Versatronik® 300
Cascade Control

704083 w/o BACnetIP
704092 with BACnetIP

Applicable Controls
Vitotronic 100, GC1/GC1B
Vitotronic 300, GW2
Vitotronic 300, GW5B
Vitotronic 200, HO1/HC1
Vitodens 200 B2HA

KWE
Technologies
🛆 ⚙ ✆ Group

Technical, Installation and Configuration Information

Cautionary Statement

The information presented in this document is
only to be used by those familiar with its
application and use.

⚠ WARNING
Disconnect power before opening cover.

VERSATRONIK 300

Esc ⬆ ⬇ ↵

CSA®

C   US   LR 102874
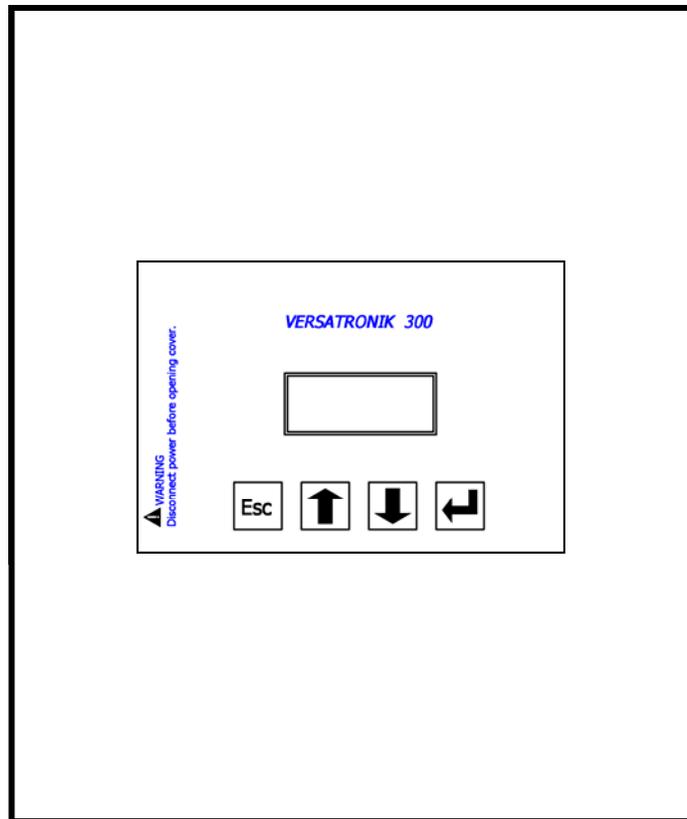
IMPORTANT

Read and save these instructions for
future reference

About these instructions

⚠ Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION" and "IMPORTANT". See below.

<table>
<tr><td>

⚠ WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in death, serious injury or substantial product/property damage.

</td><td>

→ *Warnings draw your attention to the presence of potential hazards or important product information.*

</td></tr>
<tr><td>

⚠ CAUTION

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/property damage.

</td><td>

→ *Cautions draw your attention to the presence of potential hazards or important product information*

</td></tr>
<tr><td>

⚠ CAUTION

Static sensitive components may be damaged by improper handling or work within the control. Ensure all possible measures are taken to eliminate build-up of static electricity.

</td><td></td></tr>
<tr><td>

IMPORTANT

</td><td>

→ *Helpful hints for installation, operation or maintenance which pertains to the product.*

</td></tr>
</table>

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www.viessmann.us

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For more information please visit:
www.bacnet.org
www.ashrea.org

Important Regulatory and Installation Requirements

Codes
The installation of this unit must be in accordance with local codes.

All electrical wiring is to be done in accordance with the latest edition of CSA C22,1 Part 1 and/or local codes. In the U.S. use the National Electrical Code ANSI/NFPA 70.

The installing contractor must comply with the Standard of Controls and Safety Devices for Automatically fired Boilers, ANSI/ASME CSD-1 where required by the authority having jurisdiction.

Working on the equipment
The installation, adjustment, service and maintenance of this unit must be done by a licensed professional heating contractor or persons who are qualified and experienced in the installation, service, and maintenance of similar products. There are no user serviceable parts on this control.

Power supply
Install power supply in accordance with the regulation of the authorities having jurisdiction or in absence of such requirements, in accordance with National Codes.

→ *Please carefully read this manual prior to attempting installation. Any warranty is null and void if these instructions are not followed.*

→ *The completeness and functionality of field supplied electrical controls and components must be verified by those installing the device*

⚠ **WARNING**

More than one live circuit. See wiring diagram in this manual. Turn off power supply to control and damper/blower before servicing. Contact with live electrical components can result in serious injury or death

Purpose of Device and Operation

The Versatronik 300 Cascade control is designed to stage Viessmann LON enabled boilers and boiler controls via a CAT5 wire connection LON communication.

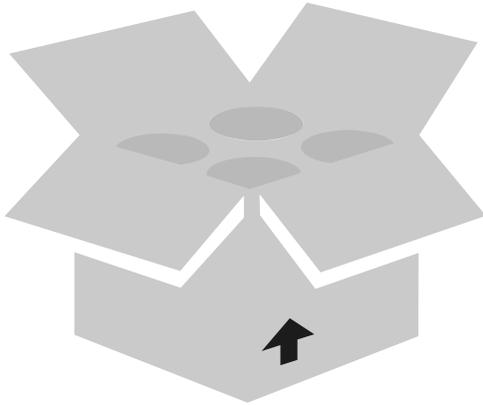**This page is intentionally left blank**

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Control Information

Section 2.0

What's in the box?

