



## *V Series*

*Superior Temperature Control  
for small trucks and vans*



- Modern compact platform
- User friendly Direct Smart Reefer
- Increased reliability
- Easy maintenance, service and installation



The V-100, 200 and 300 series offer the optimal temperature control solution for trucks and vans up to 29m<sup>3</sup>. This complete range share many common components including the Direct Smart Reefer and has many modular options to fulfil the requirements of every customer with the following benefits:



V-100, V-200 and V-300 series

### Superior Temperature Control

- High airflow to provide superior temperature management leading to a more uniform temperature distribution thereby protecting perishable goods during transport
- Higher cooling capacity at all temperatures especially on electric stand-by operation for
  - Faster temperature recovery from multiple door openings during distribution operations
  - Quicker pre-cooling on electric operation
- Offer the flexibility of choosing between R-134a and R-404A refrigerants. R-134a is especially suited to countries with high ambient temperatures (up to +45°C) due to its lower working pressures and temperatures extending compressor life



In-cab controller "Direct Smart Reefer" control panel

### User friendly Direct Smart Reefer

with the following benefits:

- Continuous temperature monitoring
- Three standard hourmeters to record working hours
- Manual or automatic defrost
- In-cab box may be removed after presetting

### Flexibility

- Retrofittable with heat option
- Can convert from single temperature to bi-temperature (TC) using the same condenser section
- Modules to add heating or bi-temperature management

### Improved Reliability of Electrical Components

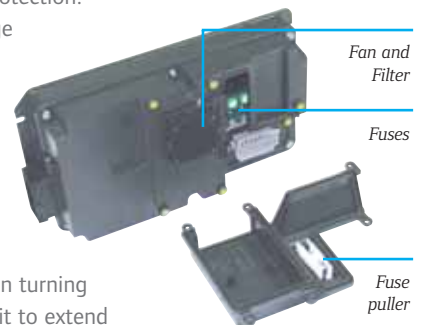
- Introduction of long life fans in both the condenser and evaporator with a working life 3 times longer than previously
- IP55 easily accessible electric box and new sealed connectors
- Components requiring frequent service such as fuses, fan and fan filter are easily accessible without affecting the seal of the electrical control box
- Individual fuses and relays for protection of the loads
- Hermetic transformer and connecting wires
- Large, compact filtering capacitors for improved d.c. supply stability during standby operation
- The Direct Smart Reefer has several features to protect and increase the life of the components



