



# V-Series

*Superior Temperature Control*

Small trucks and vans



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





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## V-Series

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:

- Superior temperature control
- User friendly Direct Smart Reefer
- Flexibility
- Improved reliability of electrical components
- Ease of maintenance and service
- Ease of installation



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

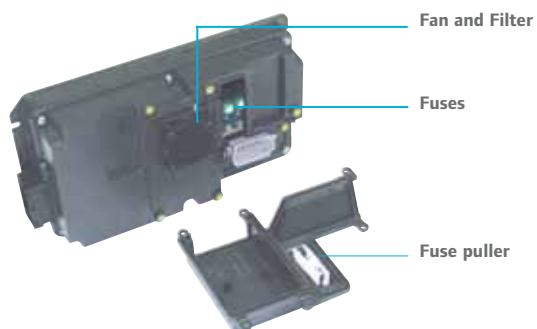


## Improved reliability of electrical components

- 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.
- Vehicle battery protection:
  - low battery voltage check
  - sequential evaporator start
  - unit delays start during vehicle start-up
  - isolation of power sources by relays
- Time limit between turning off and on the unit to extend life of electrical components & compressor.
- Clutch delay timer extends electrical motor life.



IP55 electric box with sealed connectors



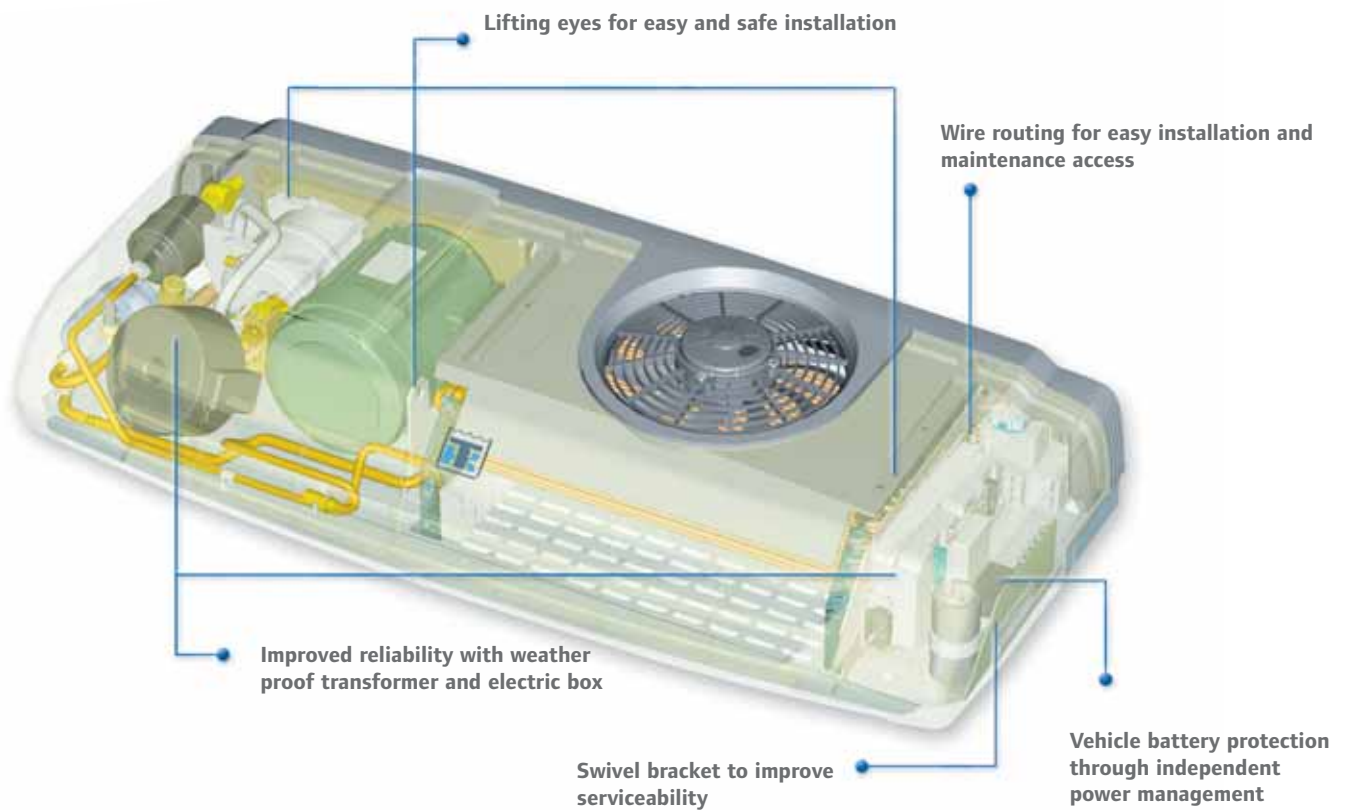
Easy access to fan, filter and fuses



## 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

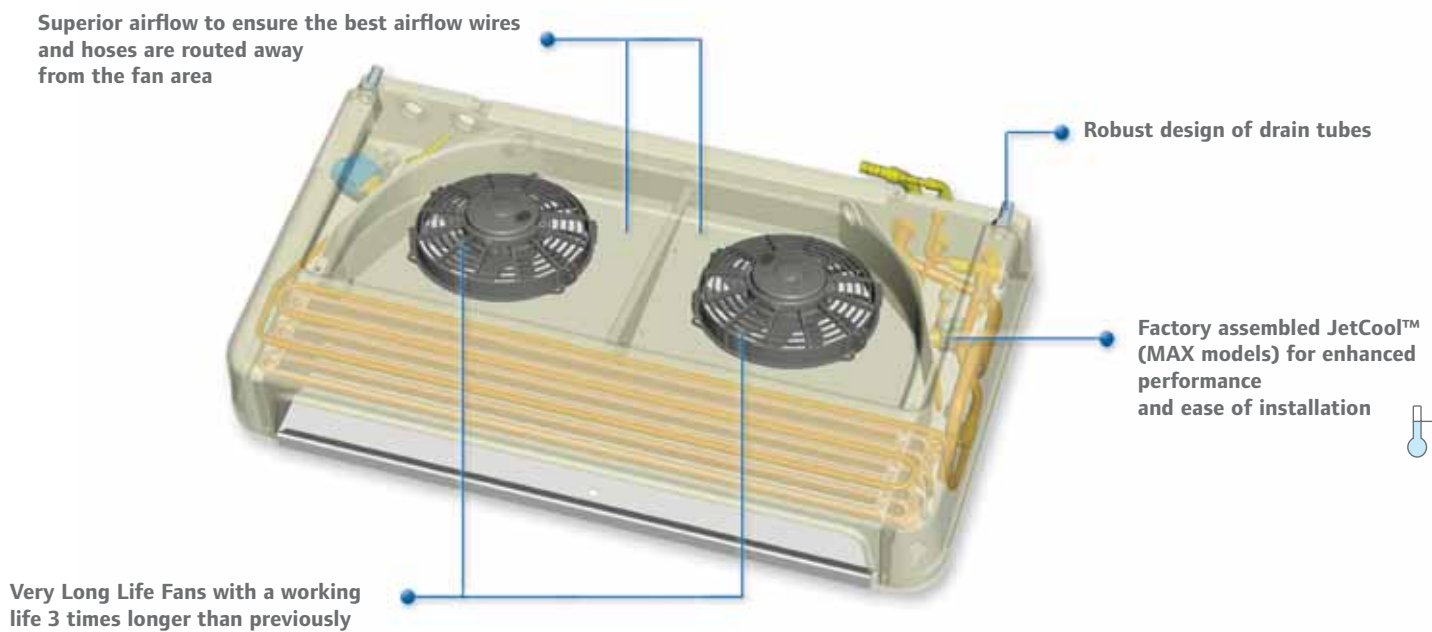
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**THERMO KING**  
V-2

## Ease of installation

- Added lifting eyes to the larger platform
- Accessible mounting holes
- Fittings outside 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 and 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 hour meters - 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 -20°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

