THERMO KING

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
Enhanced performance

Ingersoll Rand

CONTENT

V-Series

The V-100, 200 and 300 series offer the optimal temperature control solution for trucks and vans up to 28 m^3. This complete range shares many common components including the Direct Smart Reefer and has many modular options to fulfil the requirements of every customer. The V-200s even combines the compact size of the V-100 with the high cooling capacity of the V-200. This makes it ideally suited for roof-mount installations where size is critical.

Main benefits of the V-Series range:

- Superior temperature control
- User-friendly Direct Smart Reefer
- Spectrum models for multi temperature applications
- Improved reliability
- Ease of maintenance and service
- Ease of installation
- Enhanced heating performance
- Flexibility
- R-452A refrigerant as a standard

R-452A REFRIGERANT
Advanced Efficient Green

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

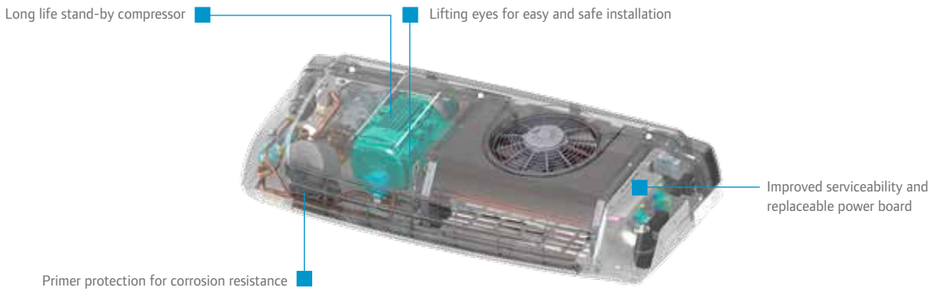
V-200/V-300 with electric stand-by

Modern compact platform
Enhanced performance
Increased reliability

Benefits

Superior temperature control

- An enhanced hot gas system boosts heating performance in low ambient temperatures and gives performance gains for demanding positive temperature applications such as pharmaceutical transport.
- High airflow ensures uniform temperature distribution in the cargo space to protect perishable goods.
- High cooling capacity over the road and on electric stand-by means:
  - Faster temperature recovery from multiple door openings during distribution operations.
  - Quicker pre-cooling on electric operation.
- A choice of R-134a, R-404A and R-452A refrigerant.
  - R-134a is idealy suited to fresh applications and extreme high outside temperatures.
  - R-404A and R-452A deliver the highest performance for frozen applications. Additionally, R-452A is developed to lower GWP (Global Warming Potential)
- The V-Series Spectrum range satisfies the most demanding multi temperature distribution applications.



Tougher components

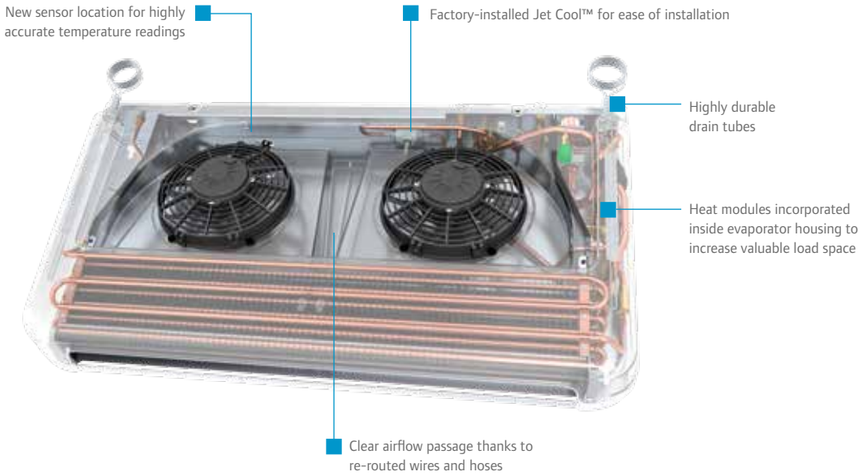
- Both the condenser and the evaporator are fitted with Very Long Life (VLL) fans giving up to three times more lifespan.
- Individual fuses are fitted for increased load protection.
- A hermetically sealed transformer and weather-proof connectors prevent water ingress.