IP55 electric box with sealed connectors

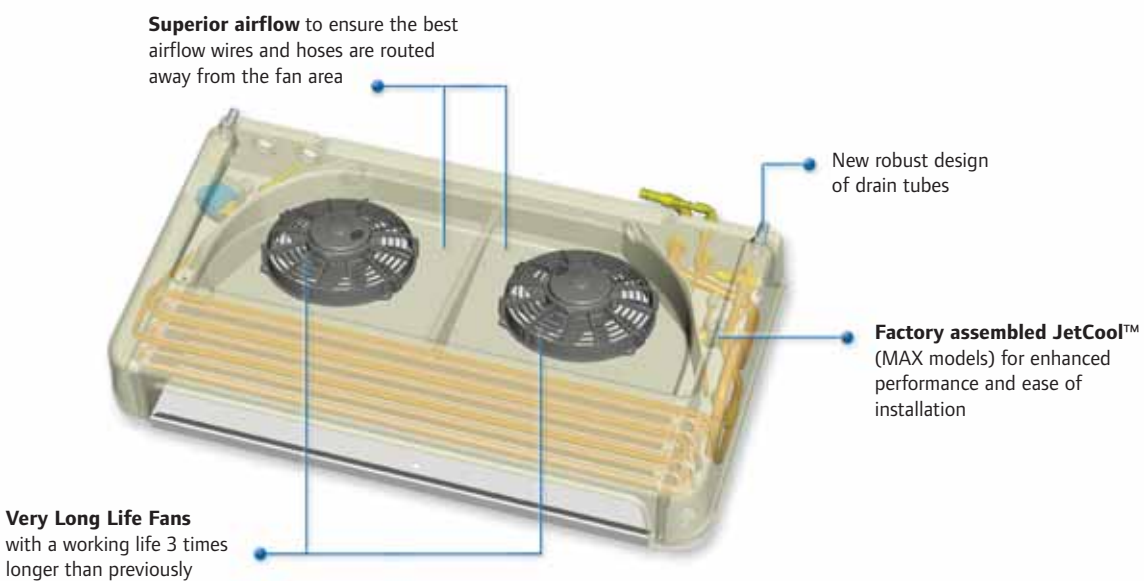
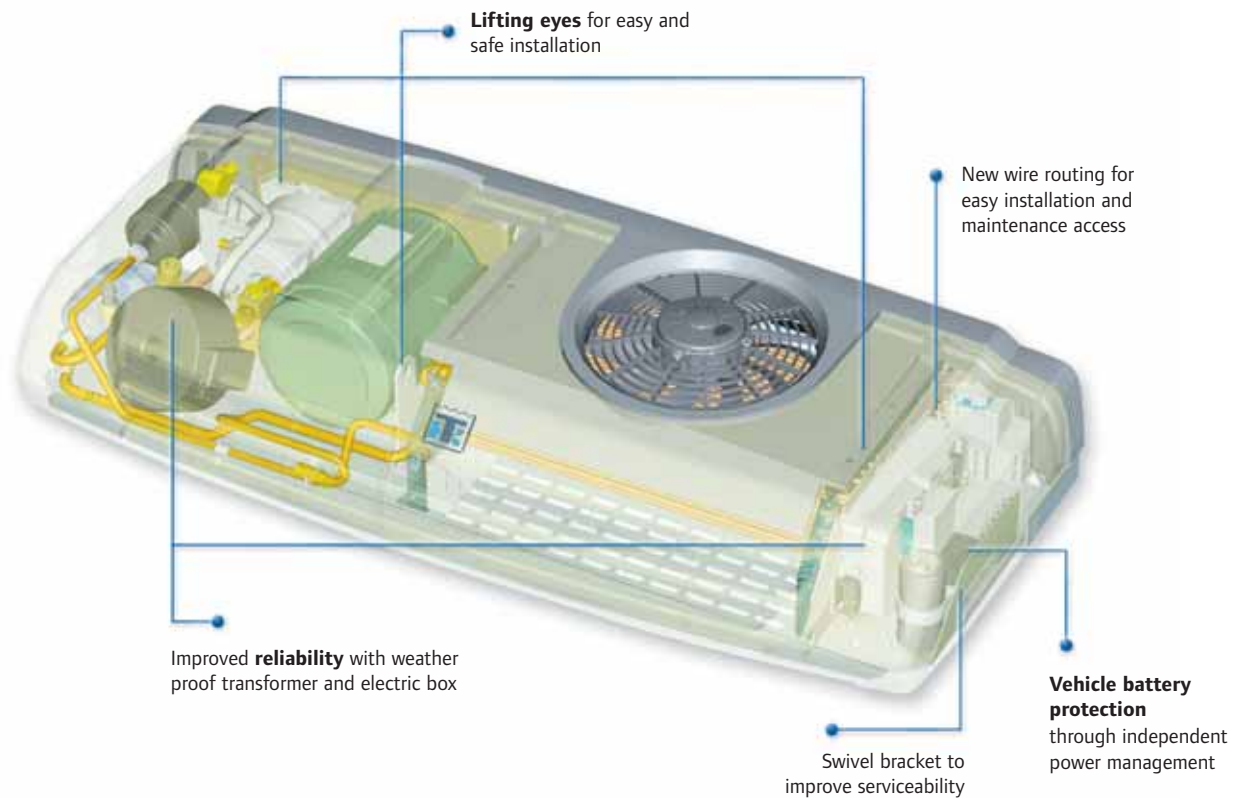
- Vehicle battery protection:

- low battery voltage check, sequential evaporator start, unit delays start during vehicle start-up, isolation of power sources by relays



Easy access to fan, filter and fuses

- Time limit between turning off and on the unit to extend life of electrical components and compressor
- Clutch delay timer extends electrical motor life



### Ease of Maintenance and Service

- The DSR has
  - a maintenance reminder
  - an easy-to-understand alarm codes for quick diagnostics
- The condenser cover can now be removed and the unit will continue to safely function for easy diagnostics

### Ease of installation

- Added lifting eyes to the larger platform
- Accessible mounting holes
- Fittings outside of the evaporator to reduce installation time and guarantee airflow
- Jet Cool™ compressor injection cooling (MAX models) is located in the evaporator and comes installed from the factory

# Direct Smart Reefer



The Direct Smart Reefer is the latest in microprocessor control for the direct drive product range: sophisticated controls with many new features, yet simple to use & easy to operate. The temperature control unit has been designed to control and/or monitor the unit from inside the cab safely and conveniently. It's very smart, small and very simple to use and looks good whether mounted on the dash or in the dash.