V-Series	*					
V-100 10	R-134a	✓	-	-	-	-
V-100 20	R-134a	✓	-	✓	-	-
V-100 MAX 10	R-404A	✓	-	-	-	-
V-100 MAX 20	R-404A	✓	-	✓	-	-
V-100 MAX 30	R-404A	✓	-	-	-	✓
V-100 MAX 50	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: legend

- \* Refrigerant
-  Small platform
-  Large platform
-  Stand-by
-  Bi-temp
-  Heating
- ✓ Included
- Not included
- Optional

# 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 with and without electric stand-by, and 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 V-100 30/50 models
  - MTC module for bi-temperature models
  - MTCH module for bi-temperature and heating models



Refrigerant	kg
V-100 10	0.62 kg
V-100 20	1.0kg
V-100 MAX 10/30	0.62 kg
V-100 MAX 20	1.0 kg
V-100 MAX 50	1.2 kg
V-200 10	0.95 kg
V-200 20	1.1 kg
V-200 MAX 10/30	1.05 kg
V-200 MAX 20/50	1.2 kg
V-300 10	1.2 kg
V-300 20	1.35 kg
V-300 MAX 10/30	1.2 kg
V-300 MAX 20/50	1.35 kg
V-200 MAX TC 10/30	1.25 kg
V-200 MAX TC 20/50	1.4 kg
V-300 MAX TC 10/30	1.55 kg
V-300 MAX TC 20/50	1.7 kg

## 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

### 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

**Note:** Specifications are subject to change without notice.

## Defrost

- Automatic hot gas defrost

## Evaporator blower performance

### Airflow volume:

- Evaporator (ES 100): 695 m<sup>3</sup>/h (410 cu. ft/min)
- Evaporator (ES 150): 760 m<sup>3</sup>/h (450 cu. ft/min)
- Evaporator (ES 200): 1070 m<sup>3</sup>/h (630 cu. ft/min)
- Evaporator (ES 300): 1250 m<sup>3</sup>/h (735 cu. ft/min)

## Heating capacity (models 30/50)

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

- Road operation:
  - V-100 series 1200 W (4100 BTU/hr)
  - V-200 series 2800 W (9565 BTU/hr)
  - V-300 series 3100 W (10585 BTU/hr)
- Electric stand-by operation:
  - V-100 series 800 W (2730 BTU/hr)
  - V-200 series 2050 W (7000 BTU/hr)
  - V-300 series 2250 W (7685 BTU/hr)

## Electric motors

- dc voltage options: 12 Vdc and 24 Vdc
- Electric stand-by options:
  - 230V/1 Phase/50Hz
  - 230V/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	20 A	10 A
V-200/200 MAX V-300/300 MAX	28 A	14 A
V-200 MAX TC V-300 MAX TC	32 A	16 A

Total stand-by current consumption:	V-100 V-100 MAX	V-200 V-200 MAX, V-300 V-300 MAX	V-200 MAX TC V-300 MAX TC
230V/1 Phase/50Hz	7 A	11 A	11.2 A
230V/1 Phase/60Hz	-	12 A	12.2 A
400V/3 Phase/50Hz	-	5.4 A	5.5 A
230V/3 Phase/50Hz	-	9.3 A	9.5 A
230V/3 Phase/60 Hz	-	9.3 A	9.5 A



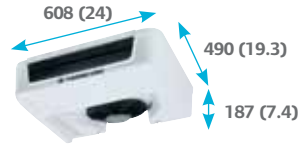
## Standard features

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

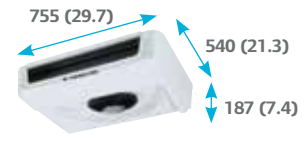




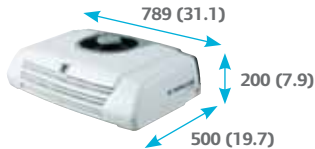
V-200/V-300 Condenser with electric stand-by



