

Introduction

- This instruction sheet only deals with control unit Viper 2000.
- Remove all packaging and check that the goods supplied are not damaged.
- Check that the articles supplied correspond with those specified on the delivery note.



Read through the documentation attached to the product before starting installation work.

Placement of the control units

The control units are to be placed at a place where it is protected from water. The nodes should be placed in the distribution box. The display unit is to be placed in a way that the driver doesn't have to move, and preferably in a way that a minimum of sunlight is reflected in the display.

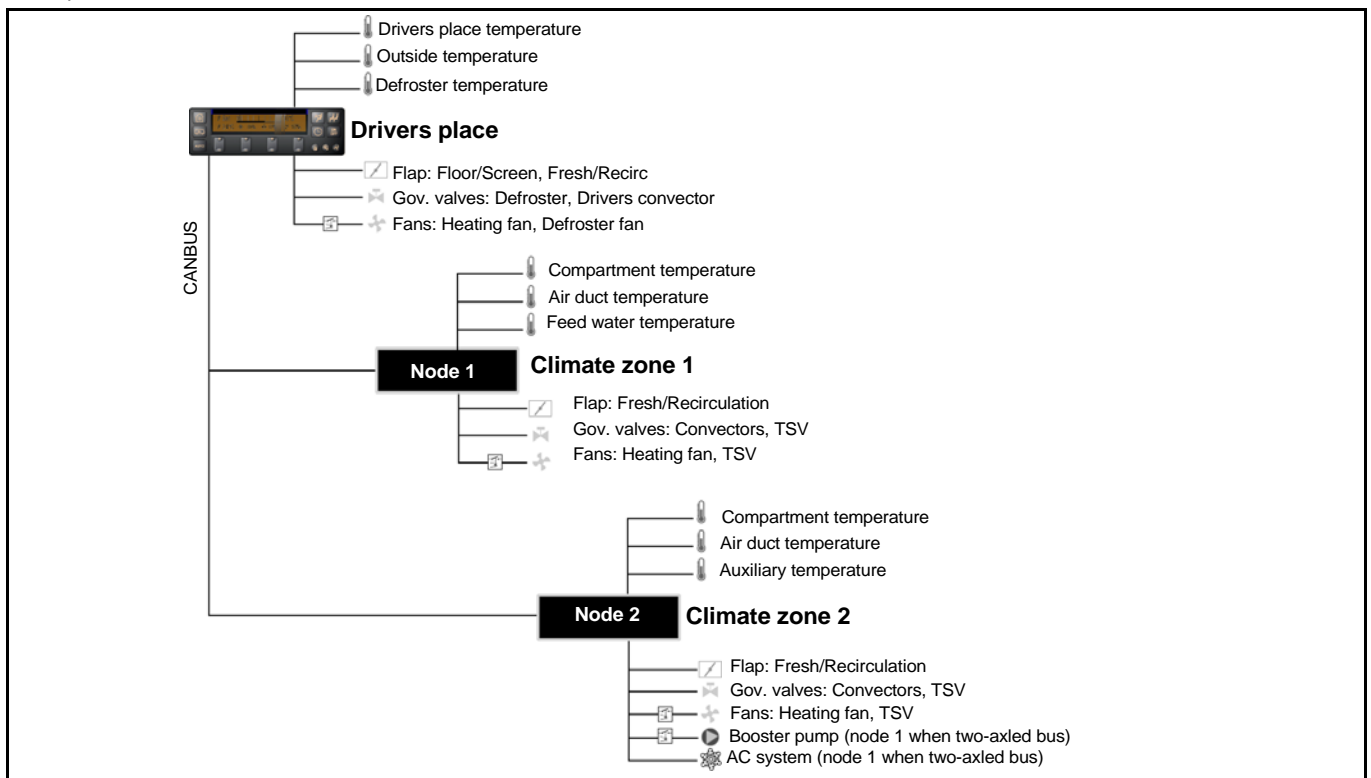
To mount the sensors, see separate installation sheet PRD0070.



Ensure that the control units are placed at a place protected from water.

