THERMO KING

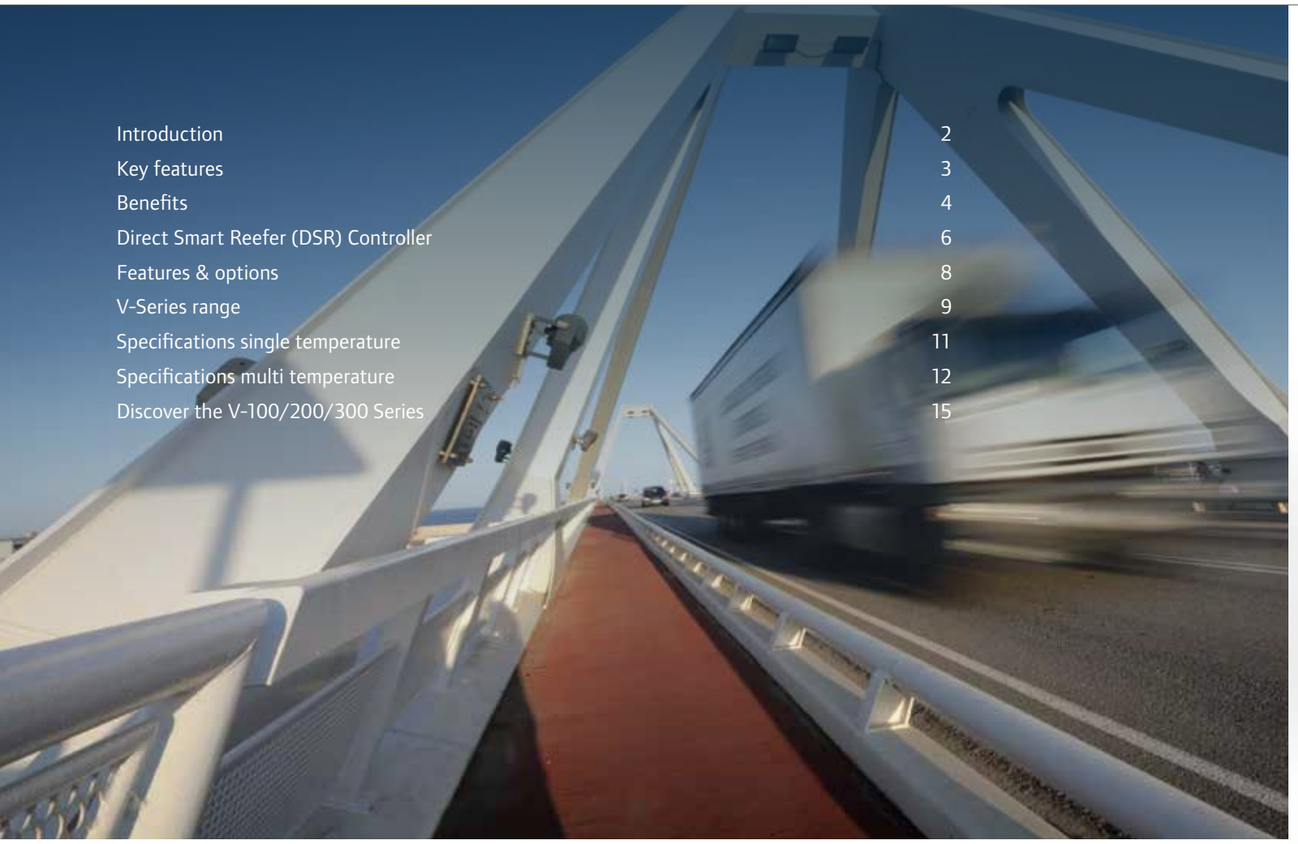
V-Series for Medium/Large Trucks

High performance non-diesel range

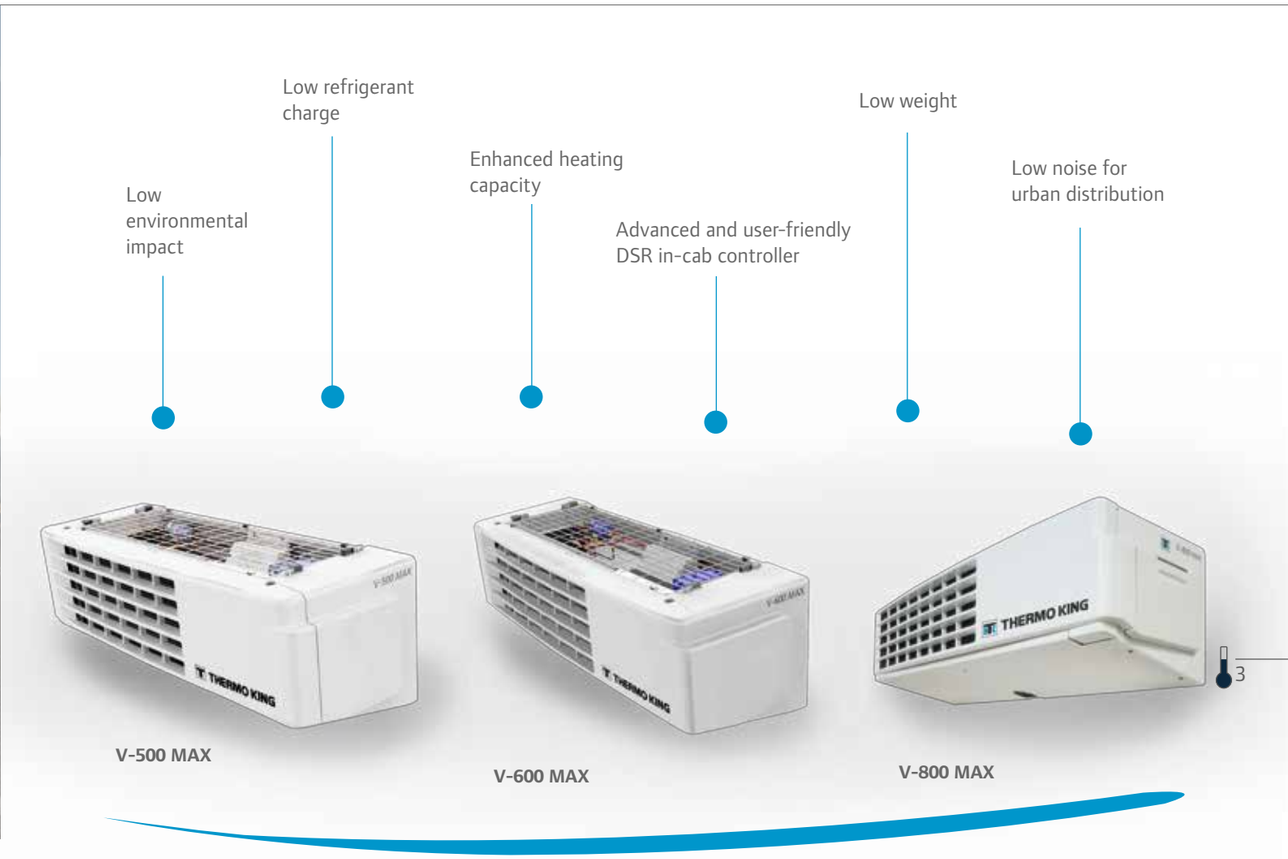
Exceptional performance, fresh and deep frozen
Superior heating performance
User-friendly in-cab DSR controller
High reliability, easy to maintain and service
Single and multi temperature solutions

