

Participant Guide



Precedent™ Symbio 700

Trane University™



TRANE
TECHNOLOGIES™

Precedent Symbio 700

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Revision Date 8/28/2024

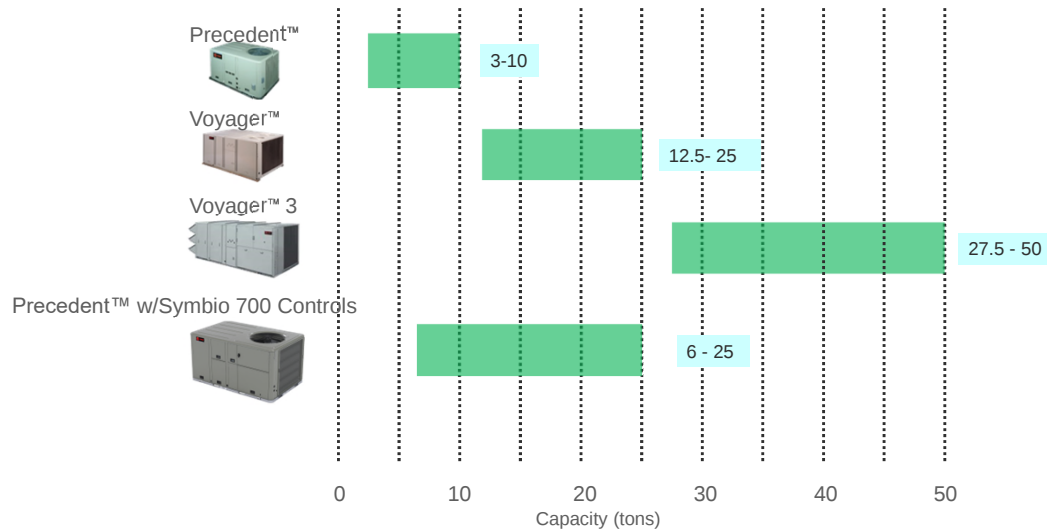


Precedent™ 6-25 tons w/Symbio 700 Controls



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Rooftop Product Family



Model Number



- Defines how unit is built
 - Tonnage 6-25 ton
 - Heat type
 - Voltage
 - Efficiency
 - Control type
 - Options



Model Number



Model Number Description

Digit 1 — Unit Function

Y = DX Cooling, Gas Heat

Digit 2 — Cooling Efficiency

S = Standard Efficiency

Digit 3 — Refrigerant

J = R-410A

Digit 4,5,6 — Nominal Gross Cooling Capacity (MBh)

072 = 6 Ton
090 = 7.5 Ton
102 = 8.5 Ton
120 = 10 Ton
150 = 12.5 Ton
180 = 15 Ton
210 = 17.5 Ton
240 = 20 Ton
300 = 25 Ton

Digit 7 — Major Design Sequence

Digit 11 — Heating Capacity¹

L = Low Gas Heat
M = Medium Gas Heat
H = High Gas Heat

Digit 12, 13 — Service Sequence

** = Factory Assigned

Digit 14 — Fresh Air Selection

0 = No Fresh Air
A = Manual Outside Air Damper 0–50%
B = Motorized Outside Air Damper 0–50%
C = Economizer, Dry Bulb 0–100% without Barometric Relief²
D = Economizer, Dry Bulb 0–100% with Barometric Relief²
E = Economizer, Reference Enthalpy 0–100% without Barometric Relief²
F = Economizer, Reference Enthalpy 0–100% with Barometric Relief²
G = Economizer, Comparative Enthalpy 0–100% without Barometric Relief²
H = Economizer, Comparative Enthalpy

Digit 15 — Supply Fan/Drive Type/Motor

0 = Standard Motor
1 = Optional Oversized/High Static Motor
2 = Single Zone Variable Air Volume with Standard Motor
3 = Single Zone Variable Air Volume with Oversized/High Static Motor
4 = Multiple Zone Variable Air Volume with Standard Motor
5 = Multiple Zone Variable Air Volume with Oversized/High Static Motor

Digit 16 — Hinged Service Access/Filters

0 = Standard Panels/Standard Filters
A = Hinged Access Panels/Standard Filters
B = Standard Panels/2" MERV 8 Filters
C = Hinged Access Panels/2" MERV 8 Filters
D = Standard Panels/2" MERV 13 Filters
E = Hinged Access Panels/2" MERV 13 Filters

Digit 17 — Condenser Coil Protection

0 = Standard Coil
1 = Condenser with CompleteCoat™

Application Guide



Application Guide
Symbio™ 700 Controller
 with Precedent™ Packaged Rooftop
 Air-Conditioners



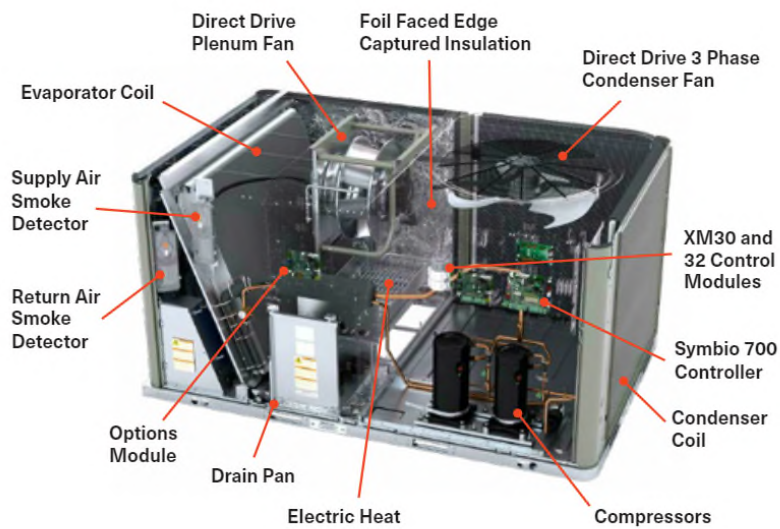
⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, debugging, and servicing of heating, ventilating, and air conditioning equipment can be hazardous and require specific knowledge and training. Improper handling, adjustment, or removal of components can result in personal injury or death or damage to the equipment. Follow all instructions in the literature and on the tags, stickers, and labels that are attached to the equipment.

December 2022

ACC-APG002B-EN

Control & Component Locations



Mobile App



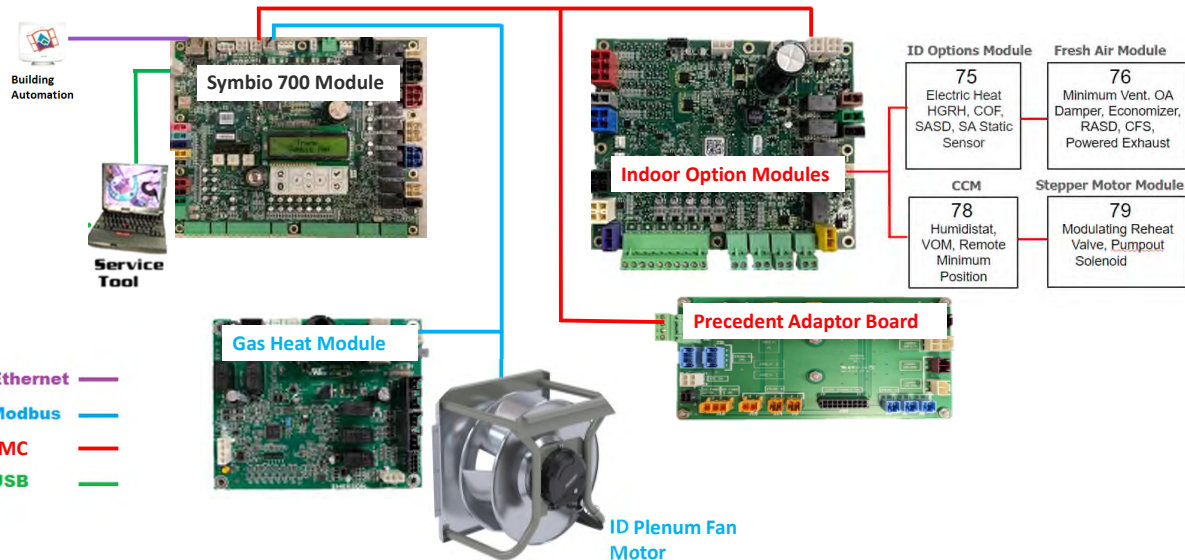
- Bluetooth Connectivity
- Faster commissioning and troubleshooting
- View Alarms
- View/Edit Unit Configuration
- Firmware Upgrade



Controls Platform



Controls Architecture



Symbio 700 UC



Version Considerations



- 2 versions of Symbio 700
 - Due to dual distribution channels from Trane
- 1 version can communicate to BAS
 - Most common version
- The other version is unable to communicate to BAS

Advanced License

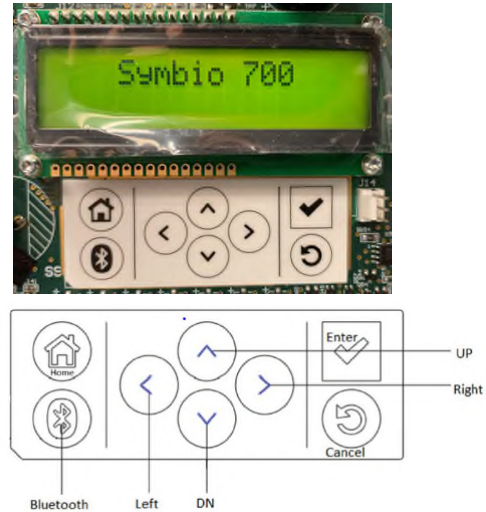


- Allows field upgrade from Basic to Advanced
- License available for purchase thru Trane Supply
- Part number: FRW00001
- Support Center Rescouces
 - [Symbio™ 700 - Unit Controller License Upgrade](#)