Structure of the control system

Example of structure in an articulated bus



Connection of display unit (syst 1)

Connections to components should be performed according to the table below::

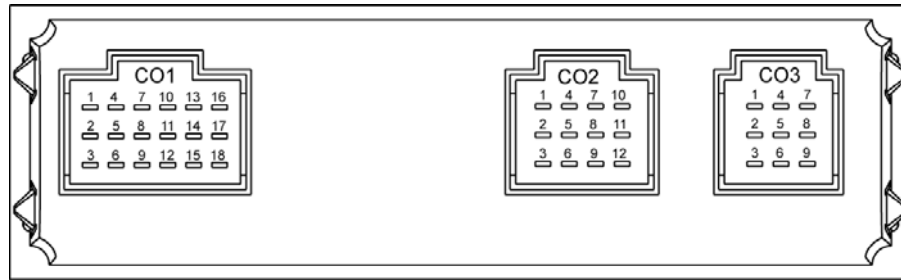


Table 1: Display unit

Description	Comment	See footnote	Pin	Type
Defroster: CO1 18 pole				
Valve, Defroster circuit	Open = 0V. Direct Drive / Motor valve driver. Inverted.	2)	CO1:1	Solid state outp. 1.9A
Valve, Driver's convector circuit	Open = 24V. Direct Drive / Motor valve driver. Non-inverted	2)	CO1:2	Solid state outp. 1.9A
Valve, Defroster circuit	Open = 24V. Direct Drive / Motor valve driver. Non-inverted	2)	CO1:3	Solid state outp. 1.9A
Valve, Driver's convector circuit	Open = 0V. Direct Drive / Motor valve driver. Inverted	2)	CO1:4	Solid state outp. 1.9A
Temp sensor, Defroster air			CO1:5	Analog NTC 4,7kΩ
Valve, Defroster circuit position feedback	Open = High Voltage	2) ,4)	CO1:6	Analog 0 - 33V
Flap Fresh/Recirc, defroster air	Rec = +24V. Source / sink		CO1:7	Solid state outp. 1.9A
Valve, Driver's Convector circuit position feedback	Open = High Voltage	2) ,4)	CO1:8	Analog 0 - 33V
Temp sensor GND, defroster air			CO1:9	Sensor ground
Flap Fresh/Recirc defroster air	Rec = 0V. Source / sink		CO1:10	Solid state outp. 1.9A
Temp sensor, Outside air			CO1:11	Analog NTC 4,7kΩ
Temp sensor GND, Outside air			CO1:12	Sensor ground
Flap Floor/Screen	Scr = +24V. Source / sink		CO1:13	Solid state outp. 1.9A
Temp sensor, Driver's place			CO1:14	Analog NTC 4,7kΩ
Temp sensor GND, Driver's place			CO1:15	Sensor ground
Flap Floor/Screen	Scr = 0V. Source / sink		CO1:16	Solid state outp. 1.9A
Flap Floor/Screen, position feedback.	Floor = High voltage Scr = 0V	1) ,4)	CO1:17	Analog 0 - 33V
Flap Fresh/Recirc, position feedback.	Recirc= High voltage Fre = 0V	1) ,4)	CO1:18	Analog 0 - 33V

