THERMO KING

V Series

Superior Temperature Control

Small trucks and vans

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

Ingersoll Rand
Climate Control Technologies

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The V Series

The V-100, 200 and 300 series offer the optimal temperature control solution for trucks and vans up to 29m³. 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

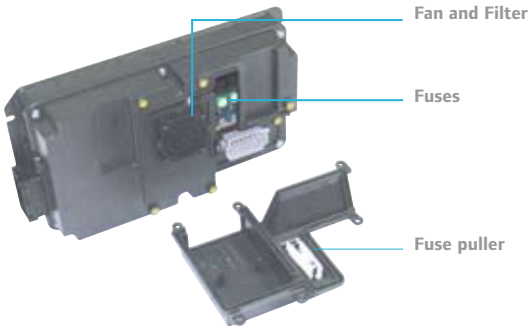
- Retrofittable with heat option
- Can convert from single temperature to bi-temperature (TC) using the same condenser section
- Modules to add heating or bi-temperature management

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.

IP55 electric box with sealed connectors

- 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.



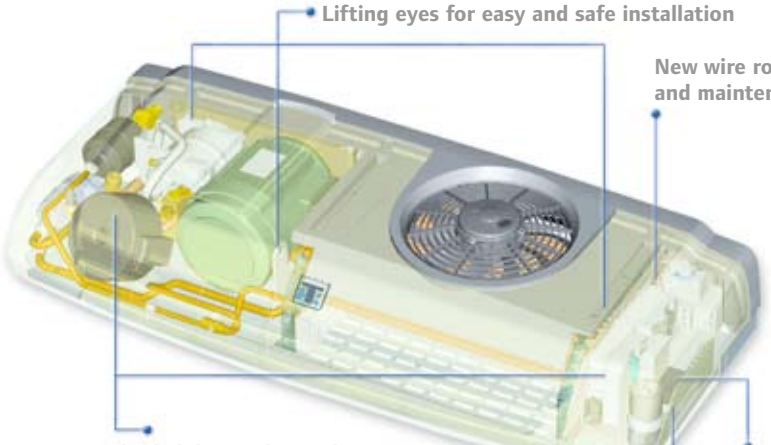
Easy access to fan, filter and fuses

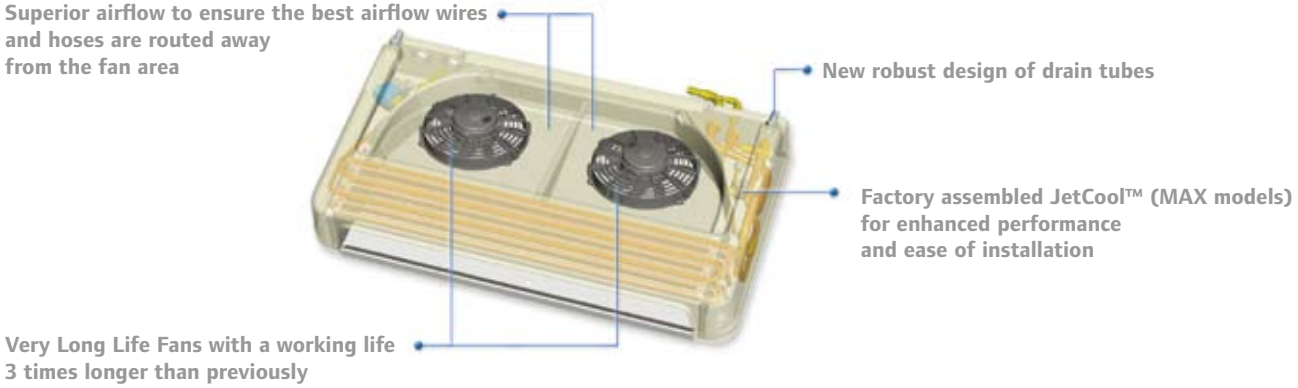
Ease of maintenance and service

- 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

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 -22ºC to 22ºC and -32ºC to 22ºC 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	–	✓	✓	✓	✓

Dealer options

Data capture and communications	
TKDL-PRO	▪
TKDL-SPR	▪
TKDL-DCS	▪
TracKing	▪
Wintrac data analysis software	▪
Door switches	▪
Guaranteed Maintenance Contracts (Total Kare)	▪

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 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: 1.0 kg of HFC R-134a
- V-100 MAX: 1.0 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

V-300 series

- Number of cylinders: 6
- Displacement: 146.7 cm3 (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

Note: Specifications are subject to change without notice.

