUBERÍAS, A MENOS QUE SEAN DISPOSITIVOS AUXILIARES CLASIFICADOS PARA PARA USAR CON EL APARATO ESPECÍFICO. CONSULTE LAS INSTRUCCIONES. |
| ⚠ AVERTISSEMENT RISQUE D'INCENDIE TOUS LES APPAREILS AUXILIAIRES QUI PEUVENT ÊTRE UNE SOURCE D'INFLAMMATION NE DOIVENT PAS ÊTRE INSTALLÉS DANS LES CONDUITS, À L'EXCEPTION DES APPAREILS AUXILIAIRES RÉPERTORIÉS POUR ÊTRE UTILISÉS AVEC CET ÉLECTROMÉNAGER EN PARTICULIER. VOIR LES INSTRUCTIONS. | X39004356001A ① Charge Added at Factory = _____ lb/oz ② Charge Added at Install = _____ lb/oz ①+② Total System Charge = _____ lb/oz REFRIGERATION SYSTEM INSTALLED BY: _____ TEL. NO.: _____ |

Refrigerant Line Sizing

| | Service Valve Sizes | | Rated Line Sizes | | Alternate Line Sizes | |
|---------------|---------------------|--------|------------------|--------|----------------------|--------|
| | Vapor | Liquid | Vapor | Liquid | Vapor | Liquid |
| 2-Ton 15 SEER | 1/2" | 5/16" | 1/2" | 5/16" | 5/8" | 3/8" |
| 3-Ton 15 SEER | 5/8" | 5/16" | 5/8" | 5/16" | 3/4" | 3/8" |
| 4-ton 15 SEER | 3/4" | 5/16" | 3/4" | 5/16" | 7/8" | 3/8" |
| 5-ton 15 SEER | 3/4" | 5/16" | 3/4" | 5/16" | 7/8" | 3/8" |

Opteon™ XL41 (R-454B)
Saturation Properties - Temperature Table

| Temp °F | Pressure [psia] | | Volume [ft³/lb] | | Density [lb/ft³] | | Enthalpy [Btu/lb] | | | Entropy [Btu/lb-°R] | | Temp °F |
|------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|---------------------------|-------------------------|--------------------------|-------------------------|------------|
| | Liquid p _l | Vapor p _v | Liquid v _l | Vapor v _v | Liquid d _l | Vapor d _v | Liquid h _l | Latent h _{lv} | Vapor h _v | Liquid s _l | Vapor s _v | |
| 19 | 87.00 | 83.39 | 0.0145 | 0.8548 | 69.071 | 1.1698 | 21.67 | 116.18 | 137.85 | 0.04791 | 0.29133 | 19 |
| 20 | 88.64 | 84.97 | 0.0145 | 0.8391 | 68.954 | 1.1917 | 22.05 | 115.89 | 137.93 | 0.04870 | 0.29099 | 20 |
| 21 | 90.30 | 86.58 | 0.0145 | 0.8238 | 68.836 | 1.2139 | 22.43 | 115.59 | 138.02 | 0.04949 | 0.29066 | 21 |
| 22 | 91.99 | 88.21 | 0.0146 | 0.8088 | 68.718 | 1.2365 | 22.81 | 115.29 | 138.11 | 0.05027 | 0.29032 | 22 |
| 23 | 93.70 | 89.86 | 0.0146 | 0.7941 | 68.599 | 1.2593 | 23.19 | 115.00 | 138.19 | 0.05105 | 0.28999 | 23 |
| 24 | 95.44 | 91.53 | 0.0146 | 0.7797 | 68.480 | 1.2826 | 23.58 | 114.70 | 138.27 | 0.05184 | 0.28966 | 24 |
| 25 | 97.20 | 93.23 | 0.0146 | 0.7656 | 68.361 | 1.3062 | 23.96 | 114.40 | 138.36 | 0.05262 | 0.28933 | 25 |
| 26 | 98.98 | 94.95 | 0.0147 | 0.7518 | 68.241 | 1.3301 | 24.34 | 114.09 | 138.44 | 0.05340 | 0.28900 | 26 |
| 27 | 100.79 | 96.70 | 0.0147 | 0.7383 | 68.121 | 1.3544 | 24.73 | 113.79 | 138.52 | 0.05418 | 0.28867 | 27 |
| 28 | 102.63 | 98.47 | 0.0147 | 0.7251 | 68.000 | 1.3791 | 25.11 | 113.49 | 138.60 | 0.05496 | 0.28834 | 28 |
| 29 | 104.49 | 100.26 | 0.0147 | 0.7122 | 67.879 | 1.4041 | 25.50 | 113.18 | 138.68 | 0.05575 | 0.28802 | 29 |
| 30 | 106.37 | 102.08 | 0.0148 | 0.6995 | 67.758 | 1.4295 | 25.89 | 112.87 | 138.76 | 0.05653 | 0.28769 | 30 |
| 31 | 108.28 | 103.92 | 0.0148 | 0.6871 | 67.636 | 1.4553 | 26.28 | 112.56 | 138.84 | 0.05730 | 0.28737 | 31 |
| 32 | 110.22 | 105.79 | 0.0148 | 0.6750 | 67.514 | 1.4815 | 26.66 | 112.25 | 138.91 | 0.05808 | 0.28704 | 32 |
| 33 | 112.18 | 107.69 | 0.0148 | 0.6631 | 67.391 | 1.5081 | 27.05 | 111.94 | 138.99 | 0.05886 | 0.28672 | 33 |
| 34 | 114.17 | 109.61 | 0.0149 | 0.6514 | 67.268 | 1.5351 | 27.44 | 111.62 | 139.06 | 0.05964 | 0.28640 | 34 |
| 35 | 116.18 | 111.55 | 0.0149 | 0.6400 | 67.144 | 1.5624 | 27.83 | 111.31 | 139.14 | 0.06042 | 0.28608 | 35 |
| 36 | 118.23 | 113.53 | 0.0149 | 0.6288 | 67.020 | 1.5902 | 28.22 | 110.99 | 139.21 | 0.06120 | 0.28575 | 36 |
| 37 | 120.30 | 115.53 | 0.0149 | 0.6179 | 66.896 | 1.6184 | 28.61 | 110.67 | 139.28 | 0.06197 | 0.28543 | 37 |
| 38 | 122.39 | 117.55 | 0.0150 | 0.6071 | 66.771 | 1.6470 | 29.00 | 110.35 | 139.35 | 0.06275 | 0.28512 | 38 |
| 39 | 124.51 | 119.60 | 0.0150 | 0.5966 | 66.646 | 1.6761 | 29.40 | 110.02 | 139.42 | 0.06353 | 0.28480 | 39 |
| 40 | 126.66 | 121.68 | 0.0150 | 0.5863 | 66.520 | 1.7056 | 29.79 | 109.70 | 139.49 | 0.06430 | 0.28448 | 40 |
| 41 | 128.84 | 123.79 | 0.0151 | 0.5762 | 66.393 | 1.7355 | 30.18 | 109.37 | 139.56 | 0.06508 | 0.28416 | 41 |
| 42 | 131.05 | 125.92 | 0.0151 | 0.5663 | 66.267 | 1.7658 | 30.58 | 109.05 | 139.63 | 0.06585 | 0.28384 | 42 |
| 43 | 133.28 | 128.08 | 0.0151 | 0.5566 | 66.139 | 1.7966 | 30.97 | 108.72 | 139.69 | 0.06663 | 0.28353 | 43 |
| 44 | 135.55 | 130.27 | 0.0151 | 0.5471 | 66.012 | 1.8279 | 31.37 | 108.39 | 139.76 | 0.06740 | 0.28321 | 44 |
| 45 | 137.84 | 132.49 | 0.0152 | 0.5377 | 65.883 | 1.8596 | 31.77 | 108.05 | 139.82 | 0.06818 | 0.28289 | 45 |