User Interface Overview



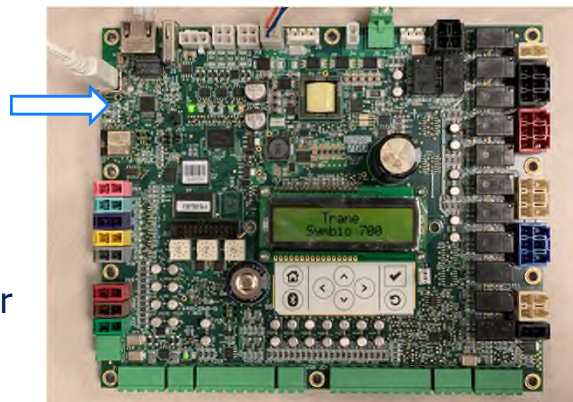
- Status reporting for most data points in controller
- Setpoint/Setting changes
- View/Edit/Create-New Equipment Configuration
- Initiate Test Modes
- View Active Alarms & Reset Diagnostics
- Bluetooth Pairing
- LON Service Pin Initiation



Control Module



- Bluetooth
 - Blinking
 - Ready to connect
 - Solid ON
 - Device is connected
- Off
 - Radio Silent; cannot pair or connect



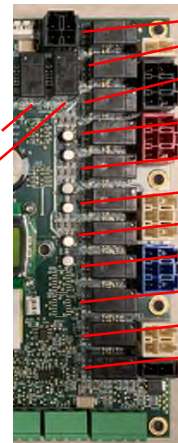
Control Module



- Binary Output Status
 - Each BO has an LED to indicate controller output command status

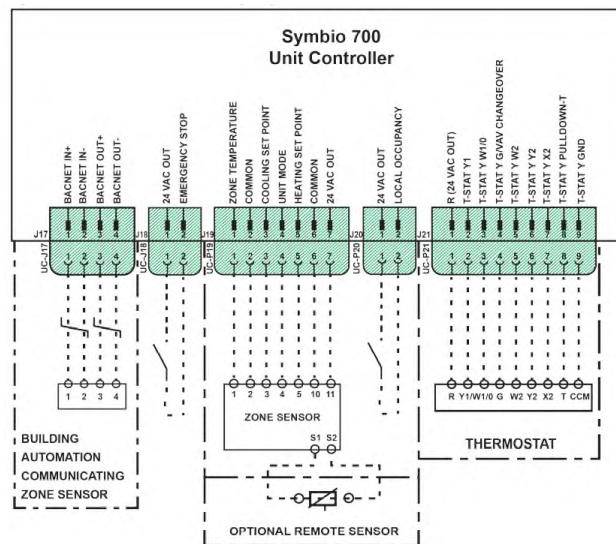


LED 21 – Indoor Fan
LED 22 –
ID Fan High Speed/VAV



LED 1 – Condenser Fan 1
LED 2 – Condenser Fan 2
LED 4 – Condenser Fan 3
LED 5 – Compressor 1
LED 6 – Compressor 1 Unloader
LED 15 – Compressor 2
LED 16 – Compressor 2 Unloader
LED 17 – Compressor 3
LED 18 – Compressor 3 Unloader
LED 19 – SOV 1
LED 20 – SOV 2

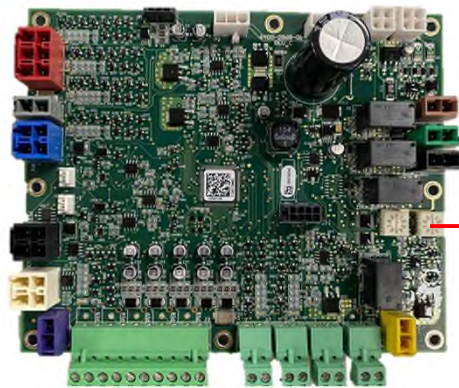
Field Wiring Connections



Symbio Options Module Addresses



- Board is addressed as 1 of 4 possible control option modules



ID Options Module

75

Electric Heat,
Modulating
HGRH, COF,
SASD, SA Static
Sensor

Fresh Air Module

76

Minimum Vent. OA
Damper, Economizer,
RASD, CFS,
Powered Exhaust

CCM

78

Humidistat,
VOM, Remote
Minimum
Position

Stepper Motor Module

79

Modulating Reheat
Valve, Pumpout
Solenoid

Emerson White Rodgers Gas Heat Module



- Direct Spark Ignition Controller w/Modbus with Diagnostic flash codes
- Diagnostics communicated to the Symbio 700



Emerson White Rodgers Gas Heat Module



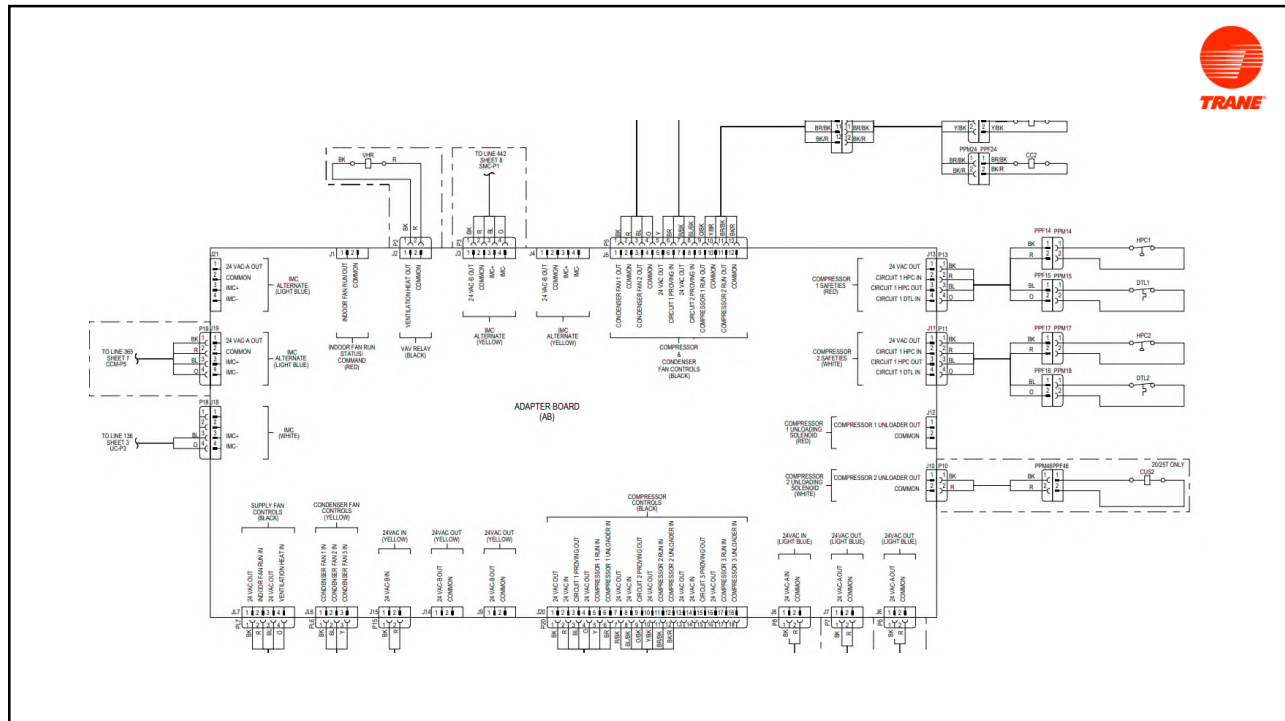
Number of Flashes	Error
1 Flash	Communication
2 Flashes	System lockout; failure to establish flame
3 Flashes	Pressure Switch
4 Flashes	Hi Limit Protection device open
5 Flashes	Flame sensed with no call for heat
6 Flashes	Flame roll out switch open
7 Flashes	Weak Flame
8 Flashes	Internal Error
9 Flashes	Hardware Mismatch

Precedent Adaptor Board

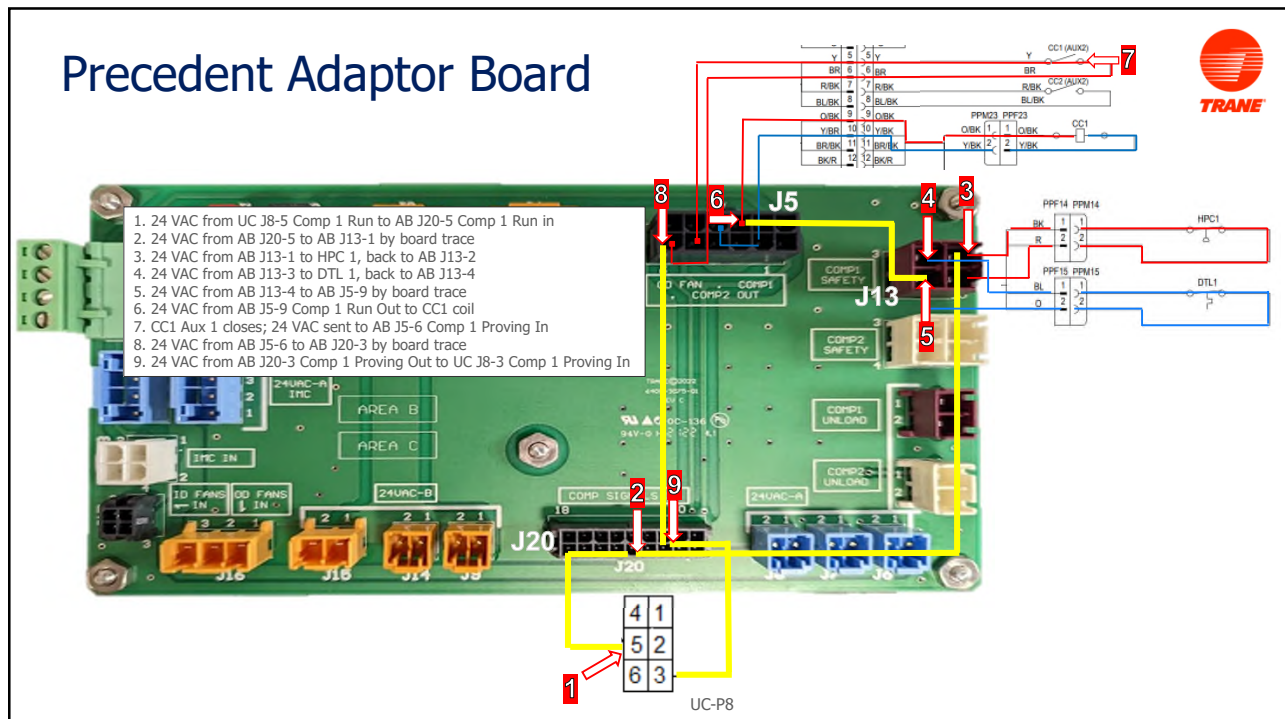


- Electrical Integration board with a series of connectors and traces
- Eliminates complex harness designs
 - Equipment protection features
 - Enables proper power distribution between components





