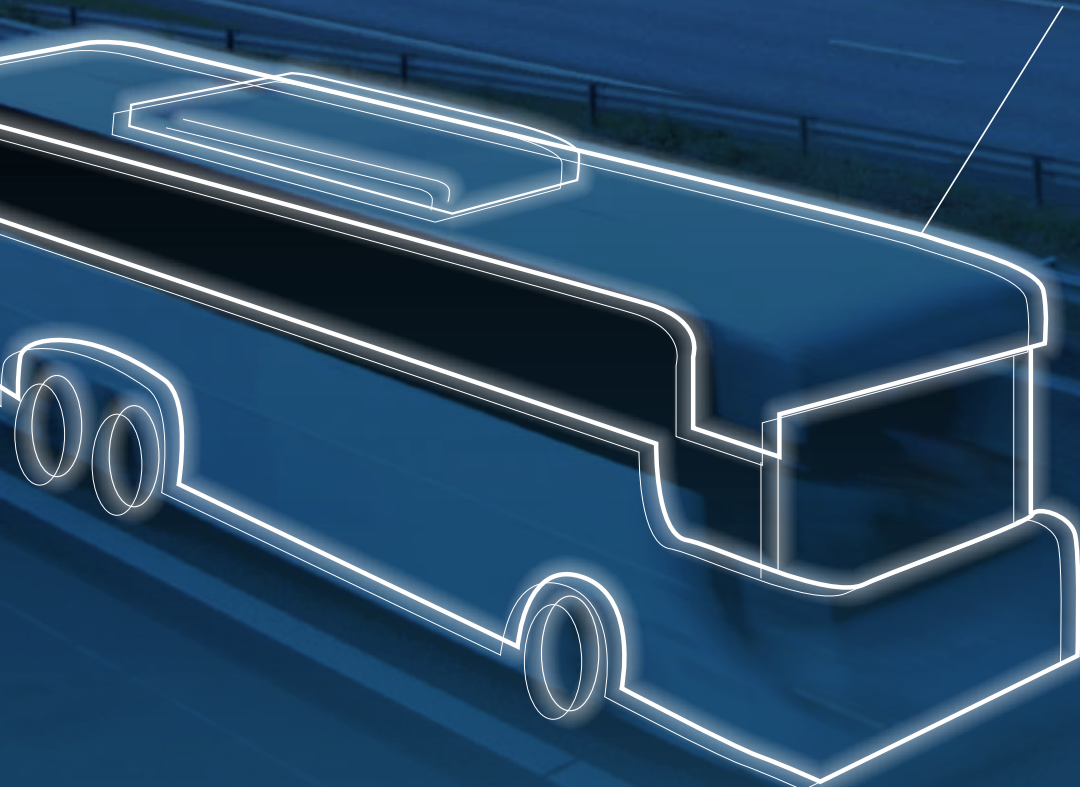


# CONTROL SOLUTIONS FOR BUS HVAC

— total control, at your finger-tips —

FEATURE-RICH CONTROLLERS  
INTUITIVE INTERFACE  
HIGH-LEVEL ACCURACY & RELIABILITY



# Control solutions for bus HVAC

## Total control, at your finger-tips

Different applications need different control solutions, and Thermo King's CANAIRE®, ClimaAIRE™ and FrontAIRE™ controllers have been developed to meet those needs. Thousands of hours of real-life testing ensure that the controllers are not only high-performing but also durable under the toughest of conditions.

Thermo King's range of bus HVAC controllers allows the operator to easily and accurately control the climate in his vehicle and ensure the comfort of his passengers, independent of outside conditions.

Easy to read displays present just enough information to monitor temperature set-point and system parameters. Touch buttons and analogue dials offer an intuitive interface for fine tuning of cooling, heating and ventilation.

Diagnostic features are built-in to reduce maintenance and repair costs.

Each bus is different in terms of structure, ambient conditions, operator and passenger needs. Thermo King not only has a wide portfolio of different driver panels but also the expertise to customize the software for most streamlined HVAC functionality in a bus fleet.

