

*Precedent™. THE FUTURE OF FUEL EFFICIENCY.*



**PRECEDENT**

## *All-New Diesel-Direct Electric Architecture:*

# *DESIGNED TO OUTPERFORM EVERYTHING*

The Precedent platform utilizes an all-new DDE (Diesel Direct Electric) architecture to drive optimum efficiencies and double-digit fuel savings across real-world applications. It's a smarter approach, with the expressed goal of making a lasting difference on your budget.

In addition to brand-new technologies, there are also some familiar components residing within the Precedent architecture. The well-proven X-430 reciprocating compressor provides the performance and reliability Thermo King is famous for and, when combined with the new architecture, delivers better operating efficiencies than ever before.

# ARCHITECTURE

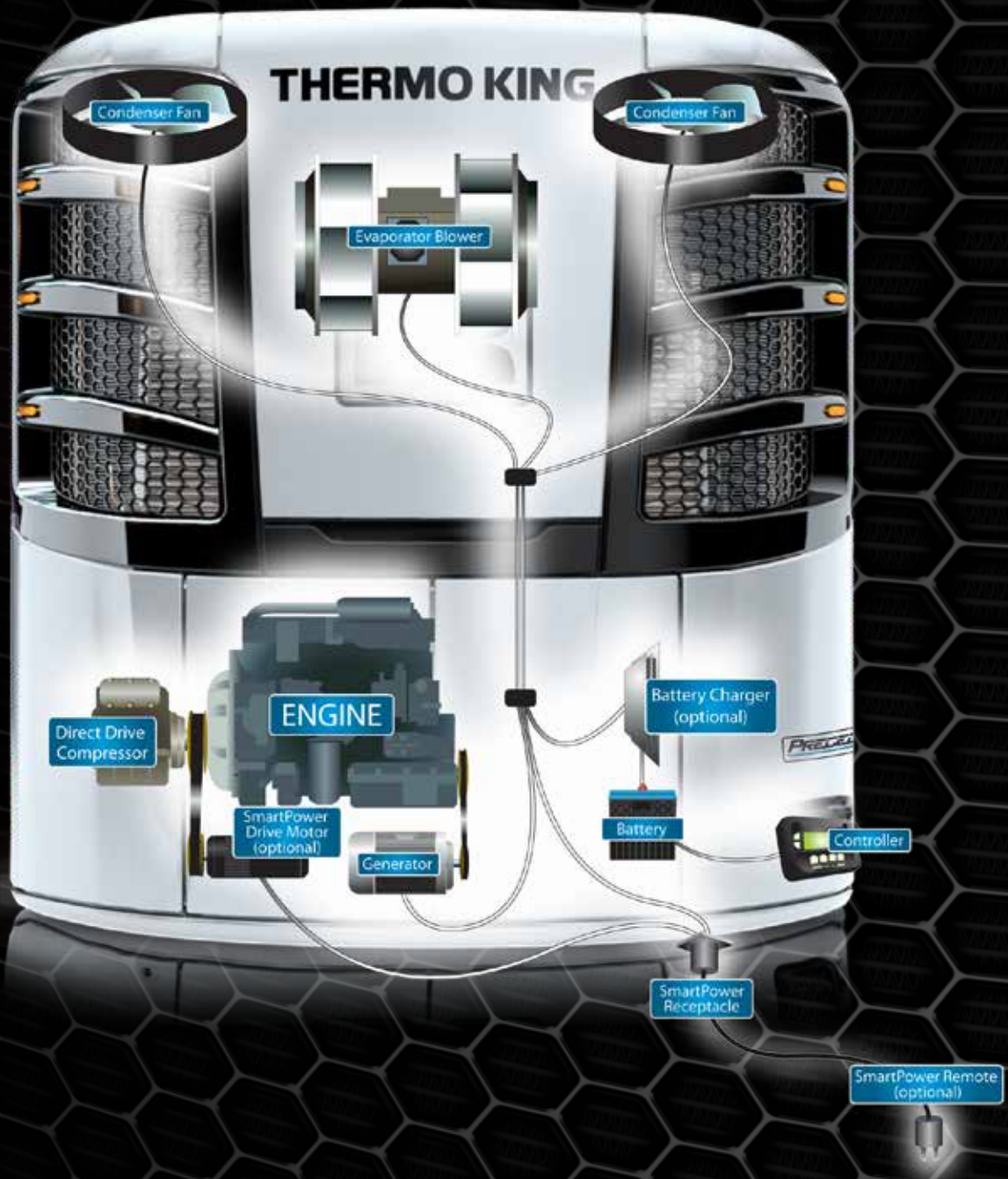


## *Why Diesel Direct Electric?*

Diesel-electrical vs. diesel-mechanical. It was the central debate when deciding Precedent's architectural framework. Instead of choosing one, we chose the best of both.