Precedent Adaptor Board



Equipment Configuration



- Active Configuration
 - Viewed from the mobile service tool or onboard user interface
- Factory Configuration is included in Backup file
- All features and functions of the equipment are driven from the equipment configuration selections
 - Factory setup
 - Field verified
 - Must be set for the equipment to operate correctly

Modbus Communication

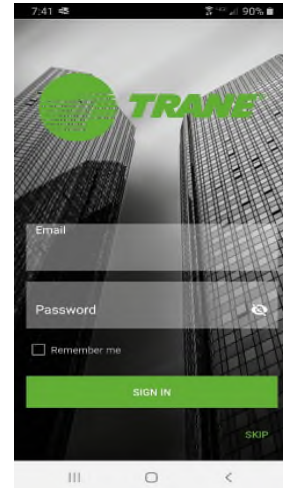


- Indoor Plenum Fan Motor
- Gas Heat Module
- No hardwire binary or analog wiring

Symbio Service and Installation App



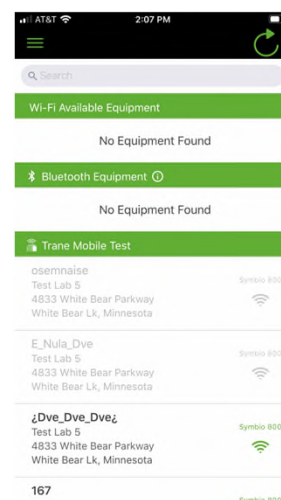
- Login screen
 - Login with Trane Connect account credentials
- Skip
 - Go directly to the unit list without logging in



Symbio Service and Installation



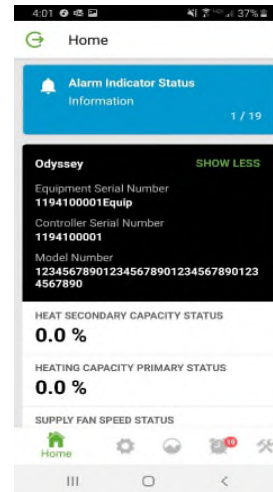
- Connecting to the controller
- Bluetooth connections for local access
- Does not auto refresh
 - Swipe down or press refresh to update



Home Screen



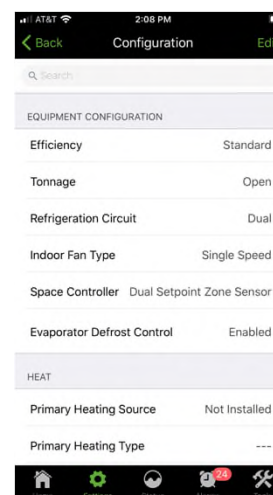
- Active Alarms
 - Sorted by time
- Unit and controller information
 - Model & Serial Number
 - Blank on replacement boards
- Refreshes every 30 seconds
 - To manually refresh pull down or press refresh



Configuration



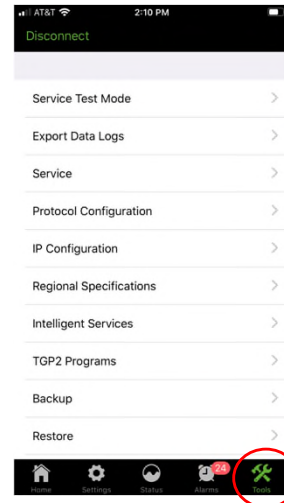
- Edit button in upper right
- Gray headings make it easier to find information
- Complete view of equipment configuration
- Search bar at top



Tools



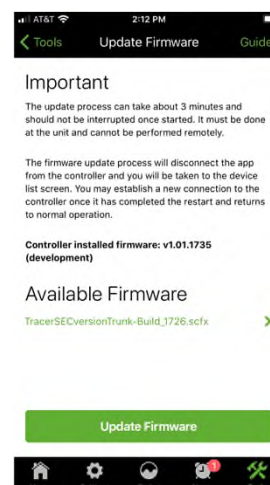
- Designed for
 - Easy setup
 - Easy troubleshooting



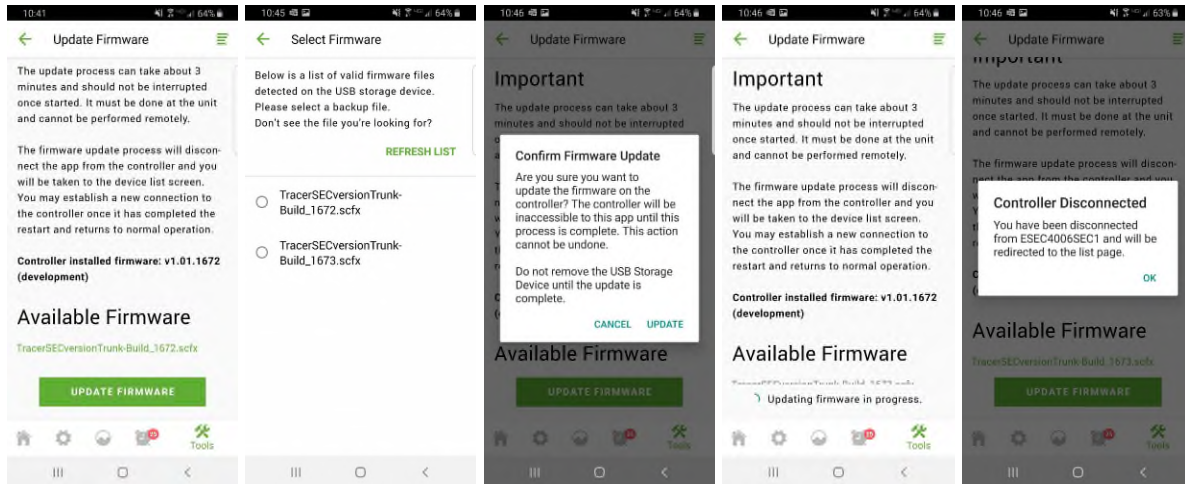
Tools - Firmware Update



- Firmware updates can be performed through the App
 - When there is a USB device connected with firmware images on it
 - The app will disconnect during the update process
 - Reconnect once the process is complete



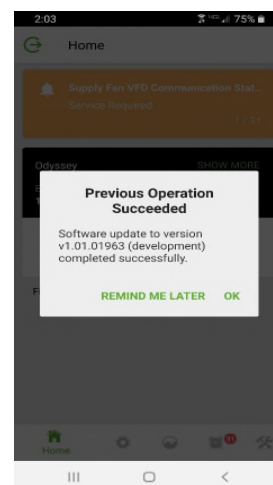
Tools - Firmware Update



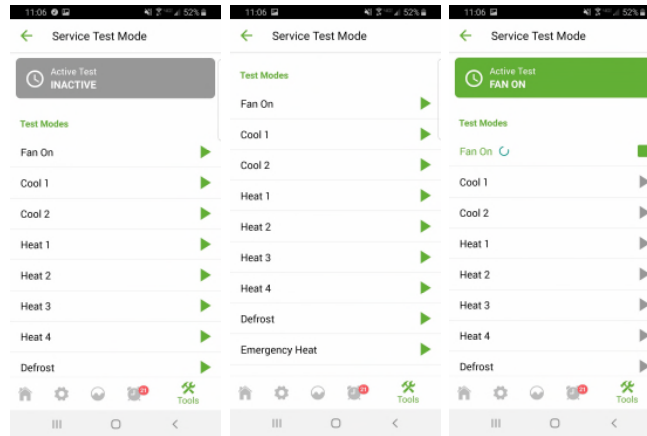
Mobile App – Tools – Firmware Update



- Firmware update successful



Tools - Service Test Mode

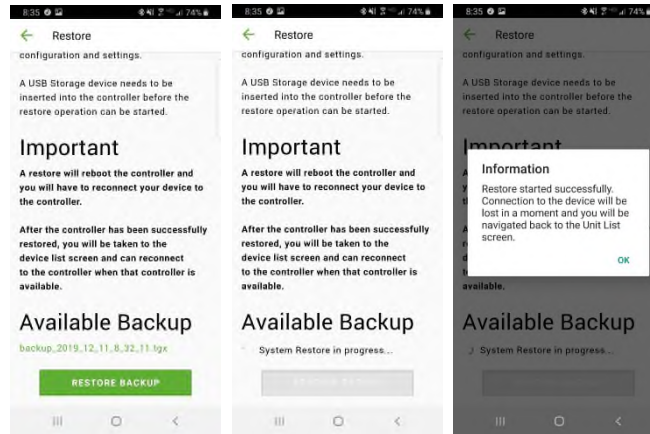


Service Test Mode



State #	State Request	Supply Fan On/Off Request	Compressor Cool Stage Request	Compressor Heat Stage Request	Auxiliary Heat Stage Request	Condenser Fan Stage Request	Heat Cool Mode Status
1	Inactive	IN CONTROL	IN CONTROL	IN CONTROL	IN CONTROL	IN CONTROL	IN CONTROL
2	Fan On	ON	0	0	0	IN CONTROL	TEST
3	Cool 1	ON	1	0	0	IN CONTROL	TEST
4	Cool 2	ON	2	0	0	IN CONTROL	TEST
5	Heat 1	ON	0	1	0	IN CONTROL	TEST
6	Heat 2	ON	0	2	0	IN CONTROL	TEST
7	Heat 3	ON	0	2	1	IN CONTROL	TEST
8	Heat 4	ON	0	2	2	IN CONTROL	TEST
9	Defrost	ON	0	2	1	IN CONTROL	TEST
10	Emergency Heat	ON	0	0	2	IN CONTROL	TEST

