

APPENDIX F3

CARRIER 5 TON HEAT PUMP



Product Data

WeatherMaker® Single Package Heat Pump Rooftop

3 to 6 Nominal Tons

ecoblue™  technology



Puron
ADVANCE™

50FEQ*04, 05, 06, 07
Single-Packaged Heat Pump with Accessory Electric
Heat and Puron Advance™ Refrigerant (R-454B)

Introducing Carrier's WeatherMaker® packaged heat pump rooftop units (RTU) with Puron Advance™ and EcoBlue™ Technology.

New major design features include:

- Puron Advance (R-454B) refrigerant, which delivers a 75% reduction in global warming potential (GWP) compared to the original Puron (R-410A). Puron Advance's GWP of 466 easily exceeds the EPA (Environmental Protection Agency) requirement of <700 GWP.
- A patented, industry-first efficient indoor fan system using vane axial fan with electronically commutated variable speed motor for simplicity and efficiency
- Reliable single (04-06 size) or 2-stage (07 size) cooling designs with fully active evaporator coils
- Unit control board (UCB) with intuitive indoor fan adjustment that uses simple dial and switch configuration
- Reliable copper tube/aluminum fin condenser coil with 5/16 in. tubing to help reduce refrigerant charge and weight versus prior designs
- New outdoor fan system with rugged, lightweight, high impact composite fan blade

Our WeatherMaker 50FEQ 3 to 6 ton units are specifically designed to fit on Carrier roof curbs installed as far back

as 1989. That makes replacement fast and easy, eliminating the need for curb adapters or different utility connections.

The 3-5 ton units deliver efficiencies of up to 13.4 SEER2 and 6.7 HSPF2. Two-stage, 6 ton units deliver up to 15.0 IEER and a COP up to 3.4. All models are field convertible and capable of either vertical or horizontal airflow.

With "no-strip" screw collars, handled access panels, and more, the unit is easy to install, easy to maintain, and easy to use. Our precisely sized suction line accumulator helps ensure reliable operation at unit operation conditions.

Value-added features include:

- Single point electrical connections
- Optional fully integrated SystemVu™ controls
- Fixed refrigerant metering devices on 3 to 5 ton models and TXV on 6 ton models
- Scroll compressors with internal line-break overload protection
- Easy-to-access tool-less filter door, filter tracks that tilt out for filter removal and replacement, and filter size consistency across units

Easy to install

All 3 to 6 ton WeatherMaker units are field-convertible to horizontal airflow, which makes it easy to adjust to unexpected jobsite complications. Our units are light, making them easy to replace,

and our standard integrated unit control board (UCB) has simple, fast, clearly labeled plug-in connection points that reduce installation time. Should a job need additional features, our large control box provides room to work and mount Carrier accessories.

Easy to maintain

With the EcoBlue vane axial fan system and direct drive ECM motor, belts or pulleys are a thing of the past. Should an adjustment be necessary, it can easily be made via the UCB in the control box. For regular service activities, our easy-access handles provide a quick solution to all commonly accessed service panels, and our sloped, corrosion-resistant composite drain pan sheds water and will not rust. Service gauge connections are included on compressor suction/discharge lines and before and after the filter drier to monitor system operation during maintenance.

Easy to use

Carrier's re-designed unit control board puts all connections and troubleshooting points in one convenient place. Most low voltage connections use the same board and are easy to access. Setting up the fan is simple using an intuitive switch and rotary dial arrangement. Our rooftops have high and low pressure switches, a filter drier, and 2 in. filters standard.

Table of contents

	Page
Features/Benefits	2
Model Number Nomenclature	4
Capacity Ratings	5
Physical Data	8
Options and Accessories	9
Base Unit Dimensions	13
Accessory Dimensions	16
Performance Data	17
Fan Data	27
Electrical Data	56
Typical Wiring Diagrams	78
Sequence of Operation	86
Application Data	88
Guide Specifications	89

Heat pump flexibility

50FEQ models offer onboard electro-mechanical heating standard. Our robust systems are rigorously tested to ensure reliable reverse cycle heating operation. The result is a clean, environmentally responsible heat source to keep occupants comfortable year-round. All 50FEQ models can be easily controlled with a standard thermostat and remove the need to burn fossil fuels to heat your building. Should you need supplemental heat, we offer a full line of single point powered electric heaters that can easily be installed at site.