- ▶ Our new platform utilizes DDE architecture to drive optimum efficiencies and double-digit fuel savings.
- ▶ DDE ensures minimal energy loss and maximized fuel efficiency and reliability when compared to an all-electrical solution.





# ARCHITECTURE

*Precedent:*

*EVERY COMPONENT ENGINEERED  
FOR MAXIMUM PERFORMANCE*

## *Evaporator Blower Assembly*

Precedent's evaporator assembly moves air more efficiently than ever. Leveraging the Smooth Air™ blower system, the airfoil blade profile and contoured air inlets deliver maximum airflow with minimal power draw. We used compression molding to produce both the evaporator and condenser side sections using SMC material and insulation with a 6.7/inch R-value to isolate the condenser and evaporator airflow sections. The bulkhead is structural, allowing for the direct mounting of hardware to cut system weight. All together, it delivers:

- ▶ High speed airflow during low speed engine operation for optimal protection of fresh loads and improved fuel efficiency
- ▶ An easily removable access panel enables service from front of unit
- ▶ 30% larger coil area for improved efficiency and faster pulldown







## *Condenser System*

With two very large coils - on both road and curb sides - Precedent's condenser system could be called massive. It could also be called smarter, as both brazed aluminum coils are curved to maximize surface area and improve airflow across the entire structure.

- ▶ More than double the surface area of previous units means faster pull down and more efficient operation
- ▶ Micro channel design improves airflow while consuming less engine power
- ▶ Curb side radiator provides independent engine cooling
- ▶ Independent fan operation for greater efficiency



# ENGINE

## *Engine Choices for Precedent:*

### *EMISSIONS COMPLIANCE PAIRED WITH ENHANCED PERFORMANCE*

At Thermo King, we approached the 2013 emissions requirement as an opportunity to flex our ingenuity. And we started by selecting and developing engine choices that comply with regulations without negatively impacting fuel efficiency. But we didn't stop there. Our evergreen solution meets the strictest requirements of the 2013 emissions regulation.\* Meaning customers can select the S-Series and not have to invest in costly compliance technologies down the road.

For customers seeking a lower first cost option, Precedent is also available in the C-Series. This build offers improved efficiencies while also maintaining our reputation for superior reliability.

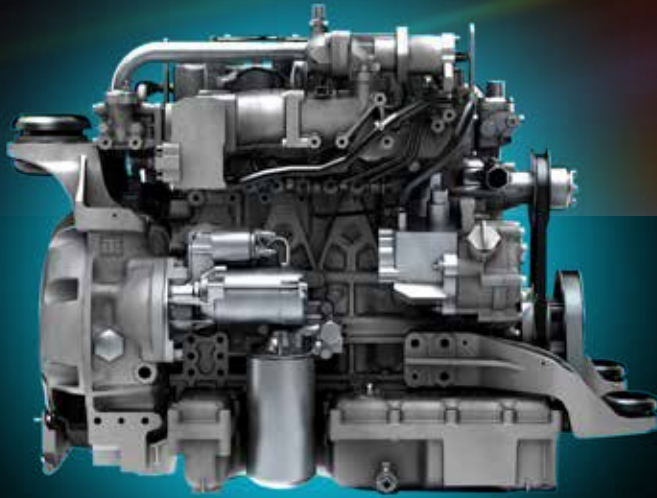




\* S-Series models, which include the S-600, S-700 and S-600M, already meet Tier 4 final emissions certification by the Environmental Protection Agency (EPA) and California Air Resources Board (CARB). Further, they comply with CARB's Ultra-Low-Emission Transport Refrigeration Unit In-Use Performance Standards (ULETRU).

# PRECEDENT S-600 AND S-700

The Precedent S-Series features a >25 horsepower engine with emission control technologies that minimize fuel consumption and deliver lifelong emissions compliance.



## S-SERIES

The S-Series is an evergreen\* solution that delivers double-digit fuel efficiency gains without the uncertainty of future compliance.

### *No Diesel Particulate Filter (DPF)*

Developed to achieve emissions compliance, the Precedent engine is notable for what it does not have: a Diesel Particulate Filter (DPF). Because of the way a transport refrigeration unit (TRU) runs, with its frequent stops/starts, light engine loads and low exhaust temperatures, using a DPF to achieve compliance is problematic. When we also considered the negative impact on engine life and fuel efficiency that a DPF brings, it was clear that a DPF had no place in the Precedent platform.