Tools - Restore Backup

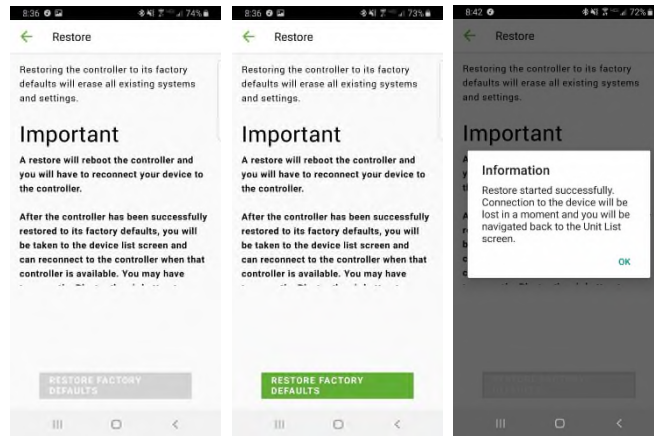


Tools - Restore Factory Default

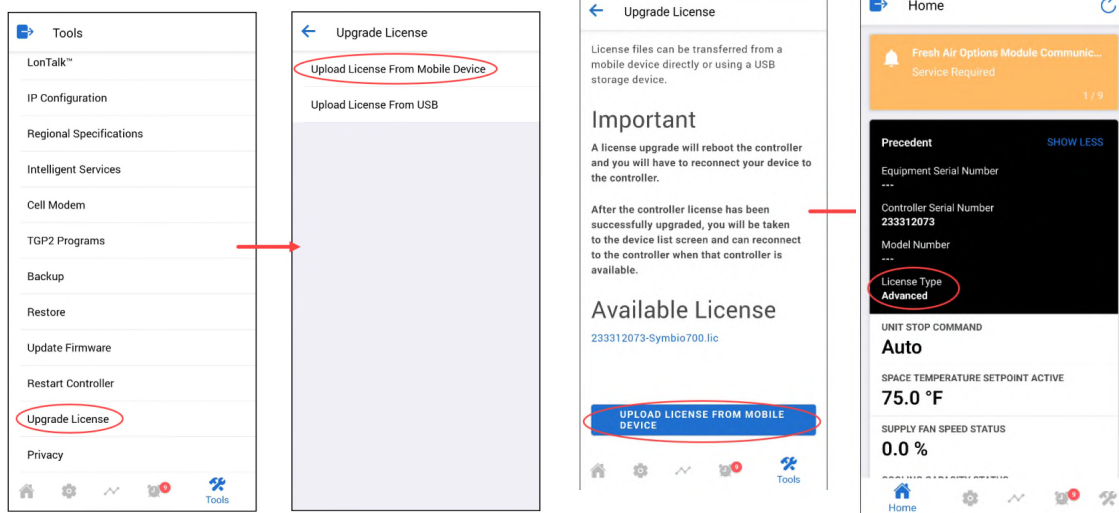


- Restore to factory defaults restores a baseline backup that is saved on the controller
- Baseline backups are created during the manufacturing process, replacement controllers will not have a baseline backup
- When there isn't a baseline backup the button will be greyed out
- When the baseline backup restore is complete the user is disconnected from the controller and taken to the unit list

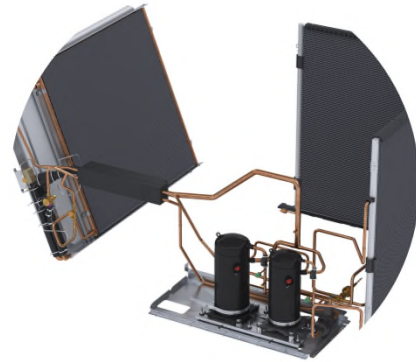
Tools - Restore Factory Default



Advanced License

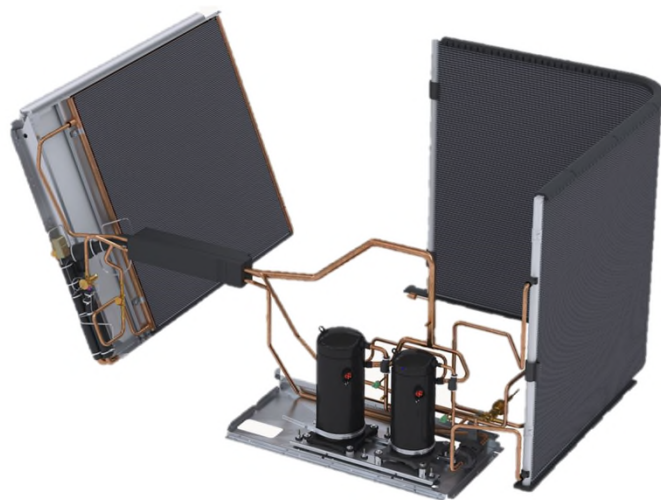


Refrigeration



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Refrigeration Subsystem



Fixed Speed Trane Compressor



- Manifolded sets
 - 3-stage compressor capacity
 - 6 to 17.5 Ton
 - 4-stage compressor capacity
 - 20 to 25 Ton



Fixed Speed Trane Compressor



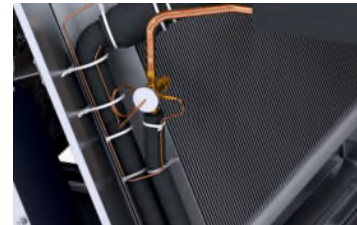
Staging			
Ton	Cool Stage Request	Compressor 1A	Compressor 1B
6 to 17.5 Ton	0	Off	Off
	1	Off	On
	2	On	Off
	3	On	On
20 to 25 Ton	0	Off	Off
	1	Off	On/Unloaded
	2	Off	On/Loaded
	3	On	Off
	4	On	On

% of Turndown				
Ton	Stage 1	Stage 2	Stage 3	Stage 4
6	32	68	100	-
7.5	33	67	100	-
8.5	32	68	100	-
10	28	72	100	-
12.5	32	68	100	-
15	33	67	100	-
17.5	33	67	100	-
20	24	36	64	100
25	24	37	63	100

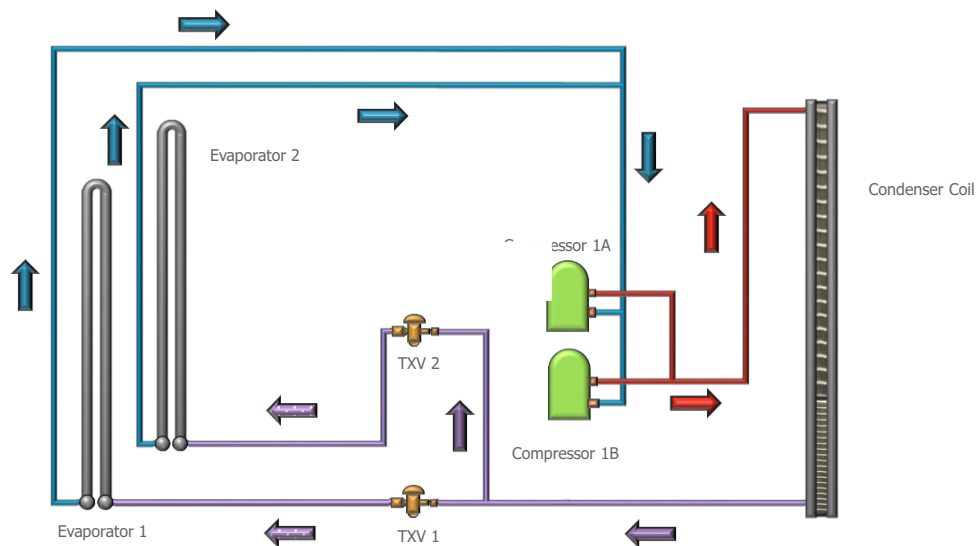
Fans and Coils



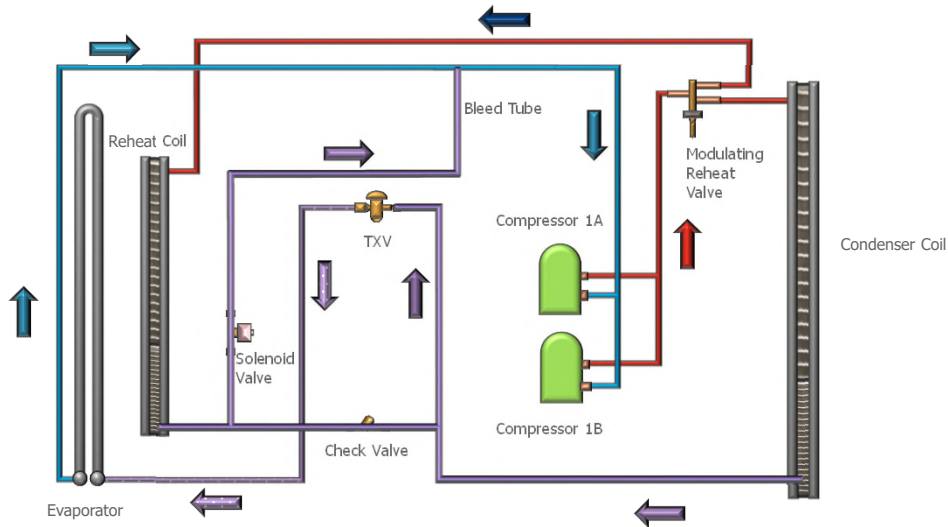
- 6-12.5 tons
 - 1 condenser fan
 - 1 Microchannel Evap Coil
 - 1 TXV
- 15-25 tons
 - 2 Condenser fans
 - 2 Microchannel Evap Coils
 - 2 TXV's



