

General

Introduction

The **Viper 2000 control system** is a total solution for the automatic control of climate systems in large vehicles, principally buses. It can control all climate parameters such as heating, cooling and ventilation. It can also control the climate in several zones within a bus, for example the driver's zone, as well as front and rear passenger zones.

A timer and pause function is also integrated into the control unit, as is the option of customising which settings are displayed in the window, the so-called home page.

Another major advantage of the Viper 2000 is its ability to test the function of and troubleshoot components. Finally, its format and ergonomic design are also extremely important. The panel is the same size as a car stereo, which means that it can be fitted into a standard frame.

Basic functions

As described above, the Viper 2000 can control a number of functions in the bus's climate system, the most significant being:

- control of heating to compartment/roof unit/defroster via regulating valve
- control of fans, e.g. defroster, roof fan, etc.
- control of flap, e.g. recirculation flap, air channels, etc.
- control of AC system
- startup of auxiliary heater at a preset time before departure

The Viper 2000 is also extremely helpful in terms of service, troubleshooting and function control of the climate system. For example, if a fault is suspected the values from all sensors can be checked direct, eliminating the need for any



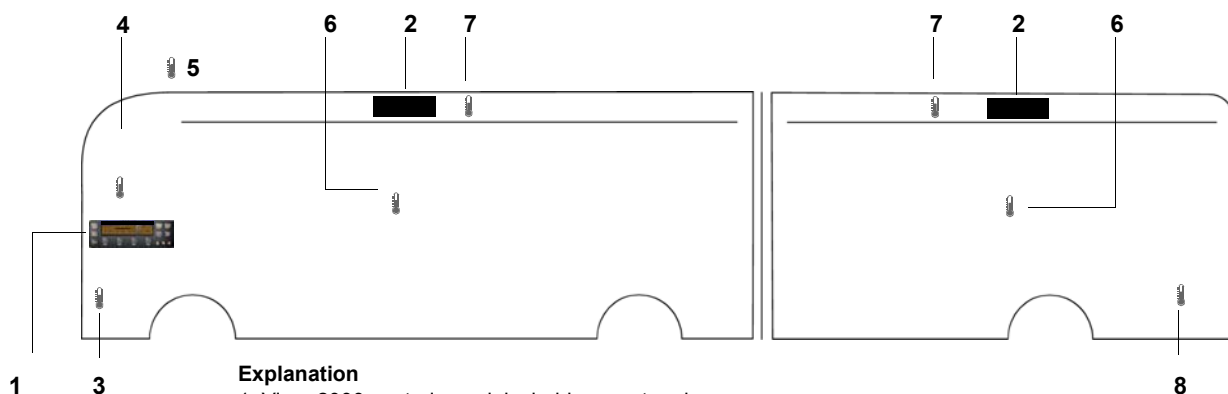
Figure: The Viper 2000 control system with control panel, node and sensors

unnecessary interruption due to time-consuming troubleshooting. On delivery it is also very simple to "test run" the climate system's components to check that they are working.

Further information

For further information, see the following documents:

Operation Instructions	PRD0130
Function Control	PRD0133
Installation Information	PRD0167

