

Description

Introduction

The **Viper Mark 1** is a complete system for advanced climate control in vehicles. It can control the heating circuit, AC, fans, and flaps in a climate zone (in the first instance the passenger compartment) with a preset temperature to achieve good climate comfort. A major benefit of the Viper system is that it can be adapted and combined with other electronic units to satisfy a number of different requirements and applications.

The climate parameters, or circuits, that Viper can regulate to achieve a stable climate in the vehicle are:

- Primary heating circuit (consists mainly of convectors and/or heating fans)
- Secondary heating circuit (TSV, regulates the temperature in the ventilating air)
- Cooling circuit (AC unit)
- Ventilation system (regulates fans and flap settings)

The Viper MK1 checks which components are installed when it starts up, and then regulates accordingly.

Primary heating circuit

The Viper can regulate this circuit in two different ways, depending on which heat source has been selected for the circuit: either 1) convector heat or 2) heating fan. Convectors circuits have different characteristics compared with a circuit based on heating fans. This has an effect on the Viper's regulation methods.

Secondary heating circuit

The main purpose of the secondary heating circuit is to heat the vehicle's ventilating air to a comfortable level. This can be drawn from outside (fresh air) or taken from inside the vehicle (recirculated air). The Viper regulation means, therefore, not only generating the right amount of ceiling heat, but also regulating the flaps to select fresh air or recirculated air.

Cooling circuit

The cooling circuit, or AC unit, is the vehicle's source of cool air. All cool air is "created" by removing heat from the ventilating air. To achieve this, the Viper regulates the AC unit's compressor clutch (1 or 2), and the evaporator fan. The Viper MK1 communicates with all AC systems available on the market. Error functions such as ice warning, etc. are processed and displayed as error messages in the Viper.

Ventilation system

The Viper also takes care of ventilation in the bus, so that the right amounts of air are used with regard to energy needs, cooling needs, etc. This is done by regulating the fan speed and the flaps (fresh air/recirculated air flap and defroster flap).

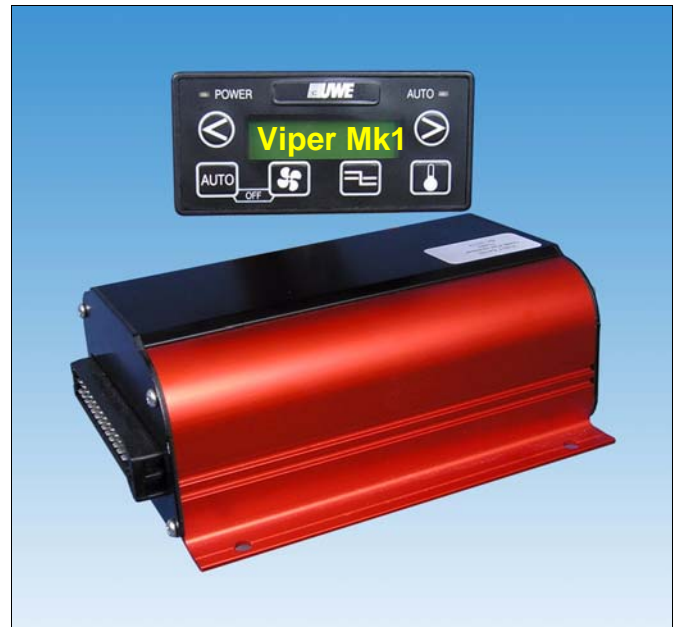


Figure 1: Photo of Viper MK1 with Viper Display and Control Box.

User-friendliness for drivers and engineers

You can use the Viper MK1 as an easy way of managing the climate in the bus and to control and test the function of the climate system. This can be very useful when the bus is delivered, and also when troubleshooting as you systematically test every component.

Tremendous combination opportunities

With the Viper MK1 it is easy to find a solution that suits a particular need. Everything from adjustment to a specific temperature using the Control Box alone or together with the Viper Display and EasyTerm Quattro. **Note:** see page 2 for more information.

You can also use the same hardware to select various methods of regulation depending on whether you have heating fans or convectors as primary heating. **Note:** see installation sheet, section on setting mode.