15-25 Ton SE



6-12.5 Ton SE w/HGRH



Modulating Hot Gas Reheat Control



- Supply Fan
 - VVDA/MZVAV- duct static pressure control
 - VVZT/SZVAV and Multi Speed fan
 - Minimum speed defined for compressor stage
- Compressors
 - Staged to achieve calculated target evaporator coil dew point temperature, based on space conditions

Modulating Hot Gas Reheat Control



- Modulating Reheat Valve
 - Valve opens when space is $< \text{CSP} - 1.5^{\circ} \text{F}$
 - Modulates to achieve Reheat DA Setpoint
- Unoccupied Dehumidification
 - Reheat valve modulates to hold space temperature at a fixed 73°F

Dehumidification Space Temp Control



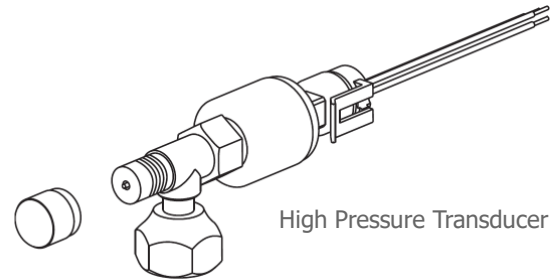
- Dehumidification termination
- Occupied
 - If the space temperature $< 3^{\circ}\text{F}$ of CSP or $< \text{HSP}$ and the reheat valve at max position for 5 minutes; exit dehumidification
- Unoccupied
 - If space temperature $< 60^{\circ}\text{F}$ and the reheat valve is at 100% for 5 minutes, exit dehumidification

Low Ambient Kit

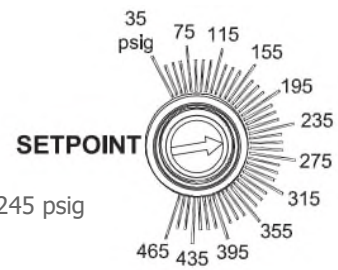


Lit #: ACC-SVN237A-EN

Recommended Setpoint: 245 psig



High Pressure Transducer



A2L Updates



What is A2L Refrigerant?



- Mildly Flammable Classification
- Lower Global Warming Potential (GWP)
- A2L
 - A = LOWEST TOXICITY
 - 2L = MILDLY FLAMMABLE
- R-454
 - Trane's choice for A2L
 - R-454B = 68.9% R-32 and 31.1% R-1234yf
 - Opteon 41, XL41 are other names and is manufactured by Chemours
 - Comes in 25 lb. and 100 lb. cylinders



A2L Refrigerant - Equipment Changes



- Refrigerant handling requirements
- Red coloring on all charging ports and equipment labels
- TXV and HPC change
 - HPC cutout is now 600 PSI
- Factory Installed Refrigerant leak sensor
 - Units with >3.91 lbs./circuit
- Symbio 700 Firmware Update
 - Supports new A2L additions

A2L Refrigerant Recovery Tools



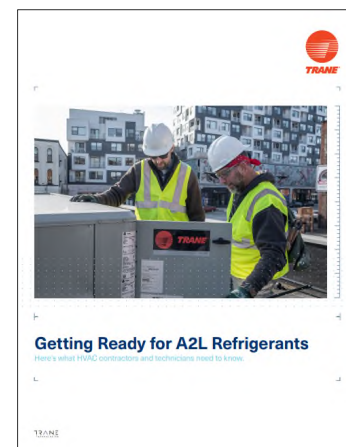
- Recovery Machine (P/N : FP-MR45)
- Vacuum pump (Trane P/N: FP-VPX7, VPX7)
- Leak Detector (Trane P/N: FP-DR82,TOL05620)
- Existing manifolds and scales are safe for use
 - Manifolds for R-410A are scaled for R-454B
- Recovery Machine (P/N : FP-MR45)
 - Fieldpiece MR45 with firmware modifications



EPA



- Current EPA Certifications comply
- Trane recommends HVAC Techs receive A2L Training
 - AHRI/ESCO Training Institute
 - Best practices
 - Safe handling
 - Trane A2L Update Bulletin



Training Resources:
REFR-SLB007-EN

P/T Differences



- R454 pressure is slightly lower than R410
- Pay attention to glide

50°F saturated temp:
135 PSIG (R454B)
145 PSIG (R410A)

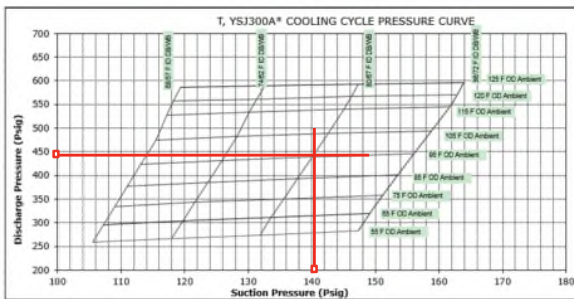
Pressure (psig)	R-454B		
	Average	Bubble	Dew
0	-58.1	-59.0	-57.3
20	-24.3	-25.2	-23.3
40	-3.6	-4.6	-2.6
60	11.9	10.9	13.0
70	18.5	17.4	19.6
80	24.5	23.4	25.6
90	30.0	29.0	31.1
95	32.7	31.6	33.8
100	35.2	34.1	36.3
105	37.7	36.6	38.8
110	40.0	38.9	41.1
115	42.3	41.2	43.4
120	44.6	43.5	45.7
125	46.7	45.6	47.9
130	48.9	47.7	50.0
135	50.9	49.8	52.1
140	52.9	51.8	54.1
145	54.9	53.8	56.0
150	56.8	55.7	58.0
155	58.7	57.6	59.8
160	60.5	59.4	61.7

GENETRON AZ-20 (R-410A)	
PRESSURE BASED PT CHART	
PSIG	°F
105	33.8
110	36.1
115	38.4
120	40.6
125	42.8
130	44.9
135	46.9
140	48.9
145	50.8
150	52.7
155	54.5
160	56.4

Refrigerant Pressure Curve Comparison

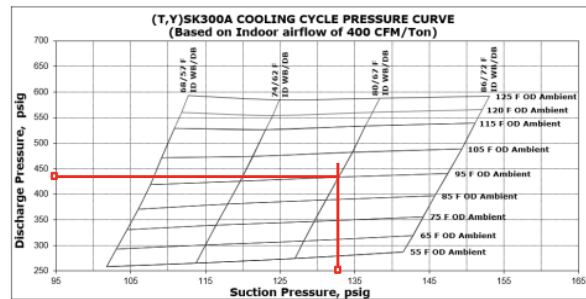


Refrigerant Charge (lbs)	Suction Superheat (°F)
17.7	12.9°±1.5°F



R410: 445/140 (HP/LP)

Refrigerant Charge (Lbs)	Suction Superheat (°F)
15.4	17.2°±1.5°F



R454: 435/133 (HP/LP)

Ex. Pressures @AHRI Conditions: 95°F ambient/80°F indoor

Equipment and Unit Changes



- Updated label indicating A2L Refrigerant



Green decal = R410A

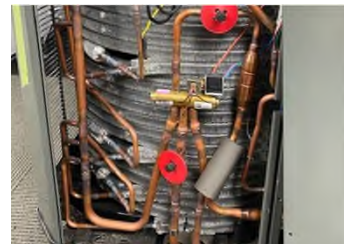
Red decal = R454B



Equipment and Unit Changes



- Red colored indicators located at refrigerant charging ports
- A2L refrigerant cylinders will have left-handed threads



Leak Detection Sensor



- Operational Voltage Range: 18-32VAC, 24VDC $\pm 10\%$
- Modbus Communications – default Modbus address is 50
- Dry Contact
 - not used for V3
- Alarm Threshold Trigger Value: 15% LFL
- Alarm Threshold Reset Value: 10% LFL



Leak Detection Sensor- Mitigation Sequence



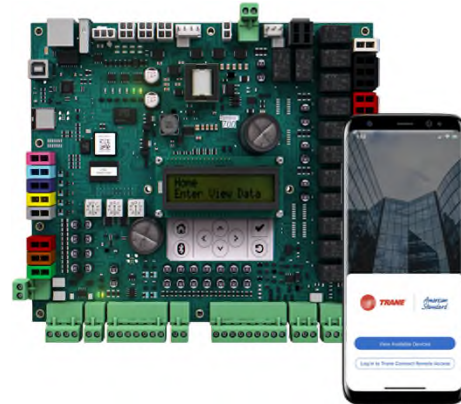
JH0

- Supply fans activated to deliver circulation airflow
- Zone dampers fully opened
 - VAV boxes
- Compressors turned off and disabled
- Additional mechanical ventilation activated
- Mitigation will continue until refrigerant has not been detected for at least five minutes.