Ingersoll Rand

CONTENT



Key features

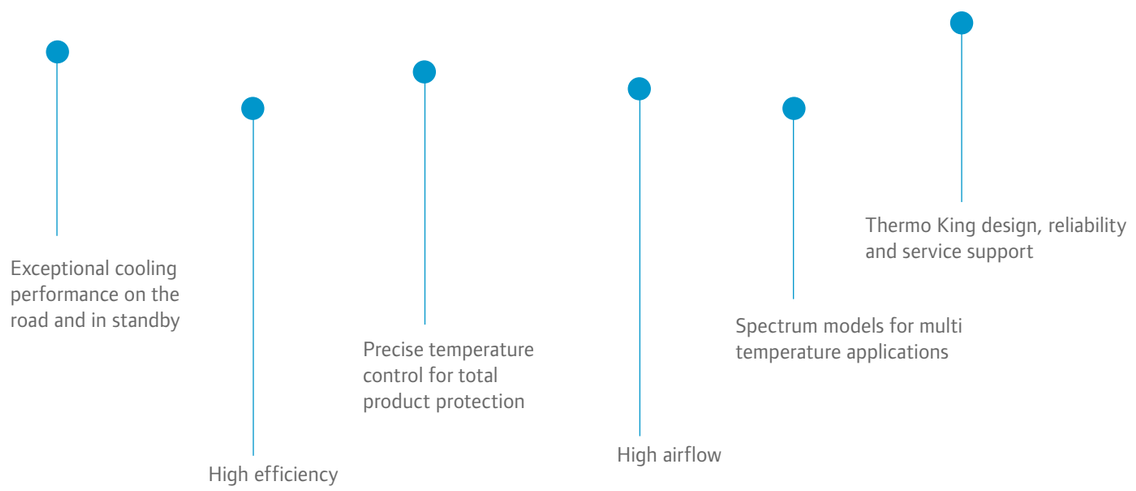


V-Series for Medium/Large Trucks

Introduction

The V-500, 600 and 800 Series offer a direct drive, non-diesel temperature control solution for operators of medium and large trucks in the 13 to 42 m^3 (frozen) and 30 to 54 m^3 (fresh) ranges.

For multi temperature applications, the V-500 and 800 Spectrum models are available. The range has minimal environmental impact as the refrigeration unit compressor is driven by the vehicle engine, offering exceptionally low noise and low emissions. All V-Series models share many common components, including the Direct Smart Reefer (DSR) controller.



Benefits

V-500 SERIES

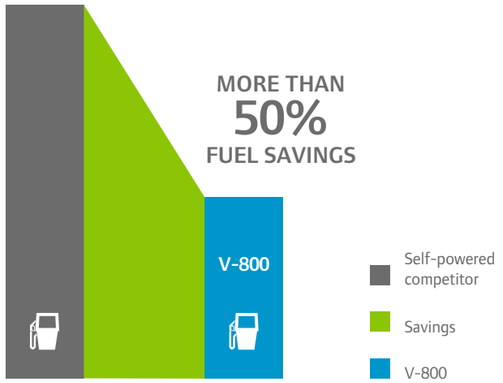
The V-500 Series comprises two-piece split units delivering top performance, reliability and ease-of-use. A small all-aluminium condenser coil and a more compact and lighter system bring significant life cycle benefits. Decreased refrigerant volume reduces expense and allows faster charging of the system, resulting in lower labour costs and less environmental impact. The range has been designed to ease maintenance and service operations and improve aesthetic effect with plastic skins increasing resistance to corrosion.

V-600 SERIES

The V-600 Series is a more efficient range of vehicle-powered temperature control units. This results in a significantly lower environmental impact. The V-600 Series delivers increased performance more efficiently. A more efficient evaporator and an all-aluminium condenser coil bring significant life cycle benefits. The V-500 and V-600 Series are equipped with the QP16 swash plate compressor for ease of installation and drive kit availability.

V-800 SERIES

The V-800 Series delivers superior capacity, attaining optimal energy efficiency. The V-800 Series is the most powerful vehicle-powered range, both in cooling and heating modes, making it more efficient and sustainable. To provide environmentally friendly solutions, the V-800 Series represents an unbeatable non-diesel alternative for large trucks, low noise and reduced weight.



Fuel savings V-800 vs "Self-powered competitor"

Total flexibility

- Many standard features and options match all requirements:
  - Refrigerant choice R-134a (V-500/800) or R404A (V-500/600/800) to suit your application set point and ambient temperatures
  - Electric standby
  - Heating
  - Multi temperature (V-500/800)

Optimised performance

- Low fuel consumption, carbon footprint and running costs
  More efficient evaporators and all-aluminium condenser coils (V-500/600) result in a significantly lower environmental impact.

- Enhanced heating system
  Improved hot gas system (V-500/600) and reverse cycle 4-way valve technology (V-800) to deliver exceptional performance under the most demanding conditions (i.e. low ambient, pharma applications).

- Exceptional cooling performance on the road and standby
  Refrigeration expertise to provide solutions with faster and more efficient pull-down for quicker recovery.

- High airflow evaporators
  For better temperature distribution across the cargo to protect load integrity.

- Low noise level
  Direct Drive technology allows a low noise solution for urban distribution.

Light design

- Lowest weight allows for higher payload and increased end user revenue.

Low refrigerant charge

- Refrigeration circuit is designed to optimize refrigerant use in order to reduce Global Warming Potential (GPW) and equivalent CO_2 emissions resulting in tax benefits and reduced environmental impact.