Puron Advance™ Features

In 2018, Carrier announced Puron Advance (R-454B) as our next generation refrigerant for light commercial rooftops. With a GWP of 466 and similar working pressure and performance to R-410A, Puron Advance easily exceeds the EPA's new, stringent <700 GWP refrigerant requirement while minimizing unit redesign. Like other next generation refrigerants (R-32, etc.), R-454B is classified as an "A2L" refrigerant by ASHRAE (American Society of Heating, Refrigerating,

and Air-Conditioning Engineers). This designation means that R-454B is "mildly flammable" under certain conditions. While this is a change from legacy "A1 — No Flame Propagation" refrigerants like Puron (R-410A), A2Ls are still very low on the flammability scale and quite safe for use. A2L refrigerants are difficult to ignite and have an extremely low flame speed — much less so than natural gas, propane, or even rubbing alcohol. At Carrier, we are committed to safety. As such, all of our Puron Advance rooftop units include a factory-installed dissipation control board and leak sensor designed to last the lifetime of the unit. This system is certified to UL 60335-2-40 and designed to work right away, without any field configuration or wiring. In the event of a leak, these systems are designed to automatically identify and resolve the issue by dissipating the refrigerant to minimize risk to equipment, buildings, or occupants.

EcoBlue™ Technology

Our direct drive EcoBlue indoor fan system uses a vane axial fan and electronically commutated motor. The benefit is clear: when compared to legacy

belt drive systems, this vane axial design has 75% fewer moving parts, uses up to 40% less energy, and has no belts, blower bearings, or shaft.

Streamlined control and integration

Carrier controllers make connecting WeatherMaker rooftops into existing building automation systems easy. The units are compatible with conventional thermostat controls, SystemVu controls, and third-party building management systems (BMS).

Operating efficiency and flexibility

The 50FEQ rooftops meet ASHRAE 90.1 and IECC®¹ (International Energy Conservation Code) minimum efficiency requirements.

Comfort control

Carrier's round tube plate fin coil design helps maximize heat transfer and reliable operation.

1. Third-party trademarks and logos are property of their respective owners.



50FEQ Model Number Nomenclature

Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Example:	5	0	F	E	Q	A	0	4	A	2	A	6	-	0	A	0	A	0

Unit Type

50 – Cooling with Electric Heat

Model Series

FE – Entry Tier Puron® Advance Rooftop

Heat Size

Q = Heat Pump

Refrig. Systems Options

A = One Stage Cooling (04-06)

M = Two Stage Cooling, Single Circuit (07)

Cooling Tons

04 = 3 tons

05 = 4 tons

06 = 5 tons

07 = 6 tons

Sensor Options

A = None

B = Return Air Smoke Detector (RA)

C = Supply Air Smoke Detector (SA)

D = RA + SA Smoke Detector

J = Condensate Overflow Switch (COFS)

K = Condensate Overflow Switch + RA Smoke Detector

L = Condensate Overflow Switch + RA and SA Smoke Detectors

M = Condensate Overflow Switch + SA Smoke Detector

Fan Options

2 = Standard/Medium Static – EcoBlue Vane Axial Fan

3 = High Static – EcoBlue Vane Axial Fan

5 = Standard/Medium Static – EcoBlue Vane Axial Fan and Filter Status Switch

6 = High Static – EcoBlue Vane Axial Fan and Filter Status Switch

RTPF Coil Options – (Outdoor - Indoor — Hail Guard)