Symbio 700 A2L Points



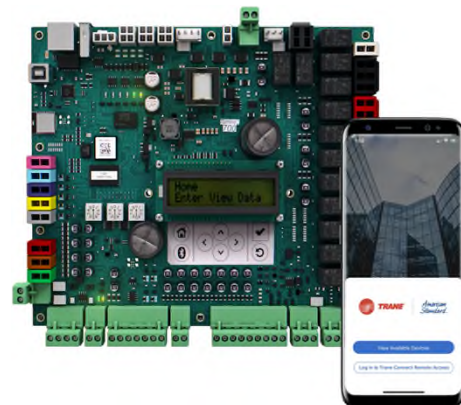
- Refrigerant Mitigation Active
- Refrigerant LFL concentration Alarm Threshold
- Refrigerant LFL Concentration



Symbio 700 A2L Alarms



- Refrigerant Leak Sensor Communication Status Sensor A
- Refrigerant Leak Sensor Failure Sensor A
- Refrigerant Concentration Sensor A



Airflow



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Supply Fans

- Direct drive plenum fans
 - Modbus controlled
 - No VFD
 - 2 Fan units run together at the same RPM



Supply Fan Max RPM Setpoint



Unit Size in Tons	Range in %	Default %
6	38-100	71
7.5	42-100	75
8.5	44-100	75
10	51-100	83
12.5	50-100	77
15	41-100	75
17.5	44-100	74
20	48-100	78
25	51- ⁶⁶ 100	79

3 HP Motor: Max RPM programmed to 1850

5 HP Motor: Max RPM programmed to 1940

Single Zone VAV Minimum Fan Speeds



Multi-speed Fan w/3 Stages of Cooling	Supply Fan Speed
Off	0
Fan Only	66 %
Cooling Stage 1	66 %
Cooling Stage 2	66 %
Cooling Stage 3	100 %
Electric/Gas Heat 1	66 %
Electric/Gas Heat 2	100 %

Single Zone VAV Minimum Fan Speeds



Multi-speed Fan w/4 Stages of Cooling	Supply Fan Speed
Off	0
Fan Only	66 %
Cooling Stage 1	66 %
Cooling Stage 2	66 %
Cooling Stage 3	66 %
Cooling Stage 4	100 %
Electric/Gas Heat 1	66 %
Electric/Gas Heat 2	100 %

Single Zone VAV Minimum Fan Speeds



Variable Speed Fan w/3 Stages of Cooling	Supply Fan Speed
Off	0
Fan Only	50 %
Cooling Stage 1	50 %
Cooling Stage 2	50 %
Cooling Stage 3	100 %
Electric/Gas Heat 1	66 %
Electric/Gas Heat 2	100 %

Single Zone VAV Minimum Fan Speeds

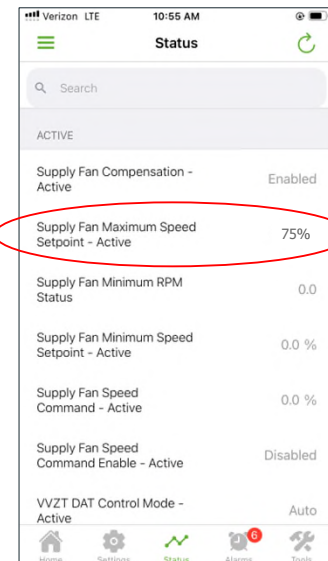


Variable Speed Fan w/4 Stages of Cooling	Supply Fan Speed
Off	0
Fan Only	50 %
Cooling Stage 1	50 %
Cooling Stage 2	50 %
Cooling Stage 3	65 %
Cooling Stage 4	100 %
Electric/Gas Heat 1	66 %
Electric/Gas Heat 2	100 %

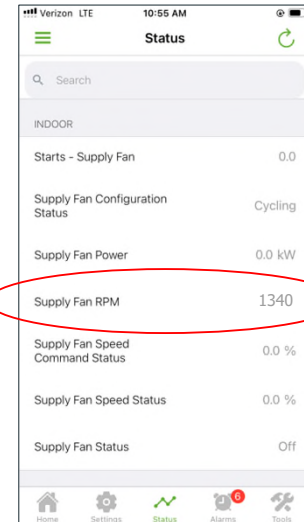
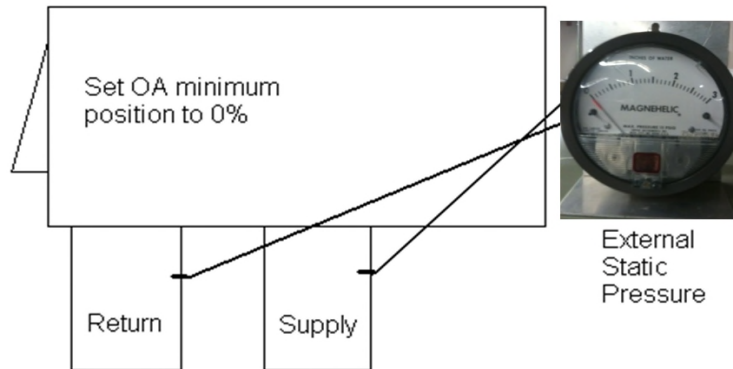
Supply Fan Max Speed Setpoint



- Setpoint will trim the max fan speed
- Based on the configured max RPM
 - Example: RPM max = 1940
 - Supply Maximum Fan Speed Setpoint @ 75% yields a maximum of 1455 RPM



How to Determine Approximate CFM



***If the unit is @ .80" ESP and Fan RPM is 1340, what is the CFM?**

Use Fan Tables in Product Catalog

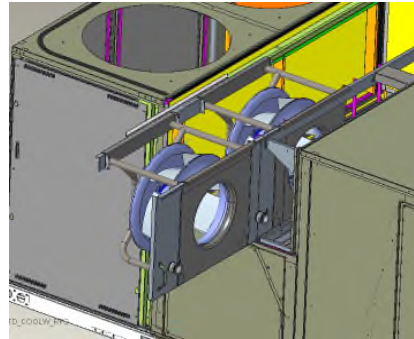
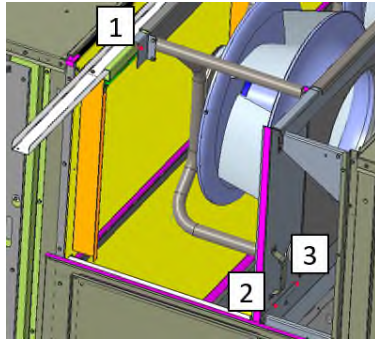


External Static Pressure (Inches of Water Gauge)												
	0.10"		0.20"		0.30"		0.40"		0.50"		0.60"	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3-hp Standard Motor												
3000	867	0.40	910	0.47	950	0.55	987	0.63	1022	0.71	1056	0.80
3200	919	0.47	960	0.55	998	0.64	1034	0.72	1068	0.81	1100	0.90
3400	971	0.55	1011	0.64	1047	0.73	1081	0.82	1114	0.91	1146	1.00
3600	1024	0.64	1061	0.74	1096	0.83	1130	0.93	1161	1.02	1191	1.12
3800	1077	0.74	1112	0.84	1146	0.94	1178	1.04	1209	1.14	1238	1.24
4000	1130	0.86	1164	0.96	1196	1.06	1227	1.17	1257	1.28	1285	1.39
4200	1183	0.98	1215	1.09	1247	1.20	1277	1.31	1305	1.42	1333	1.53
4400	1236	1.12	1267	1.23	1297	1.34	1326	1.46	1354	1.58	1381	1.69
4600	1289	1.27	1319	1.38	1349	1.50	1377	1.62	1404	1.74	1430	1.87
4800	1343	1.43	1372	1.55	1400	1.67	1427	1.80	1453	1.92	1479	2.05

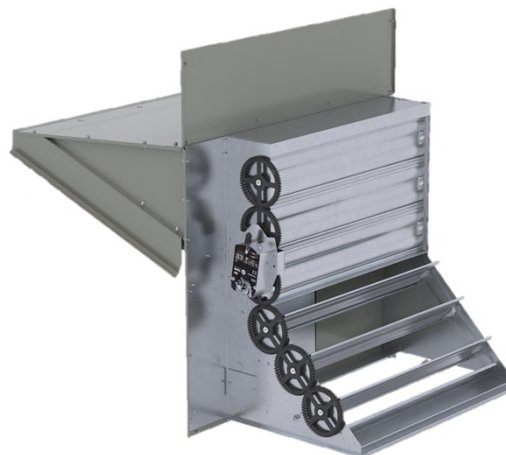
D Cabinet ID Fan Removal



- STEP 2: Remove 3 screws securing fan assembly
- Then slide out ID fan assembly, to gain access to screws securing fan to orifice
- Caution do not slide assembly beyond tipping point



Economizer

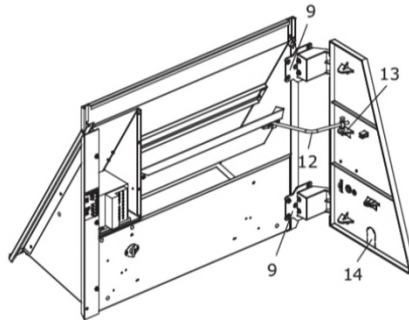


TRANE
TECHNOLOGIES

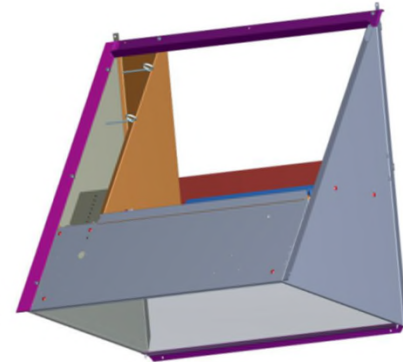
Economizer 6 - 12.5 Tons



Economizer (DF)

