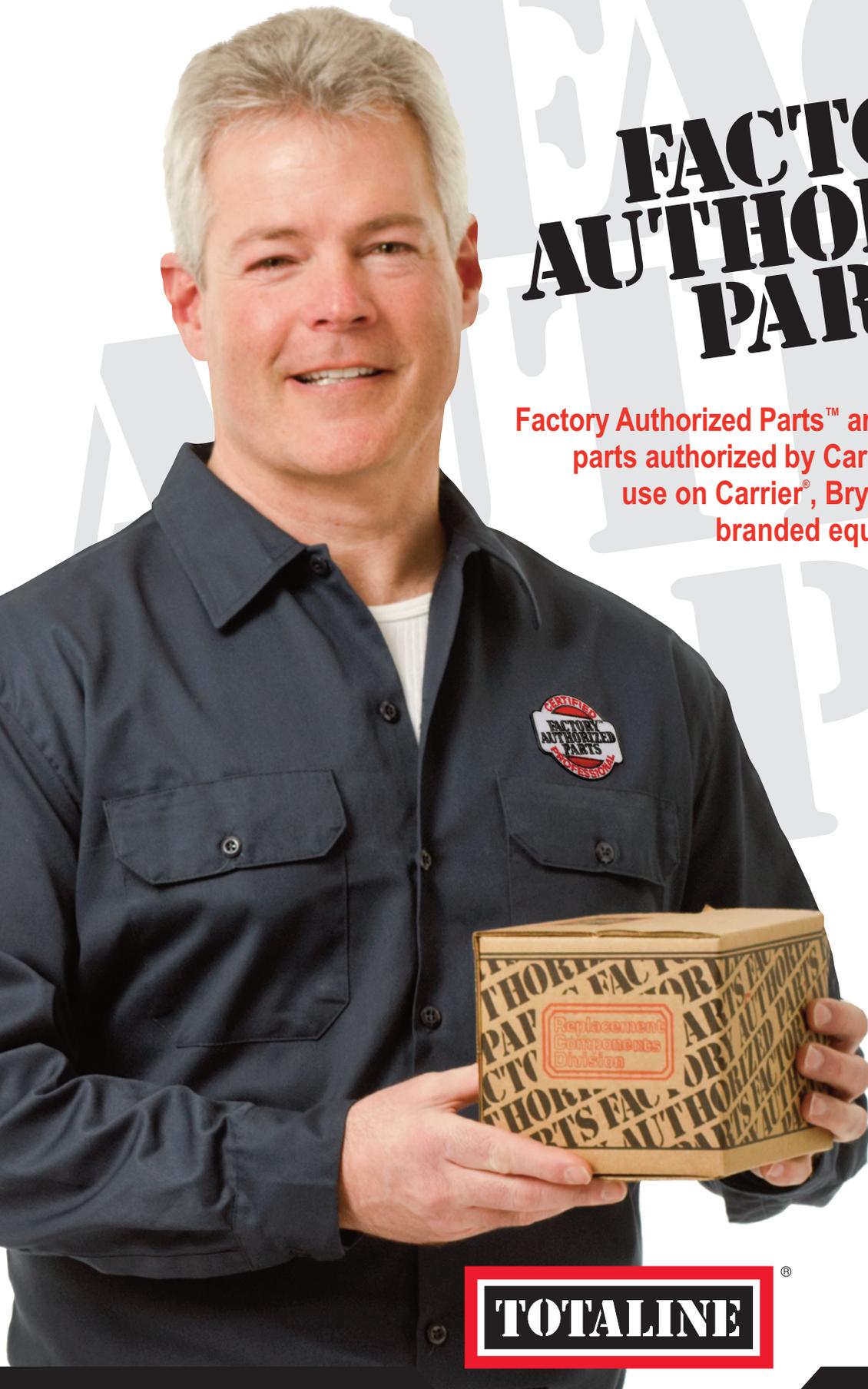


# The Factory Authorized Parts Differences

## FACTORY AUTHORIZED PARTS™

Factory Authorized Parts™ are the **ONLY** replacement parts authorized by Carrier Corporation for use on Carrier®, Bryant® and Payne® branded equipment.