The Direct Smart Reefer controller has the following features:

## Standard Features

- Continuous monitoring of the load & the temperature control unit provides PEACE OF MIND
- Automatic start-up - if the unit stops on either road or stand-by operation because of a lack of energy, it will automatically restart
- Three standard hourmeters - to record
  - the total no. of hours that the unit has been switched on
  - the no. of working hours of the vehicle driven compressor
  - the no. of working hours of the electric stand-by compressor
- Alarm codes with easy to understand abbreviated written descriptions result in quick diagnostics to reduce maintenance costs
- Maintenance reminder to encourage preventative maintenance to reduce downtime
- Manual or automatic defrost
- PCB inside an easily accessible IP55 box with accessible fuses for quick replacement
- Individual fuses and relays for independent protection of the loads
- Software can be upgraded in the field using Wintrac, a windows based simple to use software package designed to communicate with Thermo King's temperature control unit
- Several features offer protection for the vehicle battery: low battery voltage check, sequential evaporator start, unit delays start during vehicle start-up









- Evaporator fan time delay defrost cycle to prevent water spraying on to load
- Time limit between turning off and on the unit to extend life of electrical components and compressor
- Clutch delay timer extends electrical motor life

## Customer Programmable Features

- Set-Point Limits - Allowing the customer to select the permissible temperature range according to the application and the refrigerant. The default settings for R-134a are -22°C to 22°C and -32°C to 22°C for R-404A
- Initial start-up compressor protection - Optional "soft start" of engine compressor to increase compressor life
- Defrost initiation and termination timer can be programmed according to application
- Constant airflow during "null mode" - For sensitive loads to provide constant protection
- Out of range alarm - Select that the screen flashes according to when the return air is outside the selected temperature band (the default position is off for this option)
- Door switches - Option to implement a door switch so that the unit is switched off when the door is open for improved temperature management
- Buzzer - Optional warning signal for when the unit is on electrical standby and vehicle started or while the door is open
- Temperature control band can be selected



# V Series Range

	 Refrigerant	 Small Platform	 Large Platform	 Stand-by	 Bi-temp.	 Heating
V-100 10	R-134a	✓	—	—	—	—
V-100 MAX 10	R-404A	✓	—	—	—	—
V-100 MAX 30	R-404A	✓	—	—	—	✓
V-200 10	R-134a	✓	—	—	—	—
V-200 MAX 10	R-404A	✓	—	—	—	—
V-200 20	R-134a	—	✓	✓	—	—
V-200 MAX 20	R-404A	—	✓	✓	—	—
V-200 MAX 30	R-404A	✓	—	—	—	✓
V-200 MAX 50	R-404A	—	✓	✓	—	✓
V-200 MAX TC 10	R-404A	✓	—	—	✓	—
V-200 MAX TC 20	R-404A	—	✓	✓	✓	—
V-200 MAX TC 30	R-404A	✓	—	—	✓	✓
V-200 MAX TC 50	R-404A	—	✓	✓	✓	✓
V-300 10	R-134a	✓	—	—	—	—
V-300 MAX 10	R-404A	✓	—	—	—	—
V-300 20	R-134a	—	✓	✓	—	—
V-300 MAX 20	R-404A	—	✓	✓	—	—
V-300 MAX 30	R-404A	✓	—	—	—	✓
V-300 MAX 50	R-404A	—	✓	✓	—	✓
V-300 MAX TC 10	R-404A	✓	—	—	✓	—
V-300 MAX TC 20	R-404A	—	✓	✓	✓	—
V-300 MAX TC 30	R-404A	✓	—	—	✓	✓
V-300 MAX TC 50	R-404A	—	✓	✓	✓	✓

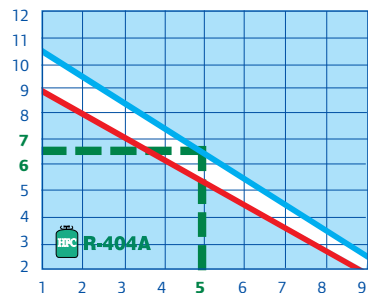
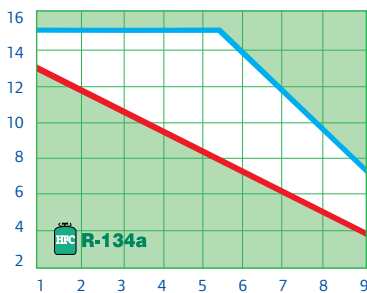
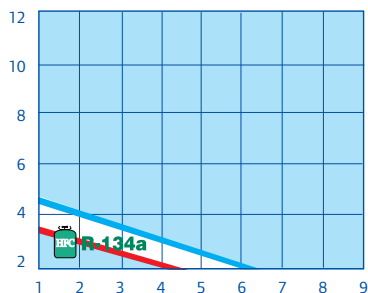
## V Series range – dealer options