ES 100 Ultra Slim Evaporator



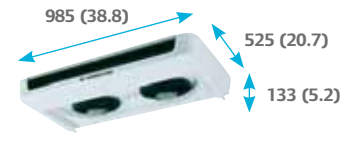
ES 150 MAX Ultra Slim Evaporator



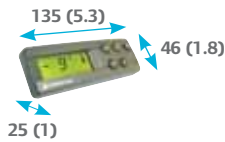
V-100 Condenser with and without electric stand-by and V-200/V-300 Condenser without electric stand-by



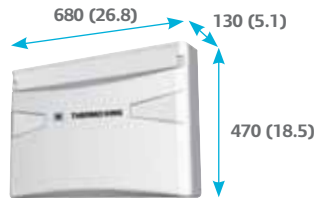
ES 300 Ultra Slim Evaporator



ES 200 Ultra Slim Evaporator



In-cab Direct Smart Reefer



MTC, MTCH



MH Module



Dimensions in millimetres

## Weights (approximate)

Condenser:

Without electric stand-by	25 kg (55 lb)
V-100 with electric stand-by	43 kg (95 lb)
V-200/V-300 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	4 kg (9 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 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 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.

Note: Specifications are subject to change without notice.

# V-Series refrigeration capacity

System net cooling capacity under ATP conditions including 30°C ambient, European standard.

V-100 (HFC R-134a Refrigerant)			V-100 MAX (HFC R-404A Refrigerant)		
Air return / On the road	Watts	BTU/hr	Air return / On the road	Watts	BTU/hr
0°C (32°F)	1530	5225	0°C (32°F)	2055	7020
-20°C (-4°F)	575	1965	-20°C (-4°F)	960	3280
Electrical stand-by 50 Hz	Watts	BTU/hr	Electrical stand-by 50 Hz	Watts	BTU/hr
0°C (32°F)	985	3365	0°C (32°F)	1410	4815
-20°C (-4°F)	300	1025	-20°C (-4°F)	660	2255
V-200 (HFC R-134a Refrigerant)			V-200 MAX (HFC R-404A Refrigerant)		
Air return / On the road	Watts	BTU/hr	Air return / On the road	Watts	BTU/hr
0°C (32°F)	2250	7685	0°C (32°F)	2710	9255
-20°C (-4°F)	1020	3485	-20°C (-4°F)	1560	5325
Electrical stand-by 50 Hz	Watts	BTU/hr	Electrical stand-by 50 Hz	Watts	BTU/hr
0°C (32°F)	1700	5805	0°C (32°F)	1990	6795
-20°C (-4°F)	655	2235	-20°C (-4°F)	1140	3895
V-300 (HFC R-134a Refrigerant)			V-300 MAX (HFC R-404A Refrigerant)		
Air return / On the road	Watts	BTU/hr	Air return / On the road	Watts	BTU/hr
0°C (32°F)	2800	9560	0°C (32°F)	3355	11460
-20°C (-4°F)	1170	3995	-20°C (-4°F)	1820	6215
			-25°C (-13°F)	1515	5175
Electrical stand-by 50 Hz	Watts	BTU/hr	Electrical stand-by 50 Hz	Watts	BTU/hr
0°C (32°F)	1880	6420	0°C (32°F)	1900	6490
-20°C (-4°F)	725	2475	-20°C (-4°F)	1055	3605
			-25°C (-13°F)	820	2800





# Features & Options overview

Features and Options		V-100 V-100 MAX	V-200 10 V-200 MAX 10/30 V-200 MAX TC_TCI 10/30	V-300 10 V-300 MAX 10/30 V-300 MAX TC_TCI 10/30	V-200 20 V-200 MAX 20/50 V-200 MAX TC_TCI 20/50	V-300 20 V-300 MAX 20/50 V-300 MAX TC_TCI 20/50
<b>LIFE COST MANAGEMENT</b>						
1	ThermoKare service contracts	▲	▲	▲	▲	▲
<b>DATA CAPTURE AND COMMUNICATIONS</b>						
2	TKDL data capture	▲	▲	▲	▲	▲
3	Wintrac (data analysis software)	▲	▲	▲	▲	▲
<b>LOAD PROTECTION</b>						
4	Door Switch	△	△	△	△	△
<b>LIFE COST MANAGEMENT</b>						
5	Din Adapter	△	△	△	△	△
6	Hose Cover	△	△	△	△	△
7	Kit Muffler	△	△	△	△	△
8	Snow Cover (Also called kit deflector Small)	△	△	△	○	○
8	Snow Cover (Also called kit deflector Big)	○	○	○	△	△
9	Harness Extension V200/300 TC/TCI	○	△	△	△	△