A = Al/Cu - Al/Cu

B = Precoat Al/Cu - Al/Cu

C = E-coat Al/Cu - Al/Cu

D = E-coat Al/Cu - E-coat Al/Cu

M = Al/Cu - Al/Cu — Louvered Hail Guard

N = Precoat Al/Cu - Al/Cu — Louvered Hail Guard

P = E-coat Al/Cu - Al/Cu — Louvered Hail Guard

Q = E-coat Al/Cu - E-coat Al/Cu — Louvered Hail Guard

R = Cu/Cu - Al/Cu — Louvered Hail Guard

S = Cu/Cu - Cu/Cu — Louvered Hail Guard

Voltage

1 = 575-3-60

3 = 208/230-1-60^{a, b}

5 = 208/230-3-60

6 = 460-3-60

Packaging

0 = Standard

Electrical Options

A = None

C = Non-Fused Disconnect (NFDC)

D = Thru-the-Base Connections (TTB)

F = NFDC + TTB

N = Phase Monitor Protection (PMR)

Q = PMR + NFDC

R = PMR + TTB

T = PMR + NFDC + TTB

1 = HSCCR^c (High Short Circuit Current Rating)

2 = HSCCR^c + TTB

Service Options

0 = None

1 = Unpowered Convenience Outlet (NPCO)

2 = Powered Convenience Outlet (PCO)

3 = Hinged Panels (HP)

4 = Hinged Panels + NPCO

5 = Hinged Panels + PCO

6 = 4-Inch MERV-13 Filters (M13)

7 = NPCO + MERV-13 Filters

8 = PCO + MERV-13 Filters

9 = Hinged Panels + MERV-13 Filters

A = HP + NPCO + MERV-13 Filters

B = HP + PCO + MERV-13 Filters

Intake / Exhaust Options

A = None

B = Standard Leak Economizer with Barometric Relief

F = Standard Leak Enthalpy Economizer with Barometric Relief

L = ULL (Ultra Low Leak) Temperature Economizer with Barometric Relief and CO₂ Sensor

M = ULL Enthalpy Economizer with Barometric Relief and CO₂ Sensor

U = ULL Temperature Economizer with Barometric Relief

W = ULL Enthalpy Economizer with Barometric Relief

Base Unit Controls

0 = Standard Electromechanical Controls (can be used with field installed economizers and dampers)

3 = SystemVu™ Controllor

8 = Electro-mechanical Controls with POL224 (includes FDD^d)

Design Revision

- = Factory Design Revision

NOTE(S):

^a Not available for size 07 units

^b On single phase models (-3 Voltage code), the following are not available as factory installed options:

Louvered Hail Guards, Coated or Copper Fin Coils, Powered Convenience Outlet, Economizer, Upgraded MERV filters

^c Not available on the following models/options:

575-v, Phase Loss Monitor, Non-Fused Disconnect, Powered Convenience Outlet.

^d Fault Detection and Diagnostic

50FEQ 04-07 AHRI Ratings — Cooling Mode^{a,b,c,d}

UNIT	COOLING STAGES	NOMINAL CAPACITY (tons)	NET COOLING CAPACITY 2 (MBtuh)	NET COOLING CAPACITY (MBtuh)	TOTAL POWER 2 (kW)	TOTAL POWER (kW)	SEER2	EER2	IEER w/ 2 SPEED	EER	RATED INDOOR AIRFLOW (cfm)
50FEQA04	1	3	35.0	—	3.0	—	13.4	11.5	—	—	1275
50FEQA05	1	4	48.0	—	4.2	—	13.4	11.5	—	—	1600
50FEQA06	1	5	59.5	—	5.2	—	13.4	11.5	—	—	2000
50FEQM07	2	6	—	70.0	—	6.3	—	—	15.0	11.2	2500

NOTE(S):

- Rated in accordance with AHRI Standards 210/240 (04-06 size) and 340/360 (07 size).
- Rating are based on:
Cooling Standard: 80°F (27°C) db, 67°F (19°C) wb indoor air temperature and 95°F (35°C) db outdoor air temperature.
- Units comply with ASHRAE 90.1-2016 (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) and DOE-2023 (Department of Energy) Energy Standard for minimum SEER2 and EER2 requirements.
- 50FEQ units comply with US Energy Policy Act (2005). To evaluate code compliance requirements, refer to state and local codes.