**Ease of use**  
**Accuracy & reliability**  
**Customised solutions**





# CANAIRE®

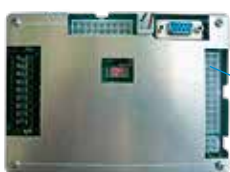
## Rely on the most sophisticated controller in the industry

### Expandable controller for multi-zone, multi-function management

The CANAIRE® is flexible, modular and expandable HVAC control system. It can be used with the unit only, or expanded to include floor heating, driver's area and auxiliary pre-heater. All these are controlled from one easy-to-use, intuitive HMI (human machine interface) panel. There are three HMI options to choose from in the CANAIRE® range to suit the specific needs of an installation. The controller uses CAN (Controller Area Network) to communicate with the I/O modules for the expanded functions as well as with the vehicle if required.

### Features

- **Driver panel available also in IP54 version**
- One integrated driver's panel for management of driver and saloon areas
- Expandable with up to three main modules to control different zones (e.g. articulated bus, double-decker)
- Easy to read, easy to understand graphic LCD display
- Ambient and two set-point temperature displays for driver and saloon
- Fuel saving features including screw compressor unloader
- Choice of automatic or manual control of temperatures, blower speeds and fresh/recycled air
- Two independently configurable CAN ports => CAN gateway function of the Main control module for safe interfacing between Thermo King HVAC and the on-board bus system ( ISO11898 and/or SAE J1939)
- Real time clock built-into driver's panel
- Diagnostic tool directly connected via CAN



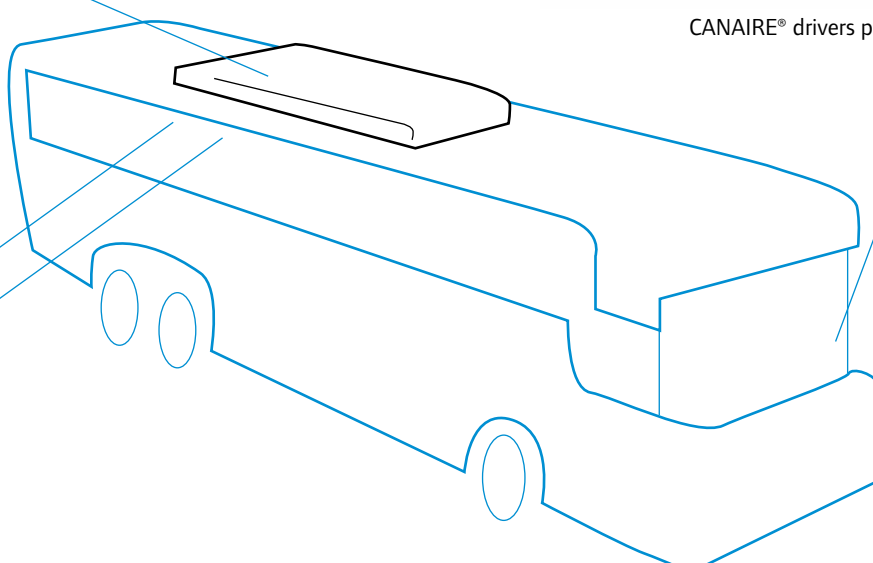
CANAIRE® Main module



CANAIRE® drivers panel



CANAIRE® I/O module



SPECIFICATIONS	CANAIRE®
<b>GENERAL</b>	
Application	Control of HVAC unit, expandable configuration per application CAN system according to ISO11898 and/or SAE J1939
Setup temperature range:	17 °C to 27 °C
Operating voltage range:	12/24 V DC per EN50155
Operating temperature range:	-30 °C up to 80 °C
	Automatic/manual operation
	Programming via RS232
	Configuration/ Detailed Diagnostic via CAN
<b>DRIVERS PANEL</b>	
Inputs / Outputs:	1 x CAN port
	1 x supply/control connector
	1 x constant battery voltage input
	1 x ignition input
	2 x analog/digital input
	2 x digital output

SPECIFICATIONS	CANAIRE®
<b>MAIN MODULE</b>	
Inputs / Outputs:	7 x temperature inputs
	2 x pressure input
	4 x servomotor interface
	4 x digital input
	2 x 5 A digital output (direct compressor clutch)
	10 x 1 A digital output
	4 x PWM output for brushless motors
	Overvoltage protection against pulse 5 per ISO 7637-2
<b>FLOOR I/O MODULE</b>	
Inputs / Outputs:	Up to 7 modules in the system
	1 x CAN port
	2 x temperature inputs
	2 x digital input
	4 x digital output 0.5 A
	1 x servomotor interface
<b>FRONTBOX I/O MODULE</b>	
Inputs / Outputs:	1 module in the system
	1 x CAN port
	4 x temperature inputs
	1 x digital input
	2 x digital output 0.5 A
	1 x PWM output for brushless motor
	3 x servomotor interface

# ClimaAIRE I D™

## Ease of use for climate control

The ClimaAIRE I D eliminates the driver interaction and interference with the HVAC system, allowing uniform fleet operation conditions. The controller allows the set point to be predetermined and fixed throughout the operation.