### Factory Authorized Parts Differences

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## Blower & Condenser Motors

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	Features	F.A.P. PSC Motors	Aftermarket Motors	
System Performance	Improved Efficiency	Motor runs at most efficient portion of motor performance curve by design <ul style="list-style-type: none"> <li>Ensures motor is not overloaded</li> <li>Ensures that motor operates at the design RPM, which produces the correct airflow</li> </ul>	Motor probably will not run at optimal position on performance curve <ul style="list-style-type: none"> <li>Motor overload can occur, which can cause overheat conditions and potential nuisance trips</li> <li>Motor can operate at reduced speed, hurting System efficiency</li> </ul>	
	Reduced System Vibration	System design put motor RPM at optimal point for limiting torque pulsations that can generate excess vibration in the unit	Motors are designed to fit 'generic' applications and as a result there is no assurance that motor RPM is at optimal point concerning torque pulsations	
	Reduced Noise	System qualification includes additional testing such as start/stop and pure tone noise identification which further ensures there is not excessive vibration or noise during unit operation.		Impact of the noise produced at start/stop and other pure tones is not known because motor was likely not tested in CBP unit
		Overall length of motor assures that fan is located at intended position to minimize sound and maximize airflow		Overall length of aftermarket motors may be too long or too short requiring the fan to be positioned up on the motor shaft or have the fan sit too high in the orifice which can cause excessive noise.
System Reliability	Reduced stress on components	Natural frequencies of the top system are determined through design process. Motor operating frequencies are designed away from these resonances	Qualification testing done on motors is generally independent of CBP system. In such cases the natural frequencies of system cannot be accounted for	
	Reduced wear on system	Motors tested to Temprise standard stricter than required by UL 1995. Motors must meet maximum winding temperatures required by UL at higher ambient and wider voltage ranges (RES-SPL-CQR-0012A)	Not all generic motors tested to the Temprise standard	
	Stringent design-life testing provides longer life	100,000 on/off cycles and 50,000 total running hours; 15 years.	Design life testing varies across motor manufacturers, but is generally shorter than 15 years	
	Reliability Testing Regimen	Each motor chassis design goes through internal and supplier testing including salt spray, torture, life, and operational envelope testing. (CC14BD002 and Alternating Current Fan Motor Standard)	Different motor manufacturers specify their own reliability requirements.	
Installation and Serviceability	Raceway Connections	F.A.P. motors have liquid tight connector for lead exit that connects to raceway.	Most motor manufacturers use a rubber bushing at lead exit which is not always water tight.	
	Wire Terminations and Lengths	Wire terminations are the same as production motors so no termination is necessary. Wire lengths reach required end points without alteration.	Wire terminations and lengths may need to be modified to fit into application.	
	Fewer On-site Modifications required	Fan guards and top covers are designed to accept F.A.P. motors without modification. Exact size fit means easiest access.	Motor manufacturers build motors that do not always mount the same as F.A.P. motors	
	Few Hardware Issues	Hardware used to mount and secure original motor can be used to mount replacement motor	Motor manufacturers may not use the same mounting hardware, requiring additional time/cost	
Safety	UL & CSA Qualified	Both the CBP unit and the F.A.P. motor are UL & CSA qualified. Using the F.A.P. motor maintains UL & CSA qualification of the equipment	Although many generic motors are UL & CSA listed as components, the CBP equipment is only qualified and listed with a F.A.P. motor. Installing the generic motor means that the equipment is no longer UL or CSA certified	