| | | |
|-----|--------|--------|
| 84 | 252.27 | 243.71 |
| 85 | 255.92 | 247.27 |
| 86 | 259.60 | 250.87 |
| 87 | 263.33 | 254.51 |
| 88 | 267.09 | 258.18 |
| 89 | 270.90 | 261.90 |
| 90 | 274.74 | 265.66 |
| 91 | 278.63 | 269.46 |
| 92 | 282.55 | 273.30 |
| 93 | 286.52 | 277.19 |
| 94 | 290.53 | 281.11 |
| 95 | 294.58 | 285.08 |
| 96 | 298.67 | 289.09 |
| 97 | 302.81 | 293.14 |
| 98 | 306.99 | 297.24 |
| 99 | 311.21 | 301.38 |
| 100 | 315.47 | 305.56 |
| 101 | 319.78 | 309.79 |
| 102 | 324.13 | 314.06 |
| 103 | 328.53 | 318.38 |
| 104 | 332.97 | 322.74 |
| 105 | 337.46 | 327.15 |
| 106 | 341.99 | 331.60 |
| 107 | 346.56 | 336.10 |
| 108 | 351.19 | 340.65 |
| 109 | 355.86 | 345.25 |
| 110 | 360.57 | 349.89 |
| 111 | 365.33 | 354.58 |
| 112 | 370.14 | 359.32 |
| 113 | 375.00 | 364.11 |
| 114 | 379.90 | 368.95 |
| 115 | 384.86 | 373.83 |
| 116 | 389.86 | 378.77 |
| 117 | 394.91 | 383.76 |
| 118 | 400.01 | 388.80 |
| 119 | 405.16 | 393.89 |
| 120 | 410.36 | 399.03 |
| 121 | 415.60 | 404.22 |