Evaporator blower performance

Airflow volume:

- Evaporator (ES 100): 680 m^3/h (400 cu. ft/min)
- Evaporator (ES 150): 790 m^3/h (465 cu. ft/min)
- Evaporator (ES 200): 1040 m^3/h (610 cu. ft/min)
- Evaporator (ES 300): 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 1050 W (3585 BTU/hr)
- Electric stand-by operation:
  - V-100 series 400 W (1365 BTU/hr)
  - 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-100/ 100 MAX)	(V-200/ 200 MAX, V-300/ 300 MAX)	(V-200 MAX TC, V-300 MAX TC)
230V/1 Phase/50Hz	5.5 A	10 A	10.5 A
230V/1 Phase/60Hz		10.2 A	10.7 A
115V/1 Phase/60Hz		16 A	16.5 A
400V/3 Phase/50Hz		4.5 A	4.6 A
230V/3 Phase/50Hz		7.7 A	8 A
230V/3 Phase/60 Hz		7.9 A	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

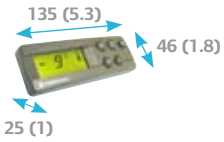
TotalKare

Dimensions- millimetres (inches)

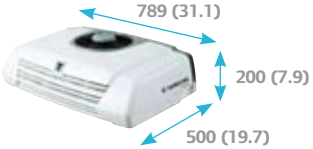
V-200/V-300 Condenser
with electric stand-by

ES 100
Ultra Slim Evaporator

ES 150 MAX
Ultra Slim Evaporator

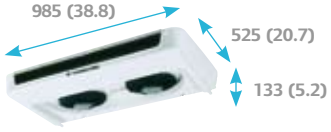


In-cab Direct Smart Reefer

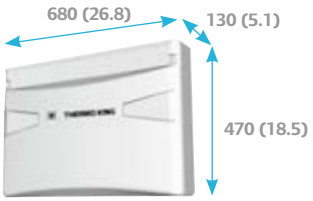


V-100 Condenser with and without
electric stand-by and V-200/V-300
Condenser without electric stand-by

ES 300
Ultra Slim Evaporator



ES 200
Ultra Slim Evaporator



MH, MTC, MTCH

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	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.

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.

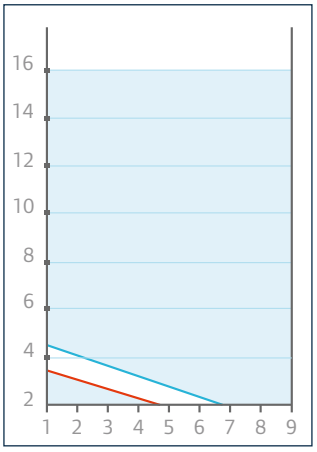
V-100 (HFC R-134a Refrigerant)			V-100 MAX (HFC R-404A Refrigerant)		
Air return / On the road	**Watts**	**BTU/hr**	**Air return / On the road**	**Watts**	**BTU/hr**
0°C (32°F)	1530	5225	0°C (32°F)	2055	7020
-20°C (-4°F)	575	1965	-20°C (-4°F)	960	3280
Electrical stand-by 50 Hz	**Watts**	**BTU/hr**	**Electrical 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

Capacities stated according to ATP certificate no. 657, 658, 603, 604, 641and 648.