Table 1: Display unit

Description	Comment	See footnote	Pin	Type
Relay + AC : CO2 12 pole				
AC Ice detection	<5V = Ice		CO2:1	Digital input
AC HP	In series with Clutch activation		CO2:2	Digital input
AC LP	In series with Clutch activation		CO2:3	Digital input
Defroster fan speed 2	Relay driver output		CO2:4	Solid state outp. 1.9A
Defroster fan speed 3	Relay driver output		CO2:5	Solid state outp. 1.9A
AC OverTemp	<5V = Compr. over tmp		CO2:6	Digital input
AC Condenser fan	Contactora driver		CO2:7	Solid state outp. 2.2A
Defroster fan speed 1	Relay driver output		CO2:8	Solid state outp.1.9A
Defroster fan speed PWM +	20 kHz Duty Cycle modulated differential output for direct interface with PWM switch. NonInv.		CO2:9	EIA RS485 transmitter output. 15kV ESD protection, slew rate limited.
AC Compressor Clutch	Direct drive		CO2:10	Solid state outp. 5.7A
Whisper heating fan (Rec. Blower)	Relay driver output		CO2:11	Solid state outp. 1.9A
Defroster fan speed PWM -	As CO2:9 Inverted		CO2:12	As CO2:9
Power supply + Communication: CO3 9 pole				
Recirculation blower for guide	Relay driver output	3)	CO3:1	Solid state outp. 1.9A
Booster pump	Relay driver output	3)	CO3:2	Solid state outp. 1.9A
Auxilliary Heater	Relay driver output	3)	CO3:3	Solid state outp. 1.9A
Batt+	Battery+ / Standby		CO3:4	Power 10A / 30mA
Generator +	>7V = Engine running		CO3:5	Digital input
CAN L	Transceiver PCA82C251		CO3:6	Communication Line
GND	Chassies Ground		CO3:7	POWER GND
Supply +	Master Switch (+30) / System wake up		CO3:8	Power input 1A
CAN H	Transceiver PCA82C251		CO3:9	Communication Line

Footnotes

1. If the flap motor drive has an additional position feedback, the flaps can be positioned in a selectable number of intermediate positions. If left unconnected the flaps will go all the way to their respective mechanical stop positions.
2. This option is added for the case that analog positioning of valve control motors is required. If a single solenoid is to be used - connect the coil between ground and either the inverted or non-inverted output.
3. These outputs are added in order to make it possible to use only the control unit as a compartment controller.
4. The feedback potentiometers can be connected directly between GND and +24V. Variations of supply voltage are internally compensated.

Connection of compartment unit (syst 1)

Connections to components should be performed according to the table below:

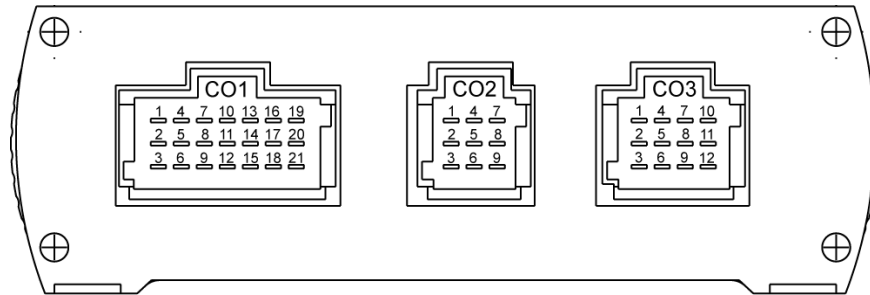


Table 2: Compartment unit

Description	Comment	See footnote	Pin	Type
Valve, Flap & analog in CO1 21 pole				
Valve, Convector circuit pos. feedb.	Open = High Voltage	2) ,4)	CO1:1	Analog 0 - 33V
Temp sensor GND, Compartment			CO1:2	Sensor ground
Temp sensor, Compartment			CO1:3	Analog NTC 4,7kΩ
Valve, Ventilation circuit	Open = 24V. Direct Drive / Motor valve driver. Non-inverted	2)	CO1:4	Solid state outp. 1.9A
Temp sensor GND, feed water			CO1:5	Sensor ground
Temp sensor, feed water			CO1:6	Analog NTC 4,7kΩ
Valve, Ventilation circuit	Open = 0V. Direct Drive / Motor valve driver. Inverted	2)	CO1:7	Solid state outp. 1.9A
Temp sensor GND, Ventilation air			CO1:8	Sensor ground
Temp sensor, Ventilation air			CO1:9	Analog NTC 4,7kΩ
Valve, Convector circuit	Open = 24V. Direct Drive / Motor valve driver. Non-inverted	2)	CO1:10	Solid state outp. 1.9A
Valve, Convector circuit	Open = 0V. Direct Drive / Motor valve driver. Inverted	2)	CO1:11	Solid state outp. 1.9A
Flap Fresh/Rec, Vent air pos feedb. Left side		1) ,4)	CO1:12	Analog 0 - 33V
Flap Fresh/Recirc, Ventilation air Right side	Rec = +24V. Source / sink		CO1:13	Solid state outp. 1.9A
Flap Fresh/Recirc, Ventilation air Right side	Rec = 0V. Source / sink		CO1:14	Solid state outp. 1.9A
Valve, Ventilation circuit pos feedb.	Open = High Voltage	2) ,4)	CO1:15	Analog 0 - 33V
Flap Fresh/Recirc, Ventilation air Left side	Rec = +24V. Source / sink		CO1:16	Solid state outp. 1.9A
Flap Fresh/Recirc, Ventilation air Left side	Rec = 0V. Source / sink		CO1:17	Solid state outp. 1.9A
Flap Fresh/Rec, Vent air pos feedb. Right side	Recirc= High voltage	1) ,4)	CO1:18	Analog 0 - 33V