### Data Capture and Communications

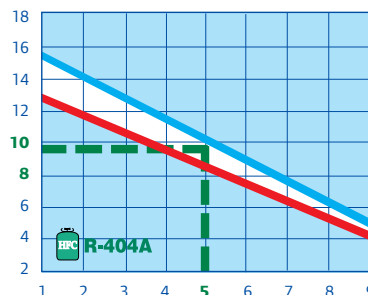
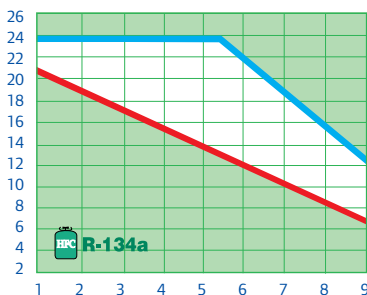
TKDL-PRO	■
TKDL-SPR	■
TKDL-DCS	■
DAS (Data Acquisition System)	■
Wintrac data analysis software	■
FleetWatch advanced management software	■
R:COM wireless data download	■
Load Protection	
Door switches	■
Life Cost Management	
Guaranteed Maintenance Contracts (Total Kare)	■

# V Series Selection guide

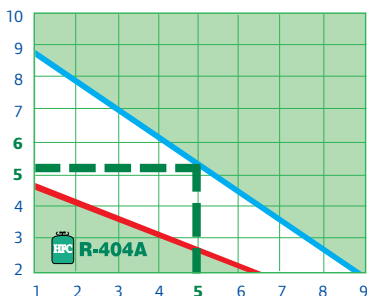
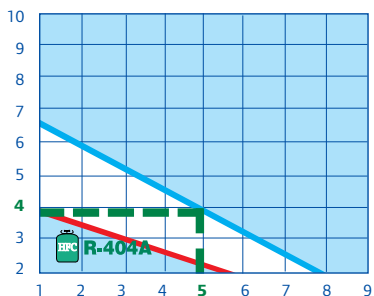
## V-100/V-100 MAX



## V-200/V-200 MAX



## V-200 MAX TC



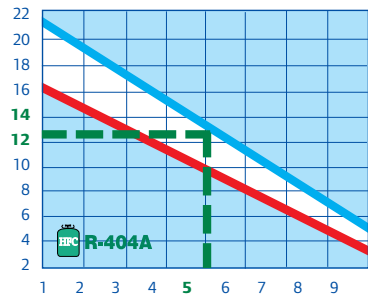
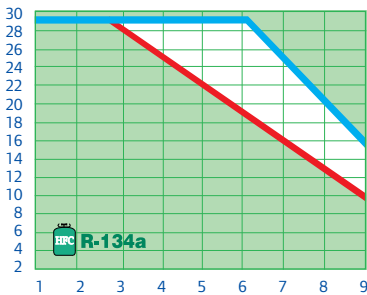
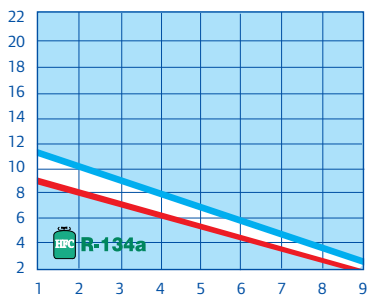
**Example:**

30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour in each compartment, V-200 MAX TC suits vehicles with frozen compartment up to 4m<sup>3</sup> (140 cu.ft.) and chilled compartment up to 5.5m<sup>3</sup> (195 cu.ft.).

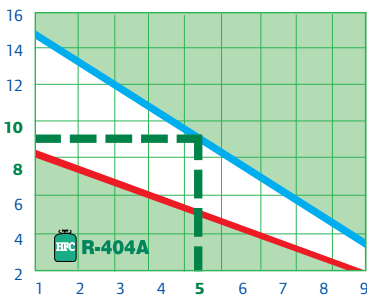
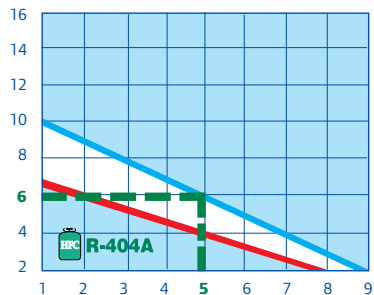
Loadspace volume (m<sup>3</sup>)



## V-300/V-300 MAX



## V-300 MAX TC



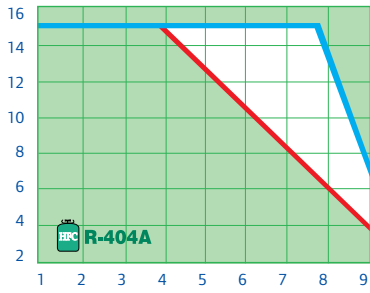
**Example:**

30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour in each compartment, V-300 MAX TC suits vehicles with frozen compartment up to 6m<sup>3</sup> (210 cu.ft.) and chilled compartment up to 9m<sup>3</sup> (320 cu.ft.).