○ Not Available    △ Option: Factory Installed    ▲ Option: Dealer Supplied



# Features & Options

## 1 ThermoKare

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

## 2 TKDL 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

## 3 Wintrac (data analysis software)

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

## 4 Door Switches

Reduce load temperature rise and save fuel when doors are opened

## 5 Din Adapter

The Din Adaptor box permits the adaption of the DSR controller to the vehicle dashboard. The esthetically designed box allows the placement of the DSR controller in any available radio slot compartment in the driver cab.

## 6 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)

## 7 Kit Muffler

Thermo King Muffler eliminates the vibration and noise in the interior cab of small vehicles. The muffler is attached to the refrigeration system thus eliminating the vibration transfer from the unit to the driver cab enhancing user comfort and ease of use.

## 8 Snow Covers

Thermo King Snow Covers are designed to protect your unit against extreme climate conditions. The Aerodynamically design snow cover prevents the buildup of snow and ice on the units fans which can lead to downtime and further maintenance costs resulting in longer running times for your unit.

## 9 Harness Extension

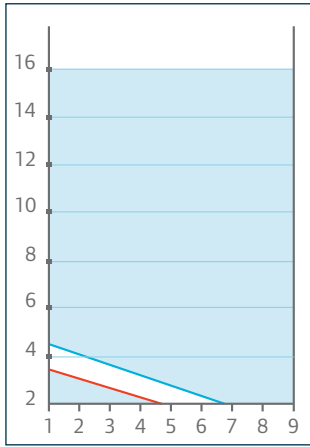
The 2 meter long harness extension allows evaporators to be located to suit any customer needs with an extremely easy installation (plug-and-play connection). As many harness extensions as needed can be connected one after the other which provides full flexibility to position the evaporators especially in multi-temp applications.



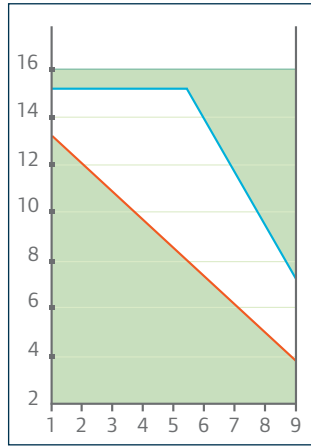
# V-Series selection guide

## V-100 / V-100 MAX

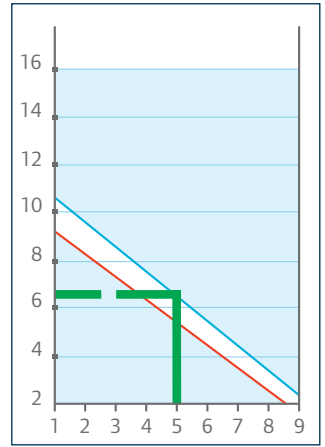
R-134a



R-134a



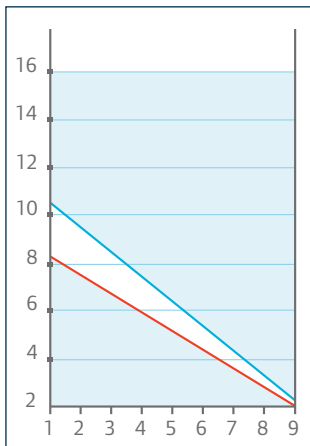
R-404A



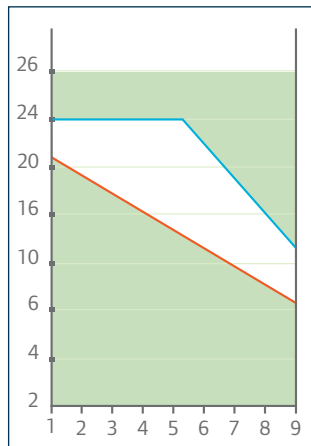
**Example:** 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour: V-100 MAX suits vehicles up to 6.5m<sup>3</sup> (230 cu.ft.).