Further information

Product Information	Prd0281E01en
Installation Instructions	Prd0282E01en
Function check	
• UWE Standard Display	Prd0283E01en UWE Standard
• Webasto Display	Prd0283E01en Webasto
AC Test/ Gas Charge	Prd0283E01en AC test
User Instructions	Prd0284E01en

Possible combinations



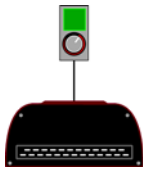







This is how the Viper Mark 1 works

The system's brains are in the control box, and it is from here that the climate in the bus is controlled. The control box receives information about the current values via a number of sensors, such as the external sensor and compartment sensor. These values are processed, and the information is passed on to the valves, flaps, fans, and AC. It is possible to only use the control box to control the climate in the bus, but with the Viper Display you have the ability to change the desired

temperature, fan speed, flap position, etc. The Viper Display also has the major benefit that it can test the system and display current values.

You can also connect the Control Box to a Easy 2000 potentiometer or a complete Easy Term Quattro panel. With EasyTerm Quattro, you will also have full control of the drivers climate. See the table below for the possible combinations.

Views of Combinations

Combination	Components included	What can be controlled/options
	<ul style="list-style-type: none"> • UWE Viper Control Box • Temperature sensor 	In this case the climate in a zone is set automatically to a predetermined temperature. The driver cannot change the temperature, fan speed, flap, etc.
	<ul style="list-style-type: none"> • UWE Viper Control Box • Easy 2000 Potentiometer • Temperature sensor 	As above, but with the ability to change the desired temperature in the climate zone in question.
	<ul style="list-style-type: none"> • UWE Viper Control Box • UWE Viper Display • Temperature sensor 	Here you can use the Viper Display to change to the desired temperature, fan speed, flap positions, AC, etc. You can also test the climate system's function via the Viper Display.
	<ul style="list-style-type: none"> • UWE Viper Control Box • UWE Easy Term Quattro • Temperature sensor 	In this instance you can activate AC and recirculated air, as well as change the desired passenger compartment temperature via EasyTerm Quattro. The driver's climate is controlled from Easy Term Quattro.
	<ul style="list-style-type: none"> • UWE Viper Control Box • UWE Easy Term Quattro • UWE Viper Display • Temperature sensor 	The most comprehensive combination. As in the combination above, here you can activate AC and recirculated air, as well as change the desired passenger compartment temperature via EasyTerm Quattro. The driver's climate is controlled from the Easy Term Quattro. You can also test the climate system's function using the Viper Display.

Regulation of the primary heating circuit (convectors plus any heating fans)

To heat up the passenger area the Viper MK1 can be used to regulate a two-way valve to maintain the required temperature. In both cases the valve (1), compartment sensor (A), and water sensor (B) (Optional) are connected to the control system.

The compartment sensor monitors the current compartment temperature. A water sensor can be connected to the Viper, although its sole function is to enable observation of the water temperature in the Viper Display. 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 heating fans (3) are started, on the condition that the water temperature is above a certain calculated temperature which is approx. 40°C.

The fans continue to run until the compartment temperature reaches the preset temperature. If you choose a circuit with a shunt valve, the Viper can also be used to control the circulation pump in the passenger circuit.

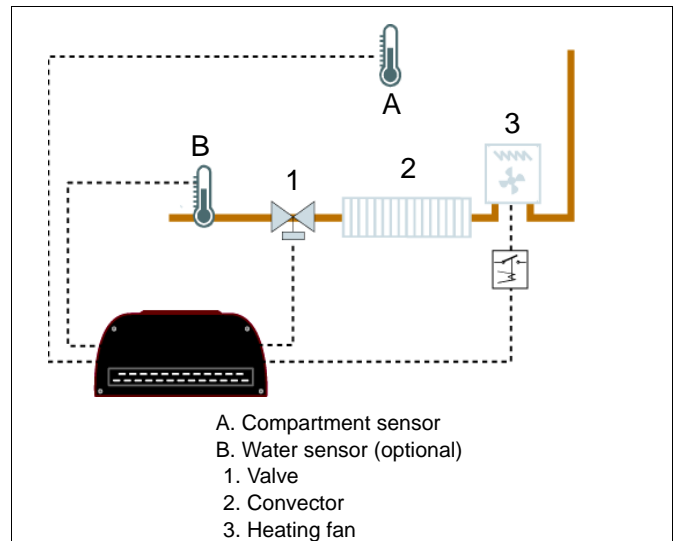


Figure: Primary heating circuit (convectors/ heating fans)

