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 and TCI can manage two evaporators to provide temperature control for two compartments. Models with hot gas heating are also available. MAC modules can be added to single-temperature cool-only units of the V-200 and V-300 series to provide air conditioning.

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 and TCI)
  - ES 150 (V-300 MAX TC and TCI)
  - ES 200 (V-200 series with the exception of bi and multi-temperature models)
  - ES 300 (V-300 series with the exception of bi and multi-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
  - MTCI module for multi-temperature models
  - MAC module for cabin a/c
- 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^3 (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^3 (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^3 (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 (ES100):	680 m^3/h	(400 cu. ft/min)
Evaporator (ES150):	790 m^3/h	(465 cu. ft/min)
Evaporator (ES200):	1040 m^3/h	(610 cu. ft/min)
Evaporator (ES300):	1295 m^3/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
V-200 MAX TCI V-300 MAX TCI	34A	18A

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/TCI, V-300 MAX TC/TCI)

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

DAS (Data Acquisition System)
High performance data acquisition system. Records temperatures, set point, operating modes and external events. Data can be output to computer or printer
- Operates independently of unit controller
- 512K memory stores over one year's data
- Reassures customer of total quality control
- Provides evidence of correct practice
- Approved to EN-12-830, CE Mark and IP-65 standards
- Up to six independent sensors
- Automatic power-up and shut-off protect unit battery

R:COM
Remote wireless communication of data logged by the data recorder
- Download data collected by DAS to PC, viewed in Wintrac
- Log vehicles on arrival and departure
- Monitor parked vehicles and report any alarms
- Redirect alarms to a mobile phone if required

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

THERMO KING

TK 52385-1-PL E (1-04)

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www.thermoking.com

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1831 Diegem, Belgium.

An Ingersoll-Rand business

THERMO KING

V Series (Small trucks and vans)

Just Right Temperature Control

Key Features:
- Modern compact platform for the models without electric stand-by
- New user friendly Direct Smart Reefer
- Increased reliability
- Easy maintenance, service and installation

An Ingersoll-Rand business

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

Superior Temperature Control

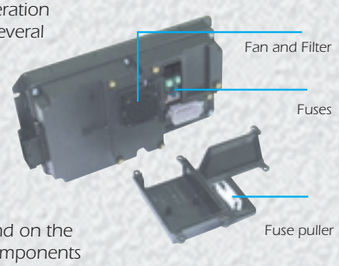
- High airflow to provide **superior temperature** management leading to a more **uniform temperature distribution** thereby protecting perishable goods during transport
- **Higher cooling capacity at all temperatures especially on electric stand-by operation for**
  - **Faster temperature recovery** from multiple door openings during distribution operations
  - **Quicker pre-cooling** on electric operation
- Offer the flexibility of choosing between R134a and R404A refrigerants. R134a is especially suited to countries with high ambient temperatures (up to +45°C) due to its lower working pressures and temperatures extending compressor life.

Improved Reliability of Electrical Components

- Introduction of new 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 independent protection of the loads
- Hermetic transformer and connecting wires

IP55 electric box with sealed connectors

- Large, compact filtering capacitors for improved d.c. supply stability during standby operation
- The new 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 and compressor
  - clutch delay timer extends electrical motor life



Easy access to fan, filter and fuses

Ease of Maintenance and Service

- The new DSR has a
  - Maintenance reminder
  - 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

New 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 conditions

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

Flexibility

- Retrofittable with heat option
- Can convert from single temperature to multi-temperature using the same condenser section
- Modules to add heating, bi-temperature or multi-temperature management
- MAC modules to manage cabin a/c and load refrigeration with the same compressor
- TCI model offers multi-temperature flexibility

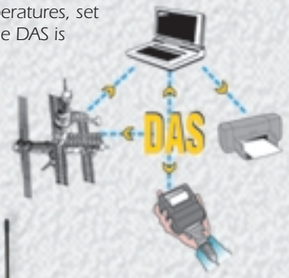
MAC models to manage cabin a/c and load refrigeration with the same compressor