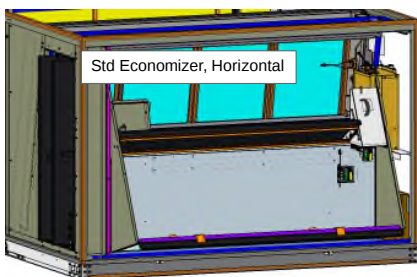


Economizer (HZ)



Motorized Damper

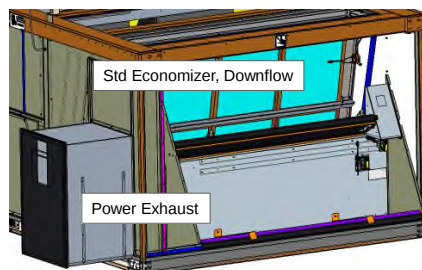
Economizer 15 – 25 tons



Std Economizer, Horizontal



Barometric Relief



Std Economizer, Downflow

Power Exhaust

Economizer



- Outside Air Options
 - 0-50% Manual Damper
 - 0-50% Motorized Damper
 - 0-100% Economizer
 - With or without Barometric Relief

Digit 14 — Fresh Air Selection

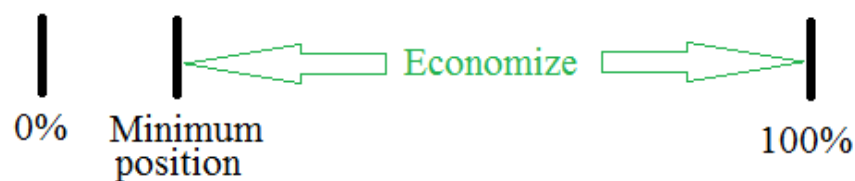
0 = No Fresh Air
 A = Manual Outside Air Damper 0–50%
 B = Motorized Outside Air Damper 0–50%
 C = Economizer, Dry Bulb 0–100% without Barometric Relief²
 D = Economizer, Dry Bulb 0–100% with Barometric Relief²
 E = Economizer, Reference Enthalpy 0–100% without Barometric Relief²
 F = Economizer, Reference Enthalpy 0–100% with Barometric Relief²
 G = Economizer, Comparative Enthalpy 0–100% without Barometric Relief²
 H = Economizer, Comparative Enthalpy 0–100% with Barometric Relief²
 K = Downflow Low Leak Economizer, Dry Bulb with Barometric Relief²
 M = Downflow Low Leak Economizer, Reference Enthalpy with Barometric Relief²
 P = Downflow Low Leak Economizer, Comparative Enthalpy with Barometric Relief²
 R = Downflow Low Leak Economizer, Differential Dry Bulb with Barometric Relief²

Outside Air Damper - Ventilation



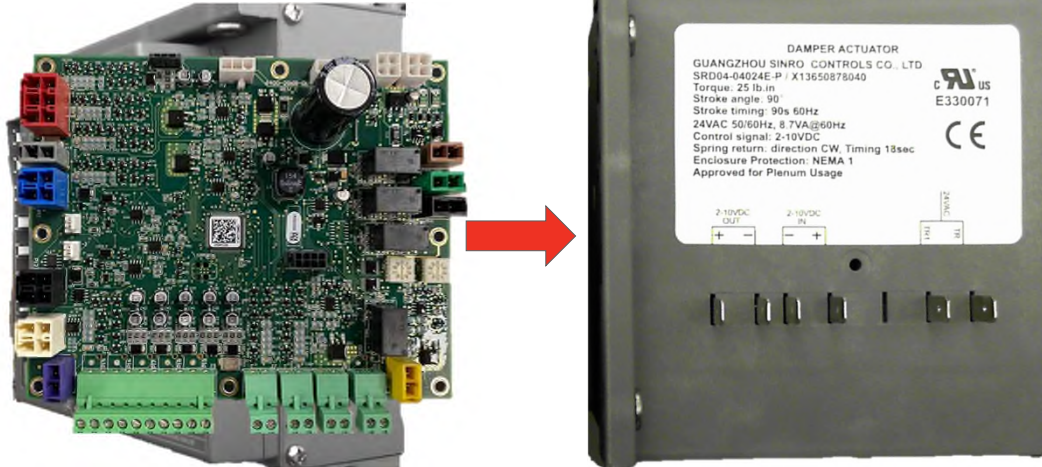
- Two functions
 - Provide ventilation
 - Min position
 - Provide free cooling
 - Min to 100%

Fresh Air Damper Position



FAOM

Fresh Air Module - Address 76



OA Temperature and Humidity

- OA temp mounted in control panel
- OA humidity sensor mount in hood for enthalpy type economizers



Economizer Control Types



- 4 types of economizer decisions
 - Differential Dry Bulb
 - Comparative Enthalpy
 - Reference Enthalpy
 - Reference Dry Bulb

Economizing w/ZT Units



- When economizing
 - OA damper will modulate between Minimum Position and 100%
 - As needed to provide cooling
 - Should damper reach 100%
 - And the fan is at 100%
 - And 3 minutes elapse
 - Allow DX if needed
- When space temperature is satisfied
 - Economizer returns to minimum

Economizing w/ZT Units and Conventional T-Stat



- If conditions are ok to economize and Y1 call from thermostat
 - OA damper will modulate to maintain Economizer Discharge Air Setpoint
 - Supply fan commanded to minimum fan speed
- Y1+Y2 from thermostat
 - OA damper opens to 100%
 - Supply fan commanded to maximum fan speed
 - 1st stage compressor energizes

Heat



TRANE
TECHNOLOGIES

Emerson White Rodgers Gas Heat Module



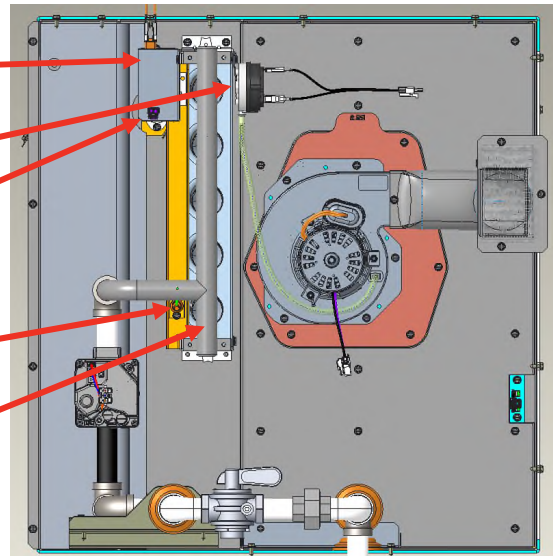
- Direct Spark Ignition Controller
 - Modbus with Diagnostic flash codes
- Diagnostics communicated to the Symbio 700



Key Components



- Roll out switch
- Pressure switch
- High Limit Cutout
- Ignitor
- In Shot Burners



Sequence of Operation – 2 stage



- Supply fan on
- 30 second pre-purge
- Direct spark ignition
 - 7 second trial for ignition
 - 3 retries before lockout

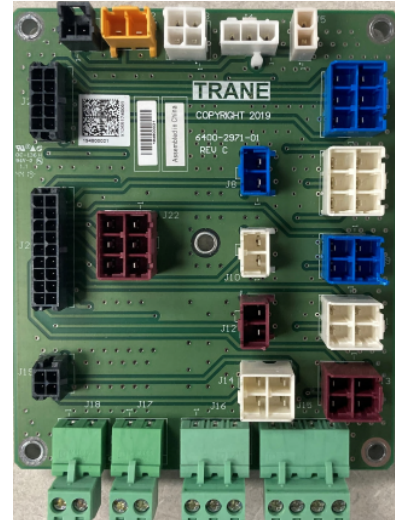
Odyssey Split Systems



Odyssey Adaptor Board



- Electrical Integration board with a series of connectors and traces
- Eliminates complex harness designs
 - Equipment protection features
 - Enables proper power distribution between components

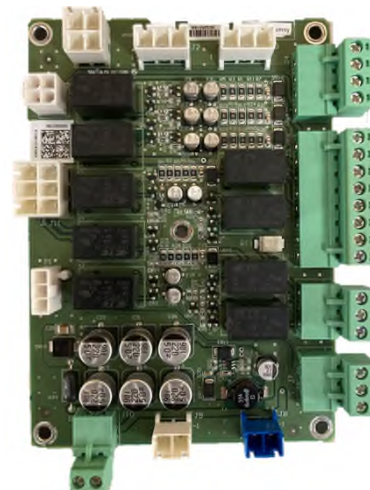


- Located in ODU

Odyssey Relay Board



- Electrical Integration board for Odyssey Air Handlers
- Field Connections with onboard relay logic
 - Supports Pairing variations
- No microcontroller
 - Hardware-based solution only



- Located in Odyssey Air Handler

Symbio Options Module



TWE low voltage
control compartment



Electric Heat Connections

Discharge Air Temperature



Trane TR150 VFD



- TR150 supports two options for fan speed control
 - 2 speed fan
 - SZVAV



VFD Parameters



3-15	Reference 1 Source		[11] Local Bus (Symbio) or [1] Analog Input 53 (EM)
5-10	Terminal 18 Digital Input		[0] No Operation (Symbio) or [8] Start (EM)
5-12	Terminal 27 Digital Input		[0] No Operation (Symbio) or [2] Coast Inverse (EM)
4-10	Motor Speed Direction		[2] Both Directions
4-12	Motor Speed Low Limit	Hz	[25] 25 Hz
8-01	Control Site		[2] Controlword only (Symbio) or [0] Digital and ctrl.word (EM)
8-02	Control Source		[1] FC Port (Symbio) or [0] None (EM)
8-30	Protocol		[2] Modbus RTU
8-31	Address		[2] Address 2
8-32	Baud Rate		[7] 115200 Baud
8-33	Parity / Stop Bits		[0] Even Parity, 1 Stop Bits