Regulation of primary heating circuit (heating fans only)

In this version heating fans are used for primary heating. A shunt (two-way valve) can be used for regulation to maintain the desired temperature. In both cases the valve (1), compartment sensor (A) and water sensor (B) (Optional) are connected to the control system.

The compartment sensor monitors the current compartment temperature. A water sensor can be connected to the Viper, although its sole function is to enable observation of the water temperature on the Viper Display. With reference to the preset temperature, the volume of hot water to the heating fans (2) is then controlled using the regulating valve. The fan speed is regulated in two speeds, according to the current energy requirement. If you choose a circuit with a shunt valve, the Viper can also be used to control the circulation pump in the passenger circuit.

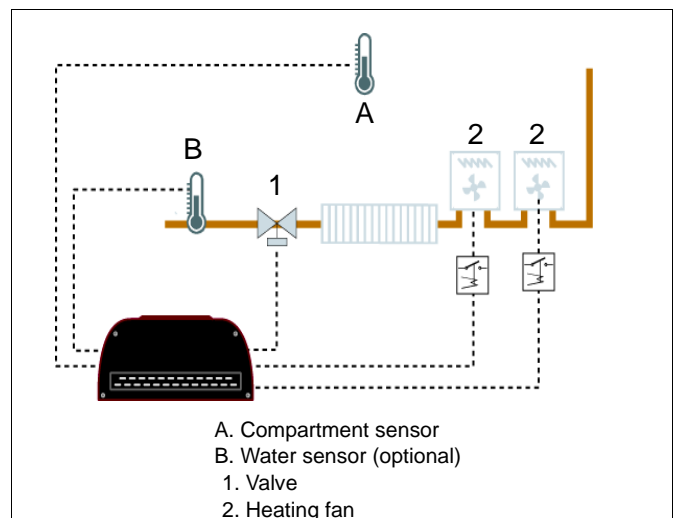


Figure: Primary heating circuit (heating fans only)

Regulation of secondary heating circuit (TSV, ceiling heat)

The Viper MK1 can also be used to regulate the temperature of incoming air and control fans and flaps in the roof unit, called the TSV unit. The TSV circuit is usually regulated by a two-way valve (1). The air channel sensor (C) and regulating valve are connected in this circuit.

Registration of compartment temperature (D) and external temperature (B) determines the selection of recirculated air/fresh air.

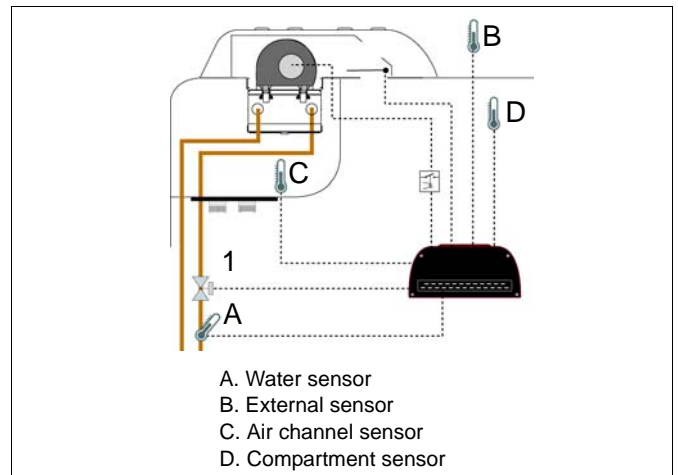


Figure: Secondary heating circuit (TSV, ceiling heat)

Regulating the defroster flap

The Viper MK1 has no defroster control, but it is possible to control the recirculated air flap with the Viper.