Table 2: Compartment unit

Description	Comment	See footnote	Pin	Type
PWM -	26 kHz Duty Cycle modulated differential output for direct interface with PWM switch. NonInv.		CO1:19	EIA RS485 transmitter output. 15kV ESD protection, slew rate limited.
PWM +	Do Inverted		CO1:20	Do
Door signal	Used to reduce fan speed when door is open		CO1:21	Digital input
AC+Vent: CO2 9 pole				
Vent. fan speed 2	Relay driver output		CO2:1	Solid state outp. 1.9A
Vent. fan speed 3	Relay driver output		CO2:2	Solid state outp. 1.9A
AC Lp	In series with Clutch activation		CO2:3	Digital input
Vent. fan speed 1	Relay driver output		CO2:4	Solid state outp. 1.9A
AC OverTemp	<5V = Compr. over tmp		CO2:5	Digital input
AC Hp	In series with Clutch activation		CO2:6	Digital input
AC Condenser fan	Contactora driver		CO2:7	Solid state outp. 2.2A
AC Compr. Clutch	Direct drive		CO2:8	Solid state outp. 5.7A
AC Ice detection	<5V = Ice		CO2:9	Digital input
Power supply + Communication : CO3 12 pole				
GND	Chassies Ground		CO3:1	POWER GND
CAN Low	Transceiver PCA82C251		CO3:2	Communication Line
Auxilliary Heater	Relay driver output		CO3:3	Solid state outp. 1.9A
Supply +	Master Switch (+30) / System wake up.		CO3:4	Digital input
CAN High	Transceiver PCA82C251		CO3:5	Communication Line
Batt+	Battery+ / Power	6)	CO3:6	Power 10A
Circulation pmp Viking	Relay drive / Selectable option: Direct Drive	5)	CO3:7	Solid state outp 1.9A / Optional 8.0A
Generator +	>7V = Engine running		CO3:8	Digital input
Batt+	Battery+ / Power	6)	CO3:9	Power 10A
Booster pump	Relay drive / Selectable option: Direct Drive	5)	CO3:10	Solid state outp 1.9A / Optional 8.0A
Whisper Heating fan (Rec. Blower)	Relay drive / Selectable option: Direct Drive	5)	CO3:11	Solid state outp 1.9A / Optional 8.0A
Batt+	Battery+ / Standby	6)	CO3:12	30mA

Footnotes

1. If the flap motor drive has an additional position feedback, the flaps can be positioned in a selectable number of intermediate positions. If left unconnected the flaps will go all the way to their respective mechanical stop positions.
2. This option is added for the case that analog positioning of valve control motors is required. If a single solenoid is to be used; connect the coil between ground and either the inverted or non-inverted output.
3. These outputs are also available in the control unit in order to make it possible to use only the control unit as a compartment controller.

4. The feedback potentiometers can be connected directly between GND and +24V. Variations of supply voltage is internally compensated.
5. Direct drive capability is a hardware option that can be delivered on request. Since no single input pin can carry a load of more than 10A, additional Batt+ connections has to be done.
6. If no high current drivers are used, only one of these outputs need to be used. If only one high current driver is used, two of these has to be connected and if two or more are used all three supply pins should be connected.

AMP Connections

For information concerning contact housing, please see product information PRD0166.

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