

ATHENIA™ ENVI HEAT PUMP WITH R744

— environmentally friendly solution —

RELIABLE AND DURABLE SOLUTIONS
FOR ELECTRIC AND HYBRID BUSES

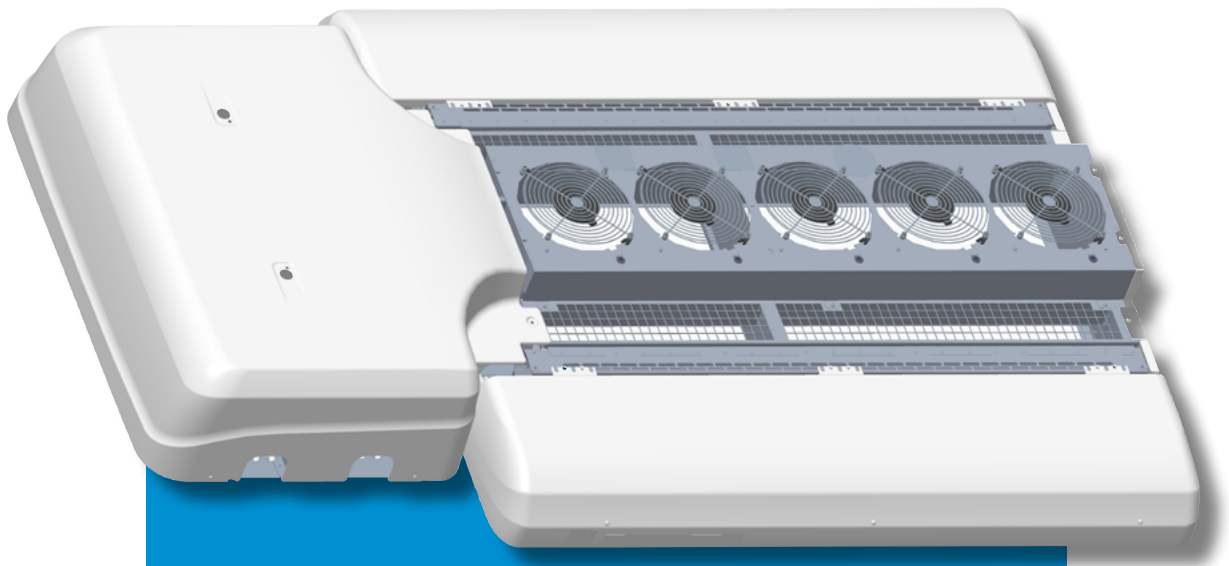
Heat Pump with R744 refrigerant for longer driving range

Reliable and durable solution for electric city buses

R744 – often just named CO₂ – is a long-lasting, natural, and reliable refrigerant that is kinder to the planet than its CFC- and HFC-containing predecessors. It is, in fact, the most environmentally friendly refrigerant available, with a Global Warming Potential (GWP) score of just 1.

When used in a Thermo King Bus HVAC unit, it delivers comfort while also looking after the driveline batteries, allowing buses to drive longer. This is thanks to patented controls, algorithms, the variable speed compressor and optimal power consumption.

Available and compatible with all electric and hybrid bus rooftops, the Thermo King “All-In-One” solution works hard in extreme conditions (-25°C to +50°C) to keep driver, staff and passengers at just right comfort levels, including heating, cooling and fresh-air control. Simultaneously the unit also protects the drive-line batteries by providing hot and cold water for thermal management during charging and discharging. The solution provides “Waste Heat Utilization” to optimize energy usage and ensure comfort.



ALL-IN-ONE:

- Refrigerant-to-air for passengers (full CO₂ circuit)
- Water cooling: Refrigerant-to-water (for front box and batteries)
- Water heating: Refrigerant-to-water (for front box, floor heating and batteries)
- Waste heat utilization



R744 Refrigerant

R744 IS A CO₂ REFRIGERANT WITH OUTSTANDING COOLING AND HEATING CAPACITY

LONGER RIDES

- R744 in Thermo King Bus HVAC units means better performance and longer distances before the electric bus needs a recharge
- Variable speed compressor, excellent controls, component selection and design

RELIABLE AND DURABLE

- Compressor designed for mobile HVAC applications and environment
- Manufacturing and installation with strong focus on process control, quality and reliability

MOST ENVIRONMENTALLY FRIENDLY REFRIGERANT

- CO₂ contributes less to climate change than HFCs and CFCs
- CO₂ is a non-toxic and non-flammable alternative to HFCs and CFCs
- R744 refrigerant has a Global Warming Potential of just 1

ALL-IN-ONE HEATING AND COOLING

- One unit, several jobs to be done
- Outstanding heating and cooling capacity for driver and passengers
- Simultaneous heating and cooling operation i.e.: heat passenger's compartment and cool batteries.
- Utilize waste heat from other accessories on the bus

WIDEST OPERATING RANGE

- CO₂ refrigerants outperform HFCs and CFC refrigerants in extreme temperatures in Thermo King Bus HVAC units
- R744 in Thermo King Bus HVAC units operate in both high temperatures (up to +50°C) and low temperatures (down to -25°C)



OPTIONS AND ACCESSORIES – TOTAL SOLUTIONS BY THERMO KING

- Inverter kit
- CO₂ sensor to manage and control fresh air exchange
- Water heating coil in rooftop unit
- Floor heating convectors
- Front box (modular and customized)
- Auxiliary heaters and control box
- Modular controller expandable to 3 temperature zones

Specifications

THERMO KING ATHENIA™ ENVI HEAT PUMP WITH R744 SPECIFICATION

Listed Capacity Value ¹	kW	29.9
Rated Cooling Capacity ²	kW	28.9
Heating Capacity ³		
-10°C	kW	23
-15°C	kW	18.5
-20°C	kW	17
-25°C	kW	15.5
Operating Voltage	V DC	450 to 750
Low voltage	V DC	27
Evaporator Air Capacity	m ³ /h	7080
Fresh Air	%	0-100
Weight	kg	385
Dimensions L x W x H	mm	3000 x 1876 x 368
Operational Range	°C	-25 to +50
Refrigerant		R744 (Factory charged)
Options		
Water Cooling (Driver's Compartment + Battery Cooling) ⁴	kW	12.4
Water Heating (Driver's Compartment + Floor Heating) ⁴	kW	22
Waste Heat Utilization [kW] ⁴	kW	12
Accessories		
Water Heating Coil Kit (Inside Rooftop Unit) ⁵		Option
CO ₂ Sensor Kit		Option
Inverter Kit		Option

NOTE: All Data points mentioned for Athenia™ Envi Heat Pump with R744 are measured values.

1. Measured at conditions 35°C / 40°C @ XX Hz
2. Measured at conditions 35°C / 27°C / 19°C
3. Free blow capacity for brushless blowers
4. Capacity dependent on application and equipment layout.
5. Heating capacity of up to 47 kW measured at conditions -20°C / 80°C / 16.7 l/min
6. CO₂ Sensor option is for fresh air exchange management and not for refrigerant leak detection. OEM include CO₂ sensor for refrigerant leak detection on vehicle.



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THERMO KING

Thermo King – by Trane Technologies (NYSE: TT), a global climate innovator – is a worldwide leader in sustainable transport temperature control solutions. Thermo King has been providing transport temperature control solutions for a variety of applications, including trailers, truck bodies, buses, air, shipboard containers and railway cars since 1938.

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