Easy to maintain and service

- The Direct Smart Reefer (DSR) controller features:
  - A maintenance reminder to ensure uptime is maximized.
  - Easily understood alarm codes to enable rapid diagnosis.
- The unit can be operated safely with the condenser cover removed to facilitate diagnosis.

Easy to install

- Lifting eyes (stand-by models)
- Easily accessible mounting holes
- Fittings located outside the evaporator to reduce installation time and maximize airflow
- Jet Cool™ compressor injection cooling (MAX models) pre-installed in the evaporator module



Direct Smart Reefer (DSR) Controller

The DSR brings the latest in microprocessor based intelligent control to Thermo King's vehicle powered product range.
It comprises an in-cab display connected to a control board which is located in the condenser module.
The DSR is:

- Simple to use but brings advanced control features
- Flexible, modular and stylish
- Designed to enable error-free control and monitoring of the refrigeration unit from inside the cab

The DSR in-cab display

HMI in-cab is equipped with the most advanced features to provide best user interface experience. LCD technology allows drivers to have a comfortable exposure and outstanding display conditions. LED backlight provides an optimal view without additional light. The multiple available functions gives customers the flexibility to adapt to their specific transport application while guaranteeing optimal temperature control and product integrity. It also allows drivers to quickly identify anomalies by displaying the right alarm code symbol. DSR in-cab includes a support to provide flexibility to mount in different points inside the cabin. An optional din adaptor is also available in order to be able to position it in a radio slot.

The DSR in-cab display

The DSR control board

- A modular concept, separating the control and power relay boards
- Improved reliability, serviceability and component replacement
- Reduced service and maintenance costs

Compatibility:

- Platform-I: V-100, V-200, V-300 and B-100 series
- Platform-II: V-500, V-600, V-800 and Spectrum series

Platform-I Control Box

Platform-II Control Box

Standard features

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

Programmable features

- **Set point limits** to allow the selection of the optimum temperature range to suit the application and the refrigerant.
- **Set point lock** to prevent the driver modifying a predetermined temperature.
- **Temperature control band** can be selected.
- **Out of range alarm** to provide an on-screen warning when the return air temperature is out of range.
- **Door switches** to shut down the unit each time the door is opened, helping to maintain the box temperature and protect the load (optional).
- **Warning buzzer** to alert the operator if the vehicle is started while the unit is on electric standby or the door is open (optional).
- **Wintrac**, a Windows-based software package, to allow configuration parameters to be edited in the field and system values such as voltage, pressure and alarms to be logged and read.
- **Firmware upgrades** can be carried out in the field using a specific .exe file provided by Thermo King.
- Independent control of two-compartments on Spectrum units (multi temperature) allows to **switch on/off compartments independently**.
- **Independent set point range adjustment** in Spectrum units for each compartment.
- Possibility to make **Spectrum configurations work as single temperature**.
- Improve door switch functionality in Spectrum units to **only stop compartment with door open**, allowing the other compartment to work as required.
- **Evacuation mode** to pump down the system before charging refrigerant during installation.

Features & options

FEATURES AND OPTIONS	V-100 V-100 MAX V-200s MAX	V-200 10 V-200 MAX 10/30 V-200 MAX 30 SPECTRUM	V-300 10 V-300 MAX 10/30 V-300 MAX 30 SPECTRUM	V-200 20 V-200 MAX 20/50 V-200 MAX 50 SPECTRUM	V-300 20 V-300 MAX 20/50 V-300 MAX 50 SPECTRUM
LIFE COST MANAGEMENT					
ThermoKare service contracts	▲	▲	▲	▲	▲
DATA CAPTURE AND COMMUNICATIONS					
TouchPrint data capture	▲	▲	▲	▲	▲
Wintrac (data analysis software)	▲	▲	▲	▲	▲
USB Datalogger	▲	▲	▲	▲	▲
Datalogger Jr	▲	▲	▲	▲	▲
LOAD PROTECTION					
Door Switch	△	△	△	△	△
Din Adapter	△	△	△	△	△
Hose Cover	△	△	△	△	△
Muffler Kit	△	△	△	△	△
Snow Cover (also called kit deflector Small)	△	△	△	●	●
Snow Cover (also called kit deflector Big)	●	●	●	△	△
Harness extension 2 m/4 m/6 m	●	△	△	△	△
Hose extension 2 m/4 m/6 m	●	△	△	△	△