R-410A Temp. & Pressure Chart

| TEMP R410 | TEMP R410 | TEMP R410 |
|-----------|-----------|-----------|
| -60 | 1.2 | 16 71.7 |
| -55 | 3.4 | 17 73.3 |
| -50 | 5.8 | 18 75.0 |
| -45 | 8.6 | 19 76.6 |
| -40 | 11.6 | 20 78.3 |
| -35 | 14.9 | 21 80.1 |
| -30 | 18.5 | 22 81.8 |
| -25 | 22.5 | 23 83.6 |
| -20 | 26.9 | 24 85.4 |
| -15 | 31.7 | 25 87.3 |
| -10 | 36.8 | 26 89.1 |
| -5 | 42.5 | 27 91.0 |
| 0 | 48.6 | 28 92.9 |
| 1 | 49.9 | 29 94.9 |
| 2 | 51.2 | 30 96.8 |
| 3 | 52.5 | 31 98.8 |
| 4 | 53.8 | 32 100.8 |
| 5 | 55.2 | 33 102.9 |
| 6 | 56.6 | 34 105.0 |
| 7 | 58.0 | 35 107.1 |
| 8 | 59.4 | 36 109.2 |
| 9 | 60.9 | 37 111.4 |
| 10 | 62.3 | 38 113.6 |
| 11 | 63.8 | 39 115.8 |
| 12 | 65.4 | 40 118.0 |
| 13 | 66.9 | 41 120.3 |
| 14 | 68.5 | 42 122.6 |
| 15 | 70.0 | 43 125.0 |
| | | 44 127.3 |
| | | 45 129.7 |
| | | 46 132.2 |
| | | 47 134.6 |
| | | 48 137.1 |
| | | 49 139.6 |
| | | 50 142.2 |
| | | 55 155.5 |
| | | 60 169.6 |
| | | 65 184.6 |
| | | 70 200.6 |
| | | 75 217.4 |
| | | 80 235.3 |
| | | 85 254.1 |
| | | 90 274.1 |
| | | 95 295.1 |
| | | 100 317.2 |
| | | 105 340.5 |
| | | 110 365.0 |
| | | 115 390.7 |
| | | 120 417.7 |
| | | 125 445.9 |
| | | 130 475.6 |
| | | 135 506.5 |
| | | 140 539.0 |
| | | 145 572.8 |
| | | 150 608.1 |
| | | 155 645.0 |

Is it that much different?

Labeling Continued

- New units will be marked with the amount of refrigerant added to the unit at shipment. Any additional refrigerant added at installation will need to be weighed and marked on the outdoor unit.

A2L Refrigerants Warning Labels

The commissioning technician must weigh in refrigerant charge adders and document total charge.

| |
|---|
| ⚠ WARNING RISK OF FIRE AUXILIARY DEVICES WHICH MAY BE IGNITION SOURCES SHALL NOT BE INSTALLED IN THE DUCTWORK, OTHER THAN AUXILIARY DEVICES LISTED FOR USE WITH THE SPECIFIC APPLIANCE. SEE INSTRUCTIONS. |
| ⚠ AVERTISSEMENT RISQUE D'INCENDIE TOUS LES APPAREILS AUXILIAIRES QUI PEUVENT ÊTRE UNE SOURCE D'INFLAMMATION NE DOIVENT PAS ÊTRE INSTALLÉS DANS LES CONDUITS, À L'EXCEPTION DES APPAREILS AUXILIAIRES RÉPERTORIÉS POUR ÊTRE UTILISÉS AVEC CET ÉLECTROMÉNAGER EN PARTICULIER. VOIR LES INSTRUCTIONS. |
| ⚠ ADVERTENCIA RIESGO DE FUEGO NO DEBEN INSTALARSE DISPOSITIVOS AUXILIARES QUE PUEDAN SER FUENTES DE IGNICIÓN EN LAS TUBERÍAS, A MENOS QUE SEAN DISPOSITIVOS AUXILIARES CLASIFICADOS PARA PARA USAR CON EL |

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① Charge Added at Factory = Data Plate lb/oz

② Charge Added at Install = Scale lb/oz

① + ② Total System Charge = Total lb/oz

REFRIGERATION SYSTEM INSTALLED BY:

 Dealer Name

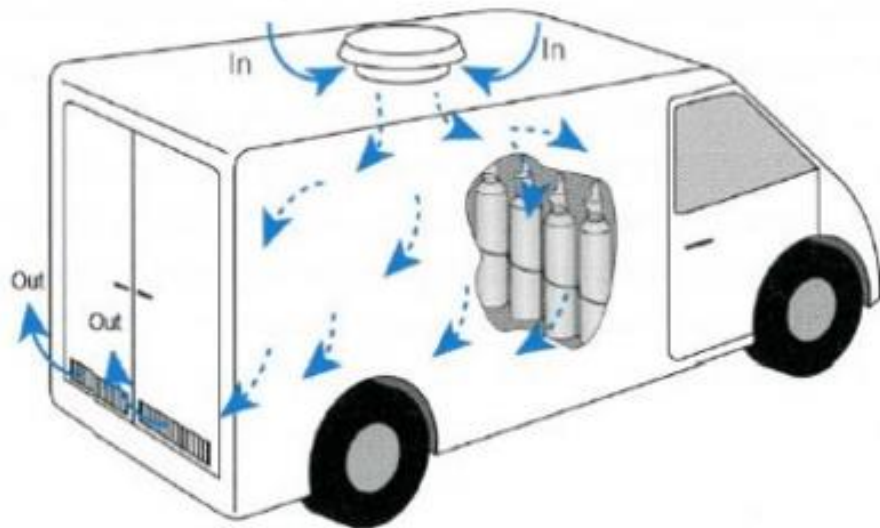
TEL. NO. : Dealer Phone #

[WarningLabelRecording.webm\(sharepoint.com\)](http://WarningLabelRecording.webm(sharepoint.com))



Cylinders

- Refrigerant cylinders will have warnings and red indicators, so we are aware of the flammable contents within the cylinder.
- A2L refrigerant cylinders will have left hand threads. - [RedCap Recording.webm \(sharepoint.com\)](https://www.sharepoint.com/RedCapRecording.webm)
- DOT 39 requires a pressure relief valve for cylinders with more than 2.2 pounds of flammable contents.
 - Storage temp < 125 degrees
 - Pressure relief valve (blows partial charge)
 - Keep valve upright (vapor side of tank)
 - Puncture tank when empty and recycle



A2L Refrigerants

- There is a max of six 25-pound cylinders per truck.
- Truck ventilation is recommended, but not required.
- Ventilation will keep the truck cooler and allow ventilation if refrigerant is released due to extreme pressures within the cylinder.

[cylinders.recording.webm \(sharepoint.com\)](http://cylinders.recording.webm.sharepoint.com)

Line Sets- [Line Set Recording.webm \(sharepoint.com\)](http://LineSetRecording.webm(sharepoint.com))

- The new equipment has **smaller line set** connection sizes.

| | Service Valve Sizes | | Rated Line Sizes | | Alternate Line Sizes | |
|---------------|---------------------|--------|------------------|--------|----------------------|--------|
| | Vapor | Liquid | Vapor | Liquid | Vapor | Liquid |
| 2-Ton 15 SEER | 1/2" | 5/16" | 1/2" | 5/16" | 5/8" | 3/8" |
| 3-Ton 15 SEER | 5/8" | 5/16" | 5/8" | 5/16" | 3/4" | 3/8" |
| 4-ton 15 SEER | 3/4" | 5/16" | 3/4" | 5/16" | 7/8" | 3/8" |
| 5-ton 15 SEER | 3/4" | 5/16" | 3/4" | 5/16" | 7/8" | 3/8" |

Max length must not exceed 100 feet. Max lift must not exceed 50 feet

Refrigerant line sets must be installed in a way to minimize leaks.

- The exterior of the pipe must be protected from corrosion, degradation & abrasions.
- Lines must be secured so that contact with building materials must not rub, scrape or damage the tubing.
- Reference ASHRAE 15.2 Standards & building codes for details.
- Refrigerant lines must be accessible for inspection.



Application & Commissioning-

[Application Recording.webm \(sharepoint.com\)](https://www.sharepoint.com)

- Recovery machines & vacuum pumps must be rated for A2L refrigerants (no spark).
- Refrigerant gauge software must be updated for R-32 & R-454B.
- Leak detectors must be rated for R-32 & R-454B.





Special Discount Pricing Today- for A2L attendees

- 15% off A2L approved tools
- 15% off all tools from Field Piece and Yellow Jacket
- 10% off everything else in the store (exl. Refrigerant and equipment)

Great news for tech's

- EPA 608 type II certification covers residential systems regardless of refrigeration type

| Nitrogen Purge Times | | | | |
|----------------------|----------------|------------|------------|------------|
| Flow Rate | Lineset Length | | | |
| CuFt/Hr | < 50 feet | < 100 feet | < 150 feet | < 200 feet |
| 15 | 2 Minutes | 4 Minutes | 6 Minutes | 8 Minutes |
| 30 | 1 Minute | 2 Minutes | 3 Minutes | 4 Minutes |
| 60 | 1 Minute | 1 Minute | 2 Minutes | 2 Minutes |



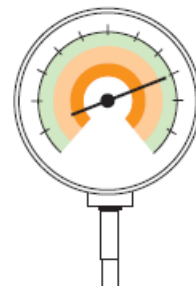
A2L Refrigerants Commissioning

[Commissioning.webm \(sharepoint.com\)](https://www.sharepoint.com)

- Refrigerant lines that contain A2L refrigerant must have a nitrogen sweep prior to making repairs.
- ASHRAE requirement for prepurge:
 - At least five volume changes at a rate of no less than 100 Ft/min.
 - Then 1 to 3 PSI while brazing.