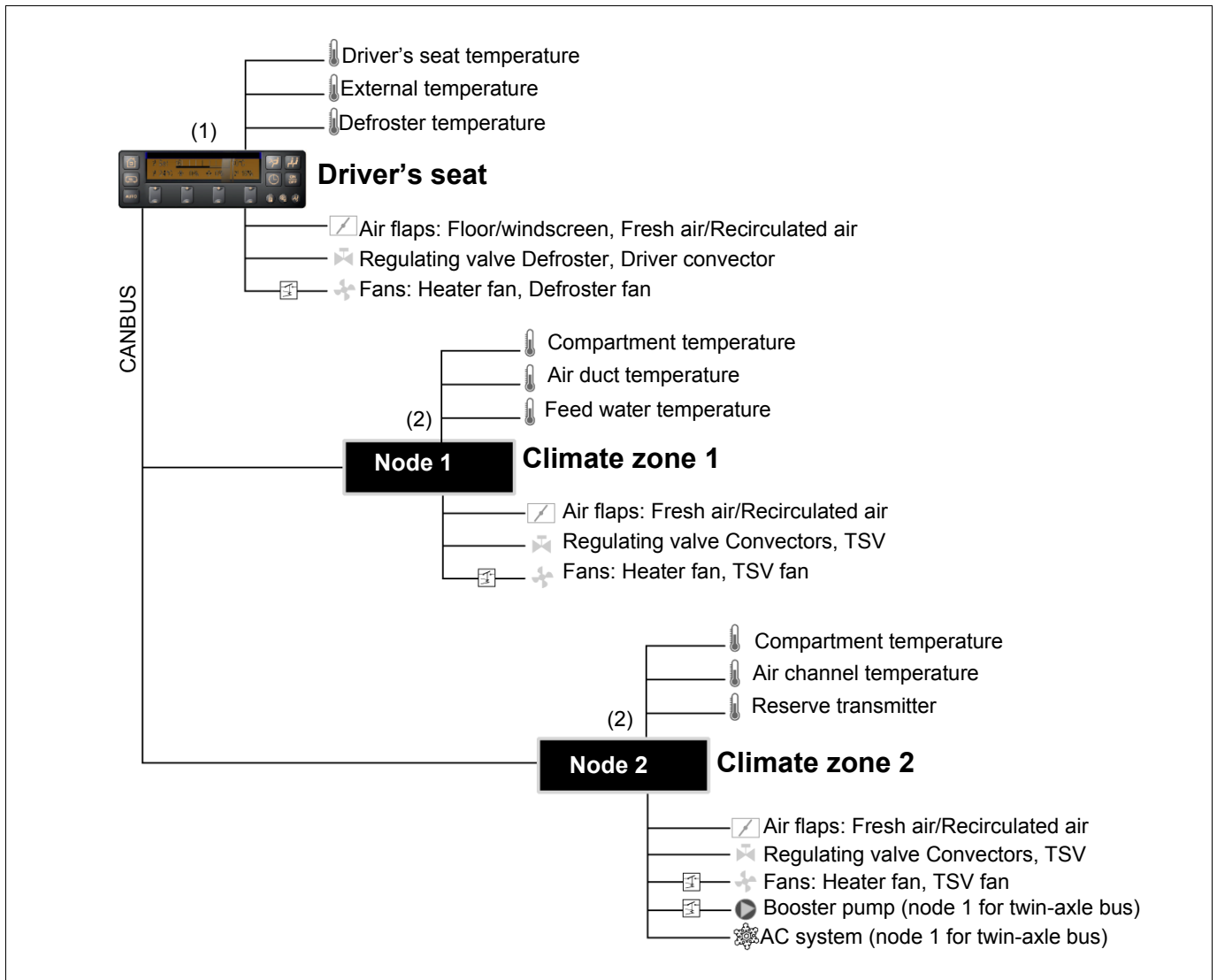


Explanation

1. Viper 2000 control panel, incl. driver seat node
2. Viper 2000 compartment node
3. Defroster sensor
4. Driver's seat sensor
5. External sensor
6. Compartment sensor
7. Air duct sensor
8. Feed water sensor

Structure of the control system

Example of control system structure in an articulated bus



Control system basics

Control panel

The main unit in the Viper 2000 Control System is the control panel (1), which also acts as a control panel for the climate components at the driver's seat, such as defroster and driver convector. This control panel can be used to set the temperature, fan speed and slide valve positions for the whole bus. With CANBUS communication the values set are transmitted to the relevant compartment's node (2).

Nodes

A node (2) is a control unit that processes the information that comes from the control panel (1) and controls regulating components to achieve the desired climate.

For each compartment there is a node with connections for temperature transmitter, voltage and connections to climate components such as fans, valves, pumps, etc.

Depending on the design of the bus, twin-axle, double-decker or articulated, it is possible to divide the passenger area into one or two climate zones. This also controls the number of nodes in the control system (one node for each climate zone).