To control emissions, we chose proven technologies that are ideally suited to TRU operation. The high-

pressure common rail fuel delivery system controls particulate matter within the cylinder while improving efficiency and performance.

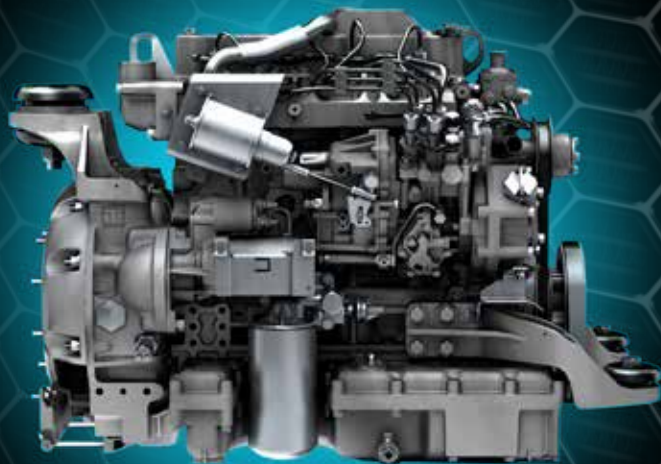
Our “EGR Light” system recirculates a small amount of exhaust back into the combustion chamber in certain load conditions to help control NO<sub>x</sub> emissions. A unique “fail closed” design assures continued peak engine performance if a failure occurs, ensuring load integrity is maintained. Additionally, the Diesel Oxidation Catalyst (DOC) provides maintenance-free performance for the life of the unit.



# ENGINE

## PRECEDENT C-600

The lower-horsepower engine in the C-600 takes full advantage of the architecture of Precedent and provides the pull-down performance appropriate for many applications. This <25 horsepower engine uses mechanical fuel injection and other enhancements to meet emissions requirements while delivering reliable, efficient cooling power for your business.



## C-SERIES

Utilizing an advanced control platform, the C-series intelligently monitors engine performance and provides significant gains in fuel efficiency.

\* S-Series models, which include the S-600, S-700 and S-600M, already meet Tier 4 final emissions certification by the Environmental Protection Agency (EPA) and California Air Resources Board (CARB). Further, they comply with CARB's Ultra-Low-Emission Transport Refrigeration Unit In-Use Performance Standards (ULETRU).

# EXPLORE THE COMPONENTS THAT PUT PRECEDENT IN A CLASS BY ITSELF.

## *Microchannel Condenser Coils*

Unique curved structure and more than double the surface area ensures no “dead spots” to compromise your operations.

## *Common Rail Fuel Injection\**

Provides a breakthrough solution that meets all known emissions standards without the need for an expensive aftertreatment system.

## *Appearance Options*

Options include chrome grills & accessories and LED lighting for a custom look both day and night.

## *Proven Diesel Direct Electric*

Ensures minimal energy loss (as opposed to an all-electrical solution) while maximizing fuel efficiency and reliability.