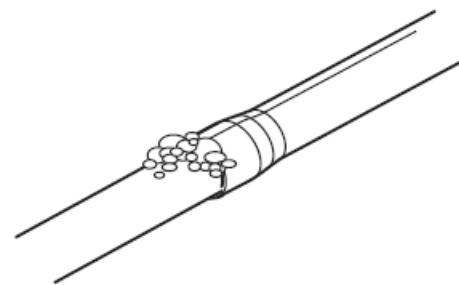
STEP 1 - Pressurize the refrigerant lines and evaporator coil to 600 PSIG using dry nitrogen.

600 PSIG



STEP 2 - Check for leaks by using a soapy solution or bubbles at each brazed location.

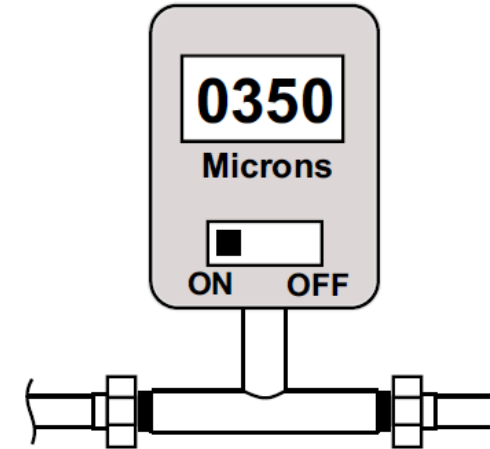
Note: Remove nitrogen pressure and repair any leaks before continuing.



Refrigerant Line and Indoor Coil Evacuation

Important: Do not open the service valves until the refrigerant lines and indoor coil leak check and evacuation are complete.

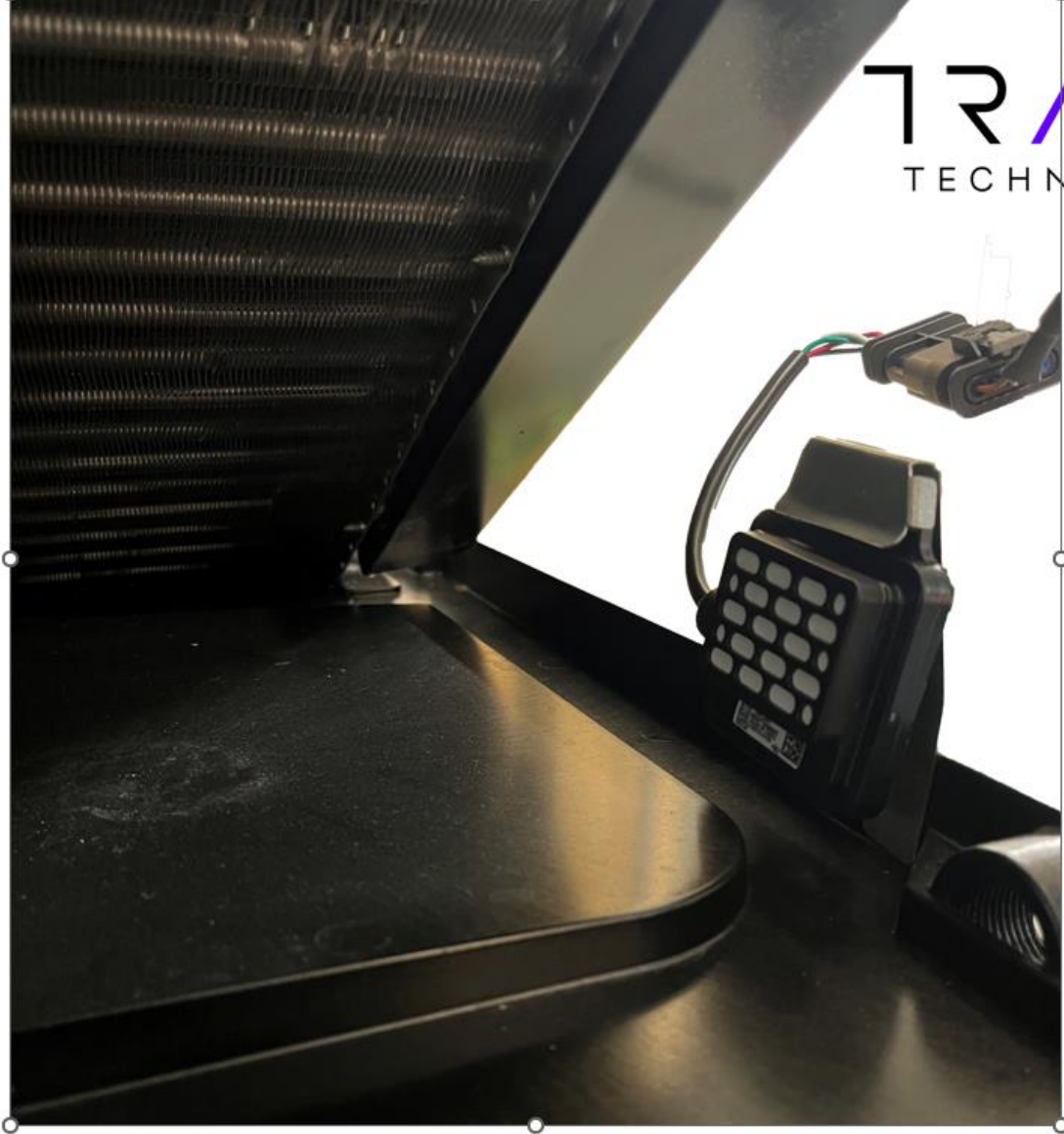
1. Evacuate until the micron gauge reads no higher than 350 microns, then close off the valve to the vacuum pump.