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# Control Boards

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	Issue	Carrier HK42FZ034 (and 325878-751)	Generic Furnace Board
System Performance	Heat Pump defrost operation	HK42FZ034 shuts off blower when the igniter is energized and then brings it back on when the igniter turns off. This reduces nuisance trips of the high switch in heat pump applications.	Some generic boards will shut off the blower when the igniter is energized, but do not bring it back on at the factory-engineered optimum time.
	Noise generation	HK42FZ034 board performs quietly during all phases of operation.	Some generic boards make a noticeable high frequency noise whenever the gas valve is energized.
System Reliability	Blower on-delay operation	HK42FZ034 is designed to run at several different blower on-delay times depending on the product type and vintage it is installed in. Use of the correct blower on-delay can significantly extend heat exchanger life.	Generic boards may have just one blower on-delay time.
	Additional wear on igniter	HK42FZ034 shuts off the igniter the moment flame is sensed. This improves igniter life.	Some generic boards keep the igniter energized after flame is present.
Installation and Serviceability	Limited nuisance trips when flame is lost mid-cycle	HK42FZ034 shuts down and completes the blower off-delay when flame is lost. After the blower off-delay is completed a new heating cycle will begin. For certain installations, this will prevent nuisance trips.	Some generic boards will shut the blower off and immediately try to reignite when flame is lost. This kind of operation could lead to a needless service call.
	Polarity sensing	HK42FZ034 polarity sense works whether the furnace is grounded or not.	On some generic boards polarity sense only works when the furnace is grounded.
	Fuse fault indication	HK42FZ034 has an indication for a faulty fuse meaning that service can avoid replacing the board when only the fuse is bad.	Some generic boards do not have an indication for faulty fuse.
Safety	Combustion air starvation lockout	HK42FZ034 has a flame rollout detection algorithm which shuts off the furnace when starved for combustion air.	Some generic boards do not lockout when the furnace is starved for combustion air.
	Stuck gas valve relay operation (gas valve input is ON and should not be).	Based on specific criteria, the HK42FZ034 will turn the inducer off to see if the pressure switch will remove power from the gas valve. In this case, it will prohibit un-ignited gas from spilling until the lack of heat is noticed.	Some generic boards will not turn the inducer off under the same scenario.
	Dead blower situation (condensing furnace, downflow position)	HK42FZ034 locks out unit for designated period of time in a dead blower situation, helping to ensure the integrity of the flue pipe.	Some generic boards may continue to cycle heat on and heat off without locking out for several hours.
	UL & CSA Qualified	Both the Carrier Furnace and the HK42FZ034 are UL & CSA qualified. Using HK42FZ034 board maintains UL and CSA qualification of the furnace  	Even if a generic board is UL & CSA qualified, the furnace will not be qualified using the generic board as a replacement.

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## Filter-Driers

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	Features	F.A.P. Filter-Drier (built for Puron® applications)	Aftermarket Filter-Drier (built for R-410A applications)
System Performance	<b>Dessicant Mix</b> <i>(% of molecular sieve vs activated alumina)</i>	100% Molecular Sieve (XH-11) keeps refrigerant at low water concentrations and helps prevent freeze-up, rust and acid formation.	Varying mix of dessicants, often 75% Molecular Sieve and 25% Activated Alumina.
	<b>Molecular size of dessicant sieve</b>	The molecular size - XH11 - provides enough capacity to absorb all the initial water and water that migrates over time, but does not co-absorb refrigerant or oils. It also allows for minimal lubricant additive depletion.	The sizes of aftermarket filter-drier's molecular sieve often do not have enough water capacity and may not solve co-absorption issue.
	<b>Dirt filtration capability</b> <i>(dirt, copper/iron oxides, scale, flux, metal chips)</i>	Added filter cylinder and exclusive design of flipped filter, baffle plate and 100 mesh screen provide maximum filtration and greater contaminant catching capacity than core type driers.	Generic design of aftermarket filter-drier internal components often does not maximize dirt filtration capability.
	<b>Water capacity</b>	F.A.P. Drier is compatible with Puron refrigerant (minimal absorption and reaction with the R-32 component of Puron refrigerant); Minimizes lubricant breakdown into acids.	R-410A aftermarket filter driers often have too little drying agent resulting in much less water removing capacity.
System Reliability	<b>Corrosion resistance ability</b>	Filter design helps avoid hydrolysis of refrigerant and formation of acids, which helps product to meet stringent reliability requirements. Must be capable of withstanding 500 hours salt spray test per Carrier Engineering Requirement R-203.	Decreased molecular sieve of some aftermarket filter-driers may cause freeze-ups in the capillary tube or expansion valve. Also, hydrolysis of the refrigerant can occur, forming corrosive acids.
	<b>Construction</b>	Solid copper thin wall extended fittings. The dessicant mechanical property must remain constant (no erosion) for a minimum application life of 15 years.	Aftermarket driers often have non-extended connections which may lead to the damage of internal filter-drier components during soldering/brazing. Some aftermarket driers use copper plated connections vs solid copper design.