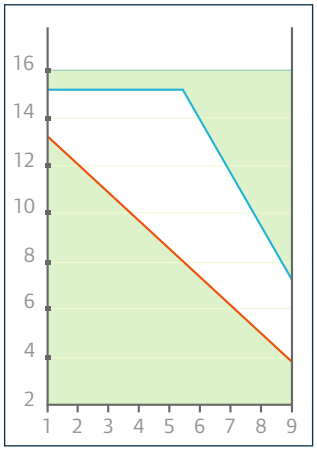
V Series selection guide

V-100 / V-100 MAX

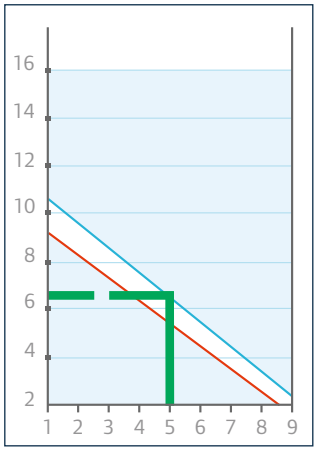
R-134a



R-134a



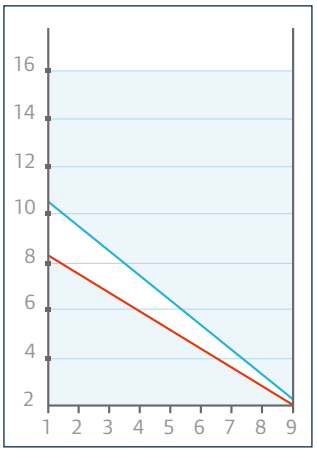
R-404A



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

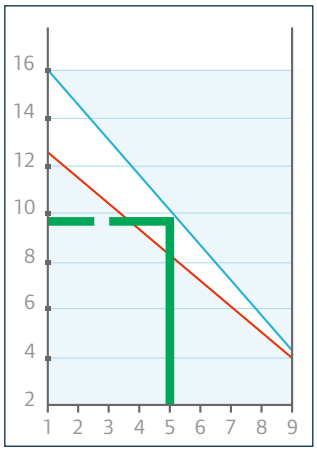
V-200 / V-200 MAX

R-134a



R-134a

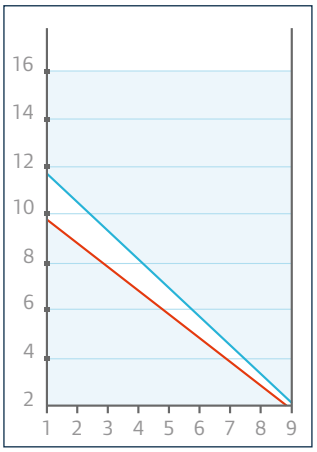
R-404A



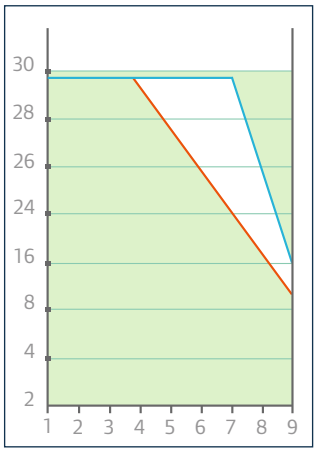
Example: 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour: V-200 MAX suits vehicles up to 9.5m³ (335 cu.ft.).

V-300 / V-300 MAX

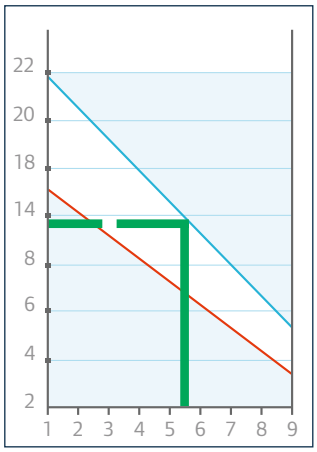
R-134a



R-134a



R-404A

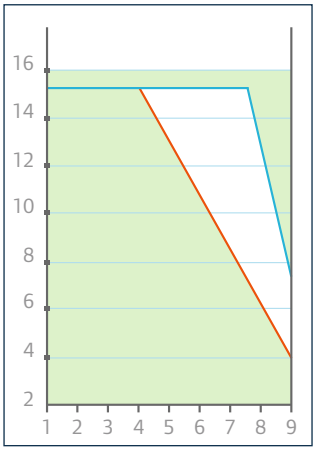


Example: 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour: V-300 MAX suits vehicles up to 11.5m³ (406 cu.ft.).