Efficiency

- Designed for highest efficiency to reduce consumption and total life cycle cost of ownership.

Direct Smart Reefer (DSR) Controller

The DSR brings the latest in microprocessor-based intelligent control to Thermo King's vehicle powered product range. Its in-cab display is connected to a control board in the condenser module.
Key features:

- Ease of use
- Flexible, modular and stylish
- Designed for error-free control and monitoring of the refrigeration unit from inside the cab

The DSR in-cab display

The DSR in-cab unit provides the ideal user interface. LCD technology with LED backlighting makes the screen easy to read in all light conditions. The operator can select from multiple functions to suit specific transport applications, ensure optimal temperature control and product integrity. In the event of a malfunction, an easily interpreted alarm code allows drivers to take rapid and appropriate remedial action. A bracket is provided for the DSR to be located in the optimum position in any cab configuration. An optional DIN adaptor is available for installation in the radio slot.

Standard features

- Continuous monitoring of load and temperature control unit.
- Automatic start-up in case of a power interruption on the road or in standby.
- A full record via three hour metres of the number of hours:
  - that the unit has been switched on.
  - that the vehicle-driven compressor has been running.
  - that the electric standby compressor has been running.
- Simple alarm codes with clear descriptions for quick diagnosis and reduced maintenance costs.
- Maintenance reminders to encourage preventative maintenance and reduce downtime.
- Manual or automatic defrost to schedule defrost initiation and termination to suit the application.
- Tamper-proofing by removing the in-cab control panel after presetting.
- Unit protection via time limited on/off cycles and overload protection to extend the life of electrical components and the compressor.
- Constant airflow option during "null mode" to protect sensitive loads.
- Automatic switchover between over-the-road battery operation and electric standby.
- Vehicle battery protection with low voltage monitoring, sequential evaporator starts and "soft starting" during unit power-up to avoid power "spikes".
- Compressor protection with the optional "soft start" feature to increase engine compressor life.
- Load protection by delaying evaporator start-up after defrosts, to avoid accidental water discharge into the load space.

The DSR control board

- A modular concept that separates control and power relay boards.
- Improved reliability, serviceability and component replacement.
- Lower service and maintenance costs.

Platform-II control box

The DSR in-cab display

Programmable features

- Set point limits for optimum temperature range selection.
- Set point lock to prevent the driver modifying a predetermined temperature.
- Temperature control band.
- Out of range alarm for on-screen warning when the return air temperature is out of range.
- Door switches to shut down the unit each time the door is opened, to help maintain the box temperature and protect the load.
- Warning buzzer to alert the operator if the vehicle is started with the unit on electric standby or the door open.
- Wintrac a Windows-based software package for configuration parameter editing in the field.
- Firmware upgrades can be carried out in the field with a specific Thermo King.

New

Spectrum multi temperature features

- Each compartment can be switched on/off independently.
- Improved door switch functionality allows each evaporator to be controlled independently so that only the compartment with the door open is turned off.
- Set point range can be independently adjusted for each compartment.
- Operation in single temperature mode selection if required for increased flexibility.

Features & options

FEATURES AND OPTIONS	V-500 V-500 MAX V-600 MAX	V-500 MAX SPECTRUM	V-800 V-800 MAX	V-800 MAX SPECTRUM
LIFE COST MANAGEMENT				
ThermoKare service contracts	▲	▲	▲	▲
DATA CAPTURE AND COMMUNICATIONS				
TKDL data logger	▲	▲	▲	▲
Wintrac (data analysis software)	▲	▲	▲	▲
USB data logger	▲	▲	▲	▲
Datalogger Jr	▲	▲	▲	▲
LOAD PROTECTION				
Door switch	△	△	△	△
Din adapter	△	△	△	△
Hose cover	△	△	△	△
Harness extension 2 m/4 m/6 m	△	△	●	△
Hose extention 2 m/4 m/6 m	●	△	●	●

● Not available △ Option: factory supplied ▲ Option: dealer supplied

ThermoKare

ThermoKare offers a complete selection of service contract solutions to manage maintenance costs and hence total life cost of a unit.

TouchPrint data capture

- User-friendly temperature recorders
- Delivery and journey printouts at the touch of a button
- Approved to EN 12830, CE Mark and IP-65 standards

Wintrac (data analysis software)

User-friendly software compatible with DSR controller for configuration file downloads.

USB data logger

Humidity, temperature and dewpoint recorder.