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# Genuine Carlyle® Remanufactured Compressors

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	Features	Genuine Carlyle Remanufactured Compressors	Aftermarket Rebuild Carlyle Substitutes
System Performance	Latest Design	Genuine Carlyle Compressors are remanufactured to the latest Carlyle Engineering standards. All engineering upgrades and improvements are applied to each Genuine Carlyle Reman.	Rebuilders do not have access to the latest Carlyle engineering upgrades. They repair or rebuild a failed compressor to an their known standard.
	Built to Rigid specifications	Compressor cores used for Genuine Carlyle compressors are dismantled to their smallest components. Critical wearing parts are automatically discarded, even if they are perfectly serviceable.  All other components are evaluated to determine if they meet current Carlyle standards. Deviations of 1/2000th of an inch or less may be tolerated for some components, for many others zero deviation is required or part is not used.	Many Rebuilders do not use instruments that can measure to within tolerances of 1/2000 th of an inch. Rebuilders routinely use many components that would be discarded by Carlyle.
	Matched Components	Genuine Carlyle Reciprocating compressor consists of at least 450 component parts routinely upgraded by Carlyle engineers, many of which must be matched to ensure optimal performance. For example, only high efficiency valve plates, pistons and motors are used in combination.	Many Rebuilders use salvage or imitation Carlyle parts. They may combine standard efficiency valve plates with high efficiency pistons.
	Gasket Materials	Genuine Carlyle compressors utilize coated metal gaskets, which maintain their integrity under higher operating pressures.	Many Rebuilders utilize older fiber or silicone based gaskets. These gaskets fail at significantly lower operating pressures than metal gaskets.
	Electric Motor	The rotor and stator iron of all cores are removed, tested and evaluated to determine if they meet Carlyle standards. The removal of the stator iron is difficult and Carlyle uses special techniques to ensure the stator is not damaged.	Some Rebuilders methods can damage the stator iron, which may not be detected by electrical or run testing but could result in electrical failure after several months of run time. Due to the complexity and the high risk of damage many rebuilders do not remove the stator iron.
	Oil Pump	Genuine Carlyle compressors are equipped with high flow oil pumps, which provide increased lubrication and operate at higher oil pressures. These pumps can also be used with POE and Alkylbenzene oils which make it possible to use HFC refrigerants in Carlyle compressors.	Aftermarket oil pumps may not provide the added lubrication or oil pressure to accommodate alternate refrigerants or synthetic oils.
System Reliability	Highest Available EER	Genuine Carlyle compressors are built to the highest efficiency standards in the industry. Efficiency is produced by the combination of Genuine Carlyle valve plates and motors.	Aftermarket Rebuilders may utilize parts salvaged from failed compressors or imitation Carlyle parts. They also rewind electrical motors in less than ideal conditions.
	Highest Quality Standard	Genuine Carlyle Compressors are remanufactured to the current original equipment manufacturing or OEM standards. More than 20,000 Carlyle compressors are remanufactured in the same plant by the same craftsmen that manufacture new Carlyle OEM compressors.	Some Rebuilders claim to "remanufacture to OEM standards", but these standards are not published and Rebuilders can only assume what they are. There are more than 150 rebuilders, that sell their products to contractors and wholesalers in North America. The larger rebuilders may build as many as 2000 Carlyle compressors, while the smaller ones may build a couple hundred annually.
	Carrier Warranty	Genuine Carlyle Compressors are backed by Carrier Corporation (RCD), which warrants each Re-manufactured compressor to be free of manufacturing defects for a period of one year.	Some Rebuilder's warranties are contingent on the compressor passing a teardown inspection. Repeat failures are almost never covered under the warranty.
Safety	UL Approval	Genuine Carlyle Compressors are UL listed and approved. Every Genuine Carlyle Service Compressor has been built to comply with internationally recognized safety standards, minimizing the risk of fire, electric shock, or other safety hazards. UL also conducts ongoing, unannounced audits at the Carlyle facility four times a year, ensuring the highest quality for the compressor. 	Rebuilt compressors may not have UL recognition. Use of these compressors in Carrier equipment will not maintain the UL rating of the equipment.