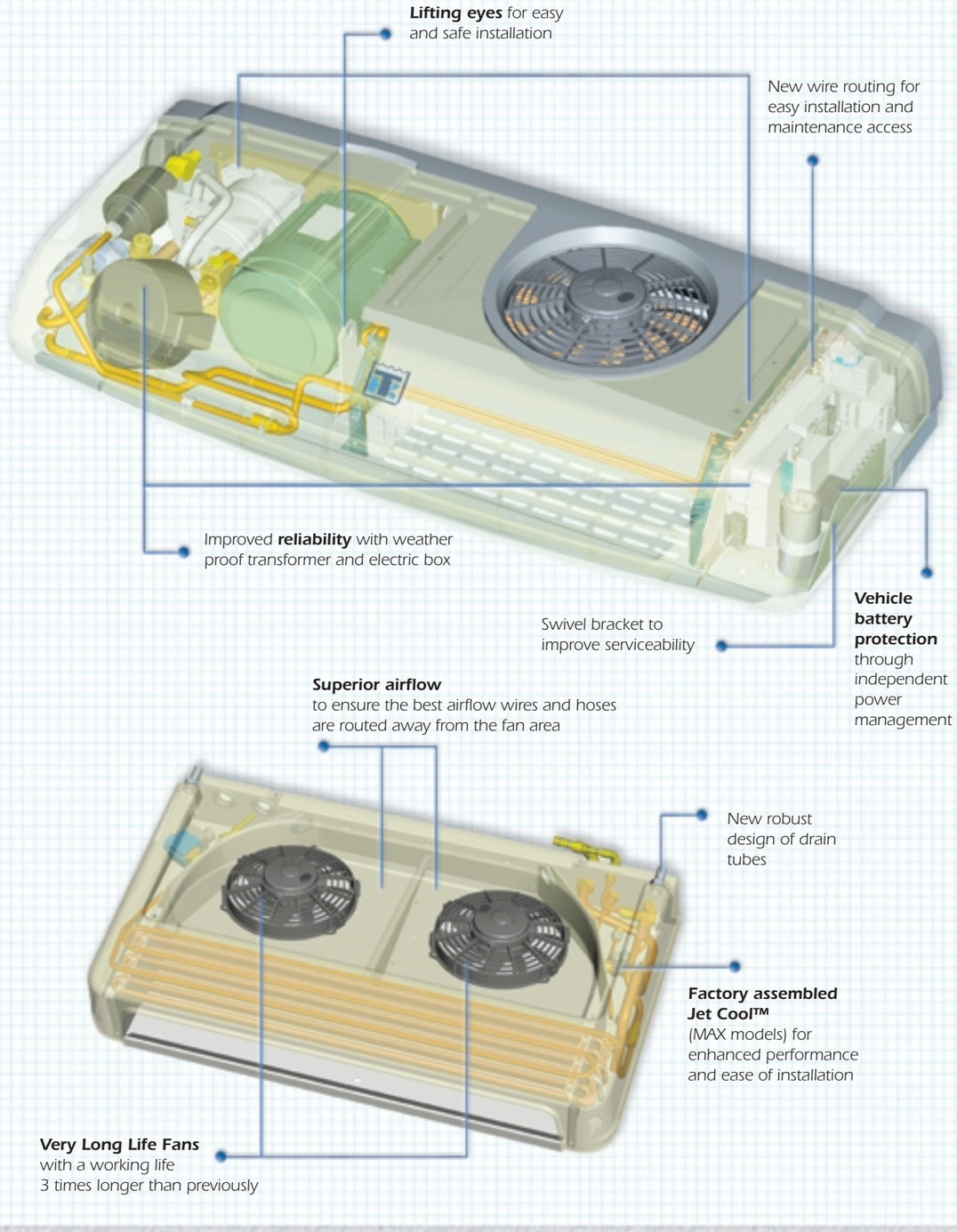
TCI model offers multi-temperature flexibility

Data Capture and Management Solutions

The new V-Series offers the possibility to work with:

- DAS (Data Acquisition System) - records temperatures, set point, operating modes and alarm codes. The DAS is compatible with Wintrac, a windows based management software package designed to communicate, download and display the information from Thermo King temperature recorders. It can also be connected with R:COM for remote temperature downloading and monitoring.
- R:COM - remote wireless communication of data logged by data recorder. The downloaded data is collected by a PC where it is viewed using Wintrac.