2. Observe the micron gauge. Evacuation is complete if the micron gauge does not rise above 1500 microns in ten (10) minute.
3. When evacuation is complete, blank off the vacuum pump and micron gauge, and close the valves on the manifold gauge set.



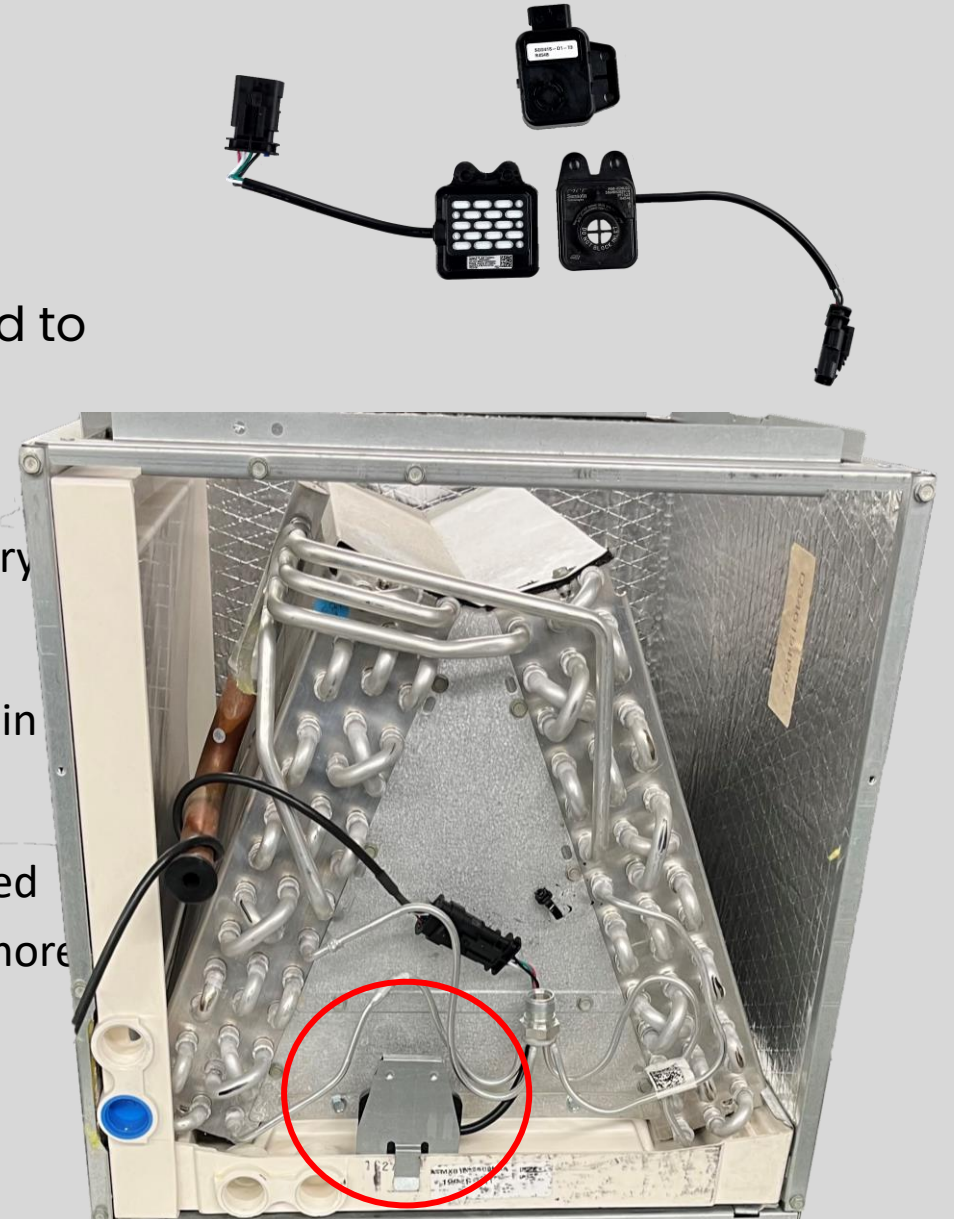
A2L Refrigerants Mitigation



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Leak Detection System

- The Refrigerant Detection System (RDS) is designed to provide additional protection for the consumer, ensuring **safety** and **comfort** in their home.
- An RDS Sensor & Mitigation Control Board (MCB) will be factory installed and connected to simplify on site installation.
- Sensor is installed in the most common orientation on the drain pan – the most likely place for refrigerant leak to be detected.
- To simplify serviceability, the same RDS is installed on all ducted split air handlers, cased coils, and packaged units containing more than 4 lbs. of refrigerant.