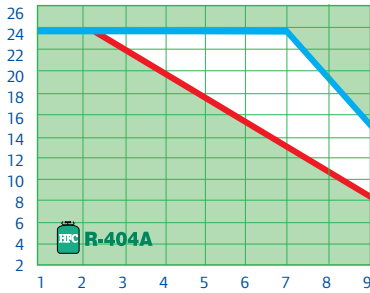


Door openings per hour

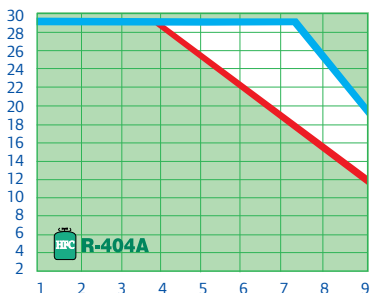
# V Series Refrigeration capacity



Example:  
30°C (86°F)  
maximum ambient,  
frozen compartment,  
5 door openings per  
hour: V-100 MAX  
suits vehicles up to  
6.5m<sup>3</sup> (230 cu.ft.).



Example:  
30°C (86°F)  
maximum ambient,  
frozen compartment,  
5 door openings per  
hour: V-200 MAX  
suits vehicles up to  
9.5m<sup>3</sup> (335 cu.ft.).



Example:  
30°C (86°F)  
maximum ambient,  
frozen compartment,  
5 door openings  
per hour: V-300 MAX  
suits vehicles up to  
11.5m<sup>3</sup> (406 cu.ft.).

Frozen compartment (k=0.35 W/m<sup>2</sup>K)  
ambient: 30°C/86°F,  
compartment: -20°C/-4°F  
— ambient: 100°F/38°C,  
compartment: 0°F/-18°C

Chilled compartment (k=0.5 W/m<sup>2</sup>K)  
ambient: 30°C/86°F,  
compartment: 3°C/37°F  
— ambient: 100°F/38°C,  
compartment: 37°F/3°C

## R-134a

30°C ambient, European standard.				100°F ambient, U.S. standard.			
<b>System net cooling capacity under ATP conditions including 30°C (86°F) ambient.</b>				<b>System net cooling capacity at 100°F (38°C) ambient and 2400 compressor rpm.</b>			
<b>V-100 (HFC R-134a Refrigerant)</b>				<b>V-100 (HFC R-134a Refrigerant)</b>			
Air return / On the road	Watts	BTU/hr		Air return / On the road	BTU/hr	Watts	
0°C (32°F)	1405	4800		35°F (2°C)	3840	1125	
-20°C (-4°F)	545	1860		0°F (-18°C)	1780	520	
<b>V-200 (HFC R-134a Refrigerant)</b>				<b>V-200 (HFC R-134a Refrigerant)</b>			
Air return / On the road	Watts	BTU/hr		Air return / On the road	BTU/hr	Watts	
0°C (32°F)	2205	7530		35°F (2°C)	5940	1740	
-20°C (-4°F)	1050	3600		0°F (-18°C)	3420	1000	
<b>Electric stand-by 50Hz</b>				<b>Electric stand-by 50Hz</b>			
0°C (32°F)	1750	5980		35°F (2°C)	4710	1380	
-20°C (-4°F)	655	2240		0°F (-18°C)	2120	620	
<b>V-300 (HFC R-134a Refrigerant)</b>				<b>V-300 (HFC R-134a Refrigerant)</b>			
Air return / On the road	Watts	BTU/hr		Air return / On the road	BTU/hr	Watts	
0°C (32°F)	2865	9789		35°F (2°C)	7720	2260	
-20°C (-4°F)	1200	4100		0°F (-18°C)	3880	1135	
<b>Electric stand-by 50Hz</b>				<b>Electric stand-by 50Hz</b>			
0°C (32°F)	1855	6335		35°F (2°C)	5000	1465	
-20°C (-4°F)	720	2460		0°F (-18°C)	2320	680	