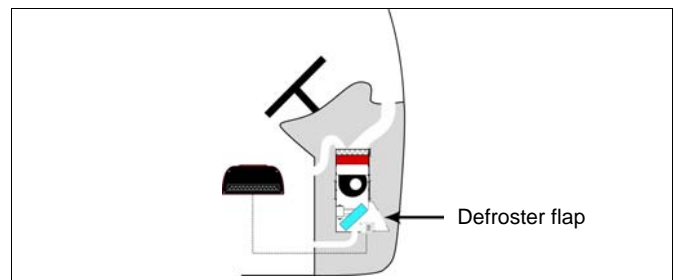


Figure: Defroster flap

Regulating the AC system

The Viper MK1 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 $>2.2^{\circ}\text{C}$ from the preset value.

Regulation in the event of an error

The Viper MK1 continues to regulate, even if one or more sensors stop working. The Viper simulates with reference to information from the known sensors. If you have the Viper Display installed then an error message will appear (for more information see the user instructions).

Potentiometer errors

If the compartment sensor stops working, the Viper will initially regulate in proportion to the potentiometer's setting. If no potentiometer is installed/working, the Viper will regulate after the setting knob on the Viper Control Box.

Sensor

If the potentiometer breaks down, the Viper will still continue to regulate after a basic setting. These invaluable functions mean that the climate in the bus will never suffer a "total breakdown".

Technical Data

Electrical Specifications

Operating Voltage

22 to 32 Volts

Nominal Voltage

24 Volts negative ground

Current Consumption (logic and outputs)

Standby without display connected < 40mA

Standby with display connected < 90mA

Interfaces

Weight

Control box 550 grams

Display 200 grams

Electrical connections

<u>Contact Viper control bo</u>	<u>AMP article no.</u>
16-pole male contact Junior Timer	0-0827535-3
25-pole male contact Junior Timer	0-0827539-1
<u>Contact Viper Display</u>	<u>AMP article no.</u>
3-pole male F-F (female-female) 6.3	0-0180940-0
Contact F-F	5-0160451-2
<u>Cable contact Viper Control Box</u>	<u>AMP article no.</u> <u>UWE article no.</u>
16-pole female contact Junior Timer	0-0827584-1 6932 8933 116
25-pole female contact Junior Timer	0-082734- 1 6932 8933 125
Contact F-F	0-0925596-2 6932 8933 901
<u>Cable contact Viper Display</u>	<u>AMP article no.</u> <u>UWE article no.</u>
3-pole male F-F 6.3	0-0180941- 06932 8934 360
Contact F-F	5-0160447-2 6932 8934 960

Temperature Sensors

Viper is optimized for UWE-sensors. **Note:** See page 6 of, *Product Information Viper Mark 1*.

Environmental Factors

EMC

Certified according to Directive 95/54/EC.

Temperature

Passenger compartment -40° C to +70° C

Storage -40° C to +70° C

Environmental Protection

Control box IP 51

Display IP 30

Material

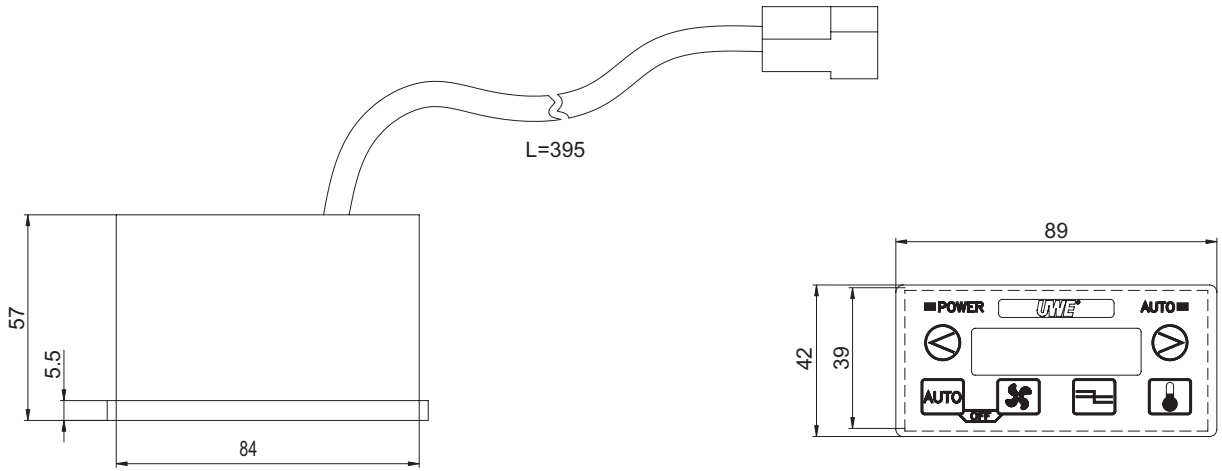
Cover control box	Aluminium
Cover Display	Aluminium
Front Display	ABS/PC