Turn on the blower to circulate air at cooling fan speed:
Minimize risk of reaching the lower flammability limit



Shut down compressor operation



Turn off accessories such as electronic air cleaners



Close alarm contacts



Once mitigation clears, the system will return to normal
operation (this is not a hard lock).



UL approved indoor heat is allowed during mitigation.



Detection must trigger before refrigerant reaches 25% of
LFL (lower flammability limit).

The goal of mitigation is simple. If refrigerant is detected it will:

Competitive landscape

Our competitors

| Refrigerant type | Confirmed |
|------------------|-----------|
| R454B | Yes |
| R32 | Yes |
| R454B | |
| R454B | Yes |
| R454B | Yes |
| R454B | Yes |
| R454B | |
| R454B | Yes |

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Ducted Splits

**METUS
Ductless**

**Residential
Packaged**

Value Ductless

PTAC

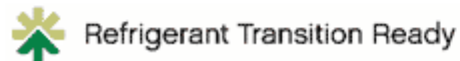
| Refrigerant type |
|------------------|
| R454B |
| R454B |
| R454B/R32 |
| R32 |
| R32 |

| Portfolio | Product | 2024 | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | 2025 |
|------------------|------------------------------|------|-----|-----|---------------------|-----|-----|----------------------|-----|-----|-----|-----|-----|-----|--|
| Outdoor | 1-Stg | | | | 15S HP [†] | | | 410 & 454 Dual Prod. | | | | | | | 13, 14, 15 SEER2 AC/HP [†] |
| | 24V Inv. | | | | | | | | | | | | | | Side Discharge 16 [†] 17 SEER2 |
| | VSPD | | | | | | | | | | | | | | 18 SEER2 20 SEER2 Side Discharge 17-19 |
| Air Handler | TEM | | | | STEM6* [†] | | | 410 & 454 Dual Prod. | | | | | | | STEM4 / 6 / C |
| | TAM/GAM | | | | | | | | | | | | | | 5TAM X & 5 |
| | TMM | | | | | | | | | | | | | | TMM |
| Coil | TXC/PXC/MXC /AXA/PXF | | | | TXC* | | | 410 & 454 Dual Prod. | | | | | | | TXC/PXC/MXC/AXA/PXF |
| Packaged Systems | 1- & 2-Stage 1- & 3-Phase | | | | | | | | | | | | | | Premium (1- & 3-Ph) New Value (1-Ph) |

*Select sizes released at early launch, full family to launch Q3

[†]Trane and RunTru Launches are together

| Portfolio | Product | 2024 | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | 2025 |
|-----------|----------------------|------|-----|-----|-----|-----|-----|-----|---------------|-----------------|-----|-----|-----|-----|------------------|
| Ductless | METUS | | | | | | | | | | | | | | Mitsubishi Trane |
| | RunTru | | | | | | | | | RunTru Ductless | | | | | |
| LCU | Odyssey | | | | | | | | R454B Odyssey | | | | | | |
| | Precedent Foundation | | | | | | | | | | | | | | R-454B |



*Select sizes released at early launch, full family to launch Q3

Transition Ready

- We have supported the transition away from R-410A and have invested more than \$500M to identify and evaluate lower Global Warming Potential (GWP) alternatives.
- The majority of our equipment will utilize **R-454B** refrigerant.
- Some select designs within our offering will utilize **R-32**.
- **R-454B** and **R-32** refrigerants have been chosen based on factors including safety, efficiency, environmental, reliability, and economic impact.

Nomenclature Changes

- Many of our products today contain a "4" in the first few digits to designate the type of refrigeration used (previously R-410A).
- As we go forward with the new refrigeration design changes, all Low-GWP models will use a "5" in the nomenclature refrigerant type to designate the R-454-B, or with a "3" for products that utilize the R-32.

4TTR4 → 5TTR4

4A7A4 → 5A7A4

A4AC4 → A5AC4

4PXC → 5PXC

TEM → 5TEM

15 SEER2 HP Launch

Bulletin coming in February!