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

ThermoKare

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

TouchPrint data capture

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

Wintrac (data analysis software)

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

USB DataLogger

Humidity, temperature and dew point recorder.

DataLogger Jr

Programmable temperature recorder.

Door switches

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

Din adapter

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

Hose covers

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

Muffler kit

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.

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.

Harness extension

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

Hose extension

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

V-Series range

V-SERIES	*					
V-100 10	R-134a	✓	–	–	–	–
V-100 20	R-134a	✓	–	✓	–	–
V-100 MAX 10	R-404A /R-452A	✓	–	–	–	–
V-100 MAX 20	R-404A /R-452A	✓	–	✓	–	–
V-100 MAX 30	R-404A /R-452A	✓	–	–	–	✓
V-100 MAX 50	R-404A /R-452A	✓	–	✓	–	✓
V-200 10	R-134a	✓	–	–	–	–
V-200 20	R-134a	–	✓	✓	–	–
V-200s MAX 20	R-404A /R-452A	✓	–	✓	–	–
V-200s MAX 50	R-404A /R-452A	✓	–	✓	–	✓
V-200 MAX 10	R-404A /R-452A	✓	–	–	–	–
V-200 MAX 20	R-404A /R-452A	–	✓	✓	–	–
V-200 MAX 30	R-404A /R-452A	✓	–	–	–	✓
V-200 MAX 50	R-404A /R-452A	–	✓	✓	–	✓
V-200 MAX 30 Spectrum	R-404A /R-452A	✓	–	–	✓	✓
V-200 MAX 50 Spectrum	R-404A /R-452A	–	✓	✓	✓	✓
V-300 10	R-134a	✓	–	–	–	–
V-300 20	R-134a	–	✓	✓	–	–
V-300 MAX 10	R-404A /R-452A	✓	–	–	–	–
V-300 MAX 20	R-404A /R-452A	–	✓	✓	–	–
V-300 MAX 30	R-404A /R-452A	✓	–	–	–	✓
V-300 MAX 50	R-404A /R-452A	–	✓	✓	–	✓
V-300 MAX 30 Spectrum	R-404A /R-452A	✓	–	–	✓	✓
V-300 MAX 50 Spectrum	R-404A /R-452A	–	✓	✓	✓	✓

V-Series range: legend

- * Refrigerant
- Small platform
- Large platform
- Stand-by
- Multi temp.
- Heating
- ✓ Included
- \- Not included

Unit selection guide

The table below indicates a guide to select the right unit in the V-100/V-200/V-300 series that could match your application. These figures are maximum vehicle volumes, calculated in road operation, at 2400 rpm compressor speed and 30°C/40°C ambient temperature.

MODEL	AMBIENT TEMPERATURE			
	30°C		40°C	
	m^3			
	+0/2°C	-20°C	+0/2°C	-20°C
V-100	12	5	8	4
V-100 MAX	16	8	11	6
V-200	18	9	13	7
V-200s MAX	19	10	14	8
V-200 MAX	22	13	15	10
V-300	25	10	18	8
V-300 MAX	28	17	20	13
V-200 MAX Spectrum		12		9
V-300 MAX Spectrum		16		12

Recommendations are based on precooled loads and K value of 0.35 W/m^2K is used for frozen goods (-20°C) and 0.5 W/m^2K for fresh goods (0°C and +6°C), for a distribution of 8 hours. Recommendations are not a guarantee of performance as there are many variables to be considered. See your Thermo King dealer for complete information.