Spare Parts)

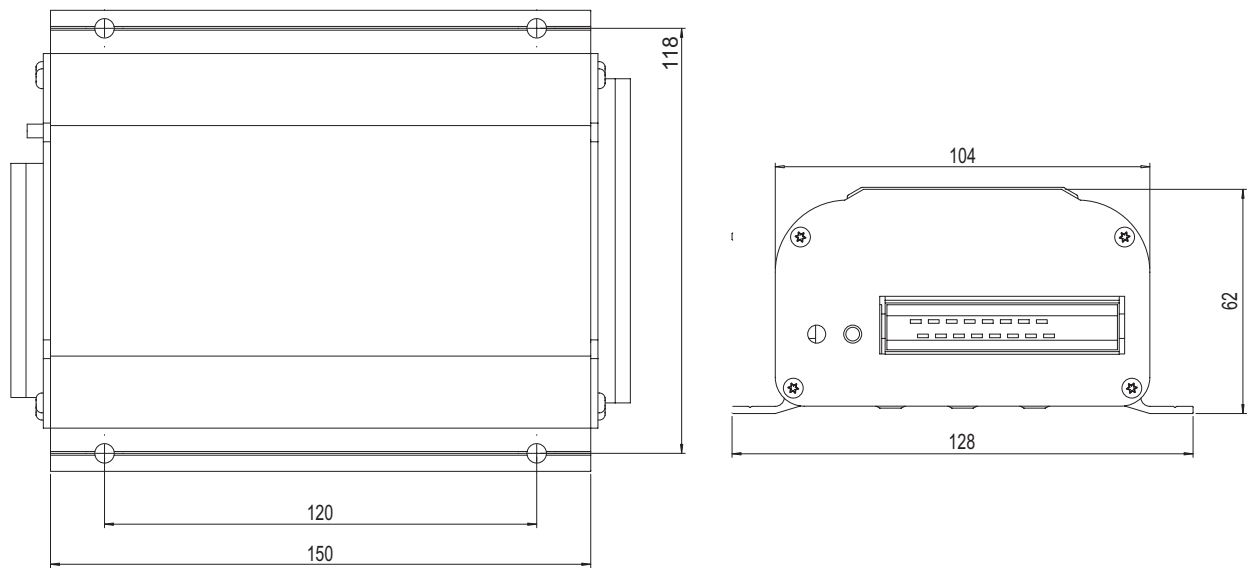
Viper Mk 1 Display

Viper Control Box

Dimensions





Viper Display



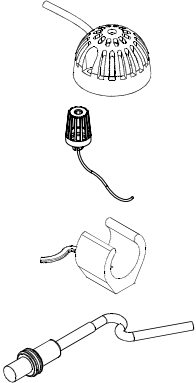


Viper Control Box

Viper System Products

The Viper system includes the following components:

Name	Item	Article no.
Viper MK1 Control Box		
Viper MK1 Control Box UWE Standard 12V		15377
Viper MK1 Control Box UWE Standard 24V		11459
Viper MK1 Control Box UWE Standard 24V Marine		11215
Viper MK1 Display		11168

Accessories/combination components

Name	Item	Article no.
Sensors		Note: See Product Information Prd0071E01sv
EasyTerm Quattro		Note: See Product Information Prd0274E01sv
Easy 2000 Potentiometers		Note: See Product Information Prd0119E01sv