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AHRI — Air Conditioning, Heating and Refrigeration Institute
EER — Energy Efficiency Ratio
MBtuh — Btuh in Thousands
SEER — Seasonal Energy Efficiency Ratio



Capacity ratings (cont)



50FEQ 04-07 AHRI Ratings — Heating Mode^{a,b,c,d}

UNIT	HSPF 2	HIGH HEATING CAPACITY 2 (MBtuh)	HIGH HEATING CAPACITY (MBtuh)	HIGH HEAT COP2	HIGH HEAT COP	LOW HEATING CAPACITY 2 (MBtuh)	LOW HEATING CAPACITY (MBtuh)	LOW HEAT COP2	LOW HEAT COP	RATED INDOOR AIRFLOW (cfm)
50FEQA04	6.7	34.0	—	3.6	—	18.0	—	2.1	—	1275
50FEQA05	6.7	45.0	—	3.5	—	21.0	—	2.0	—	1600
50FEQA06	6.7	56.0	—	3.7	—	29.0	—	2.2	—	2000
50FEQM07	—	—	63.0	—	3.4	—	34.5	—	2.25	2500

NOTE(S):

- Rated in accordance with AHRI Standards 210/240 (04-06 size) and 340/360 (07 size).
- Rating are based on:
Cooling Standard: 80°F (27°C) db, 67°F (19°C) wb indoor air temperature and 95°F (35°C) db outdoor air temperature.
 High Temperature Heating Ratings: 47°F (8°C) db, 43°F (6°C) wb outdoor air temperature and 70°F (21°C) entering indoor coil air.
 Low Temperature Heating Ratings: 17°F (–8°C) db, 15°F (–9°C) wb outdoor air temperature and 70°F (21°C) entering indoor coil air.
- Units comply with ASHRAE 90.1-2016 (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) requirements, as well as DOE-2018 (Department of Energy) Energy Standard for minimum SEER and EER and DOE-2023 Energy Standards for minimum SEER2 and EER2 requirements. ASHRAE 90.1 requires M1 ratings on 3-phase models.
- 50FEQ units comply with US Energy Policy Act (2005). To evaluate code compliance requirements, refer to state and local codes.

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AHRI — Air Conditioning, Heating and Refrigeration Institute
COP — Coefficient of Performance
HSPF — Heating Seasonal Performance Factor
MBtuh — Btuh in Thousands



Sound Ratings Table^{a,b,c}

UNIT	COOLING STAGES	OUTDOOR SOUND (dB) AT 60 Hz								
		A-WEIGHTED	63	125	250	500	1000	2000	4000	8000
50FEQ*04	1	75.4	81.8	81.8	77.0	72.6	69.9	64.6	59.3	55.6
50FEQ*05	1	79.0	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3
50FEQ*06	1	79.0	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3
50FEQ*07	2	79.0	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3

NOTE(S):

- Outdoor sound data is measured in accordance with AHRI.
- Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
- A-weighted sound ratings filter out very high and very low frequencies, to better approximate the response of "average" human ear. A-weighted measurements for Carrier units are taken in accordance with AHRI.

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dB — Decibel

Minimum - Maximum Airflow Ratings (cfm) — Cooling Units and Accessory Electric Heat

UNIT	COOLING				ELECTRIC HEAT ^a	
	Minimum Airflow (cfm)	Minimum 2-Speed Airflow (low speed)	Minimum 2-Speed Airflow (high speed)	Maximum Airflow (cfm)	Minimum Airflow (cfm)	Maximum Airflow (cfm)
50FEQ*04	900	—	—	1500	900	1500
50FEQ*05	1200	—	—	2000	1200	2000
50FEQ*06	1500	—	—	2500	1500	2500
50FEQ*07	1800	1200	1800	3000	1800	3000

NOTE(S):

- Electric heat modules are available as field-installed accessories for 50FEQ units.