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## Ignitors

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	Features	Carrier LH33ZS004	Generic Ignitors
Quality	Design Life	Our Factory Authorized Ignitor is designed for at least 1700 hours over a 20 year life and 200,000 cycles.	Many generic ignitors last 4-7years and are tested at 100,000 cycles.
	CSA Specifications	Our Factory Authorized Ignitor is CSA certified to comply with ANSI Z21.20 Automatic Gas Ignition Systems and Components.	Some generic ignitors do not carry CSA certification.
Direct Replacement Claims	Specific Engineering Requirements	Factory Authorized Parts are designed, manufactured and tested to a set of specified engineering requirements including cycle tests, maximum operating temperatures and others-- all of which are documented for CSA certification.	Manufacturers of generic ignitors do not have access to Carrier's engineering requirements and testing and cannot substantiate that a generic ignitor is a direct replacement for a Factory Authorized Ignitor.
	Quality Consistency	Our Factory Authorized Ignitor is required to pass inspections by the certifying agency to assure that the required testing is being conducted and that there have been no unauthorized changes in the design and manufacture of the certified component.	A non-certified generic ignitor may not be built to established quality standards. They may use inferior materials without being audited.
Installation and Serviceability	Drop in Replacement	The Factory Authorized Ignitor was designed specifically for your unit. The Factory Authorized replacement is the exact ignitor, fit, form and function.	Many generic ignitors come with additional hardware that is needed to make the replacement fit. It is possible that the generic ignitor could come in close contact with the burners causing burner misalignment during installation.
	Technical Service	In the unlikely event of an issue during installation of a Factory Authorized ignitor, the technician can count on technical assistance from Carrier.	Carrier cannot assist with the installation of a generic ignitor in a Carrier branded unit.
Safety and Reliability	Terminal Pull	The Factory Authorized Ignitor is designed to withstand a 30lb pull on the molex plug so as not to dislodge terminations from leads.	A generic ignitor may or may not have terminal pull specifications.
	Crack Detection	The Factory Authorized Ignitors are tested against stringent crack detection requirements, including, Room Temperature Resistance, Visual, and Resistance with Vibration.	Generic suppliers design to their own requirements.
	Reliability	Designed and manufactured to reliability goal of 99.5% for the first year of operation and 94.5% for the design life.	Generic suppliers design to their own requirements.
	Delayed Ignition	Reduces the possibility of delayed ignition because of its strict engineering and reliability standards.	Some generic ignitors might use inferior materials which could cause delayed ignition and gas build up.
	UL listed and CSA Approved	The Carrier equipment is UL and CSA agency approved with the Factory Authorized Ignitor. Using the agency certified components maintains the equipment certification.	Even if a generic ignitor is UL & CSA qualified, the furnace will not remain qualified if a Factory Authorized ignitor is not used.