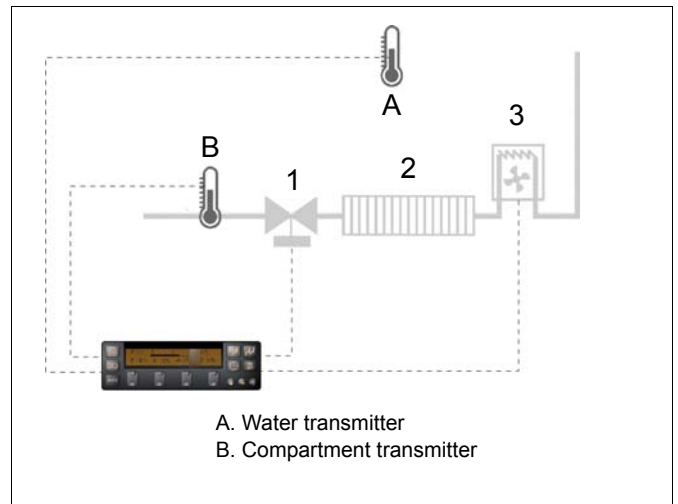
Sensors

The sensors play an extremely important role in the control system. The sensors used are negative resistance thermometer models, which means that resistance decreases as the temperature increases. It is extremely important that the sensors are located so that the registered temperature is representative of the air that the transmitter is supposed to be measuring. If cold air leaks into the transmitter the control system will find it very difficult to maintain a comfortable climate in the bus. For more information about sensors, see product sheet PRD0071.

Regulating the passenger circuit

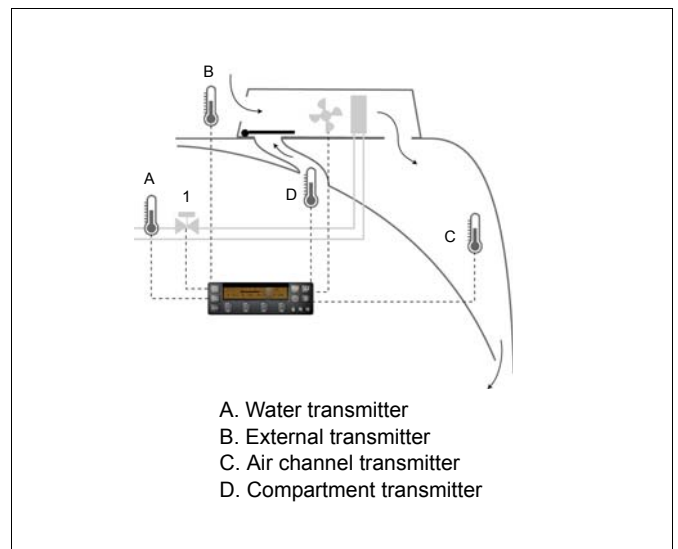
To heat up the passenger area the Viper 2000 can be used to regulate a shunt or two-way valve to maintain the required temperature. In both cases the valve (1), compartment transmitter (A) and water transmitter (B) are connected to the control system.

The water transmitter registers the temperature of the feed water, and the compartment transmitter the current compartment temperature. With reference to the preset temperature, it then regulates the volume of hot water to the convectors (2) using the regulating valve. If the heat in the convectors is not sufficient, the heater fans (3) are started, on the condition that the water temperature is not above a certain temperature, approx. 40°C. The fans continue to run until the compartment temperature corresponds to the preset temperature. If you choose a circuit with a shunt valve, the Viper 2000 can also be used to control the circulation pump in the passenger circuit.