Direct Smart Reefer

The New 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 New 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 Kings 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 R134a are –22°C to +22°C and –32°C to +22°C for R404A.
- 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.	Multi-temp.	Heating	MAC module
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-200 MAX TCI 10	R-404A	✓	–	–	–	✓	–	–
V-200 MAX TCI 20	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-300 MAX TCI 10	R-404A	✓	–	–	–	✓	–	–
V-300 MAX TCI 20	R-404A	–	✓	✓	–	✓	–	–

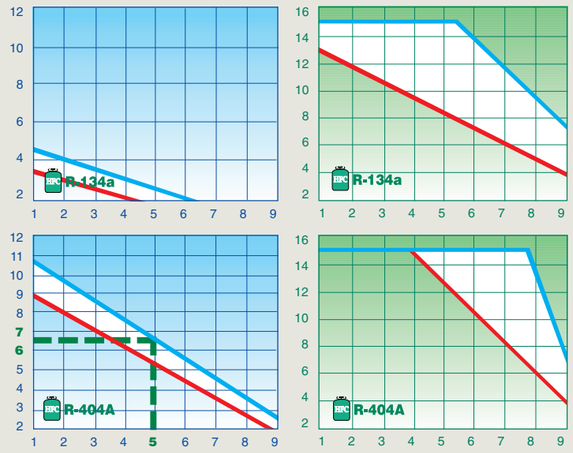
V Series range – dealer options

Data Capture and Communications	
TranScan 2	■
Sentinel	■
TranScan XL	■
DAS (Data Acquisition System)	■
Wintrac data analysis software	■
R:COM wireless data download	■
Load Protection	
Door switches	■
Life Cost Management	
Guaranteed Maintenance Contracts (Total Kare)	■

V Series Selection guide

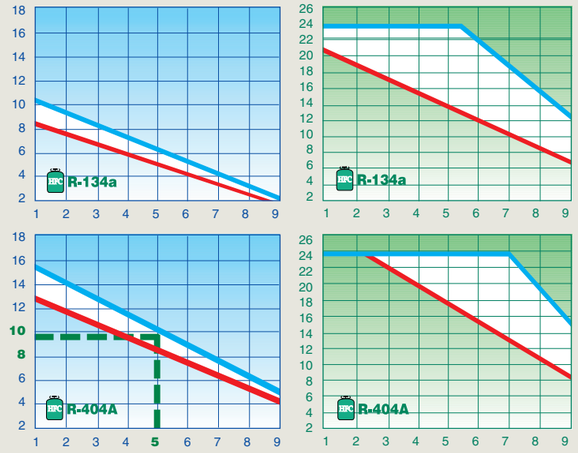
Loadspace volume (m3)

V-100/V-100 MAX



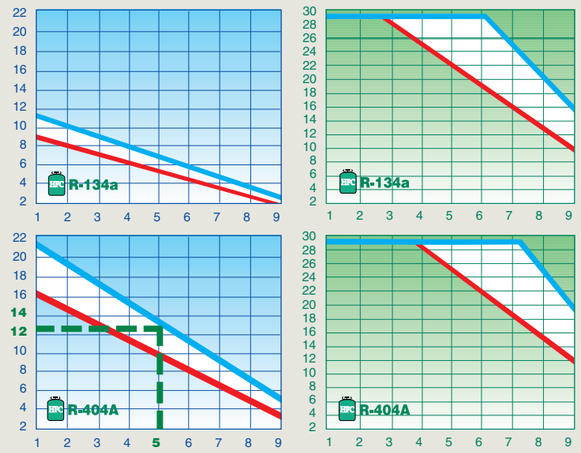
Example: 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour: V-100 MAX suits vehicles up to 6.5m³ (230 cu.ft.).