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# Replacement Coils

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	Features	F.A.P. Replacement Coils	Aftermarket Coil Replacement
System Performance	Product Design	F.A.P. Coils are manufactured to the same specifications as the OEM coils. They are built to current product designs and enhancements for optimum system performance.	Aftermarket coil manufacturers do not have access to Carrier drawings and the latest product enhancements.
	Fin and Tube Surfaces	F.A.P. Coils are built with the same coil surfaces as the factory for exact performance. Standard evaporator and condenser coils have copper or aluminum plate fins mechanically bonded to internally grooved tubes for maximum heat transfer capability. F.A.P. coils are also tested to comply with UL fatigue and burst strength requirements.	Aftermarket coil manufacturers do not have the fin dies that were used in the original coil design and manufacture. These aftermarket manufacturers would be approximating factory fin and tube surfaces. This alternate coil surface design may compromise the original equipment performance.
	AHRI System Performance	Since our F.A.P. coils are consistent in design and performance with OEM coils, the system performance ensured through the AHRI certification program is maintained.	Aftermarket coil manufacturers do not participate in Carrier's AHRI certification programs, therefore, their tube/fin design may not meet Carrier's certified performance rating.
System Reliability	Quality Construction	F.A.P. Coils are made of quality materials and manufactured to Carrier's rigid quality standards to maintain their durability and integrity under design operating conditions.	Aftermarket coil manufacturing quality standards vary by manufacturer, possibly resulting in greater failure rates.
	Leak & Pressure Testing	F.A.P. Coils undergo stringent quality testing, including leak tests at 150 psig (1034 kPa) and pressure tests at 450 psig (3103 kPa). Testing requirements may vary by product and refrigerant.	Aftermarket coil manufacturers leak and pressure test using their own operating procedures. These procedures may not meet the standards specified in the product UL file.
	Optional Coil Coatings	Optional pre-coated, copper-fin and e-coated coils are available depending on the specific application. Coatings are corrosion tested per Carrier procedures and criteria to ensure proper application selection. Optional e-coated aluminum-fin coils have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. The e-coating process ensures complete coil encapsulation.	Aftermarket coil coating and corrosion test procedures and criteria vary by aftermarket manufacturer, meaning heat transfer efficiency and performance cannot be guaranteed. Coating methods used by aftermarket manufacturers may be inferior in durability and uniformity.
	Carrier Warranty	F.A.P. coils are backed by Carrier's Replacement Components warranty, which warrants each F.A.P. coil to be free from defects in material and workmanship for a period of one year from date of shipment.	Many aftermarket manufacturers offer only limited product warranties.
Safety	UL Approved	F.A.P. coils are UL listed and approved. Every F.A.P. coil is built to comply with internationally recognized safety standards, minimizing the risk of premature failure. UL also conducts ongoing, unannounced audits at the Carrier facility four times a year, ensuring the highest quality standards for our F.A.P. coils. 	Aftermarket coils are not listed in the Carrier product UL file. The UL listing on the equipment is voided when an aftermarket coil is installed.

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## Thermostatic Expansion Valves

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	Features	F.A.P. TXVs Thermostatic Expansion Valves	Aftermarket TXVs Thermostatic Expansion Valves
System Performance	Balance port/Pressure drop across valve	Has balanced port design and allows TXV to be independent of high ambient conditions and reduces the risk of oversized valve.	Often have a fixed orifice design for majority of air conditioning valves. Fixed orifice valves are not as effective at high ambient conditions and may not handle reduced load.
	Bleed port and /or rapid pressure balancer	Majority of F.A.P. TXVs have a bleed port (sometimes rapid pressure balancer) ranging from 5% to 40%, which in addition to equalization provides 5% to 40% extra capacity.	Aftermarket valves generally do not have bleed ports or rapid pressure balancers in their standard offering. If bleed port option exists, it is often difficult to match correct percentage of bleed to F.A.P. design. Aftermarket valves generally do not have bleed port/rapid pressure balancer feature.
	Superheat Adjustment	Majority of F.A.P. TXVs are non-adjustable - set to special superheat setting to keep evaporator coil completely refrigerated under Carrier Corporation design conditions.	Adjustable valve with "aftermarket" setting can create load fluctuations. Factory superheat setting does not normally match the setting of the F.A.P. valve.
System Reliability	System charging	Proper subcooling is specified for CBP equipment and usually is a part of data plate and technical specifications. Sizing of the valve reflect unit design to provide adequate amount of subcooling.	Aftermarket valves generally do not consider specifics of CBP units design and use "standard" values for pressure drop in valve selections.
	Internal valve design	Very stringent internal leakage and external leakage requirements. Valve to satisfy reliability requirements per Carrier Reliability Requirement CC14DC511	Internal valve design for aftermarket valves is according to valve manufacturer's specifications only, not according to CBP system design
Installation and Serviceability	Connections	Always matches CBP system design requirements. Majority of valves have extended connections which makes brazing much easier.	Generally use only one set of standard connections for different valves. If available, special connections are usually non-stock and available with additional lead time.
	Built-in check valve	Presence of built in check valve assures bi-flow capability.	Aftermarket valves usually do not have built in check valve.
	Superheat Adjustment	Preset - no adjustable stems on product	Adjustable stem can add 1"-2" to the height of the valve which could be a problem in a limited space.
Safety	Extended connections	Reduce risk of damaging valve's interior parts and thermostatic element with a torch flame.	Not all aftermarket valves have extended connections.
	Design life	100,000 cycles; 15 years.	Different valve manufacturers specify their own design life requirements