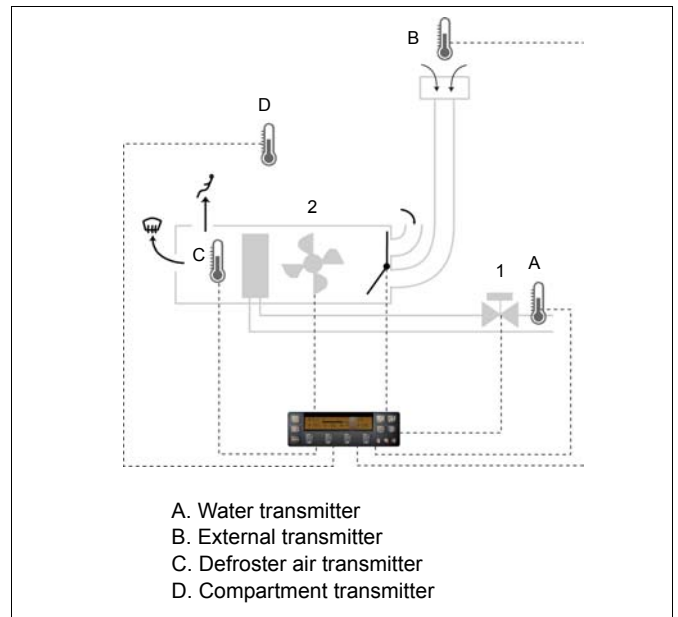
Regulating the TSV unit

The Viper 2000 can also be used to regulate the temperature of incoming air and control fans and air flaps in the roof unit, the so-called TSV unit. The TSV circuit is usually regulated by a pulsing regulating valve (1). The air duct transmitter (C) and regulating valve are connected by this regulation. Registration of compartment temperature (D) and external temperature (B) facilitates the selection of recirculated air/fresh air. If the current temperature after the heater core is 5 degrees higher than the set value, the air flap will be set to the recirculated air setting until the required temperature is achieved.



Regulating the defroster

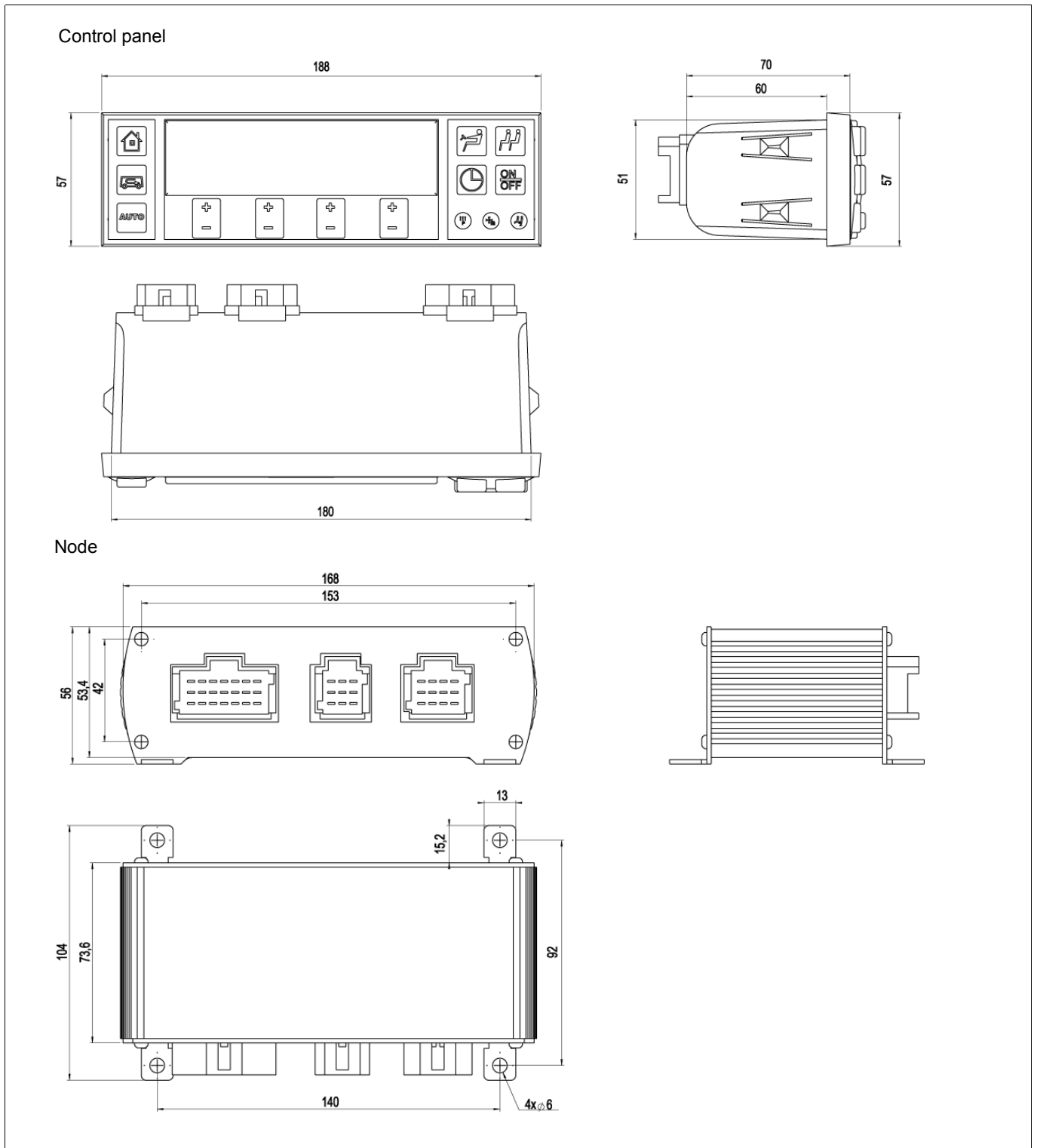
Regulation takes place in the same way as for the TSV unit, i.e. using a pulsing regulating valve (1). The defroster channel transmitter (C) and regulating valve are connected by this regulation. The Viper 2000 can also regulate, for example, the defroster fan (2) and air flap, using either fresh air or recirculated air to supply air. It is also possible to control the air distribution flap.