Loadspace volume (m³)

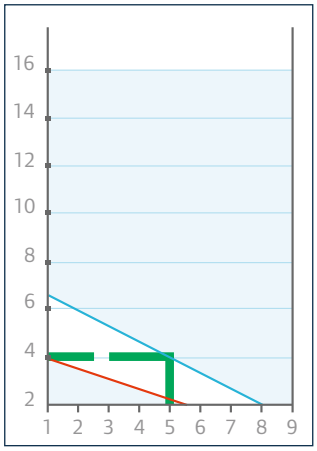
Door openings per hour

R-404A



V-200 MAX TC

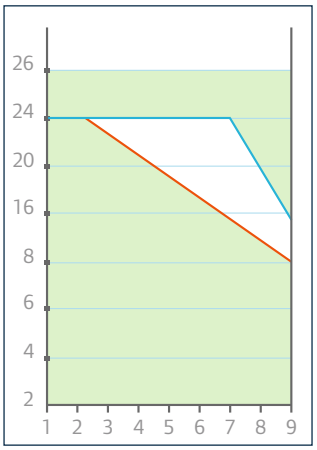
R-404A



R-404A

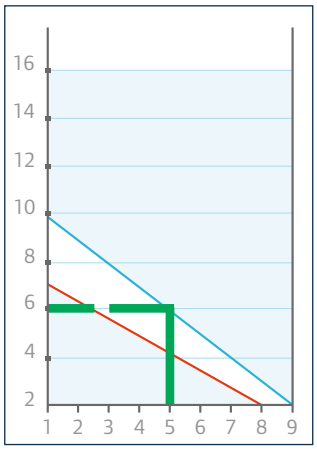
Example: 30°C (86°F) maximum ambient, frozen compartment, 5 door openings per hour in each compartment, V-200 MAX TC suits vehicles with frozen compartment up to 4m³ (140 cu.ft.) and chilled compartment up to 5.5m³ (195 cu.ft.).

R-404A



V-300 MAX TC

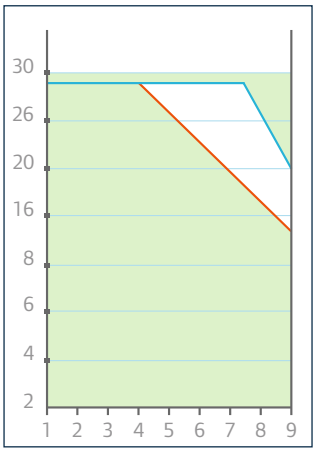
R-404A



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 6m³ (210 cu.ft.) and chilled compartment up to 9m³ (320 cu.ft.).

R-404A



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

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.

V-500 and V-700 series

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

Always insist on genuine Thermo King service parts

Thermo King understands the importance of parts availability and performance. That's why we have expanded our range of aftermarket products. Now you can get the parts and accessories you need, where you need them, when you need them, quicker and more efficiently than ever before. Our goal is to provide you with the total solutions package to increase operating performance and reduce life cycle costs.

Replacement parts

Genuine Thermo King replacement parts are proven time after time in side-by-side testing, to be superior to other non-original parts. Specifically engineered to provide optimal performance and maximum life, Thermo King replacement parts protect your investment and give you confidence and peace of mind on the road.