50FEQ Physical Data

50FEQ UNIT	50FEQA04	50FEQA05	50FEQA06	50FEQM07
NOMINAL TONS	3	4	5	6
BASE UNIT OPERATING WT (lb) ^a	467	473	584	589
REFRIGERATION SYSTEM				
No. Circuits/No. Compressors/Type	1 / 1/ Scroll	1 / 1/ Scroll	1 / 1 / Scroll	1 / 1 / 2-Stage Scroll
Puron Advance™ (R-454B) Charge (lb-oz)	8-3	10-3	11-3	12-13
Metering Device	Acutrol	Acutrol	Acutrol	TXV
High-Pressure Trip/Reset (psig)	630/505	630/505	630/505	630/505
Low-Pressure Trip/Reset (psig)	54/117	54/117	54/117	54/117
EVAPORATOR COIL (Indoor)				
Material (Tube/Fin)	Cu/Al	Cu/Al	Cu/Al	Cu/Al
Coil Type	3/8 in. RTPF	3/8 in. RTPF	3/8 in. RTPF	3/8 in. RTPF
Rows/FPI	3/15	3/15	4/15	4/15
Total Face Area (ft²)	5.5	5.5	7.3	7.3
Condensate Drain Connection Size	3/4 in.	3/4 in.	3/4 in.	3/4 in.
CONDENSER COIL (Outdoor)				
Material	Cu/Al	Cu/Al	Cu/Al	Cu/Al
Coil Type	5/16 in. RTPF	5/16 in. RTPF	5/16 in. RTPF	5/16 in. RTPF
Rows/FPI	2/18	2/18	2/18	2/18
Total Face Area (ft²)	14.6	15.9	20.5	20.5
EVAPORATOR FAN AND MOTOR (Indoor)				
Medium Static 1 Phase				
Motor Qty/Drive Type	1/Direct	1/Direct	1/Direct	—
Max Cont Bhp	0.71	1.06	1.44	—
Rpm Range	219-2190	217-2170	239-2390	—
Fan Qty/Type	1/Vane Axial	1/Vane Axial	1/Vane Axial	—
Fan Diameter (in.)	16.6	16.6	16.6	—
High Static 1 Phase				
Motor Qty/Drive Type	1/Direct	1/Direct	1/Direct	—
Max Cont Bhp	1.07	1.53	1.96	—
Rpm Range	249-2490	246-2460	266-2660	—
Fan Qty/Type	1/Vane Axial	1/Vane Axial	1/Vane Axial	—
Fan Diameter (in.)	16.6	16.6	16.6	—
Medium Static 3 Phase				
Motor Qty/Drive Type	1/Direct	1/Direct	1/Direct	1/Direct
Max Cont Bhp	0.71	1.06	1.44	1.76
Rpm Range	219-2190	217-2170	239-2390	253-2530
Fan Qty/Type	1/Vane Axial	1/Vane Axial	1/Vane Axial	1/Vane Axial
Fan Diameter (in.)	16.6	16.6	16.6	16.6
High Static 3 Phase				
Motor Qty/Drive Type	1/Direct	1/Direct	1/Direct	1/Direct
Max Cont Bhp	1.07	1.96	2.43	2.43
Rpm Range	249-2490	266-2660	284-2836	284-2836
Fan Qty/Type	1/Vane Axial	1/Vane Axial	1/Vane Axial	1/Vane Axial
Fan Diameter (in.)	16.6	16.6	16.6	16.6
CONDENSER FAN AND MOTOR (Outdoor)				
Qty / Motor Drive Type	1 / Direct	1 / Direct	1 / Direct	1 / Direct
Motor Hp/Rpm	1/4 / 1100	1/4 / 1100	1/4 / 1100	1/4 / 1100
Fan Diameter (in.)	23	23	23	23
FILTERS				
RA Filter Qty / Size (in.)	2 / 16x25x2	2 / 16x25x2	4 / 16x16x2	4 / 16x16x2
OA Inlet Screen Qty / Size (in.)	1 / 20x24x1	1 / 20x24x1	1 / 20x24x1	1 / 20x24x1

NOTE(S):

a. Base unit operating weight does not include weight of options.