Regulating the AC system

The Viper 2000 can also be used to regulate the AC system. The control system senses whether the temperature in the compartment is above the preset temperature, and starts the compressors in the event of a temperature variance of $>1.5^{\circ}\text{C}$ from the preset value.

Dimensions



Technical Data

Control unit connections

Electrical socket	Number of poles	Article number
CO1		
Socket housing on the unit	18-pole	AMP 966,140-1
Suitable socket housing	18-pole	AMP 1-967 624 - 1
CO2		
Socket housing on the unit	12-pole	AMP 966,140-3
Suitable socket housing	12-pole	AMP 1-967,622 - 1
CO3		
Socket housing on the unit	9-pole	AMP 966,140-4
Suitable socket housing	9-pole	AMP 1-967,621 - 1

Weight

Name	Article number	Weight (kg)
Control panel	14697	0.3 kg
Node 1/Node 2	14389/14390	0.5 kg

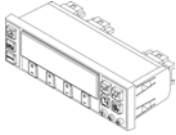
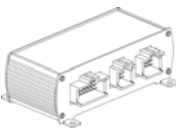
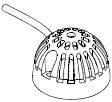
Electrical features

Name	Voltage	Power consumption
Control panel	24 VDC	0.1 A
Node 1/Node 2	24 VDC	0.1 A

Compartment node connections

Electrical socket	Number of poles	Article number
CO1		
Socket housing on the unit	21-pole	AMP 966,140-6
Suitable socket housing	21-pole	AMP 1-967,625 - 1
CO2		
Socket housing on the unit	9-pole	AMP 966,140-4
Suitable socket housing	9-pole	AMP 1-967,621 - 1
CO3		
Socket housing on the unit	12-pole	AMP 966,140-3
Suitable socket housing	12-pole	AMP 1-967,622 - 1

Products

Name	Part number
Control panel	
	
Viper 2000 control panel Version with driver's place temperature setting	14697
Viper 2000 control panel type SA Version with defroster air temperature setting	17441
Nodes	
	
Node 1 Viper 2000	14389
Node 2 Viper 2000	14390
sensors	see product sheet PRD0071
	

UWE Verken AB
Box 262
S-601 04 Norrköping, Sweden
Phone +46 11 24 88 00
Fax +46 11 12 47 04
www.uwe.se