DataLogger Jr

Programmable temperature recorder.

Door switches

Reduce load temperature rise and save fuel when doors are opened.

Din adapter

The din adaptor box permits the adaption of the DSR controller to the vehicle dashboard. The aesthetically designed box allows the placement of the DSR controller in any available radio slot compartment in the driver cab.

Hose covers

Full protection of hoses and cables on the road and full resistance under all climate adversities. Designed with best aesthetics to promote brand image and with an exceptional durability. User-friendly installation (only for chassis installations, no vans).

Harness extension

The 2, 4 or 6 metre harness extension allows evaporators to be located to suit any customer's needs with an extremely easy installation (plug-and-play connection) and provides full flexibility to position the evaporators especially in multi-temp applications.

Hose extension

The 2, 4 or 6 metre hose extensions (includes corresponding splice connectors) are also on offer as option for remote evaporators.

V-Series range

RANGE	Refrigerant	Standby	Heating	Multi-temp.
V-500 10	R-134a	✗	✗	✗
V-500 20	R-134	✓	✗	✗
V-500 MAX 10	R-404A	✗	✗	✗
V-500 MAX 20	R-404A	✓	✗	✗
V-500 MAX 30	R-404A	✗	✓	✗
V-500 MAX 50	R-404A	✓	✓	✗
V-500 MAX 10 Spectrum [1]	R-404A	✗	✗	✓
V-500 MAX 20 Spectrum [1]	R-404A	✓	✗	✓
V-500 MAX 30 Spectrum [1]	R-404A	✗	✓	✓
V-500 MAX 50 Spectrum [1]	R-404A	✓	✓	✓
V-600 MAX 10	R-404A	✗	✗	✗
V-600 MAX 20	R-404A	✓	✗	✗
V-600 MAX 30	R-404A	✗	✓	✗
V-600 MAX 50	R-404A	✓	✓	✗
V-800 10	R-134a	✗	✗	✗
V-800 20	R-134a	✓	✗	✗
V-800 MAX 10	R-404A	✗	✗	✗
V-800 MAX 20	R-404A	✓	✗	✗
V-800 MAX 30	R-404A	✗	✓	✗
V-800 MAX 50	R-404A	✓	✓	✗
V-800 MAX 50 Spectrum [2]	R-404A	✓	✓	✓

✓ Included
✗ Not included

(1) Available in the following configurations: ES300+ES300, ES300+ES150 and ES300+2xES150
(2) Available in the following configurations: ES400+ES400, ES600+ES150 and ES600+2xES150

Unit selection guide

The table below indicates a guide to select the right unit that could match your application. These figures are maximum vehicle volumes, calculated on road operation, at 2400 rpm compressor speed and 30ºC ambient temperature.

Model	Ambient temperature			
	30ºC		40ºC	
	+0/2ºC	-20ºC	+0/2ºC	-20ºC
V-500	30	13	21	10
V-500 MAX	42	25	29	19
V-500 MAX Spectrum	-	22	-	17
V-600 MAX	48	30	34	24
V-800 MAX Spectrum	-	40	-	30
V-800	44	-	31	-
V-800 MAX	54	42	38	34

Recommendations are based on precooled loads and K value of 0.35 W/m²K is used for frozen goods (-20ºC) and 0.5 W/m²K for fresh goods (+0/2ºC), for a distribution of 8 hours. Recommendation for V-500 MAX Spectrum unit is based on ES300+ES300 configuration, and ES400+ES400 for V-800 MAX Spectrum unit. Recommendations are not a guarantee of performance as there are many variables to be considered. See your Thermo King dealer for complete information.