V-200/V-200 MAX



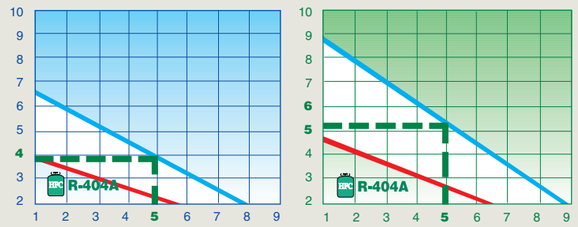
Example: 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour: V-200 MAX suits vehicles up to 9.5m³ (335 cu.ft.).

V-300/V-300 MAX



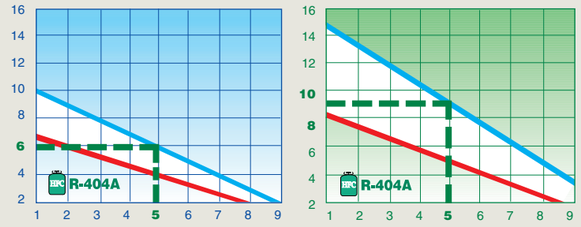
Example: 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour: V-300 MAX suits vehicles up to 11.5m³ (406 cu.ft.).

V-200 MAX TC/TCI



Example: 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour in each compartment, V-200 MAX TC/TCI suits vehicles with frozen compartment up to 4m³ (140 cu.ft.) and chilled compartment up to 5.5m³ (195 cu.ft.).

V-300 MAX TC/TCI



Example: 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour in each compartment, V-300 MAX TC/TCI suits vehicles with frozen compartment up to 6m³ (210 cu.ft.) and chilled compartment up to 9m³ (320 cu.ft.).

Frozen compartment (k=0.35 W/m2K)
- 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/m2K)
- ambient: 30°C/86°F, compartment: 3°C/37°F
- ambient: 100°F/38°C, compartment: 37°F/3°C

Door openings per hour

V Series Refrigeration capacity

R-134a

30°C ambient, European standard.

System net cooling capacity under ATP conditions including 30˚C (86˚F) ambient.

V-100 (HFC R-134a Refrigerant)

Air return / On the road	Watts	BTU/hr
0°C (32°F)	1405	4800
-20°C (-4° F)	545	1860

V-200 (HFC R-134a Refrigerant)

Air return / On the road	Watts	BTU/hr
0°C (32°F)	2205	7530
-20°C (-4° F)	1050	3600
Electric stand-by 50Hz		
0°C (32°F)	1750	5980
-20°C (-4° F)	655	2240

V-300 (HFC R-134a Refrigerant)

Air return / On the road	Watts	BTU/hr
0°C (32°F)	2865	9789
-20°C (-4° F)	1200	4100
Electric stand-by 50Hz		
0°C (32°F)	1855	6335
-20°C (-4° F)	720	2460

100°F ambient, U.S. standard.

System net cooling capacity at 100˚F (38˚C) ambient and 2400 compressor rpm.

V-100 (HFC R-134a Refrigerant)

Air return / On the road	BTU/hr	Watts
35°F (2°C)	3840	1125
0° F (-18°C)	1780	520

V-200 (HFC R-134a Refrigerant)

Air return / On the road	BTU/hr	Watts
35°F (2°C)	5940	1740
0° F (-18°C)	3420	1000
Electric stand-by 50Hz		
35°F (2°C)	4710	1380
0° F (-18°C)	2120	620

V-300 (HFC R-134a Refrigerant)

Air return / On the road	BTU/hr	Watts
35°F (2°C)	7720	2260
0° F (-18°C)	3880	1135
Electric stand-by 50Hz		
35°F (2°C)	5000	1465
0° F (-18°C)	2320	680

R-404A

30°C ambient, European standard.