Un-boxing the Control
In the box, you will find the following:

Qty.	Description	Part Number
2	Immersion Sensor LLH Supply/Return 10K	211059
1	Outdoor Temperature Sensor 5K	211062
1	Versatronik 300 Manual	394031
1	Spare fuse Sub-miniature T160mA	255071
1	Spare fuse 10A	255017
1	Termination resistor	213018

Mounting Versatronik 300 Control
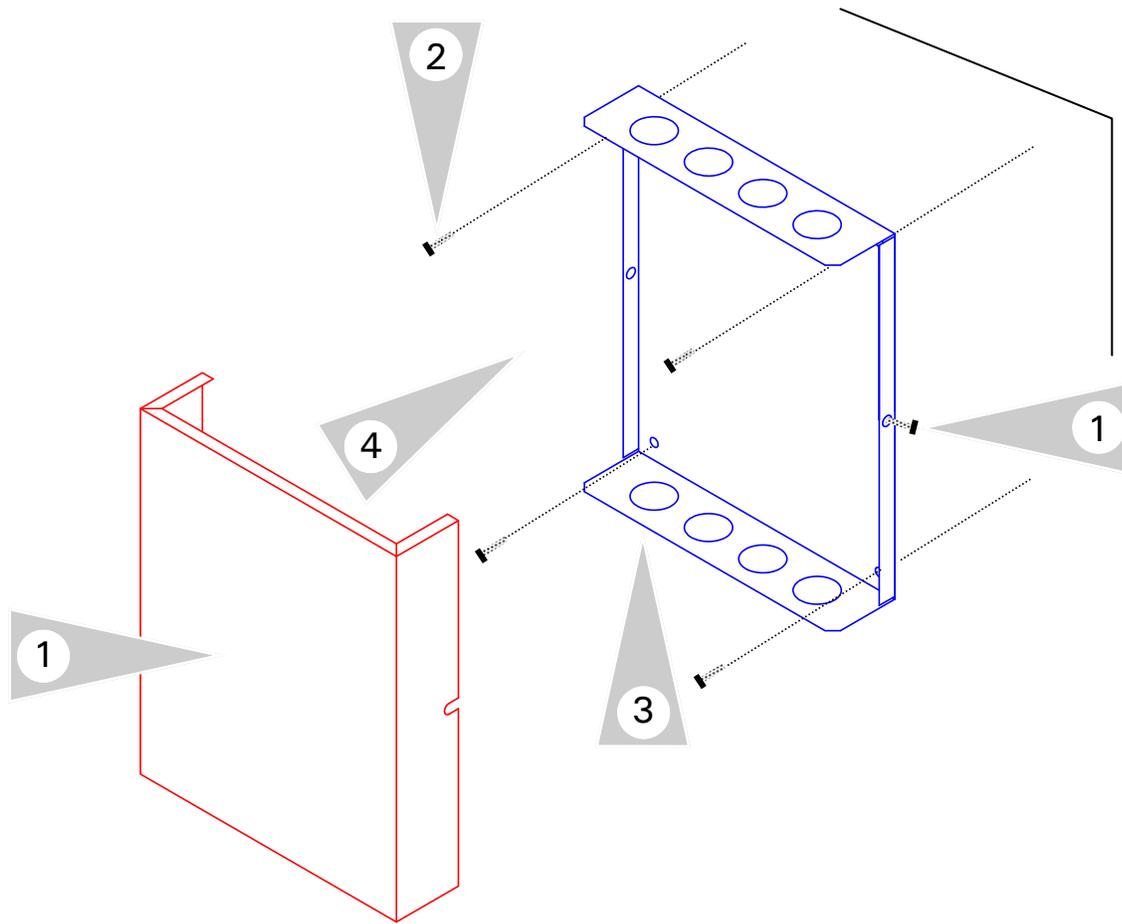
Mounting Steps

1. Mount Versatronik 300 in a convenient location near the connected boiler controls control. Remove cover by loosening the two screws on either side of base to release the cover.
2. Fasten base to wall using field-supplied screws/fasteners.
3. Remove knockout and installed wire strain relief or box connector. Removal of remaining knockouts is required to make further connections.
4. Once all of the 120VAC and low voltage connections are complete and verified, reinstall the cover from Step 1.

⚠ **WARNING**

When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair of shield design wire. Ensure that only one end of the shielding is grounded.

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Outdoor Temperature Sensor Connections (If Required)
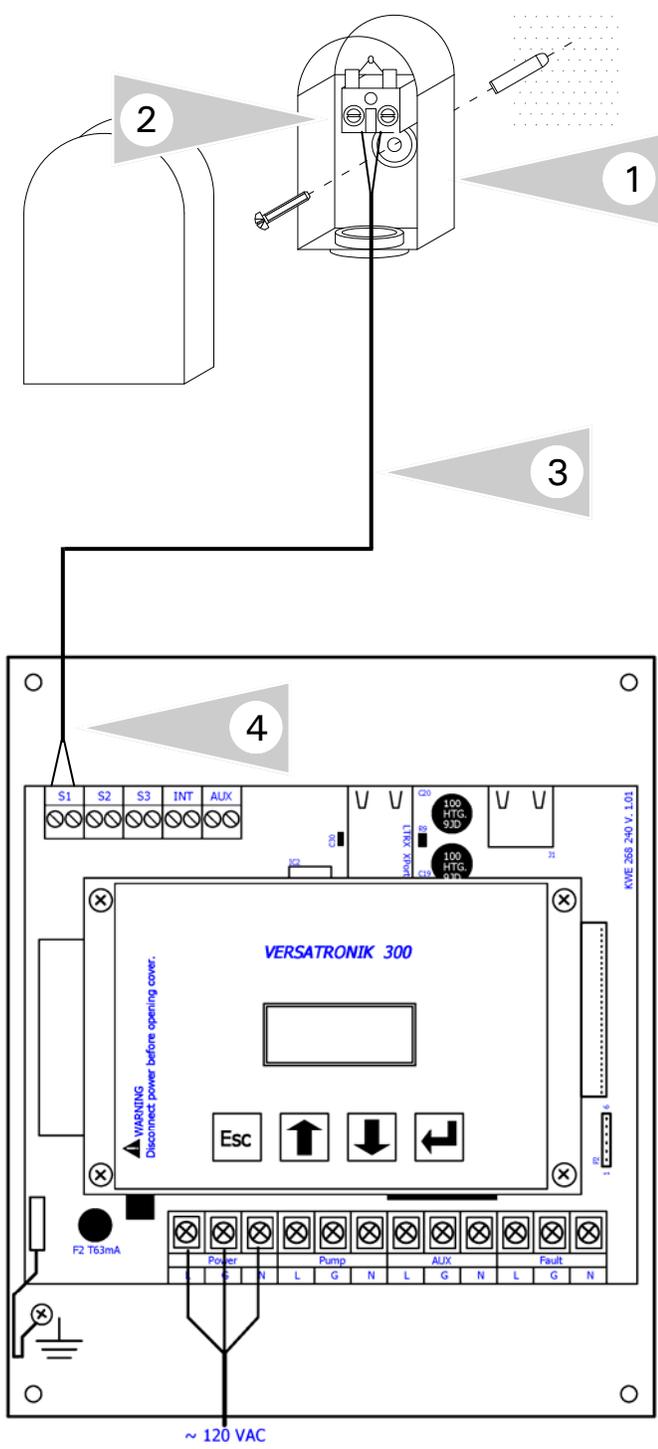
Wiring Steps

1. Install outdoor temperature sensor on outside of structure.
2. Connect field supplied wiring to terminals inside of sensor. Ensure wiring is run through strain relief at bottom of sensor housing. Reinstall sensor cover onto sensor backing.
3. Run field supplied wiring between sensor and Versatronik 300 control.
4. Connect wires to the S1 wire terminals inside of the control.

Note:

In applications which are not outdoor reset based, it is not necessary to install the sensor.

Activation of the sensor only occurs when outdoor reset is enabled in the set up menu.

Important

The outdoor temperature sensor should be mounted 2 to 2.5 metres above ground level on the north or north-west facing wall of the building. In the case of multi-storey buildings, it should be mounted in the upper half of the second storey. Make sure that the sensor is not located over windows, doors and air vents, nor immediately beneath a balcony or guttering. Do not paint over the outdoor temperature sensor housing.
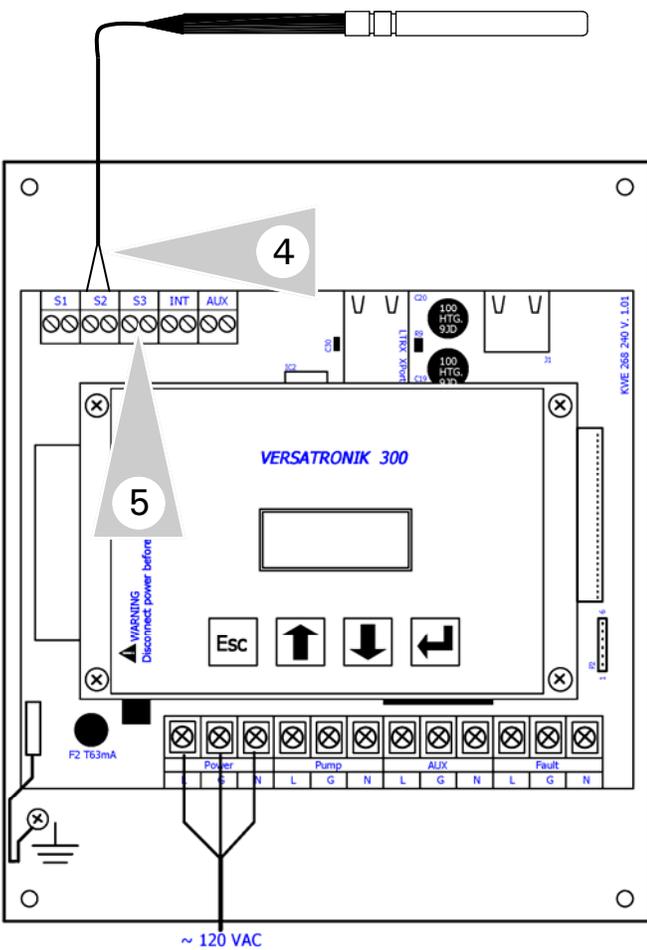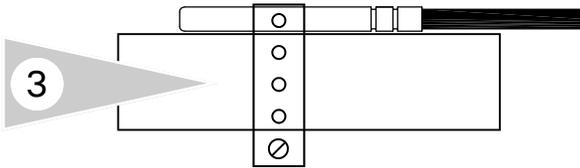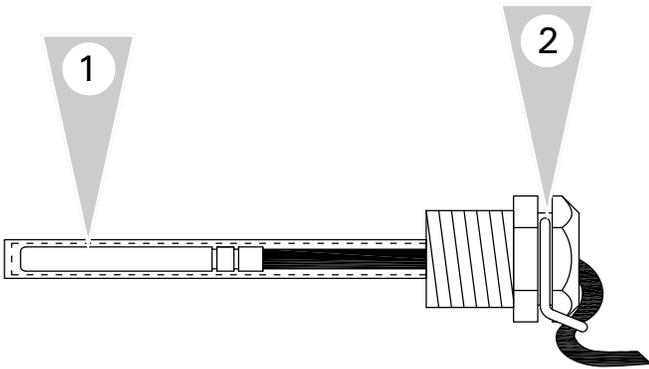
⚠ WARNING

When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair of shield design wire. Ensure that only one end of the shielding is grounded.

Section 2.1

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8

Supply & Return Temperature Sensor (Immersion)

Installation Instruction

The immersion sensor supplied with the control is designed to be used with an immersion well. Should it be necessary to be used as a strap-on sensor, ensure the sensor is tight against the pipe. Where possible, conductive paste can be used along with a metal strap for fastening. Avoid using wire ties as the plastic will become brittle and loosen.

Once securely fastened, cover with pipe insulation.

1. Ensure that sensor is pushed completely into temperature well.
2. Use temperature well clip to ensure that sensor remains securely in place.
3. Alternate method of securing sensor to pipe should there be no immersion temperature well.
4. Wire the sensor to the S2 terminals inside of the Versatronik 300 control.

Return Temperature Sensor (Optional)

Installing a return temperature sensor will allow the temperature differential to be seen by the user. There is no control logic associated with the extra sensor.

5. Connect leads of sensor to terminal connections at S3 input.

   Securely mount onto pipe or install in correct immersion sensor well like that of the supply temperature sensor.

⚠ **WARNING**

When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair of shield design wire. Ensure that only one end of the shielding is grounded.

BMS
or
mechanical
control

1

R

2

3

4

S1 S2 S3 INT AUX

100
HTG.
9JD

100
HTG.
9JD

KWE 268 240 V. 1.01

VERSATRONIK 300

⚠ WARNING
Disconnect power before opening cover.

Esc ↑ ↓ ↵

F2 T63mA

Power   Pump   AUX   Fault
L S N L G N   L G N   L G N

~ 120 VAC

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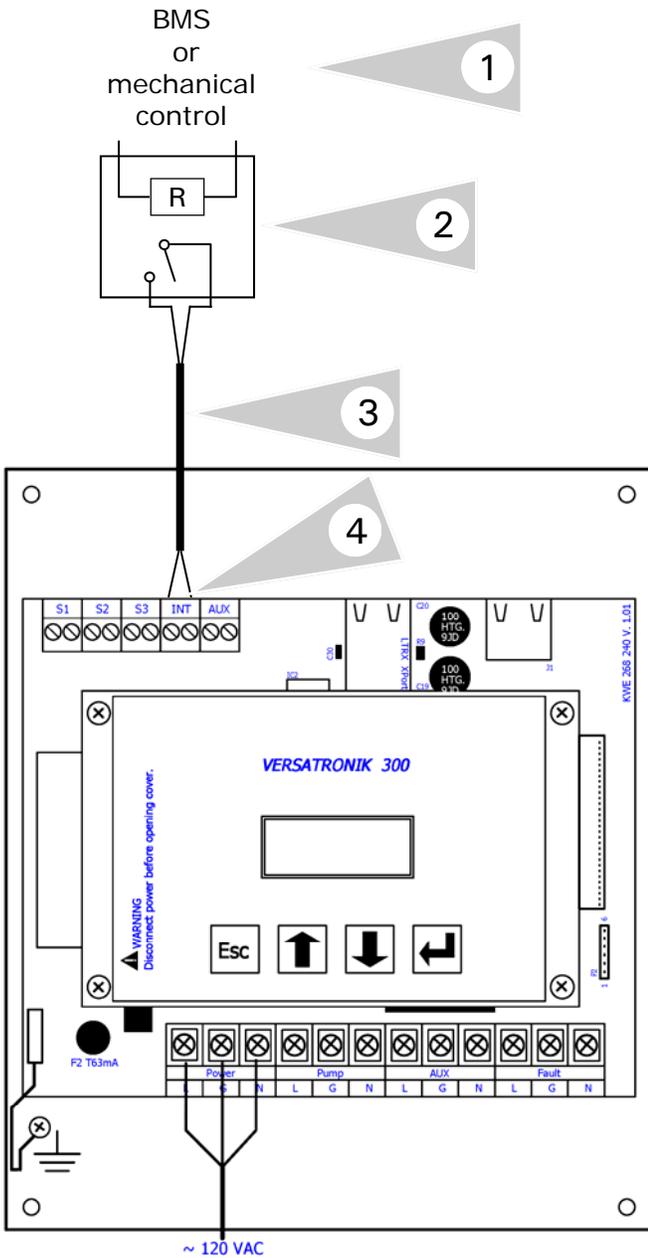
Installation Instruction

The boiler interlock is designed for any potential-free, dry contact to be connected to the INT terminals. The operational intent of this input is the boiler plant will be shut down when the Versatronik 300 does not sense a contact closure.

1. Control signal from BMS system or mechanical device control such as damper or blower motor.

2. Control relay (field supplied) of either AC or DC control voltage to relay coil. Contact closure necessary for operation of boiler plant.

3. Low voltage wiring to Versatronik 300 control.

4. Connect to terminals of the INT terminal block.

Coding Requirement

If this function is used, it must be turned on in the Specifications menu selection of the control.

Press and hold ENTER button for 5 seconds.

Press arrow up to Specifications main menu option.

Locate Interlock menu selection and press ENTER button to "Enable".

Press ESC to escape from menu

If successfully programmed, a C1 error will be present indicating an open contact and fault output will be ON.

The alarm function can be disabled as a way to simply enable/disable the boiler plant. In circumstances where an alarm is not required, ensure that the alarming is turned off. Refer to the menu page with applicable instructions.

⚠ **WARNING**

When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair of shield design wire. Ensure that only one end of the shielding is grounded.
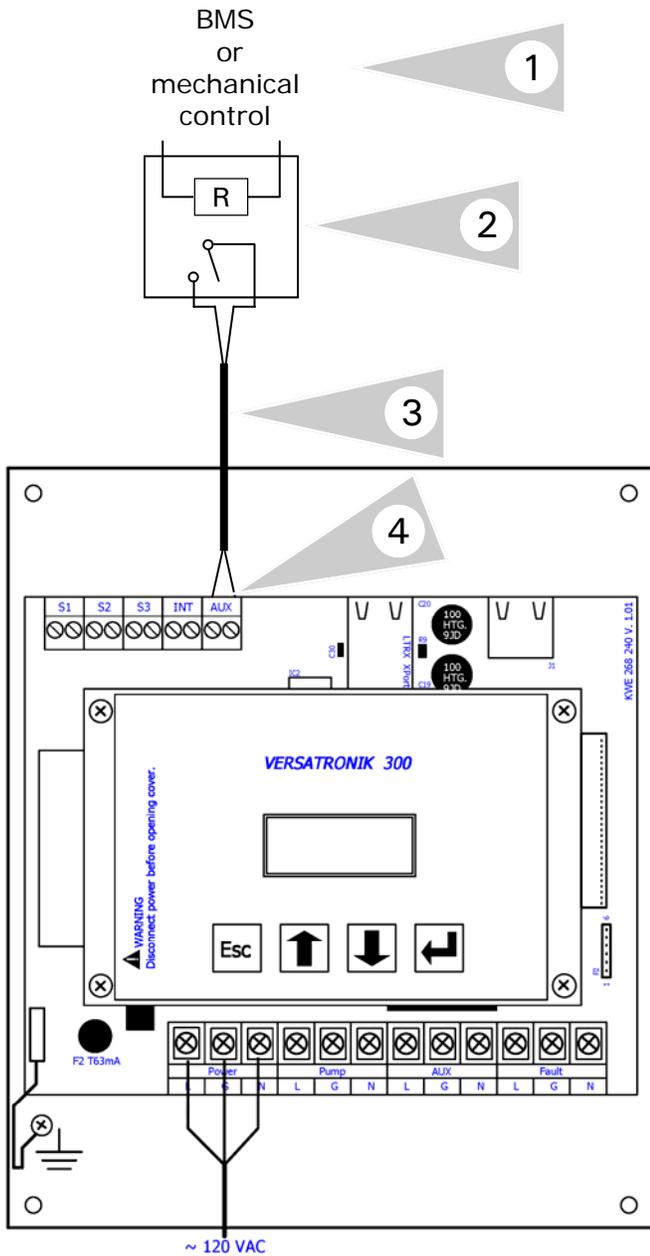
Installation Instruction

The heat demand is designed for any potential-free, dry contact to be connected to the AUX terminals. The function of this input allows a heat demand to be provided to the control thereby causing a fixed set point temperature. This demand can be used in conjunction with the Outdoor reset or without as a constant enable/disable function.

The fixed temperature setpoint is adjustable in the Specifications menu selection.

1. Control signal from BMS system or mechanical device control. .

2. Control relay (field supplied) of either AC or DC control voltage to relay coil. Contact closure for heat demand.

3. Low voltage wiring to Versatronik 300 control.

4. Connect to terminals of the AUX terminal block.

Coding Requirement

The external demand is the default function of the Versatronik 300 control.

To modify the set point temperature when a demand contact closure is present, access the programming by pressing the ENTER button for 5 seconds.

Press the arrow up until Specifications appears and press ENTER button.

Press the arrow up until DMD SetP is viewed and press ENTER to modify the value. Arrow up or down to increase/decrease and press enter to select desired value.
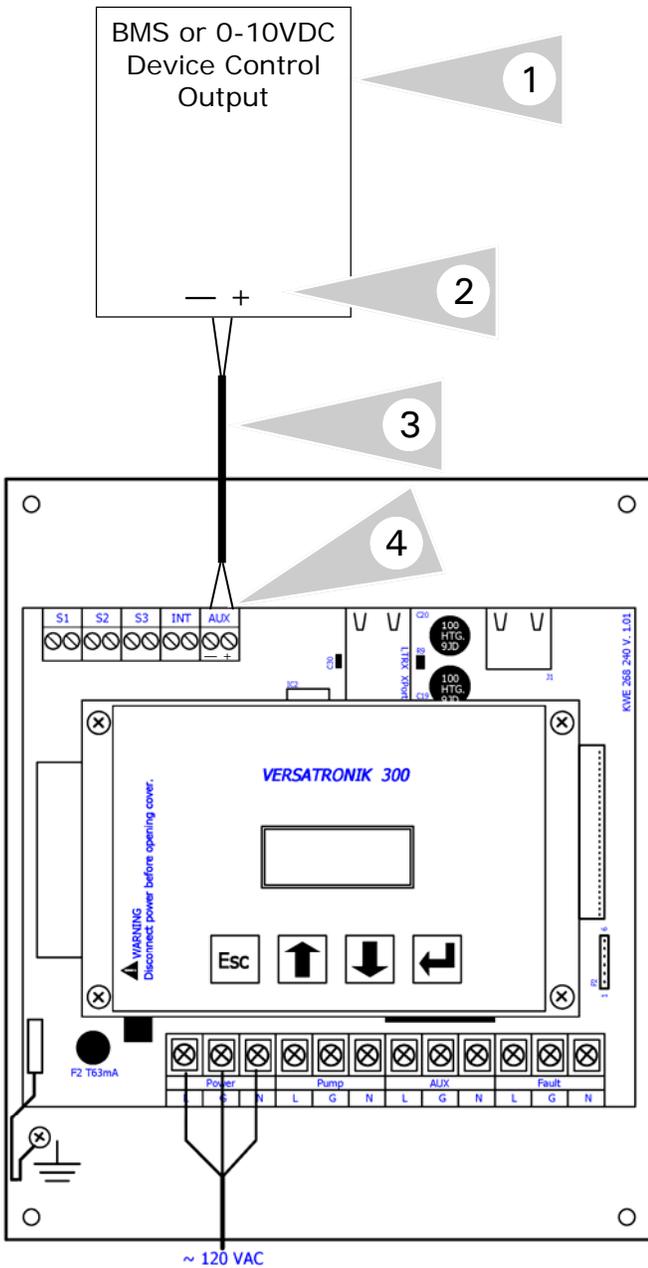
Press ESC to exit from programming. Return to screen showing Set Point Temperature. The value presently displayed should equal the programmed value of the set point demand. As well, an A should be present indicating the "AUX" demand.

11

AUX 0-10VDC Input (Option)

Installation Instruction

The 0-10VDC input is to allow a BMS controlled set point for the common supply. The signal is connected to the AUX terminals. The function of this input must be changed from the factory default of DEMAND to the 0-10VDC setting. This input can be used in conjunction with the Outdoor Reset function, but the control will operate to the higher of the two set points.

1. Control signal from BMS system or mechanical device control. .

2. Terminal connections from BMS or 0-10VDC device control output signal

3. Low voltage wiring to Versatronik 300 control.

4. Connect to terminals of the AUX terminal block. Left terminal is — and the right terminal is the + input.

Coding

Selection of the 0-10VDC input is set in the Specification menu selection. Press the ENTER button for 5 seconds.

Press the arrow up until Specifications appears and press ENTER button.

Press the arrow up until AUX Mode is viewed in the screen. Pressing the ENTER button will allow you to set the 0-10VDC mode. Once this is viewed in the screen, press the ESC button to exit.

Press ESC to exit from programming. Return to screen showing Set Point Temperature. The present 0-10VDC signal should appear at the setpoint value. As well, an A should be present indicating the "AUX" demand.

NOTE:
The scaling of the range of 2V to 10V equates to a 20C/68F to 100C/212F set point.

⚠️ **WARNING**

When extending wire there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair of shield design wire. Ensure that only one end of the shielding is grounded.

Communications-Vitotronic 100, GC1 and GC1B

Communication connections—Vitotronic 100, GC1 and GC1B
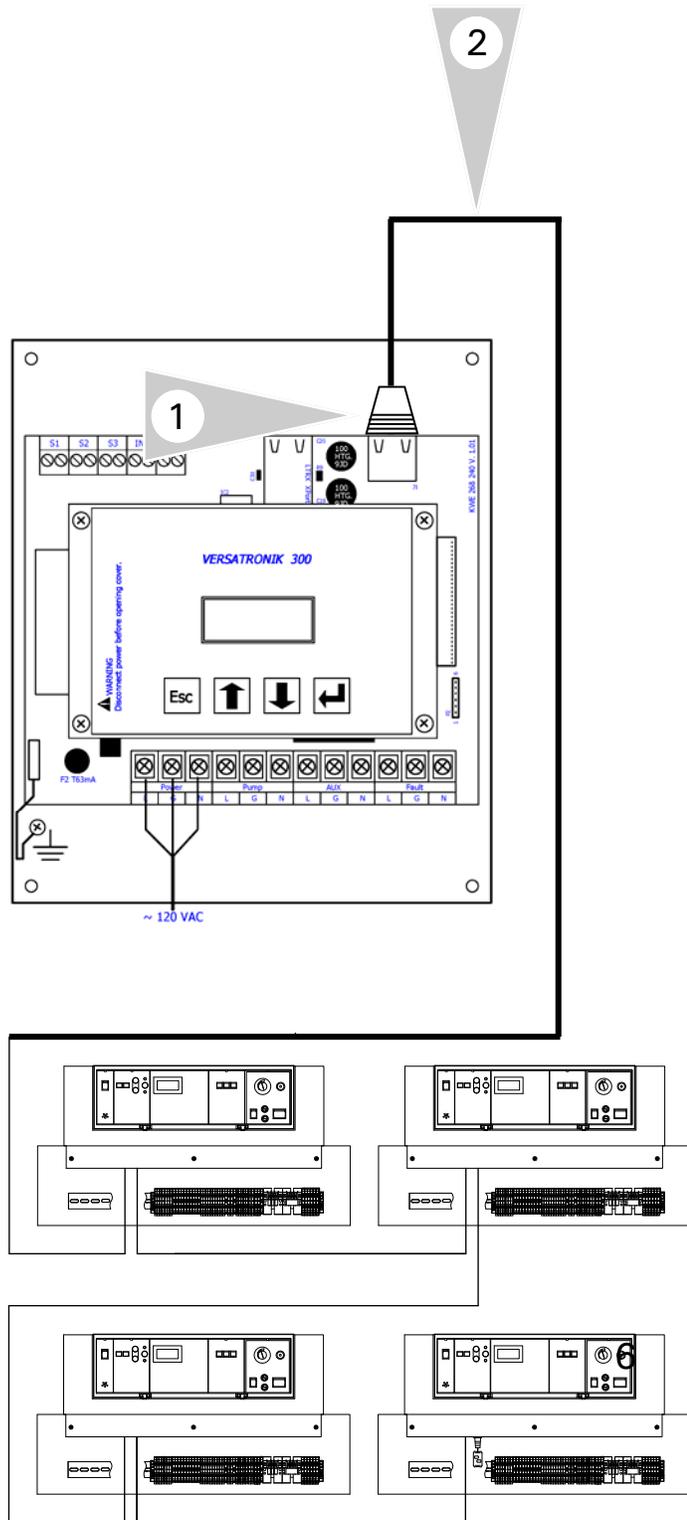
Connection Overview

The communication between the Versatronik 300 control and Viessmann Vitotronic 100, GC1 is a CAT5E cable with RJ45 ends, non cross over type connection. This cable can made up on site or ordered from Viessmann.

The cable is plugged into the Versatronik 300 and daisy chained from control to control.

1. Plug connection into the J1 receptacle on the PCB in the upper right hand corner of the PCB.
2. CAT5e cable connecting the boiler control LON communication boards.

Boiler Control Programming Considerations

Refer to manual specific to boiler control. Ensure necessary LON communication card installed.

The GC1 coding considerations:

Address 01 set to 01 for single boiler operation.

Boiler set point [🌡III] turned down to a value of 20C/68F. Should not be left at the factory default of 75C.

Ensure that burner load settings are made correctly. Addresses 08, 09 and 0A will influence how the Versatronik 300 will see the modulation rates from the boilers.

If boiler pumps are being used, address 4d must be set to a value of 2.

LON Settings:
Boiler control LON settings must be made from the factory values. Address 77 is the individual boiler LON addressing. The Versatronik 300 understands addressing from 1 to 16. Ensure that there are no boiler controls programmed with duplicate LON address values.

Minimum Boiler Functions:
The minimum boiler functions are handled by the boiler control. The boiler temperature may need to be satisfied before the actual boiler turns off after disabling by the Versatronik 300.

13

Communications-Vitotronik 300, GW5B

Communication connections—Vitotronic 300, GW5B
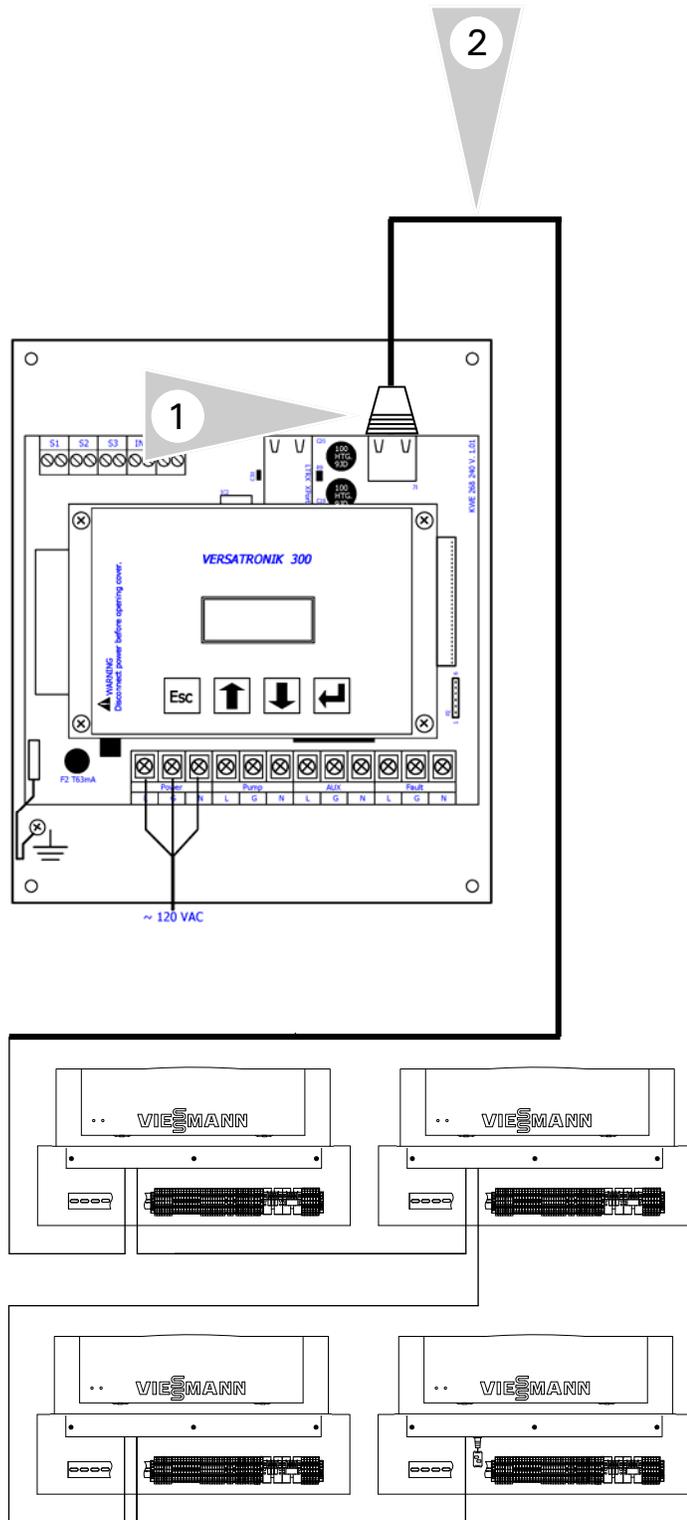
Connection Overview

The communication between the Versatronik 300 control and Viessmann Vitotronic 300, GW5B is a CAT5E cable with RJ45 ends, non cross over type connection. This cable can made up on site or ordered from Viessmann.

The cable is plugged into the Versatronik 300 and daisy chained from control to control.

1. Plug connection into the J1 receptacle on the PCB in the upper right hand corner of the PCB.
2. CAT5e cable connecting the boiler control LON communication boards.

Boiler Control Programming Considerations

Refer to Viessmann manual specific to boiler control. Ensure necessary LON communication card installed.

The Vitotronic 300, GW5B coding considerations: The boiler must be set to single boiler mode, **not** multi-boiler cascade control. The outdoor sensor can be mounted inside of the control.

Ensure that burner load settings are made correctly. Addresses 08, 09 and 0A will influence how the Versatronik 300 will see the modulation rates from the boilers.

If boiler pumps are used, address 4d will need to be set to a value of 2.