100% fresh air can be selected where appropriate and there is a choice of four operating modes: ventilation, cool, heat and auto. The ClimaAIRE™ is also a sophisticated diagnostic tool, displaying alarms. It can be linked to a PC monitor to display output.

## Features

- Two-digit display with automatic brightness control
- Monitors return air, coil and ambient temperatures via analogue sensors
- Four operating modes: ventilation, cool, heat, auto or reheat
- Fully automatic system with blower and fresh air damper control
- Full diagnostic functions and PC monitor output
- Directly interchangeable with previous model: same functions, same mounting slot



SPECIFICATIONS	CLIMAIRE I D™
Application	Control of rooftop HVAC unit
Setup temperature range	17 °C (63° F) to 27° C (80 °F)
Operating voltage range	10-35 V DC
Current consumption	Max. 100 mA
Operating temperature range	-30 °C (22 °F) to 80 °C (176 °F)
Connection	Molex 39-01-2140
Dimension (W x D x H)	152 mm x 57 mm x 23 mm
Inputs	Interior Temperature Sensor
	Coil Temperature Sensor
	Ambient Temperature Sensor
	Pressure Sensor - Switch (LPCCO, HPCO)
Outputs	Number of Outputs - 7:
	• Low Speed Blower
	• Medium Speed Blower
	• High Speed Blower
	• Compressor Clutch
	• Boost Pump
	• Solenoid Heat Valve (PWM 0.1 Hz)
• Fresh Air Damper (via PWM signal 1Hz)	
Diagnostic / Programming	RS232
	CAN 2.0B communication according to ISO11898 and/or SAE J1939

# FrontAIRE II™

## Effective control of driver cab and heating

FrontAIRE II™ is an innovative system offering either automatic or manual climate control of the driver's cab and of floor heating in the passenger area. Bus drivers can choose to cool, heat, ventilate or pre-heat their compartment and enjoy the ultimate in comfort.

### Features

- Four digit display
- Auto/manual operation: cooling, heating, ventilation, pre-heating
- Easy to read, easy to understand display with automatic brightness
- Stepless control of blower speed, 2 flaps and 2 water valves
- Defrost and smog functions
- Easy installation with standard ISO car radio bracket
- Universal controller for Thermo King Front Box
- Operation modes:
  - Stand-alone HVAC front box with condenser
  - Dependent on compressor of main HVAC unit
- Real time clock and pre-heater timer
- Compressor and freeze protection
- Alarm mode display and hour meter
- Diagnostics and communication through PC (RS 232 port)



SPECIFICATIONS	FRONTAIRE II™
Application	Control of front box and heaters
Setup temperature range	15° C to 30 °C
Operating voltage range	22-30 V DC
Current consumption	Max. 60 mA
Operating temperature range	-30 °C (22 °F) to 80 °C (176 °F)
Connection	Molex 39-01-2140 and 39-01-2180
Dimension W x D x H [mm]	187 x 57 x 60
Inputs	Return Air Temperature Sensor
	Coil Temperature Sensor
	Ambient Temperature Sensor
	Floor Temperature Sensor
	Duct Temperature Sensor
	3 Inputs (0 /24 VDC) 2 Digital Inputs (0 - 24 VDC)
Outputs	6 Hi/Lo Side Universal Outputs (max. 0.5 A each)
	4 Servomotor Outputs: <ul style="list-style-type: none"> <li>• Heat Valve</li> <li>• Floor Heat Valve</li> <li>• Fresh Air Damper</li> <li>• Windshield Damper</li> </ul>
	Compressor Clutch Output (24 VDC / 2 A)
	PWM Blower Output (24 VDC, 20 kHz, 0 - 100%)
Software Features	Real-time clock
	Timer for Preheater
Diagnostic / Programming	RS232



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.

For further information, please contact:

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