System net cooling capacity under ATP conditions including 30˚C (86˚F) ambient.

V-100 MAX (HFC R-404A Refrigerant)

Air return / On the road	Watts	BTU/hr
0°C (32°F)	1925	6570
-20°C (-4° F)	911	3110
-25°C (-13° F)	620	2110

V-200 MAX (HFC R-404A Refrigerant)

Air return / On the road	Watts	BTU/hr
0°C (32°F)	2650	9050
-20°C (-4° F)	1480	5055
-25°C (-13° F)	1190	4065
Electric stand-by 50Hz		
0°C (32°F)	1945	6645
-20°C (-4° F)	1055	3605
-25°C (-13° F)	840	2870

V-300 MAX (HFC R-404A Refrigerant)

Air return / On the road	Watts	BTU/hr
0°C (32°F)	3390	11580
-20°C (-4° F)	1900	6490
-25°C (-13° F)	1480	5050
Electric stand-by 50Hz		
0°C (32°F)	1930	6590
-20°C (-4° F)	1185	4050
-25°C (-13° F)	885	3020

100°F ambient, U.S. standard.

System net cooling capacity at 100˚F (38˚C) ambient and 2400 compressor rpm.

V-100 MAX (HFC R-404A Refrigerant)

Air return / On the road	BTU/hr	Watts
35°F (2°C)	5260	1540
0° F (-18°C)	2950	865
-20° F (-29°C)	1330	390

V-200 MAX (HFC R-404A Refrigerant)

Air return / On the road	BTU/hr	Watts
35°F (2°C)	7160	2100
0° F (-18°C)	4775	1400
-20° F (-29°C)	3170	930
Electric stand-by 60Hz		
35°F (2°C)	5250	1540
0° F (-18°C)	3410	1000
-20° F (-29°C)	2265	665

V-300 MAX (HFC R-404A Refrigerant)

Air return / On the road	BTU/hr	Watts
35°F (2°C)	10015	2935
0° F (-18°C)	5835	1710
-20° F (-29°C)	3530	1035
Electric stand-by 60Hz		
35°F (2°C)	5800	1700
0° F (-18°C)	3790	1110
-20° F (-29°C)	2560	750

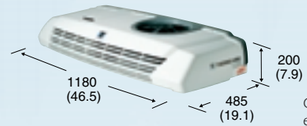
Capacities stated according to ATP certificate No. M575, No. M574 ,No. M488, No. M530 and No. M529. In the case of using the MAC module, capacity can reduce by up to 40%.

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.

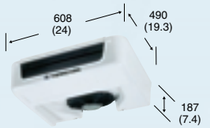
Dimensions millimetres (inches)



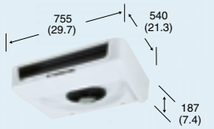
Condenser with electric stand-by

Condenser without electric stand-by

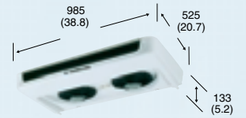
In-cab Direct Smart Reefer



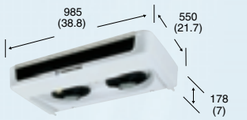
ES100 Ultra Slim Evaporator



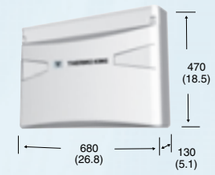
ES150 MAX Ultra Slim Evaporator



ES200 Ultra Slim Evaporator



ES300 Ultra Slim Evaporator



MH, MTC, MTCH, MTCI or MAC module

Weights (approximate)

Condenser:	
w/o electric stand-by	50 kg (111 lb)
with electric stand-by	75 kg (165 lb)
ES100 (Ultra Slim evaporator)	9 kg (20 lb)
ES150 MAX (Ultra Slim evaporator)	12.5 kg (27.5 lb)
ES200 (Ultra Slim evaporator)	15 kg (33 lb)
ES300 (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)
Multi-temp. module MTCI	9 kg (20 lb)
MAC air conditioning module	9 kg (20 lb)