## R-404A

30°C ambient, European standard.				100°F ambient, U.S. standard.			
<b>System net cooling capacity under ATP conditions including 30°C (86°F) ambient.</b>				<b>System net cooling capacity at 100°F (38°C) ambient and 2400 compressor rpm.</b>			
<b>V-100 MAX (HFC R-404A Refrigerant)</b>				<b>V-100 MAX (HFC R-404A Refrigerant)</b>			
Air return / On the road	Watts	BTU/hr		Air return / On the road	BTU/hr	Watts	
0°C (32°F)	1925	6570		35°F (2°C)	5260	1540	
-20°C (-4°F)	911	3110		0°F (-18°C)	2950	865	
-25°C (-13°F)	620	2110		-20°F (-29°C)	1330	390	
<b>V-200 MAX (HFC R-404A Refrigerant)</b>				<b>V-200 MAX (HFC R-404A Refrigerant)</b>			
Air return / On the road	Watts	BTU/hr		Air return / On the road	BTU/hr	Watts	
0°C (32°F)	2650	9050		35°F (2°C)	7160	2100	
-20°C (-4°F)	1480	5055		0°F (-18°C)	4775	1400	
-25°C (-13°F)	1190	4065		-20°F (-29°C)	3170	930	
<b>Electric stand-by 50Hz</b>				<b>Electric stand-by 60Hz</b>			
0°C (32°F)	1945	6645		35°F (2°C)	5250	1540	
-20°C (-4°F)	1055	3605		0°F (-18°C)	3410	1000	
-25°C (-13°F)	840	2870		-20°F (-29°C)	2265	665	
<b>V-300 MAX (HFC R-404A Refrigerant)</b>				<b>V-300 MAX (HFC R-404A Refrigerant)</b>			
Air return / On the road	Watts	BTU/hr		Air return / On the road	BTU/hr	Watts	
0°C (32°F)	3390	11580		35°F (2°C)	10015	2935	
-20°C (-4°F)	1900	6490		0°F (-18°C)	5835	1710	
-25°C (-13°F)	1480	5050		-20°F (-29°C)	3530	1035	
<b>Electric stand-by 50Hz</b>				<b>Electric stand-by 60Hz</b>			
0°C (32°F)	1930	6590		35°F (2°C)	5800	1700	
-20°C (-4°F)	1185	4050		0°F (-18°C)	3790	1110	
-25°C (-13°F)	885	3020		-20°F (-29°C)	2560	750	

Capacities stated according to ATP certificate  
No. M575, No. M574, No. M488, No. M530 and No. M529.

# Specifications

## Description

The V-100, 200 and 300 series from Thermo King comprise two-piece split units designed for fresh, frozen and deep frozen applications on small trucks and vans. The road compressor is powered by the vehicle's engine. In models with electric stand-by, the second one is powered by an electric motor. The V-200 and V-300 MAX TC can manage two evaporators to provide temperature control for two compartments. Models with hot gas heating are also available.

## System components

- Condenser
  - Small condenser section: V-100 series, V-200 and V-300 series without electric stand-by
  - Larger condenser section: V-200 and V-300 series with electric stand-by
- Ultra slim evaporator
  - ES 100 (V-100 series and V-200 MAX TC)
  - ES 150 (V-300 MAX TC)
  - ES 200 (V-200 series with the exception of bi-temperature models)
  - ES 300 (V-300 series with the exception of bi-temperature models)
- Engine driven compressor
- Installation kit
- In-cab control box
- Modules
  - MH (heating) module for 30/50 models
  - MTC module for bi-temperature models
  - MTCH module for bi-temperature and heating models
- Vehicle drive kit (on request)

## Refrigerant

- V-100: 1.2 kg of HFC R-134a
  - V-100 MAX: 1.1 kg of HFC R-404A
  - V-200: 1.4 kg of HFC R-134a
  - V-200 MAX: 1.25 kg of HFC R-404A
  - V-300: 1.75 kg of HFC R-134a
  - V-300 MAX: 1.75 kg of HFC R-404A
- Chlorine: Zero

## Compressor (engine driven)

### V-100 series

- Number of cylinders: 6
- Displacement: 82 cm<sup>3</sup> (5 cu. in.)
- Maximum recommended speed: 3,000 rpm
- Jet Lube™ and Jet Cool™ (on MAX units) compressor lubrication and cooling systems

### V-200 series

- Number of cylinders: 6
- Displacement: 131 cm<sup>3</sup> (8 cu. in.)
- Maximum recommended speed: 3,000 rpm
- Jet Lube™ and Jet Cool™ (on MAX units) compressor lubrication and cooling systems

### V-300 series

- Number of cylinders: 6
- Displacement: 146.7 cm<sup>3</sup> (8.95 cu. in.)
- Maximum recommended speed: 3,000 rpm
- Jet Lube™ and Jet Cool™ (on MAX units) compressor lubrication and cooling systems

## Defrost

- Automatic hot gas defrost

## Evaporator blower performance

Airflow volume:

Evaporator (ES 100):	680 m <sup>3</sup> /h	(400 cu. ft/min)
Evaporator (ES 150):	790 m <sup>3</sup> /h	(465 cu. ft/min)
Evaporator (ES 200):	1040 m <sup>3</sup> /h	(610 cu. ft/min)
Evaporator (ES 300):	1295 m <sup>3</sup> /h	(760 cu. ft/min)

## Heating capacity (models 30/50)

Conditions: 5°C internal air temperature, -20°C ambient air temperature

- Road operation
 

V-100 series	600 W (2050 BTU/hr)
V-200 series	820 W (2800 BTU/hr)
V-300 series	1280 W (4370 BTU/hr)
- Electric stand-by operation
 

V-200 series	600 W (2050 BTU/hr)
V-300 series	935 W (3195 BTU/hr)