## V-200 / V-200 MAX

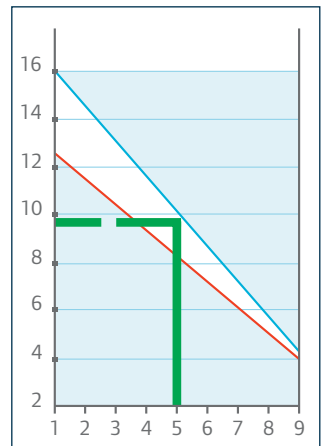
R-134a



R-134a



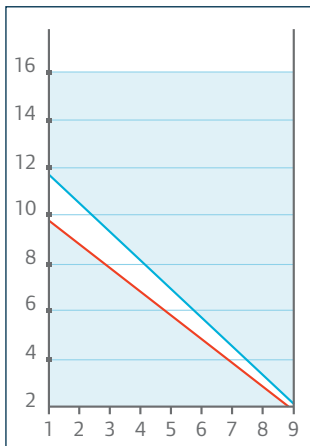
R-404A



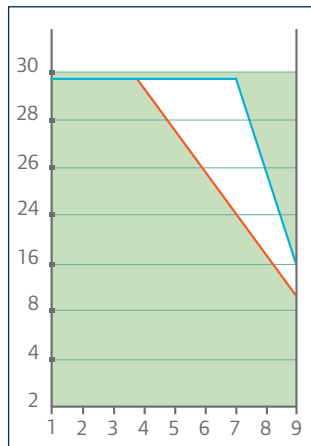
**Example:** 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour: V-200 MAX suits vehicles up to 9.5m<sup>3</sup> (335 cu.ft.).

## V-300 / V-300 MAX

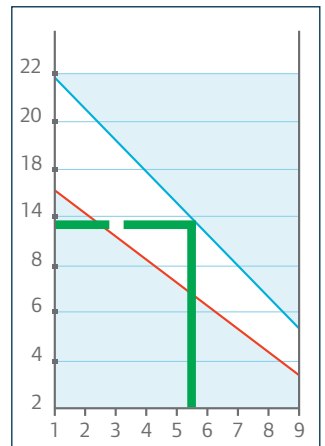
R-134a



R-134a



R-404A



**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.).

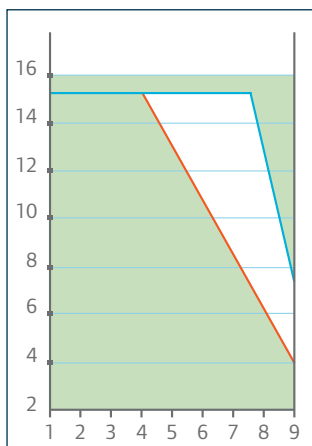


Loadspace volume (m<sup>3</sup>)