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 Spectrum 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/V-200s 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:**
  - ES100 (V-100, V-100 MAX and V-200 MAX Spectrum)
  - ES150 (V-300 MAX Spectrum)
  - ES100N* (V-200 MAX Spectrum)
  - ES200 (V-200, V-200 MAX and V-300 MAX Spectrum)
  - ES300 (V-300 and V-300 MAX)
- **Engine driven compressor**
- **Installation kit**
- **In-cab control box**

* ES100N only available upon special request. Please consult with your ASM.

REFRIGERANT	KG
V-100 10	0.62 kg
V-100 20	1.0 kg
V-100 MAX 10/30	0.62 kg
V-100 MAX 20	1.0 kg
V-100 MAX 50	1.0 kg
V-200 10	1.0 kg
V-200 20	1.1 kg
V-200s MAX 20/50	1.1 kg
V-200 MAX 10/30	1.0 kg
V-200 MAX 20/50	1.2 kg
V-300 10	1.1 kg
V-300 20	1.35 kg
V-300 MAX 10/30	1.1 kg
V-300 MAX 20/50	1.35 kg
V-200 MAX 30 Spectrum	1.35 kg
V-200 MAX 50 Spectrum	1.35 kg
V-300 MAX 30 Spectrum	1.55 kg
V-300 MAX 50 Spectrum	1.60 kg

Note: Specifications are subject to change without notice.

Compressor (engine driven)

V-100/200s series

- Number of cylinders: 6
- Displacement: 82 cm^3 (5 cu. in.)
- Maximum recommended speed: 3000 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: 3000 rpm
- Jet Lube™ and Jet Cool™ (on MAX units) compressor

V-300 series

- Number of cylinders: 6
- Displacement: 146.7 cm^3 (8.95 cu. in.)
- Maximum recommended speed: 3000 rpm
- Jet Lube™ and Jet Cool™ (on MAX units) compressor lubrication and cooling systems

Specifications

Defrost

- Automatic hot gas defrost

Evaporator blower performance

Airflow volume:

- Evaporator (ES100N*): 530 m^3/h (312 cu. ft/min)
- Evaporator (ES100): 745 m^3/h (440 cu. ft/min)
- Evaporator (ES150): 890 m^3/h (525 cu. ft/min)
- Evaporator (ES200): 1100 m^3/h (650 cu. ft/min)
- Evaporator (ES300): 1400 m^3/h (825 cu. ft/min)

* ES100N only available upon special request. Please consult with your ASM.

Heating capacity (models 30/50)

Conditions: +18°C internal air temperature, -18°C ambient air temperature

- **Road operation:**
  - V-100 series 1900 W (6490 BTU/hr)
  - V-200s series 2200 W (7515 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 1100 W (3755 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

Standard features

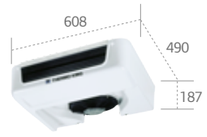
- Jet Lube™ compressor lubrication
- Jet Cool™ compressor injection cooling (MAX models)
- In-cab controls with digital LED thermometer
- Automatic hot gas defrost
- Electric thermostat

TOTAL CURRENT CONSUMPTION ON THE ROAD	12 VDC	24 VDC
V-100/100 MAX/V-200s MAX	20 A	10 A
V-200/200 MAX V-300/300 MAX	28 A	14 A
V-200 MAX Spectrum V-300 MAX Spectrum	32 A	16 A

TOTAL CURRENT CONSUMPTION STAND-BY	V-100 V-100 MAX V-200s MAX	V-200 V-200 MAX, V-300 V-300 MAX	V-200 MAX SPECTRUM V-300 MAX SPECTRUM
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

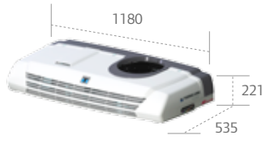
Dimensions (mm)

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



ES100
Ultra Slim Evaporator

ES100N*
Ultra Slim Evaporator



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

ES150 MAX
Ultra Slim Evaporator

ES300
Ultra Slim Evaporator

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

ES200
Ultra Slim Evaporator

In-cab Direct Smart Reefer

Weights (approximate)

Condenser:

V-100/V-200/V-300 without electric stand-by	25 kg
V-100/V-200s with electric stand-by	43 kg
V-200/V-300 single temp. with electric stand-by	70 kg
V-200/V-300 Spectrum with electric stand-by	72 kg

Evaporator:

ES100 (Ultra Slim evaporator)	9.5 kg
ES100N* MAX (Ultra Slim evaporator)	8.5 kg
ES150 MAX (Ultra Slim evaporator)	14 kg
ES200 (Ultra Slim evaporator)	15 kg
ES300 (Ultra Slim evaporator)	18 kg

Others:

Installation kit (incl. cpr.)	24 kg

* ES100N only available upon special request. Please consult with your ASM.