Specifications single temperature

SPECIFICATIONS		V-500		V-500 MAX		V-600 MAX		V-800		V-800 MAX	
REFRIGERATION CAPACITY: AT 30°C AMBIENT											
	°C	0°C	-20°C	0°C	-20°C	0°C	-20°C	0°C	-20°C	0°C	-20°C
Air return/on the road	W	3915	1655	4890	2630	5910	3280	5175	-	7790	4160
Electric standby 50 Hz	W	3160	1090	4215	1830	4970	2550	4920	-	7030	3795
HEATING CAPACITY: AT -18°C AMBIENT/2400 RPM											
On the road swash plate compressor	R-404A (W)	-		3600		4000		-		7030	
Electric standby operation		-		3120		3200		-		6450	
AIRFLOW											
Airflow volume @ 0 pa static pressure	m^3/h	2200		2200		2580		2680		2680	
WEIGHT											
Condenser w/o electric standby	kg	53		53		53		100		100	
Condenser with electric standby	kg	125		125		125		160		160	
Evaporator	kg	25.50		25.50		28		35		35	
Swash plate compressor	kg	7.10		7.10		7.10		8.50		8.50	
COMPRESSOR											
Model		QP16		QP16		QP16		QP21		QP21	
Displacement	cc	163		163		163		215		215	
Number of cylinders		6		6		6		10		10	
ELECTRIC STANDBY MOTOR											
Voltage/phase/frequency		400/3/50 - 380/3/60 - 230/3/50 - 230/3/60 230/1/50 - 230/1/60						400/3/50 - 400/3/60 - 230/3/50 - 230/3/60			
Rating	kW	6.40 (400/3/50)		6.40 (400/3/50)		6.40 (400/3/50)		8.20 (400/3/50)		8.20 (400/3/50)	
REFRIGERANT CHARGE											
Charge		10:2.00 20:2.20		10:2.10 20/30:2.20 50:2.30		10:2.20 20/30:2.30 50:2.40		10:4.55 20:4.85		10/30:4.70 20/50:5.00	
GENERIC											
Refrigerant		R-134a		R-404A		R-404A		R-134a		R-404A	
Controller		DSR III		DSR III		DSR III		DSR III		DSR III	
DEFROST											
Defrost		Automatic hot gas defrost/Reverse cycle									

Specifications multi temperature

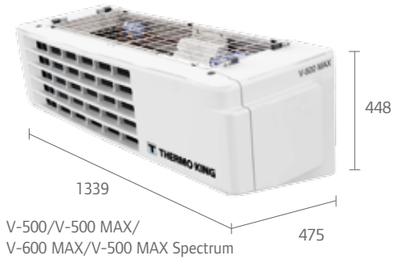
SPECIFICATIONS		V-500 MAX SPECTRUM					
REFRIGERATION CAPACITY: AT 30°C AMBIENT							
		ES300 MAX+ES300 MAX		ES300 MAX+2xES150 MAX		ES300 MAX+ES150 MAX	
Return air to evaporator	°C	-20°C		-20°C		-20°C	
Capacity on engine power	W	2390		2390		2390	
Capacity on electrical stand	W	2005		2005		2005	
REFRIGERATION CAPACITY: INDIVIDUAL COOLING CAPACITY							
		ES300 MAX		2XES150 MAX		ES150 MAX	
Return air to evaporator		0°C	-20°C	0°C	-20°C	0°C	-20°C
Capacity on engine power	W	3585	1930	3975	2055	2925	1580
Capacity on electrical stand	W	3385	1745	3595	1770	2580	1380
HEATING CAPACITY							
On the road	W	3600					
Electric standby operation	W	3120					
AIRFLOW							
		ES300 MAX + ES300 MAX		ES300 MAX + 2XES150 MAX		ES300 MAX + ES150 MAX	
On high speed engine operation	m^3/h	2x1185		1185+(2x700)		1185+700	
WEIGHT							
Condenser w/o electric standby	kg	53					
Condenser with electric standby	kg	125					
Evaporator ES300 MAX	kg	18					
Evaporator ES150 MAX	kg	12.50					
Swash plate compressor	kg	7.10					
COMPRESSOR							
Model		QP 16					
Displacement	cc	163					
Number of cylinders		6					
ELECTRIC STANDBY MOTOR							
Voltage/phase/frequency		400/3/50 - 230/3/50 - 230/3/60 - 230/1/50 - 230/1/60 - 380/3/60					
Rating	kW	6.40 (400/3/50)					
REFRIGERANT CHARGE							
Charge	kg	10 : 2.30 - 20/30 : 2.40 - 50: 2.50					
GENERIC (BOXLENGTH, REFRIGERANT….)							
Refrigerant		R-404A					
Controller		DSR III					
DEFROST							
Defrost		Automatic hot gas defrost					