Notable talking points:

- First Ship from Tyler: March 29th
- Higher efficiencies to meet CEE Tier 1 North and South criteria. ← Better Tax Credit qualification!!
 - 15.2 SEER2 / 11.7 EER2 / 8.1 HSPF2
 - 1.75 COP @5F and 58% heating capacity ratio (17F/47F)
- Opportunity for RNC: Avoid ambiguity of indoor/outdoor availability over time!
- New product names to replace legacy “XR” and “XL” nomenclature.
- Factory will dual produce the current/existing R-410A models as well as the new R-454B models until later in the year. Further communications will come later in the year to provide specific phase-out for those models.

| Current Product Name | Current R410 Model Number | New Product Name | New R454b Superseding Model Number | Crated Dimensions (in) | | | Shipping Weight (lbs) | Service Valve Line Set Connection Sizes* | |
|----------------------|---------------------------|--|------------------------------------|------------------------|------|------|-----------------------|--|------|
| | | | | H | W | D | | Liquid | Gas |
| XR15 | 4TWR5018N1000A | 15 Single-Stage Heat Pump | 5TWR5018A1000A | 38 | 30.1 | 33 | 208 | 5/16" | 3/4" |
| | 4TWR5024N1000A | | 5TWR5024A1000A | 38 | 30.1 | 33 | 208 | 5/16" | 3/4" |
| | 4TWR5030N1000A | | 5TWR5030A1000A | 38 | 30.1 | 33 | 208 | 5/16" | 3/4" |
| | 4TWR5036N1000A | | 5TWR5036A1000A | 42 | 35.1 | 38.7 | 256 | 5/16" | 3/4" |
| | 4TWR5042N1000A | | 5TWR5042A1000A | 51 | 35.1 | 38.7 | 301 | 5/16" | 7/8" |
| | 4TWR5048N1000A | | 5TWR5048A1000A | 51 | 35.1 | 38.7 | 301 | 5/16" | 7/8" |
| | 4TWR5060N1000A | | 5TWR5060A1000A | 51 | 35.1 | 38.7 | 301 | 5/16" | 7/8" |
| XL15 | 4TWX5018N1000A | 15 Single-Stage Heat Pump with WeatherGuard™ Top | 5TWX5018A1000A | 41.9 | 30.1 | 33 | 218 | 5/16" | 3/4" |
| | 4TWX5024N1000A | | 5TWX5024A1000A | 41.9 | 30.1 | 33 | 218 | 5/16" | 3/4" |
| | 4TWX5030N1000A | | 5TWX5030A1000A | 41.9 | 30.1 | 33 | 218 | 5/16" | 3/4" |
| | 4TWX5036N1000A | | 5TWX5036A1000A | 46.6 | 35.1 | 38.7 | 266 | 5/16" | 3/4" |
| | 4TWX5042N1000A | | 5TWX5042A1000A | 55.6 | 35.1 | 38.7 | 311 | 5/16" | 7/8" |
| | 4TWX5048N1000A | | 5TWX5048A1000A | 55.6 | 35.1 | 38.7 | 311 | 5/16" | 7/8" |
| | 4TWX5060N1000A | | 5TWX5060A1000A | 55.6 | 35.1 | 38.7 | 311 | 5/16" | 7/8" |

*See Installers guide for alternative line set size usage and information

| Product Name | Current R410 Model Number | New R454b Superseding Model Number | Crated Dimensions (in) | | | Shipping Weight (lbs) | Service Valve Line Set Connection Sizes* | |
|--------------|---------------------------|------------------------------------|------------------------|------|------|-----------------------|--|------|
| | | | H | W | D | | Liquid | Gas |
| Silver 15 | 4A6H5018N1000A | 5A6H5018A1000A | 38 | 30.1 | 33 | 208 | 5/16" | 3/4" |
| | 4A6H5024N1000A | 5A6H5024A1000A | 38 | 30.1 | 33 | 208 | 5/16" | 3/4" |
| | 4A6H5030N1000A | 5A6H5030A1000A | 38 | 30.1 | 33 | 208 | 5/16" | 3/4" |
| | 4A6H5036N1000A | 5A6H5036A1000A | 42 | 35.1 | 38.7 | 256 | 5/16" | 3/4" |
| | 4A6H5042N1000A | 5A6H5042A1000A | 51 | 35.1 | 38.7 | 301 | 5/16" | 7/8" |
| | 4A6H5048N1000A | 5A6H5048A1000A | 51 | 35.1 | 38.7 | 301 | 5/16" | 7/8" |
| | 4A6H5060N1000A | 5A6H5060A1000A | 51 | 35.1 | 38.7 | 301 | 5/16" | 7/8" |

*See Installers guide for alternative line set size usage and information

What can dealers do today to prepare?

Working with A2L refrigerant calls for new tooling

1. Recommend dealers inspect their equipment and verify A2L compatibility including *A2L compatible gauges, recovery machines, vacuum pumps and leak detectors* - *Don't forget a reverse thread adapter!*
2. Visit FieldTechHelp.com periodically and check for updated training videos and other materials.
3. Visit the Playbook → our 1-stop shop for all refrigerant transition related information on ComfortSite & ASDealerNet; check often for updated content!
4. ***Install a new 454b 15 SEER2 HP launching in April!!***



Fieldpiece

WHERE
CAN I
REVIEW
OR LEARN
MORE?



SCAN ME



QUESTIONS?
CALL OUR TECHNICAL SUPPORT TEAM:
844-358-7263 OPT 2 EXT 3

Thank You!



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NEXTUP: SWITCH
ROOMS
FOR
VENDOR PORTION>

WITH
FIELDPIECE

AND

YELLOW JACKET