Supply Airflow Adjustments



- Constant Volume – **Model Digit 15= 1**
 - Adjust motor sheave
- SZVAV – **Model Digit 15= D**
 - Set "Supply Fan Max RPM Setpoint" in Symbio App
- 2 stage airflow/ Electromechanical units – **Model Digit 15 = C**
 - Configure VFD parameter 6-15 to HZ value that best meets required RPM per the catalog fan tables



Odyssey with Symbio 700 Updates

Odyssey Symbio 700 Updates



- New simplified interconnecting wire strategy
 - Reduction in required conductors
 - Applicable to a majority of installs
 - New accessory kit for field conversion
- Ordering options updated
 - Aid for selecting right combination
- A2L Refrigerant Updates
 - Components and wiring

New Simplified Wiring



- Updated Wiring and Startup guide
- R410a
 - Lit Number SS-SVN016*
- R454b
 - Lit Number SS-SVN017*

Installation Guide
Split System Air Conditioners
Odyssey™ with Symbio® Controls
 Wiring and Startup

SAFETY WARNING

Only qualified personnel should install and service this equipment. The installation, starting up, and servicing of heating, ventilating, and air conditioning equipment can be hazardous and require specific knowledge and training. Improperly installed, adjusted or altered equipment is an unsafe condition and may result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, labels, and signs that are attached to the equipment.

June 2022

SS-SVN016B-EN

New Simplified Wiring



Symbio Air Handler
Digit 15 — Controls
C = 2-speed
D = Single Zone VAV (not for use with 24V thermostat)

Table 4. Condenser and air handler pairing details — simplified wiring

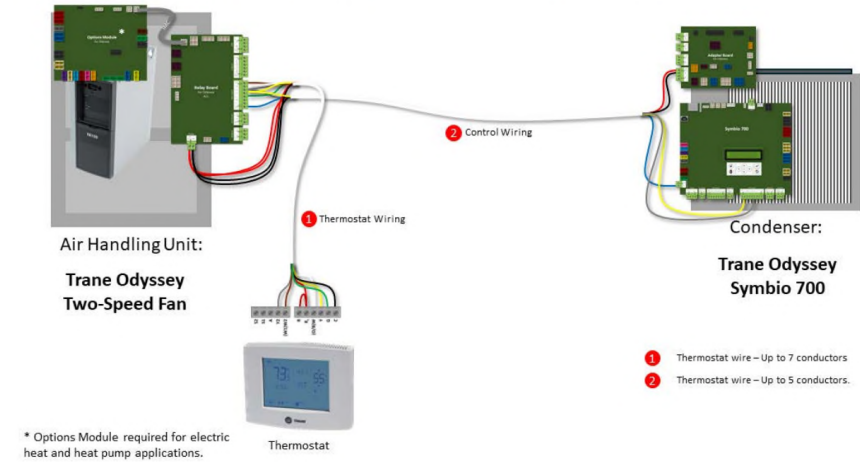
Condens- er (model # digit)	Air Handler		Wiring Reference	Description
	Type	Supply Fan Type (model # digit)		
Odyssey Symbio (Digit 15 = S)	Odyssey Symbio	2-Speed Fan (Digit 15 = C)	Figure 1, p. 8	The VFD harness and programming is factory installed in this scenario. Important: Additional Symbio 700 setup is necessary for the simplified wiring. Control is provided by the thermostat, not the Symbio 700. Symbio 700 controls the cooling stages and heat pump reversing valve, when applicable. Electric heat will not operate in heat pump defrost mode.
		Single Zone VAV (Digit 15 = D) Convert for use with 24V thermostat		If the AHU was ordered as SZVAV, the unit MUST be converted for 2-speed operation to leverage the simplified thermostat wiring. Single Zone VAV operation requires the full featured wiring methods described later in this guide. Install the necessary harness to the VFD and reprogram the VFD accordingly. Important: Additional Symbio 700 setup is necessary for the simplified wiring. Control is provided by the thermostat, not the Symbio 700. Symbio 700 controls the cooling stages and heat pump reversing valve, when applicable. Electric heat will not operate in heat pump defrost mode.

New Simplified Wiring



Pairing H for Condenser Cooling

Figure 1. Pairing H for condenser cooling thermostat control applications

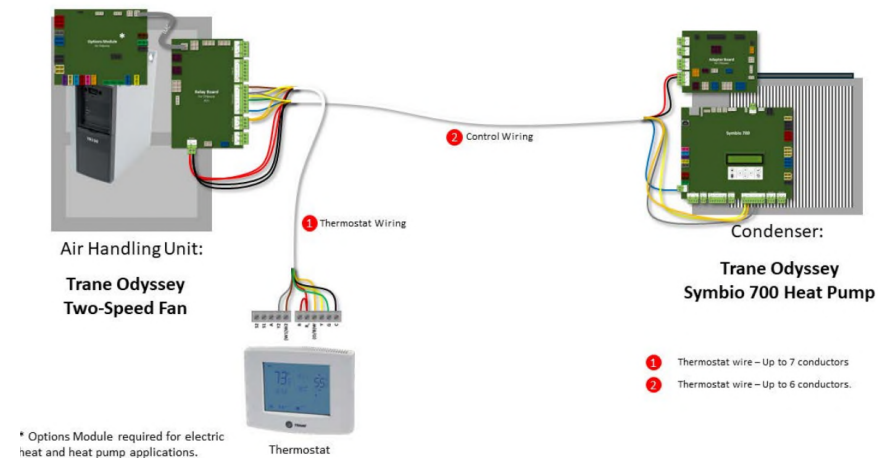


New Simplified Wiring



Pairing H for Heat Pump Operation

Figure 2. Pairing H for heat pump thermostat control applications

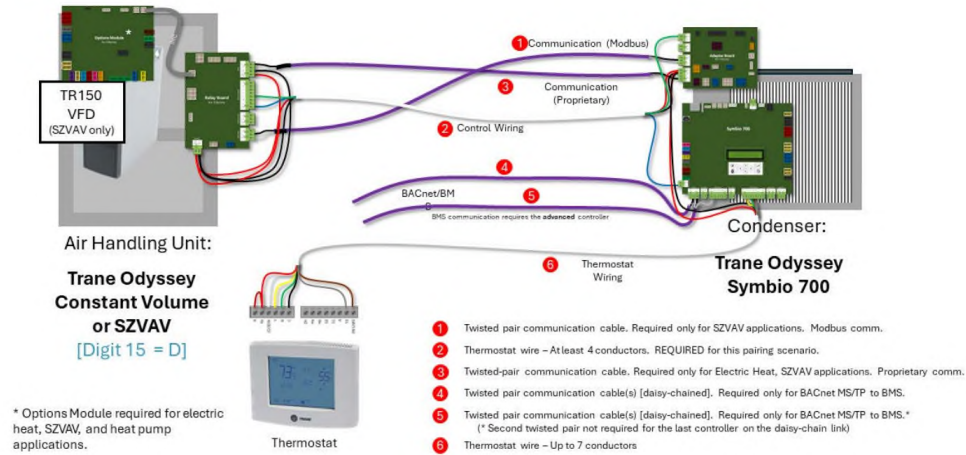


Full Feature Functionality



Pairing A or B

Figure 8. Pairing A or B for Symbio condenser to Symbio air handler constant Volume or SZVAV

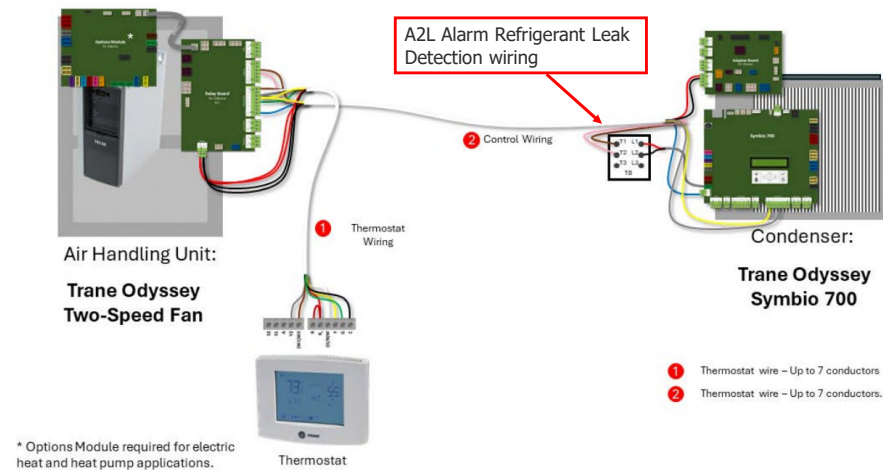


R454b Standard Thermostat Functionality



Pairing H for Condenser Cooling

Figure 1. Pairing H for condenser cooling thermostat control applications



SZVAV to 2 speed Conversion



- Requirements
 - Wire harness WIR11487
 - Connection for Relay board to VFD
 - VFD Parameters
 - Adjust VFD parameters for 2 speed configuration
 - Heat Pump Aux Electric Heat
 - W1 and W2 jumpered at Relay Board
 - Thermostat Aux Heat call W2 energizes EH stages





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Symbio 700
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