## Electric motors

- dc voltage options
  - 12 Vdc and 24 Vdc
- Electric stand-by options
  - 230V/1 Phase/50Hz
  - 230V/1 Phase/60Hz
  - 115V/1 Phase/60Hz
  - 400V/3 Phase/50Hz
  - 230V/3 Phase/50Hz
  - 230V/3 Phase/60Hz

Total current consumption on the road:

	12 Vdc	24 Vdc
V-100/100 MAX	21A	11.5A
V-200/200 MAX V-300/300 MAX	28A	15A
V-200 MAX TC V-300 MAX TC	33A	17A

Total stand-by current consumption:

(V-200/200 MAX, V-300/300 MAX)

230V/1 Phase/50Hz	10 A
230V/1 Phase/60Hz	10.2 A
115V/1 Phase/60Hz	16 A
400V/3 Phase/50Hz	4.5 A
230V/3 Phase/50Hz	7.7 A
230V/3 Phase/60Hz	7.9 A

Total stand-by current consumption:

(V-200 MAX TC, V-300 MAX TC)

230V/1 Phase/50Hz	10.5 A
230V/1 Phase/60Hz	10.7 A
115V/1 Phase/60Hz	16.5 A
400V/3 Phase/50Hz	4.6 A
230V/3 Phase/50Hz	8 A
230V/3 Phase/60Hz	8.2 A

## Standard Features

- Jet Lube™ compressor lubrication
- Jet Cool™ compressor injection cooling (MAX models)
- In-cab controls with digital LED thermometer
- Automatic hot gas defrost
- Electric thermostat

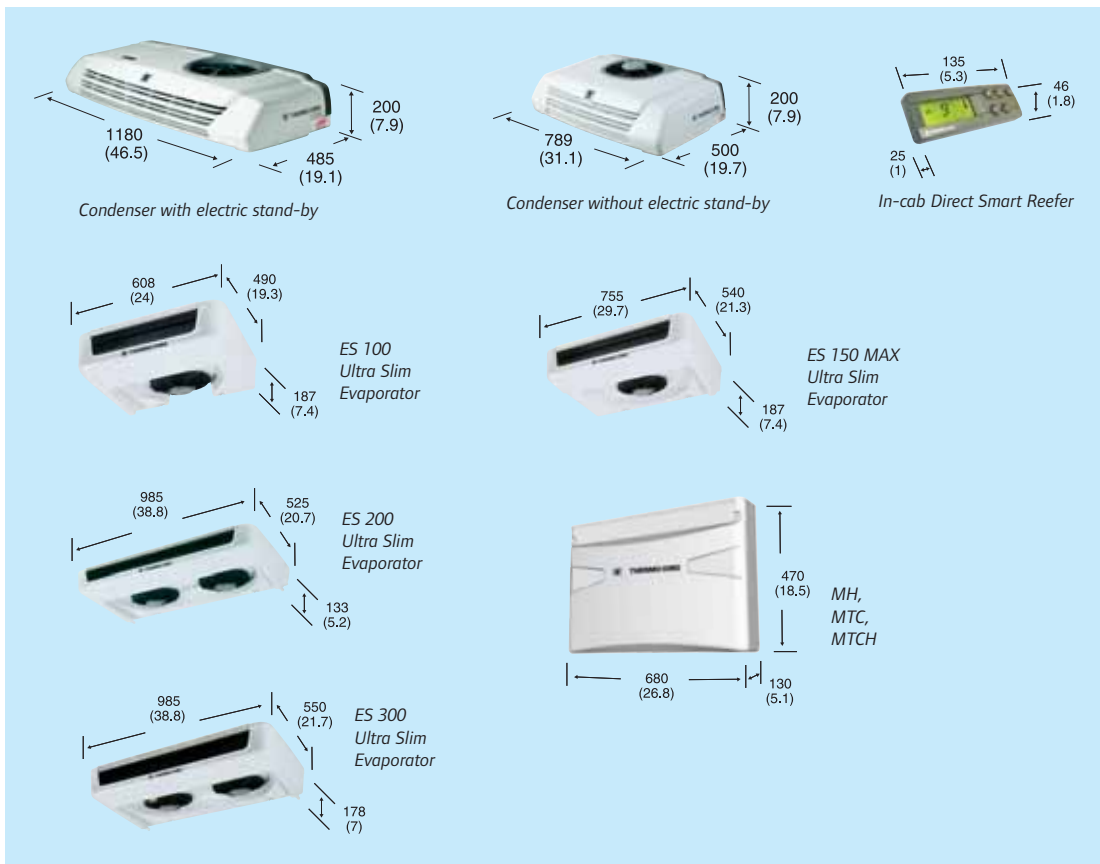
## Total Kare

Because maintenance costs constitute a key variable in the Total Life Cost of a temperature control system, we now offer, through Total Kare, a complete selection of

maintenance programmes.  
total\_kare@thermoking.com



## Dimensions - millimetres (inches)



## Weights (approximate)

Condenser:

w/o electric stand-by	50 kg (111 lb)
with electric stand-by	75 kg (165 lb)
ES 100 (Ultra Slim evaporator)	9 kg (20 lb)
ES 150 MAX (Ultra Slim evaporator)	12.5 kg (27.5 lb)
ES 200 (Ultra Slim evaporator)	15 kg (33 lb)