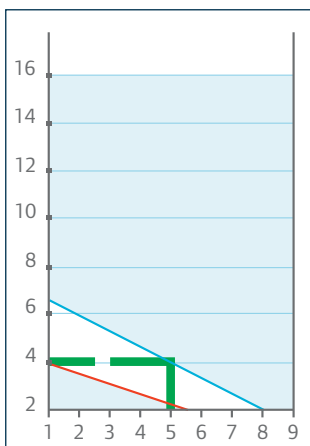
Door openings per hour

## V-200 MAX TC

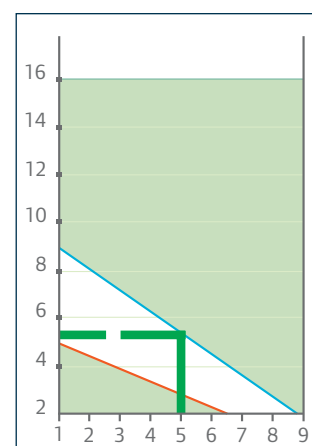
R-404A



R-404A



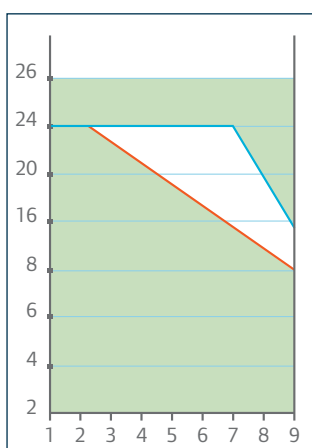
R-404A



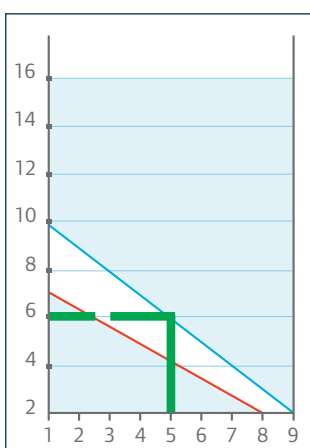
**Example:** 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour in each compartment, V-200 MAX TC suits vehicles with frozen compartment up to 4m<sup>3</sup> (140 cu.ft.) and chilled compartment up to 5.5m<sup>3</sup> (195 cu.ft.).

## V-300 MAX TC

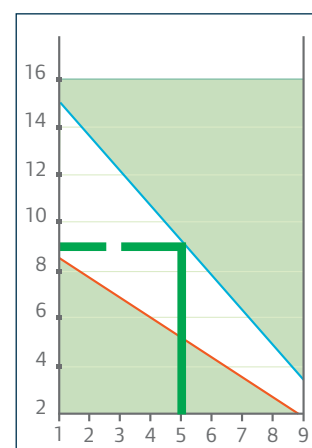
R-404A



R-404A

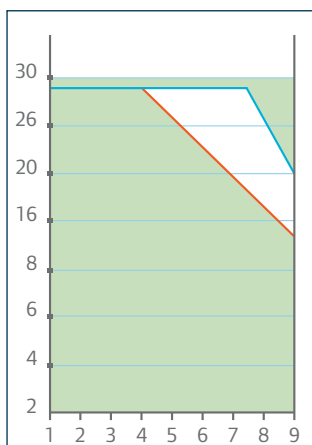


R-404A



**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.).

R-404A



**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

# 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 nosemount 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.



V-500 and V-700 series





# ThermoKare Service Solutions

ThermoKare is a complete selection of service contract solutions, designed for fleets operating nationally or internationally. The contracts are designed to optimise the efficiency of your fleets, minimise operating costs and maximise the resale value of your equipment. Our tailored service contract solutions help to remove the non-core tasks from your daily business operations such as maintenance planning, scheduling, invoice interpretation and general fleet administration. The ThermoKare service contract solutions offer you everything from “administration only” to the complete “peace of mind” contract at an agreed, fixed cost.



**For more information about ThermoKare, please contact your Thermo King representative.**

## Thermo Assistance

Thermo Assistance is a multilingual 24-hour telephone breakdown assistance service available throughout Europe that puts you in direct contact with an authorised Service Dealer whenever you require one.



# Thermo King Dealer Service Network

## Anywhere in Europe

- Blanket coverage across Europe
- Open & available 24/7
- Over 300 authorised service points
- 1300 certified technicians





Thermo King Corporation, a business of Ingersoll Rand – the world leader in creating and sustaining safe, comfortable and energy efficient environments – was founded in 1938 and manufactures transport temperature control systems for a variety of mobile applications, including trailers, truck bodies, buses, shipboard containers and railway cars. The company operates 10 manufacturing facilities and 17 parts distribution centers worldwide. Sales and service is provided by a global dealer network of 865 independently owned companies in 75 countries.

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For further information please contact: