WindVent Solutions

VeroVent –VV-01DD

NATURAL VENTILATION CONTROLS with MULTI FUNCTION SOLUTIONS

INSTALLATION and COMMISSIONING INSTRUCTIONS

TRENT INTELLIGENT PRODUCTS

Product Overview

The ***WindVent*** system is based on the ***VeroVent***™ range of products and ancillary equipment design to meet the ever changing requirements of the HVAC industry and associated regulations.

The system has a number of models, you have selected

VV-01-DD intelligent controller with LCD Display
with Multi function solutions

Contents

1.0 General Info

1.01 Opening the unit

The ***VV-01-DD*** unit is made up of five (5) component parts, two (2) are PCB circuit boards and three (3) make up the enclosure. There may also be an additional "expansion" PCB connected to the 50 way connector at the bottom of the main PCB, and/or a communications module plugged in to the left hand side of the main PCB.

The enclosure has a facia plate, two (2) side covers and a back box. The back box houses the main PCB circuit board and the facia plate has the touch pad PCB circuit board attached to it. These two sections are inter-connected via a ribbon cable.

To open the enclosure, first remove the snap-in clips at the bottom of the two side panels; press the release pad on each side at the bottom of the enclosure and lift off each side panel in turn. This will reveal the four facia plate fixing screws, located at the four corners of the facia plate.

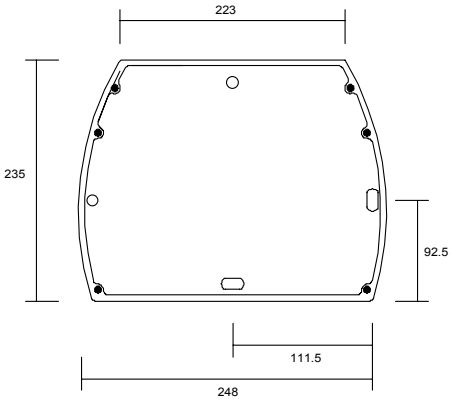
Unscrew these four screws and lift the facia plate from the back box, ensuring that the ribbon cable between the two PCBs has been unplugged at the main PCB end.

Place the screws, snap-in clips, side panels and facia plate in a safe place until the back box has been fixed, wired and is ready for reassembly and set-up.

1.02 Fixing details

The ***VV-01-DD*** unit has four (4) mounting holes which can be used *(as shown below)*

Note: Ensure that the enclosure is mounted on a clean and level surface



1.03 Cable entry

The ***VV-01-DD*** unit has two main areas for cable entry. The top area *(200 x 40mm)* and in the back of the enclosure *(200 x 80mm located at the top)* to enable back entry.

1.04 Electrical connections

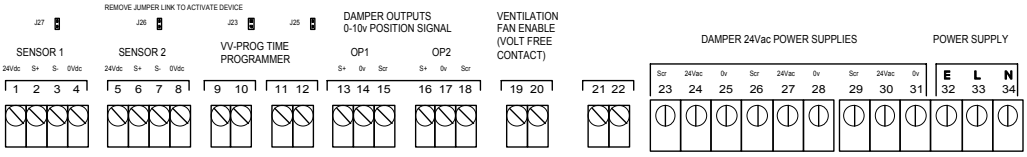
The ***VV-01-DD*** system has two sets of terminals all mounted along the top edge of the main PCB circuit board.

Terminals 1 to 22 are the smaller terminals (1.5 mm² cable) and are used for the sensors, inter-locking devices, damper signals and on/off control.

Terminals 23 to 34 are the larger terminals (4 mm² cable) and are for the damper 24Vac power and 240Vac power supply to the unit.

The terminals are of the rising clamp type with protection.

All cabling should be kept to the top of the unit within the designated area. No cables should be placed or laid across the PCBs as they may cause damage.



2.0 Set-up and Commissioning

2.01 Operator Interface

Once the installation has been carried out, the system is now ready to be powered up.

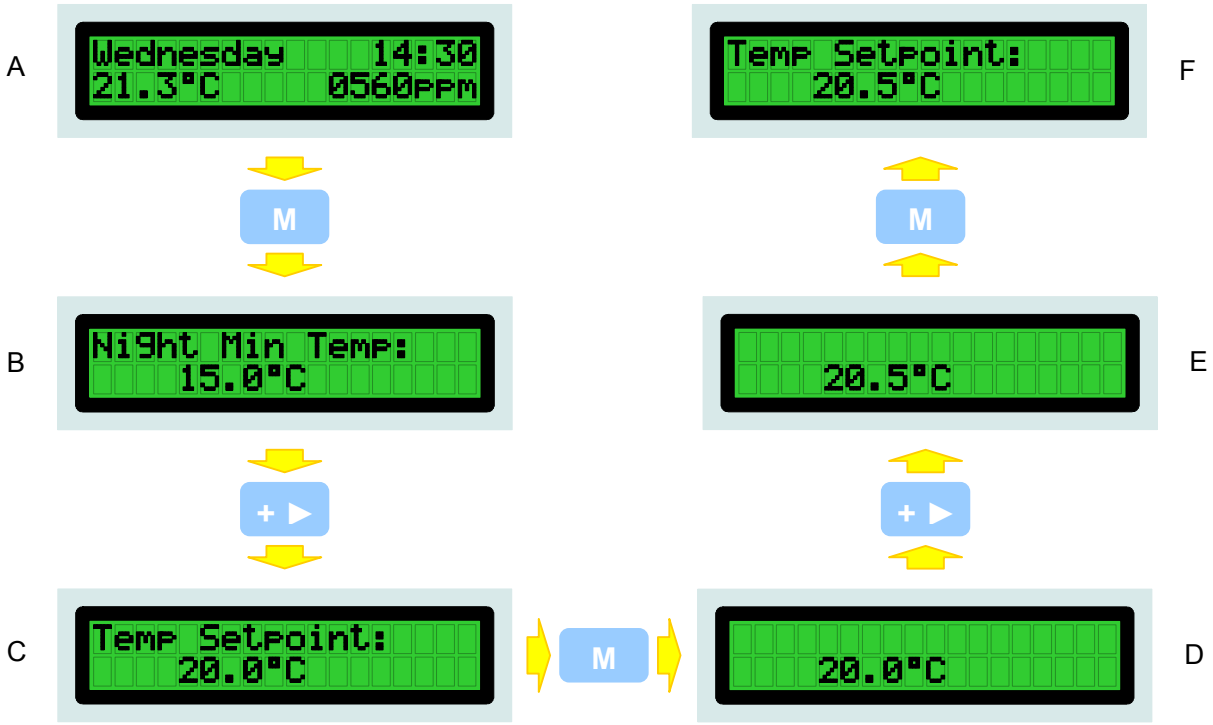
The ***VV-01-DD*** has a three level passcode protected access system. The three levels are:

Level 1:	**Observer mode**	**=**	**View sensor readings and set-point**
Level 2:	**Supervisor mode (1 1 1 1)**	**=**	**As level 1 + set-point adjustment**
Level 3:	**Engineer mode (6 2 7 5)**	**=**	**Full access to all points**

To change the current access level, press and hold **M** . This will bring up the access code entry display.

The access code has four digits. The next digit can be selected by pressing **M** .
The digit can be changed using the **◄ -** and **+ ►** keys.

The user is returned to the previous menu by pressing and holding **M** .



At power up, or after 30 seconds of inactivity, the display returns to the status screen (A). The user can move to the parameter viewing mode (B) by pressing M .

Once in this mode, the parameters can be scrolled through (C) using ◀ - and + ▶

The parameters can be altered by pressing M to move to the parameter editing mode (D).

Once in this mode, the value of the parameter can be changed (E) with ◀ - and + ▶ .

The new value is saved and the display returned to the parameter viewing mode (F) by pressing M .

In "Engineer" mode, the parameters are grouped into five sections, **"INPUTS"**, **"OUTPUTS"**, **"SETPOINTS"**, **"OVERRIDES"** and **"TIME SCHEDULES"**. Each section can be accessed by scrolling to the appropriate title using ◀ - and + ▶ , and then selecting that menu with M . The controller will jump to the first parameter in the selected section.

2.03 Parameter list

The menu items marked in red are available from the "operator" and "supervisor" access levels. All other parameters can only be accessed from "engineer" mode.

INPUTS

Parameter Name	*Description*	*Range*	*BACnet data type, Object ID*
Temp Sensor 1:	The reading from temperature sensor 1	*0 - 50°C*	*AI, 1*
CO2 Sensor 1:	The reading from carbon dioxide sensor 1	*0 - 2000ppm*	*AI, 2*
Temp Sensor 2:	The reading from temperature sensor 2	*0 - 50°C*	*AI, 3*
CO2 Sensor 2:	The reading from carbon dioxide sensor 2	*0 - 2000ppm*	*AI, 4*
Damper 1 Pos:	The feedback signal from the damper	*0 - 100%*	*AI, 5*
Damper 2 Pos:	The feedback signal from the damper	*0 - 100%*	*AI, 6*
Sensor UIP3:	The reading from the sensor connected to universal input 3	*0 - 255*	*AI, 7*
Sensor UIP4:	The reading from the sensor connected to universal input 4	*0 - 255*	*AI, 8*
Fire Alarm:	The status of digital input 1, the "fire alarm" contact	*True, False*	*BI, 46*
Remote Start:	The status of digital input 2, the "remote start" contact	*True, False*	*BI, 47*
Room Temp:	The current calculated room temperature. This is either the reading from sensor 1, or an average of sensors 1 and 2 depending on the configuration of your controller	*0 - 50°C*	-
Room CO2:	The current calculated carbon dioxide levels in the room. This is either the reading from sensor 1, or an average of sensors 1 and 2 depending on the configuration of your controller	*0 - 2000ppm*	-
Remote 1 But. A:	The status of button A (damper open) from remote override module 1	*True, False*	*BI, 48*
Remote 1 But. B:	The status of button B (damper close) from remote override module 1	*True, False*	*BI, 49*
Remote 1 But. C:	The status of button C (fan on) from remote override module 1	*True, False*	*BI, 50*
Remote 1 But. D:	The status of button D (fan off) from remote override module 1	*True, False*	*BI, 51*
Remote 2 But. A:	The status of button A (damper open) from remote override module 2.	*True, False*	*BI, 52*
Remote 2 But. B:	The status of button B (damper close) from remote override module 2	*True, False*	*BI, 53*
Remote 2 But. C:	The status of button C (fan on) from remote override module 2	*True, False*	*BI, 54*
Remote 2 But. D:	The status of button D (fan off) from remote override module 2	*True, False*	*BI, 55*
Wind Direction:	The current wind direction	*N, NE, E, SE, S, SW, W, NW*	*AI, 10*
Wind Speed:	The current wind speed	*0 - 50m/s*	*AI, 11*
Rain Detected:	The feedback from the rain sensor	*True, False*	*BI, 56*

OUTPUTS

Parameter Name	*Description*	*Range*	*BACnet data type, Object ID*
Dig. Output 1:	The status of relay contact 1	*True, False*	*BO, 57*
Dig. Output 2:	The status of relay contact 2	*True, False*	*BO, 58*
Output 1:	The positioning signal from AO1	*0 - 100%*	*AO, 12*
Output 2:	The positioning signal from AO2	*0 - 100%*	*AO, 13*
Output 3:	The positioning signal from AO3	*0 - 100%*	*AO, 14*
Output 4:	The positioning signal from AO4	*0 - 100%*	*AO, 15*

SETPOINTS

Parameter Name	*Description*	*Range*	*Default*	*BACnet data type, Object ID*
Damper 1 Min:	The minimum signal sent to damper 1 during normal operation	*0 - 100%*	*10%*	*AV, 24*
Damper 1 Max:	The maximum signal sent to damper 1 during normal operation	*0 - 100%*	*100%*	*AV, 25*
Damper 1 Night:	The signal sent to damper 1 out of normal operation.	*0 - 100%*	*5%*	*AV, 26*
Damper 2 Min:	The minimum signal sent to damper 2 during normal operation	*0 - 100%*	*10%*	*AV, 27*
Damper 2 Max:	The maximum signal sent to damper 2 during normal operation	*0 - 100%*	*100%*	*AV, 28*
Damper 2 Night:	The signal sent to damper 2 out of normal operation.	*0 - 100%*	*5%*	*AV, 29*
Temp Low Alarm:	The alarm is sounded once every 30 mins and led "A" changes colour if the temperature falls below this setting.	*0 - 50°C*	*10°C*	*AV, 16*
Temp High Alarm:	The alarm is sounded once every 30 mins and led "A" changes colour if the temperature rises above this setting.	*0 - 50°C*	*40°C*	*AV, 17*
CO2 High Alarm:	The alarm is sounded once every 30 mins and led "B" changes colour if the CO_2 levels rise above this setting.	*0 - 2000ppm*	*1500ppm*	*AV, 18*
Night Min Temp:	The damper will close fully if the temperature falls below this setting outside the normal hours of operation. If the temperature rises by more than 2°C above this setting, the damper will return to its previous position.	*0 - 50°C*	*5°C*	*AV, 23*
Temp Setpoint 1:	The required room temperature for zone 1	*0 - 50°C*	*20°C*	*AV, 19*
CO2 Setpoint 1:	The maximum CO_2 level for zone 1	*0 - 2000ppm*	*1000ppm*	*AV, 21*
Temp Setpoint 2:	The required room temperature for zone 2	*0 - 50°C*	*20°C*	*AV, 20*
CO2 Setpoint 2:	The maximum CO_2 level for zone 1	*0 - 2000ppm*	*1000ppm*	*AV, 22*
Prop. Band 1:	The proportional band for the temperature control loop (in °C)	*0 - 99*	*5*	-
Integral 1:	The integral resetting time for the temperature control loop (in minutes)	*0 - 99*	*5*	-
Wind Dir. Pt. 1:	Moving clockwise, the wind direction is at its "alternative" position if the reading is after this point	*N, NE, E, SE, S, SW, W, NW*	*N*	*AV, 31*
Wind Dir. Pt. 2:	Moving clockwise, the wind direction is at its "normal" position if the reading is after this point	*N, NE, E, SE, S, SW, W, NW*	*S*	*AV, 32*
Max. Wind Speed:	Above this speed, the wind is considered significant to affect the operation of the system	*0 - 50 m/s*	*2 m/s*	*AV, 33*

OVERRIDES

Parameter Name	*Description*	*Range*	*Default*	*BACnet data type, Object ID*
Fan Enabled 1:	If set to true, DO1 is closed when the solar fan is required. If set to false, DO1 is closed when a heating demand is detected.	*True, False*	*True*	-
Fan Enabled 2:	If set to true, DO2 is closed when the solar fan is required. If set to false, DO2 is closed when a heating demand is detected.	*True, False*	*True*	-
Open on Fire:	If true, the dampers will fully open if a fire alarm is detected. Otherwise, they will fully close.	*True, False*	*False*	-
Comms Address:	The address of the controller on the BMS network	*0 - 99*	*0*	-
Low Temp. 1:	True if the temperature in zone 1 is less than the minimum level	*True, False*	*n/a*	*BO, 59*
Low Temp. 2:	True if the temperature in zone 2 is less than the minimum level	*True, False*	*n/a*	*BO, 60*
High Temp. 1:	True if the temperature in zone 1 is more than the maximum level	*True, False*	*n/a*	*BO, 61*
High Temp. 2:	True if the temperature in zone 2 is more than the maximum level	*True, False*	*n/a*	*BO, 62*
High CO2 1:	True if the CO_2 level in zone 1 is more than the maximum level	*True, False*	*n/a*	*BO, 63*
High CO2 2:	True if the CO_2 level in zone 2 is more than the maximum level	*True, False*	*n/a*	*BO, 64*
BMS Start:	If set to true from a remote controller, the system goes into "day" mode. *(BACnet)*	*True, False*	*n/a*	*BV, 65*
BMS Night Cool:	If set to true from a remote controller, the system goes into "night cooling" mode. *(BACnet)*	*True, False*	*n/a*	*BV, 66*
BMS Fire Alarm:	If set to true from a remote controller, the system goes into "fire alarm" mode. *(BACnet)*	*True, False*	*n/a*	*BV, 67*
BMS Full Open:	If set to true from a remote controller, the system goes into "purge" mode. *(BACnet)*	*True, False*	*n/a*	*BV, 68*
BMS Full Close:	If set to true from a remote controller, the dampers fully close. *(BACnet)*	*True, False*	*n/a*	*BV, 69*
Override AI1:	AI1 Override enable. If set to true from a remote controller, the system takes it's value for AI1 from a remote source (see below). *(BACnet)*	*True, False*	*n/a*	*BV, 70*
***New Value AI1:**	AI1 Override value. This value is set by a remote source to override AI1 (see above). *(BACnet)*	*0 - 50°C*	*n/a*	*AV, 34*
Override AI2:	AI2 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 71*
***New Value AI2:**	AI2 Override value *(BACnet)*	*0 - 2000ppm*	*n/a*	*AV, 35*
Override AI3:	AI3 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 72*
***New Value AI3:**	AI3 Override value *(BACnet)*	*0 - 50°C*	*n/a*	*AV, 36*
Override AI4:	AI4 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 73*
***New Value AI4:**	AI4 Override value *(BACnet)*	*0 - 2000ppm*	*n/a*	*AV, 37*
Override UI1:	UI1 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 74*
***New Value UI1:**	UI1 Override value *(BACnet)*	*0 - 100%*	*n/a*	*AV, 38*
Override UI2:	UI2 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 75*
***New Value UI2:**	UI2 Override value *(BACnet)*	*0 - 100%*	*n/a*	*AV, 39*
Override UI3:	UI3 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 76*
***New Value UI3:**	UI3 Override value *(BACnet)*	*0 - 255*	*n/a*	*AV, 40*
Override UI4:	UI4 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 77*

***New Value UI4:**	UI4 Override value *(BACnet)*	*0 - 255*	*n/a*	*AV, 41*
Override DI1:	DI1 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 78*
***New Value DI1:**	DI1 Override value *(BACnet)*	*True, False*	*n/a*	*BV, 86*
Override DI2:	DI2 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 79*
***New Value DI2:**	DI2 Override value *(BACnet)*	*True, False*	*n/a*	*BV, 87*
Override DO1:	DO1 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 80*
***New Value DO1:**	DO1 Override value *(BACnet)*	*True, False*	*n/a*	*BV, 88*
Override DO2:	DO2 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 81*
***New Value DO2:**	DO2 Override value *(BACnet)*	*True, False*	*n/a*	*BV, 89*
Override AO1:	AO1 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 82*
***New Value AO1:**	AO1 Override value *(BACnet)*	*0 - 100%*	*n/a*	*AV, 42*
Override AO2:	AO2 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 83*
***New Value AO2:**	AO2 Override value *(BACnet)*	*0 - 100%*	*n/a*	*AV, 43*
Override AO3:	AO3 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 84*
***New Value AO3:**	AO3 Override value *(BACnet)*	*0 - 100%*	*n/a*	*AV, 44*
Override AO4:	AO4 Override enable *(BACnet)*	*True, False*	*n/a*	*BV, 85*
***New Value AO4:**	AO4 Override value *(BACnet)*	*0 - 100%*	*n/a*	*AV, 45*

* The "new values" are only visible if the appropriate override flag has been set.

TIME SCHEDULES

Parameter Name	***Description***	***Range***	***Default***	***BACnet data type, Object ID***
Time:	The current system time and day	*hh:mm, ___day*	*00:00, Monday*	-
Time Control:	Sets what controls the day/night operation	*Local-7 day, Local-Not Wkend, Manual, VV-TP-01, BACnet*	*Local-Not Wkend*	*AV, 30*
On Time:	The start of "day" time (Local time control only)	*hh:mm*	*09:00*	-
Off Time:	The end of "day" time (Local time control only)	*hh:mm*	*17:00*	-
Nt Cool On Time:	The time at which night time cooling starts, and dampers are fully opened (Local time control only)	*hh:mm*	*22:00*	-
Cool Duration:	The duration of night time cooling (in hours)	*0 - 99*	*2*	-
Purge Duration:	The duration of the "purge" setting once pad is pressed (in minutes)	*0 - 99*	*15*	-

2.04 LED Indication

The ***VV-01-DD*** unit has five status indication LEDs. These change colour to allow instant diagnosis of the system state.

POWER ON:

- Lights up when power is applied to ***VV-01-DD*** unit.

SYSTEM CONDITION:

- System is in "day" mode
- System is in "night" mode
- System purging (dampers 100% open)
- Fire alarm activated

LED A:

- Room temperature within acceptable limits
- Room temperature low warning
- Room temperature high warning

LED B:

- CO^2 level within acceptable limits
- CO^2 level high warning

LED C:

- ***VV-01-DD*** unit is in "Observer" mode
- ***VV-01-DD*** unit is in "Supervisor" mode
- ***VV-01-DD*** unit is in "Engineer" mode
- (any colour) Power fail indication: the power to the unit has recently been removed. The internal clock does not have a battery backup, and should be checked. This LED will stop flashing once the system time has been set.

BACnet Protocol Implementation Conformance Statement

Date: 22nd July, 2008
Vendor Name: Trent Control Panels Ltd.
Product Name: VeroVent
Product Model Number: VV-DD-01
Applications Software Version: N/A
Firmware Revision: V2.0

Product Description:

This product provides control to heating and ventilation equipment. The product can be integrated into a building management system using BACnet over IP or MS/TP, provided via a plug-in communications module.

BACnet Standardized Device Profile (Annex L):

☐ BACnet Operator Workstation (B-OWS)
☐ BACnet Building Controller (B-BC)
☐ BACnet Advanced Application Controller (B-AAC)
☒ BACnet Application Specific Controller (B-ASC)
☒ BACnet Smart Sensor (B-SS)
☒ BACnet Smart Actuator (B-SA)

BACnet Interoperability Building Blocks Supported (Annex K):

K.1.2 BIBB - Data Sharing - ReadProperty-B (DSRP-B)
K.1.8 BIBB - Data Sharing - WriteProperty-B (DSWP-B)
K.5.2 BIBB - Device Management - Dynamic Device Binding-B (DM-DDB-B)

Segmentation Capability:

☐ Segmented requests supported Window Size N/A
☐ Segmented responses supported Window Size N/A

Standard Object Types Supported:

☒ Binary Input	☒ Binary Output	☒ Binary Value	☐ Averaging	☐ Loop
☒ Analog Input	☒ Analog Output	☒ Analog Value	☐ LifeSafetyZone	☐ File
☒ Multi-state Input	☒ Multi-state Output	☒ Multi-state Value	☐ Notification Class	☐ Program
☐ Command	☐ LifeSafetyPoint	☐ Calendar	☐ Schedule	☐ Group
☐ Event Enrollment	☐ Trend Log	☒ Device		

For each of the supported properties, the following apply:

1) Does not support BACnet CreateObject
2) Does not support BACnet DeleteObject
3) Does not support any optional properties
4) Has no additional writeable properties
5) Has no proprietary properties
6) Has no property range restrictions

Data Link Layer Options:

☒ BACnet IP, (Annex J)
☐ BACnet IP, (Annex J), Foreign Device
☐ ISO 8802-3, Ethernet (Clause 7)
☐ ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
☐ ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s) _____
☒ MS/TP master (Clause 9), baud rates up to 76800 bps
☒ MS/TP slave (Clause 9), baud rates up to 76800 bps
☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s):_____
☐ Point-To-Point, modem, (Clause 10), baud rate(s): _____
☐ LonTalk, (Clause 11), medium: _____
☐ Other: _____

Device Address Binding:

Is static device binding supported? ☐Yes ☒No

Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

☒ ANSI X3.4	☐ IBM™/Microsoft™ DBCS	☐ ISO 8859-1
☐ ISO 10646 (UCS-2)	☐ ISO 10646 (UCS-4)	☐ JIS C 6226

If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports:

NOT APPLICABLE

FOR FURTHER TECHNICAL ASSISTANCE, PLEASE CONTACT US BY

Phone: 01782 844688

Fax: 01782 844688

e-mail: info@trentproducts.com

Website: www.trentproducts.com

Notes:

i) Ensure that the electrical installation has been installed in accordance with the current edition of the IEE regulations.

ii) If in doubt, ask! (contact us on or by any of the above).

iii) Ensure that the client has been shown how to operate the system and that they have been handed the users guide.

This symbol on this product or the package indicates that disposal of this product after its lifecycle could harm the environment.
DO NOT dispose of this product (or batteries if used) as unsorted municipal waste. It should be disposed by a specialised company for recycling.
This product should be returned to your distributor or to a local recycling service.
Respect the local environment rules.

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