ES 300 (Ultra Slim evaporator)	18 kg (40 lb)
Installation kit (incl. cpr.)	28 kg (62 lb)
Heating module MH	6 kg (13 lb)
Bi-temp. module MTC	8 kg (18 lb)
Bi-temp. & heating module MTCH	9 kg (20 lb)

## Warranty Summary

Terms of the Thermo King Express Warranty are available on request. The unit and its components are warranted to be free from defects in material and workmanship from date in service according to the terms (in months) as specified in the Thermo King Express Warranty. Manufacturer is not responsible and will not be held liable in contract or tort (including

strict liability and negligence) for any special, indirect or consequential damages including but not limited to injury or damage caused to vehicles, contents or persons, by reason of the installation or use of any Thermo King product or its mechanical failure.

Specifications are subject to change without notice.

# V Series - a complete product range

The V Series product range from Thermo King also comprises products for medium and large trucks, which offer you the optimal performance while using less fuel and making less noise: V-400, V-500 and V-700.



## Total Flexibility

- The V-400, V-500 and V-700 series offer multiple options to cover your every need including R-134a, R-404A, electric stand-by operation, heating, undermount or nose-mount and bi-temperature management.

## High Performance under Any Conditions

- High capacity and airflow to ensure a superior temperature distribution, decrease pull-down and temperature recovery time from door openings to protect the product load.
- Electric stand-by capacity of the V-700, V-500 and V-400 series is approximately 100% of the road capacity.

## Technological Advantages

- Semi-hermetic reciprocating electrical stand-by compressor to provide high capacity.
- The Triple Cooling Capacity (TCC) system provides an outstanding pull-down capacity and contributes to system efficiency and noise reduction.
- Reciprocating road compressor (V-700 and V-500), which has a 5 times longer life than previous swash plate compressor.



More detailed information about these products is available in a separate brochure or on [thermoking.com](http://thermoking.com)



[www.thermoking.com](http://www.thermoking.com)

# Service Parts and Accessories

Now, you can get the parts, accessories and services you need, where you need them, when you need them, quicker and more efficiently than ever. Recognised as the industry leader, Thermo King understands the importance of immediate parts availability and quality service performance. That's why we are expanding our aftermarket product line and increasing our service offerings. Our goal is to provide you with the total solutions package to keep your units operating for longer, with less down time.

## Replacements Parts

Genuine Thermo King replacement parts are proven time after time to beat the competition in side-by-side testing. Engineered to provide optimal performance and maximum life, Thermo King service parts protect your investment and provide you peace of mind and confidence on the road. Insist on Genuine Thermo King Parts, every time!



## For Maintenance

Thermo King offers the highest quality in durable maintenance parts on the market today. All products have been carefully selected and designed to keep your Thermo King equipment operating efficiently and at full capacity for longer. Insist on genuine Thermo King products . . . there is a difference!

## Accessories

Complete your performance package with Thermo King's new and innovative quality accessories. Thermo King Accessories enhance equipment performance and increase productivity as well as driver safety and comfort and can be retrofitted for individual needs or factory fitted.

## Telematics

Utilizing the newest generation of technology, Thermo King's Telematics systems and software provide integrated solutions for global communications and asset management.



## Controllers Devices

Designed exclusively for transport refrigeration applications, Thermo King's microprocessor controllers are the most advanced in the industry-providing versatility and allowing for total temperature control.

## TOTAL KARE Service Contracts

Because maintenance costs constitute a key variable in the Total Life Cost of a temperature control system we can offer, through Total Kare, a complete selection of maintenance programs.

Thermo King - Total Kare is the solution for all your concerns about fleet management, offering you a program tailored to your needs. You only have to ask Thermo King Total Kare and we will answer what else we can do for you.



## Life Cost Management

- \*\*\*\* Full Services
  - \*\*\* Extended Warranty
  - \*\* Preventative Maintenance
  - \* Central Administration

**Your Needs + TK<sup>2</sup> Advantages = Your Benefits**

Anywhere in Europe, 24 hours a day, 365 days a year.



Providing equipment and services to manage controlled-temperature environments for food and other perishables, our Climate Control Technologies sector encompasses both transport and stationary refrigeration solutions. Our product brands include Thermo King®, a world leader in transport temperature control system and Hussmann®, a manufacturer of refrigeration and food merchandising equipment.

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