## *Reciprocating Compressor*

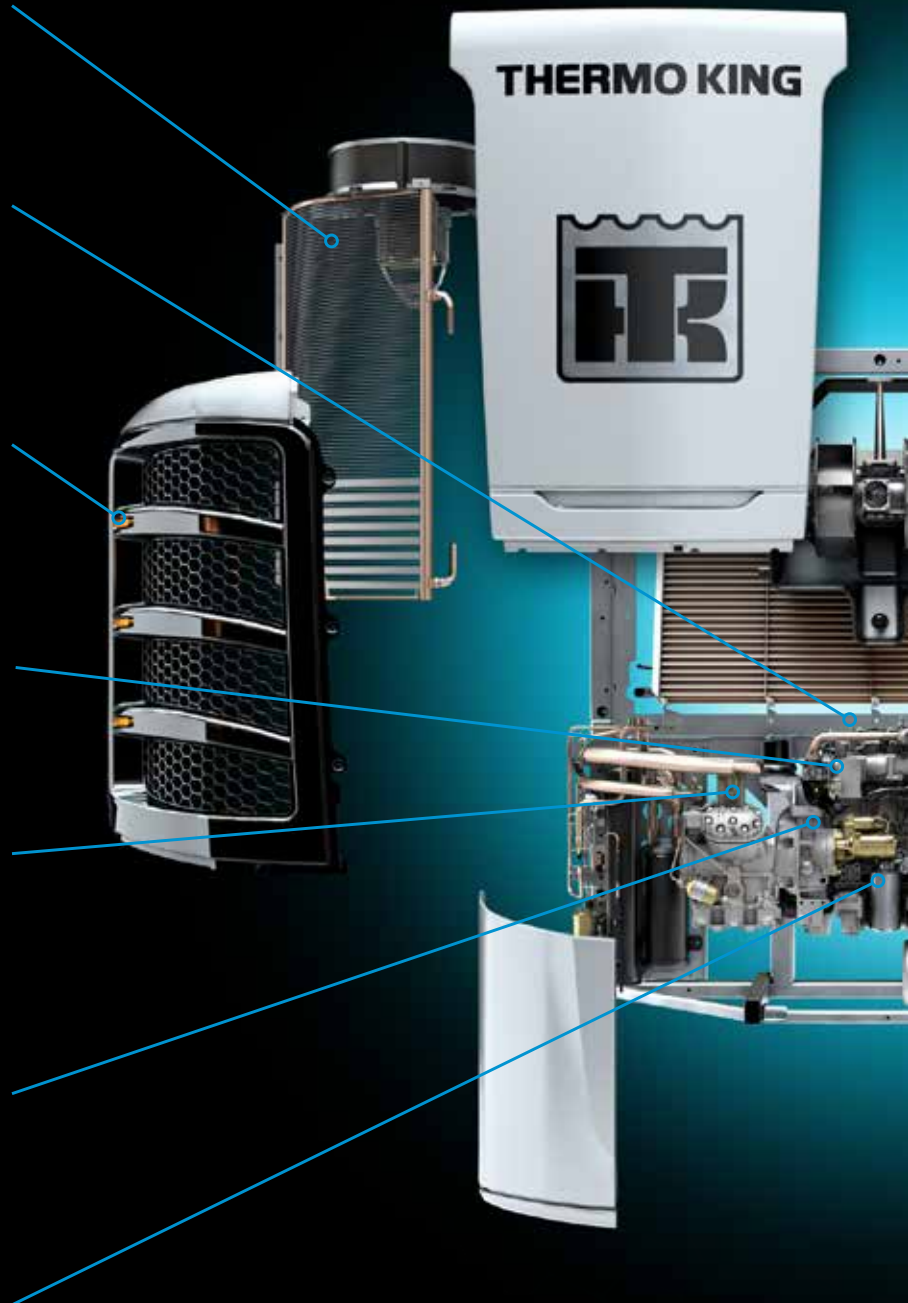
Founded on a nearly 40-year operational legacy for unmatched serviceability and substantial efficiencies.

## *Testing*

Precedent has undergone strenuous testing for three years to ensure optimal performance under all conditions.

## *Serviceability*

Filtration systems are built around a 3,000 hour expected maintenance interval with improved accessibility.







### *Condenser Fans*

Smart induction motors operate electronically-driven fans based on conditions and needs of the refrigeration system.

### *Evaporator System*

Utilizes dual-speed induction fan to maximize airflow at high and low engine speeds.

### *Diesel Oxidation Catalyst\**

Helps deliver industry-leading performance in reduction of hydrocarbons and carbon monoxide emissions.

### *Belt Life*

Each of Precedent's belts is made of high-grade engineered rubber and designed to last 12,000 hours.

### *Exhaust Gas Recirculation\**

Light solution meets government NOx emission standards without penalizing fuel efficiency.

### *Battery Charger*

An option to our traditional alternator, the electronically-driven battery charger provides superior longevity and reliability.

### *Generator*

Permanent Magnet Generator provides smaller, lighter and more reliable package for improved performance.

### *SmartPower™*

Offers superior temperature control in electric standby situations. Available in both standard and high-output versions.

\*Exclusive to the Precedent S-Series



*Not Just a New Piece of Machinery:*  
**BACKED BY EVERYTHING  
THERMO KING STANDS FOR**

*Thermo King Peace-of-Mind: Standard with Precedent*

The Precedent platform represents the very latest in transport refrigeration technology, but it's backed by something that can only be built up slowly over time: Thermo King peace-of-mind. Precedent takes everything we've learned since we invented transport refrigeration back in 1938 and gives you industry-leading performance and the quality and reliability that Thermo King is known for. And because it's backed by the Thermo King warranty, you can rest easy knowing we've got you and your business covered, day in and day out.





## *Total Support from the Thermo King Dealer Network*

Every Precedent unit is backed by the Thermo King Dealer Network, with over 200 locations across North America. Each location is staffed with expert technicians who are factory-certified to service Precedent, and each location is stocked with genuine Thermo King parts for both the Precedent platform as well as older units to get you back out on the road as soon as possible.



# PEACE OF MIND



## *We Tested Everything. Again and Again.*

In order to ensure that Precedent stands up to the demands of the road, it underwent exhaustive testing, both in our state-of-the-art testing facilities and out on the highway. We put Precedent through everything, from pounding vibration tests to demanding applications in extreme temperatures. All together, we performed over 800,000 hours of rigorous testing to make sure every Precedent unit stays on the road for the long haul.





## *New Thermo Gard™ Assurance*

**CUSTOMIZABLE FLEET MANAGEMENT  
OPTIONS FOR YOUR BUSINESS  
ARE NOW 5-7% LESS THAN EVER BEFORE\***

*Thermo King SVC's new Thermo Gard Assurance guaranteed maintenance program includes set programs and a wide variety of coverage options to fit the needs of your business. And because of Precedent's improved reliability and lower maintenance costs, peace-of-mind is now less expensive than ever!*



\*Compared to similar guaranteed maintenance program costs for SB trailer units.





### *Optimize Efficiency*

Get expert service at over 200 Thermo King dealer locations across North America from factory-trained technicians using Genuine Thermo King parts.

### *Maximize Uptime*

Preventive maintenance done during regular inspections prevents costly breakdowns before they happen.

### *Reduce Costs*

Cut operational costs by reducing emergency service expenses. Minimize maintenance costs with regularly scheduled maintenance intervals.

### *Level Yearly/Monthly Maintenance Costs*

Consistent maintenance costs throughout the year make budgeting simpler and help avoid surprises.

### *Utilize Diagnostic Tools*

Only Thermo King dealers have the new diagnostic tools needed to service Precedent units properly.

### *Rely on Certified Precedent Service*

Only certified Thermo King technicians have the training and certification to maintain and service Precedent units.

### *Leverage Reporting Data*

Comprehensive data on the new Precedent units is only available from Thermo King SVC.

**DIMENSIONS:**  
S-600, S-700, C-600



# SPECIFICATIONS

## S-600

**Refrigeration Capacity** (System net cooling capacity at 100°F ambient and high speed engine operation)

	Engine Power w/ETV		Electric Power		Electric Power (HO)	
	BTU/hr	Watts	BTU/hr	Watts	BTU/hr	Watts
35°F	60,000	17,584	30,000	8,792	57,000	16,705
0°F	32,000	9,378	22,000	6,448	34,000	9,964
-20°F	20,000	5,861	15,000	4,396	20,000	5,861

**Heating Capacity** (System net heating capacity at 35/0°F ambient)

BTU/hr	Engine Power
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59,500

**Airflow Capacity**

Volume at 0 Pa static pressure	3,300 ft <sup>3</sup> /min
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**Engine:** four cylinder, direct injection, liquid cooled (Compliant with Final Tier 4 EPA Emissions Regulations Standards)

Model	TK488CR
Hp Rating at 2,050 RPM	33.0
Oil Capacity	12 qt
Maintenance Interval	3,000 hrs/4,000 hrs

**Compressor:** lightweight aluminum alloy body, heads and sump

Model	X430L
Displacement	30.0 in <sup>3</sup>

**Refrigerant:** (Zero Ozone Depletion Potential (ODP), internationally approved)

**R404A**

Charge	14.5 lbs
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<b>System Weight</b>	<b>1872 lbs</b>
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50 gallon fuel tank w/bracket	76 lbs
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# S-700

**Refrigeration Capacity** (System net cooling capacity at 100°F ambient and high speed engine operation)

	Engine Power w/ETV		Electric Power	
	BTU/hr	Watts	BTU/hr	Watts
35°F	68,000	19,929	50,000	14,654
0°F	37,000	10,844	35,000	10,257
-20°F	25,000	7,327	25,000	7,327

**Heating Capacity** (System net heating capacity at 35/0°F ambient)

BTU/hr	72,000
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**Airflow Capacity**

Volume at 0 Pa static pressure	3,300 ft <sup>3</sup> /min
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**Engine:** four cylinder, direct injection, liquid cooled (Compliant with Final Tier 4 EPA Emissions Regulations Standards)

Model	TK488CRH
Hp Rating at 2,600 RPM	35.0
Oil Capacity	12 qt
Maintenance Interval	3,000 hrs/4,000 hrs

**Compressor:** lightweight aluminum alloy body, heads and sump

Model	X430L
Displacement	30.0 in <sup>3</sup>

**Refrigerant:** (Zero Ozone Depletion Potential (ODP), internationally approved)

Charge	14.5 lbs
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**System Weight**

50 gallon fuel tank w/bracket	1872 lbs
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# C-600

**Refrigeration Capacity** (System net cooling capacity at 100°F ambient and high speed engine operation)

	Engine Power w/ETV		Electric Power	
	BTU/hr	Watts	BTU/hr	Watts
35°F	59,000	16,998	51,000	14,947
0°F	34,000	9,964	34,000	9,964
-20°F	21,000	6,154	21,000	6,154

**Heating Capacity** (System net heating capacity at 35/0°F ambient)

BTU/hr	50,000
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**Airflow Capacity**

Volume at 0 Pa static pressure	3,350 ft <sup>3</sup> /min
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**Engine:** four cylinder, direct injection, liquid cooled (Compliant with Final Tier 4 EPA Emissions Regulations Standards)

Model	TK486V25
Hp Rating at 2200 RPM	24.0
Oil Capacity	12 qt
Maintenance Interval	3,000 hrs

**Compressor:** lightweight aluminum alloy body, heads and sump

Model	X430L
Displacement	30.0 in <sup>3</sup>

**Refrigerant:** (Zero Ozone Depletion Potential (ODP), internationally approved)

Charge	14.5 lbs
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**System Weight**

50 gallon fuel tank w/bracket	1863 lbs
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### *Precedent Options:*

## *CUSTOMIZABLE FOR YOUR BUSINESS*

For over 75 years, Thermo King has offered the most choices to help your business get the right solution for your specific needs. Precedent is no exception.

The new platform provides a range of engine options and configurations to suit any application. And with a full array of available options, you can customize your unit exactly the way you want.

### *Severe Duty Package*

If your routes take you on unpaved roads or you need a longer service interval, the Severe Duty Package may be for you. The package delivers 3000-hour intervals under extreme conditions and extends the interval to 4000 hours under normal operating conditions. The package includes:

- ▶ 4000-hour air, oil and fuel filtration
- ▶ HMI cover
- ▶ Synthetic oil

### *Supplemental Power Kit*

Some operations demand powered trailer accessories, such as additional interior lighting, power lift gates, air curtains and more. These accessories place a high load on batteries. This kit provides an additional 12 volts of power dedicated to charging the accessory batteries. Available for S-Series units only. Package includes:

- ▶ 30 amp battery charger for unit operation
- ▶ 120 amp alternator for accessory power





# OPTIONS

## *Arctic Package*

Cold weather starts place added demands on your engine, and extended down time in cold weather causes additional problems. The Arctic Package improves cold weather starts and minimizes wear associated with cold weather operation.

This package includes:

- ▶ Block heater
- ▶ Electric fuel heater
- ▶ Synthetic oil

## *Appearance Options*

Form follows function, but that doesn't mean you can't make the form more attractive. To make Precedent look even better, choose from several options to make your unit stand out from the crowd.

- ▶ **LED Lighting Kit** includes six sets of lights that stand out day or night along with premium Thermo King crest ornament
- ▶ **Chrome Package** adds the look of shiny chrome to the grills and belly band and also includes the premium Thermo King crest ornament and silver lettering on top of the unit

## *Battery Charger*

Designed specifically for use in Precedent, our battery charger delivers 30 amps continuously up to an operating condition of 70°C. In operations above 70°C, the charger will derate to allow for continued operation of the unit and to prevent damage to the charger itself. The charger also extends the unit's battery life by combining a multi-stage charge cycle with temperature compensation based on ambient conditions around the battery.

The charger also offers diagnostic data to the controller and a visual indicator to the operator, allowing for proactive maintenance to the system. Other benefits include a gain in fuel efficiency and coverage under the Thermo King 4-year major component warranty.



*Precedent Options:*

## *CUSTOMIZABLE FOR YOUR BUSINESS*

### *SmartPower™ Electric Standby Packages*

Having the ability to run off shore power can be an important consideration for some operations. Thermo King understands this and has expanded the SmartPower options for Precedent models. Our system offers you the additional flexibility of selecting the voltage and capacity option that best fits your needs. Regardless of which SmartPower option you select, all components are included in our major component warranty coverage.

- ▶ Our Standard SmartPower system maintains setpoint within the trailer and can be ordered in either 230V 3-phase or 460V 3-phase
- ▶ Our High Output (HO) Smart Power option provides the capacity to pull the trailer to temperature on shore power and is available in 460V 3-phase
- ▶ Multiple receptacle options are available for Precedent — choose to have the receptacle placed on the trailer nose, below the unit (standard location) or remotely located toward the rear of the trailer in either a Pin and Sleeve or Twistlok configuration





# OPTIONS

## *SmartPower™ Prep Package*

Many customers elect to purchase SmartPower initially, thinking the need for it may arise in the future. For customers who want the flexibility and comfort of knowing their units have the ability to meet changing market conditions, we offer the SmartPower Prep Package. This package allows you to upgrade units post-purchase to accept the SmartPower electric standby system. At any time post-purchase, any Thermo King dealer can convert your unit from non-shore power equipped to shore power equipped and operational in less than a day. For flexibility in asset utilization, the SmartPower prep package may be the perfect addition to Precedent units.

## *Fresh Air Exchange*

The Fresh Air Exchange offers the ability to draw exterior air into the trailer and exhaust interior air during unit operation. This option is intended for loads that require fresh air during transportation.

## *Fuel Tanks and Sensors*

Precedent offers a range of fuel tank options – all of which are available with our Ultra Sonic Fuel Level Sensor. In addition, each tank has a visual site gauge for quick fuel level confirmation. For those who prefer a tank without the Ultra Sonic Fuel Level Sensor, we offer two tanks with traditional float-style gauges.

## *65 Amp Alternator*

The 65 amp alternator replaces the standard alternator and provides an additional 12 volts of charging capacity for the reefer unit battery. Available for S-Series units only.

*For Additional Options See Checklist on Page 27*



# OPTIONS

## *Precedent Options:*

## *CUSTOMIZABLE FOR YOUR BUSINESS*

### *PrimAir™ Air Management Products*

PrimAir chutes and return air bulkheads help deliver optimal airflow and even temperature distribution throughout the trailer. These bulkheads and chutes have been designed and optimized to work with Precedent.

- ▶ New PrimAir Return Air Bulkheads are designed for the lowest pressure drop of any one-piece bulkhead for lower fuel consumption. Narrower and lighter than current models for easier handling and installation. Made from food-safe, durable, high-density polyethylene for years of reliable service.
- ▶ New PrimAir Chutes feature unique, integrated airflow management outlets along length of chute for even temperature distribution within the trailer. The mesh, ramped end prevents teardown during loading to reduce possibility of damage. Made from the strongest vinyl and polyethylene material of any chute on the market for maximum durability.

### *CargoLink™ Wireless Sensors*

The CargoLink wireless sensor system offers enhanced load protection while saving money on installation and reducing maintenance. The wireless door sensors improve efficiency and reduce temperature swings inside the trailer by shutting down the unit while doors are open. The wireless fuel sensors provide fuel data to the unit or to TrackKing telematics, whether the unit is on or off, for improved visibility and security. This system has been engineered for durability and reliability in the demanding transport refrigeration environment with an IP-69k rated sensor enclosure, a 500' signal range, UV-protected materials, and smart two-way communication.





*Now available for Precedent:*

## *AN INTEGRATED, STATE-OF-THE-ART SOLUTION FOR CARGO PROTECTION AND IMPROVED ASSET UTILIZATION.*

### *Cargo Protection*

- ▶ Cargo integrity with tight temperature management
- ▶ Fewer rejected loads and reduced liability
- ▶ Quick response from Thermo King dealers leading to fewer unit breakdowns
- ▶ Improved traceability to maintain food safety standards

### *Fuel Management*

- ▶ Lower fuel consumption by setting accurate setpoints and modes remotely
- ▶ Reduced environmental impact due to less reefer idling
- ▶ Improved carbon footprint
- ▶ Real-time low fuel level alarms
- ▶ Accurate mode settings increase unit off-time and save fuel

### *Asset Up-Time*

- ▶ On-time delivery and improved customer responsiveness
- ▶ Increased productivity and profitability with information on asset utilization
- ▶ Real-time alarms to prevent breakdowns and guide drivers to nearest Thermo King dealer

### *Asset Security*

- ▶ Visibility of sudden fuel drops
- ▶ Be notified of unauthorized door openings
- ▶ Monitor and control unauthorized vehicle movements
- ▶ Receive notifications of fuel levels and low battery voltage
- ▶ Prevention of theft
- ▶ Real-time event notifications of cargo and fuel alarms to protect assets

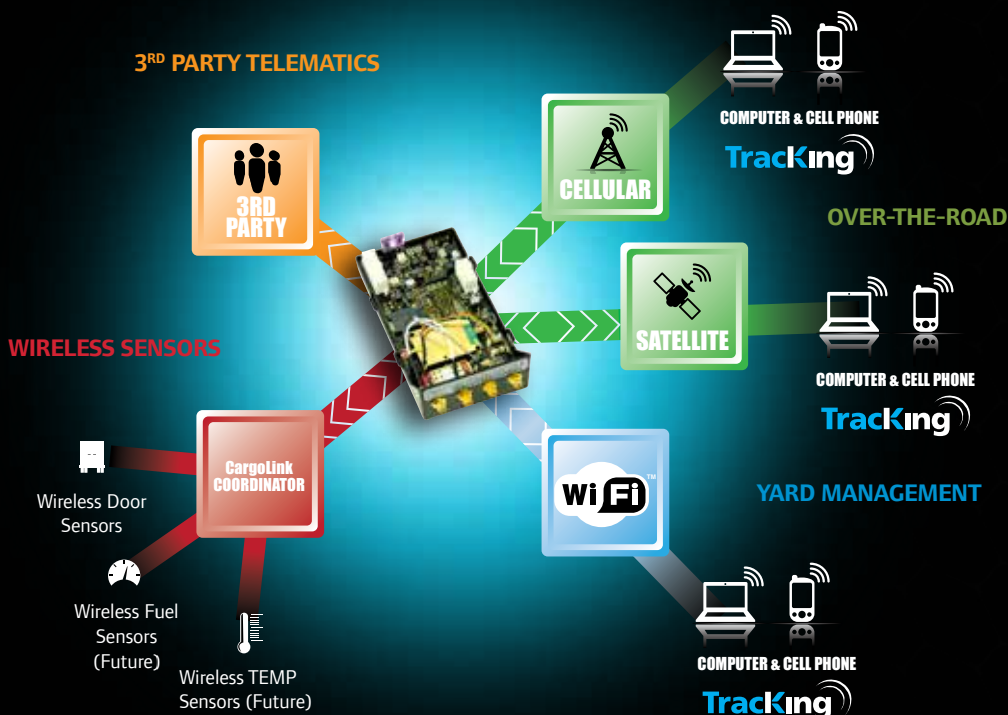
# A NEXT GENERATION, EMBEDDED TELEMATICS COMMUNICATION PLATFORM



Thermo King's REB embedded telematics communication platform offers fleet owners the ability to monitor their refrigerated trailers using multi-mode technology. Embedded in the SR-4 controller, the REB platform integrates with Thermo King's web-based TrackKing application, enabling customers to manage their refrigerated fleets both over-the-road and in the yard.

The REB platform also enables multiple remote features over-the-air using TrackKing, like OptiSet Plus and flashloading of the SR-4 controller. Fleet owners can remotely upgrade multiple refrigeration units simultaneously, saving time and lowering maintenance costs.

Multiple wireless technologies converge on this robust platform, making it "future proof." Cellular, Wi-Fi and GPS capabilities offer fleet owners multiple communication options as well as a way to leverage their existing Wi-Fi infrastructure.







## OPTIONS CHECKLIST:

### SmartPower Electric Standby:

- ☐ Standard
- ☐ High-Output
- ☐ SmartPower Prep Package
- ☐ SmartPower Remote Receptacle
- ☐ Fresh Air Exchange
- ☐ Severe Duty Package
- ☐ Supplemental Power Kit\*
- ☐ Arctic Package

### Appearance Packages:

- ☐ LED Lighting Kit
- ☐ Chrome Package

- ☐ Battery Charger
- ☐ 65 Amp Alternator\*

### Fuel Tanks with Ultra Sonic

#### Fuel Level Sensor (USFLS):

- ☐ 30 Gallon (also available w/o USFLS)
- ☐ 50 Gallon (also available w/o USFLS)
- ☐ 75 Gallon
- ☐ Anti-Siphon Device

- ☐ Heat Shield

### Batteries:

- ☐ EON
- ☐ ReliaMax

### TracKing Telematics:

- ☐ TracKing – Satellite
- ☐ TracKing – Cellular
- ☐ I-box Interface

### Remote Status Lights:

- ☐ Triple Combo
- ☐ Fuel Combo
- ☐ Status Only

### Door Switches:

- ☐ CargoLink™ Wireless Door Switches
- ☐ Wired Door Switches

- ☐ CargoWatch™ Sensor Kits

### Air Management:

- ☐ PrimAir™ Return Air Bulkheads
- ☐ PrimAir™ Chutes

\*Not available on C-600 models