Specifications multi temperature

SPECIFICATIONS		V-800 MAX SPECTRUM							
REFRIGERATION CAPACITY: AT 30°C AMBIENT									
		ES400 MAX+ ES400 MAX		ES600MAX+ ES150 MAX		ES600 MAX+ 2x ES150 MAX			
Return air to evaporator	°C	-20°C		-20°C		-20°C			
Capacity on engine power	W	4395		3850		4300			
Capacity on electrical stand	W	3595		3385		3595			
REFRIGERATION CAPACITY: INDIVIDUAL COOLING CAPACITY									
		ES400 MAX		ES600 MAX		ES150 MAX		2 X ES150 MAX	
Return air to evaporator		0°C	-20°C	0°C	-20°C	0°C	-20°C	0°C	-20°C
Capacity on engine power	W	5740	3300	6765	3460	3975	2270	5640	2995
Capacity on electrical stand	W	5300	3010	6305	3110	3850	2165	5045	2705
HEATING CAPACITY									
On the road	W	4500							
Electric standby operation	W	4000							
AIRFLOW									
		ES400 MAX + ES400 MAX		ES600 MAX + ES150 MAX		ES600 MAX + 2XES150 MAX			
On high speed engine operation	m^3/h	1760x2		2260+890		2260+(2x890)			
WEIGHT									
Condenser w/o electric standby	kg	100							
Condenser with electric standby	kg	160							
Evaporator ES600 MAX	kg	28							
Evaporator ES400 MAX	kg	20							
Evaporator 2 X ES150 MAX	kg	25							
Evaporator ES150 MAX	kg	12.50							
Swash plate compressor	kg	8.50							
COMPRESSOR									
Model		QP21							
Displacement	cc	215							
Number of cylinders		10							
ELECTRIC STANDBY MOTOR									
Voltage/phase/frequency		400/3/50 - 230/3/50 - 400/3/60 - 230/3/60							
Rating	kW	8.20 (400/3/50)							
REFRIGERANT CHARGE									
Charge	kg	ES400+ES400: 5.20 - ES600+ES150: 5.00 - ES600+2XES150: 5.15							
GENERIC									
Refrigerant		R-404A							
Controller		DSR III							
DEFROST									
Defrost		Automatic hot gas defrost							

Note: specifications are subject to change without notice.

Dimensions (mm)



V-500/V-500 MAX/
V-600 MAX/V-500 MAX Spectrum

ES150 MAX Ultra Slim Evaporator

ES300 MAX Ultra Slim Evaporator

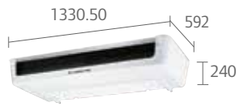
ES500 Ultra Slim Evaporator

ES600 MAX Evaporator

V-800/V-800 MAX/V-800 MAX Spectrum

ES150 MAX Ultra Slim Evaporator

ES400 MAX Evaporator



ES600 MAX Evaporator

ES800 Ultra Slim Evaporator

2 YEAR WARRANTY

WARRANTY CONDITIONS

Thermo King warrants the new product delivered will be free of defects in material and workmanship for the period of time specified in the applicable warranties. Specific terms of the Thermo King warranty are available on request.

Discover the V-100/200/300 Series

The V-Series product range from Thermo King also comprises products for smaller trucks and vans. Just like the larger series, the V-100, V-200 and V-300 offer optimal performance while using less fuel and making less noise.

The range is suited to load spaces from 5 to 17 m³ (frozen) and from 12 to 28 m³ (fresh).

Total flexibility

The V-100, V-200 and V-300 offer multiple options to suit every application including R-134a refrigerant for fresh loads/ high ambient and R-404A for frozen, electric standby operation and heating capability. The range includes Spectrum V-200 MAX and V-300 MAX models for multi temperature vehicles.

High performance under any conditions

High capacity and airflow ensure superior temperature distribution as well as faster pull-down and temperature recovery to protect the product load after door openings.

Ease of use

The V-100, V-200 and V-300 enjoy all the same advantages of the DSR in-cab controller including ease of use, flexibility and alarm functions.

Form and function

Condenser modules are compact, stylish and aerodynamic. They can be installed on the vehicle roof or over the cab. Slim-line evaporators provide maximum load space, which is critical in smaller vehicles.

V-100 Series

V-200 Series

V-300 Series

europe.thermoking.com

For further information please contact:

Thermo King is a brand of Ingersoll Rand®. Ingersoll Rand (NYSE:IR) advances the quality of life by creating comfortable, sustainable and efficient environments. Our people and our family of brands—including Ingersoll Rand®, Thermo King®, Trane® and Club Car® — work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; and increase industrial productivity and efficiency. We are a global business committed to a world of sustainable progress and enduring results.

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