Maintenance parts

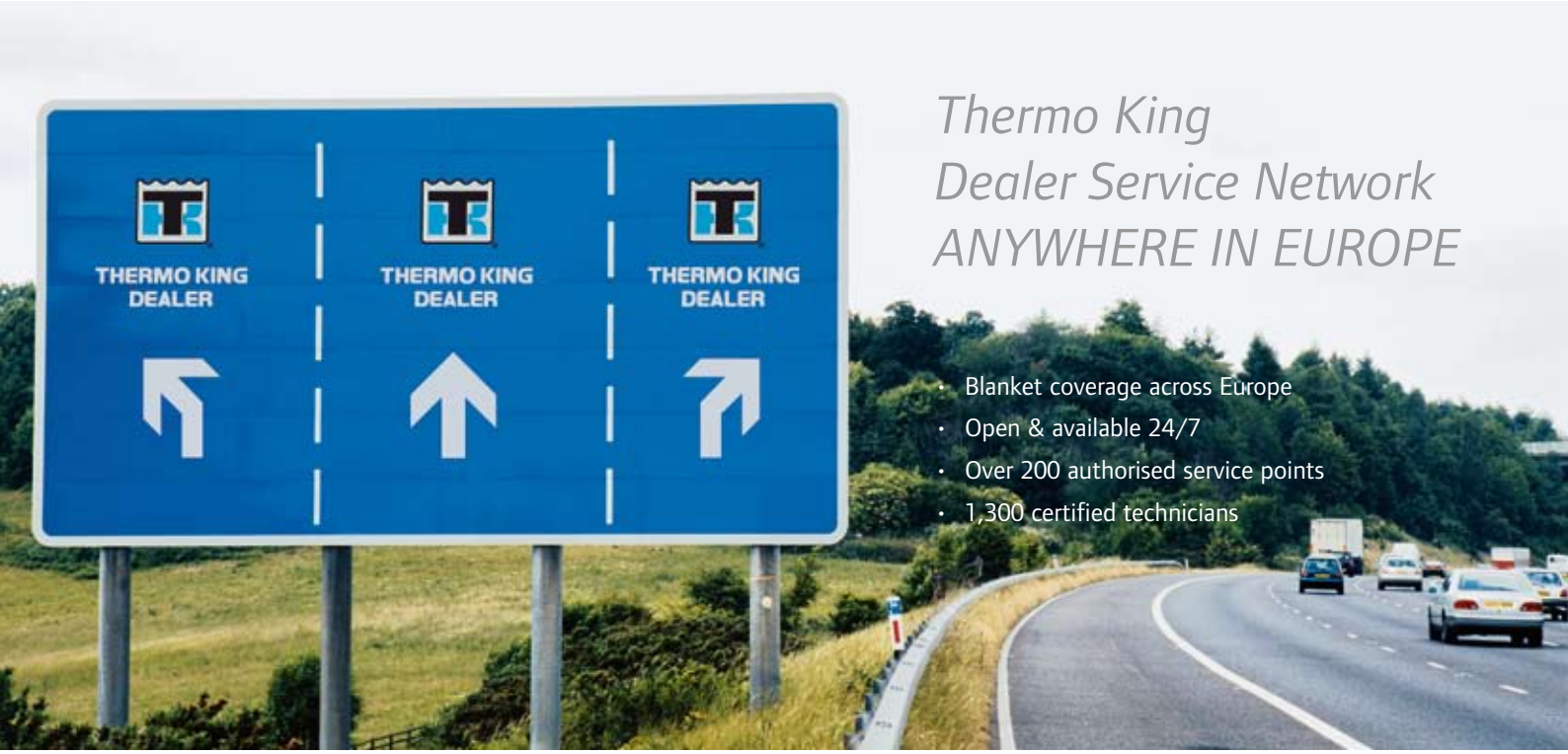
Thermo King offers the highest quality in durable maintenance parts. All parts have been carefully selected and designed to keep your Thermo King equipment operating efficiently and at full capacity for longer and to reduce life cycle costs.

Accessories

Complete your performance package with Thermo King's new and innovative range of quality accessories. Thermo King accessories are specifically designed to enhance equipment performance and increase productivity as well as improving driver safety and comfort. These accessories can be supplied with new equipment or as a retrofit option to suit individual customer needs.

Telematics

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



Thermo King Dealer Service Network ANYWHERE IN EUROPE

- Blanket coverage across Europe
- Open & available 24/7
- Over 200 authorised service points
- 1,300 certified technicians

Ingersoll Rand Climate Control Technologies provides equipment and services for:

TRANSPORT REFRIGERATION

Road Cargo

Air Cargo

Sea Cargo

HEATING, VENTILATION & AIR CONDITIONING

Bus

Rail

STATIONARY REFRIGERATION

Commercial Applications

Industrial Applications

Ingersoll Rand
Climate Control Technologies

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 systems, and Hussmann® - Koxka® manufacturer of refrigeration and food merchandising equipment.

www.thermoking.com www.hussmann.com www.koxka.com www.ingersollrand.com

For further information please contact:

Ingersoll Rand Climate Control Technologies NCI Building - 4th Floor, Culliganlaan 1B, 1831 Diegem, Belgium.

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