2 YEAR WARRANTY

WARRANTY CONDITIONS

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

V-Series refrigeration capacity

SPECIFICATIONS		V-100		V-200		V-300		V-100 MAX		V-200s MAX		V-200 MAX		V-300 MAX	
		R-134A REFRIGERANT						R-404A/R-452A REFRIGERANT							
SYSTEM NET COOLING CAPACITY UNDER ATP CONDITIONS INCLUDING 30°C AMBIENT, EUROPEAN STANDARD															
	°C	0°C	-20°C	0°C	-20°C	0°C	-20°C	0°C	-20°C	0°C	-20°C	0°C	-20°C	0°C	-20°C
Air return/on the road	W	1665	680	2255	945	2965	1260	2080	1090	2410	1180	2770	1460	3330	1840
Electric stand-by 50 Hz	W	975	390	1850	685	2090	865	1260	695	1500	650	1970	1130	2840	1235

SPECIFICATIONS	V-200 MAX SPECTRUM	
Total nominal capacity on engine power at -20°C/30°C		
ES100 MAX + ES100 MAX	1750 W	
ES100 MAX + ES100N MAX*	1750 W	
Total nominal capacity on electric standby at -20°C/30°C		
ES100 + ES100	1170 W	
ES100 + ES100N*	1170 W	
EVAPORATOR	**ES100 MAX**	**ES100N MAX***
Individual capacity on engine power		
0°C/30°C	2670 W	2260 W
-20°C/30°C	1450 W	1345 W
Individual capacity on electric standby		
0°C/30°C	2195 W	2015 W
-20°C/30°C	1125 W	1015 W
EVAPORATOR FAN PERFORMANCE		
Airflow volume @ 0 Pa static pressure	660 m^3/h	530 m^3/h

Capacity on engine power given at 2400 rpm (ATP conditions)
* ES100N only available upon special request. Please consult with your ASM.

SPECIFICATIONS	V-300 MAX SPECTRUM		
Total nominal capacity on engine power at -20°C/30°C			
ES150 + ES150	2150 W		
ES150 + ES100	2150 W		
ES200 + ES100	1870 W		
Total nominal capacity on electric standby at -20°C/30°C			
ES150 + ES150	1380 W		
ES150 + ES100	1415 W		
ES200 + ES100	1315 W		
EVAPORATOR	**ES150 MAX**	**ES100 MAX**	**ES200 MAX**
Individual capacity on engine power			
0°C/30°C	2895 W	2685 W	2940 W
-20°C/30°C	1625 W	1540 W	1585 W
Individual capacity on electric standby			
0°C/30°C	2340 W	2205 W	2480 W
-20°C/30°C	1240 W	1145 W	1180 W
EVAPORATOR FAN PERFORMANCE			
Airflow volume @ 0 Pa static pressure	890 m^3/h	765 m^3/h	1210 m^3/h

Capacity on engine power given at 2400 rpm (ATP conditions)

V-Series: discover V-500, V-600 and V-800 Series

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-500, V-600 and V-800 Series.

Total flexibility

The V-500, V-600 and V-800 Series series offer multiple options to cover your every need including R-134a, R-404A, R-452A, electric stand-by operation, heating, undermount or nosemount and multi-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-500, V-600 and V-800 series is approximately 85% of the road capacity.

Technological advantages

- Semi-hermetic reciprocating electrical stand-by compressor to provide high capacity.

V-500 series

V-600 series

V-800 series

europe.thermoking.com

For further information please contact:

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