LON Settings:
Boiler control LON settings must be made from the factory values. Address 77 is the individual boiler LON addressing. The Versatronik 300 understands addressing from 1 to 16. Ensure that there are no boiler controls programmed with duplicate LON values.
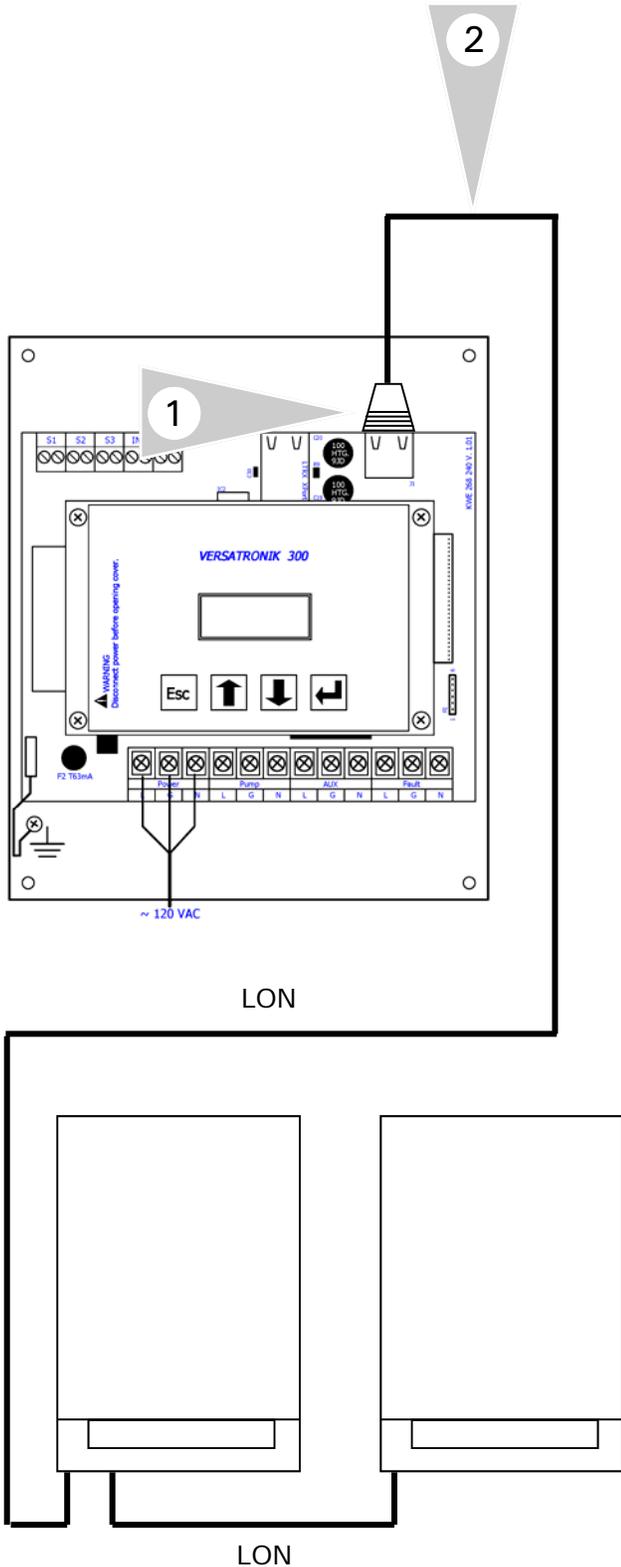
Minimum Boiler Functions:
The minimum boiler functions are handled by the boiler control. The boiler temperature may need to be satisfied before the actual boiler turns off after disabling by the Versatronik 300. Typically this can be approximately 149F/65C.

14

Communications-Vitodens 200 w/HC1 Control

Communication connections—Vitodens 200, WB2B with Vitotronic 100, HC1 control

Connection Overview

The communication between the Versatronik 300 control and Viessmann Vitodens is a CAT5e cable with RJ45 ends, non cross over type connection. This cable can made up on site or ordered from Viessmann.

The cable is plugged into the Versatronik 300 and daisy chained from control to control.

1. Plug connection into the J1 receptacle on the PCB in the upper right hand corner of the PCB.

2. CAT5e cable connecting the boiler control LON communication boards.

Boiler Control Programming Considerations

Refer to manual specific to boiler control. Ensure necessary LON communication card installed.

IMPORTANT
Coding 00: 00 (Vitodens WB2B Only) Note: this coding cannot be directly set to 0. The way to do this is to temporarily change coding 01 to 2 (multi-boiler). A click can be heard. Change 01:02 back to 01:01. Address 34 must be changed to a value of 23 as well.

The Vitodens boiler pump will remain running unless this is performed correctly.

Boiler set point [🌡️▥] turned down to a value of 20C/68F. Should not be left at the factory default of 75C.

LON Settings:
Boiler control LON settings must be made from the factory values. Address 77 is the individual boiler LON addressing. The Versatronik 300 understands addressing from 1 to 16. Ensure that there are no boiler controls programmed with duplicate addresses.

Start at LON address 1 and sequentially increase for all of the controls. Address 76:1, 78:1, 79:0, 98:1

Communication connections—Vitodens 200, WB2B with Vitotronic 200, H01 control

Connection Overview

The communication between the Versatronik 300 control and Viessmann Vitodens is a CAT5e cable with RJ45 ends, non crossover type connection. This cable can made up on site or ordered from Viessmann.

The cable is plugged into the Versatronik 300 and daisy chained from control to control.

1. Plug connection into the J1 receptacle on the PCB in the upper right hand corner of the PCB.
2. CAT5e cable connecting the boiler control LON communication boards.

Boiler Control Programming Considerations

IMPORTANT CONSIDERATIONS
When communicating to a Vitodens WB2B boiler with Vitotronic 200, HO1 control, the outdoor temperature sensor will need to be connected. It can be located inside of boiler housing. An outdoor temperature sensor fault will always appear if it is not connected. An alternate installation method is to use a resistor to simulate an outdoor temperature greater than 68F/20C.

The Sun and Moon settings should be adjusted so that the boiler is always in warm weather shutdown mode. A setting of 10C/50F for each is typical.

Address 34 must be changed to a value of 16 as well.

For some systems that have small DHW production demands, it is still possible to use the boiler to satisfy tank demands. The priority settings may need to be changed based on desired functionality.

LON Settings:
Boiler control LON settings must be made from the factory values. Address 77 is the individual boiler LON addressing. The Versatronik 300 understands addressing from 1 to 16. Ensure that there are no boiler controls programmed with duplicate addresses. Start at LON address 1 and sequentially increase for all of the controls. Address 76:1, 78:1, 79:0, 98:1

16
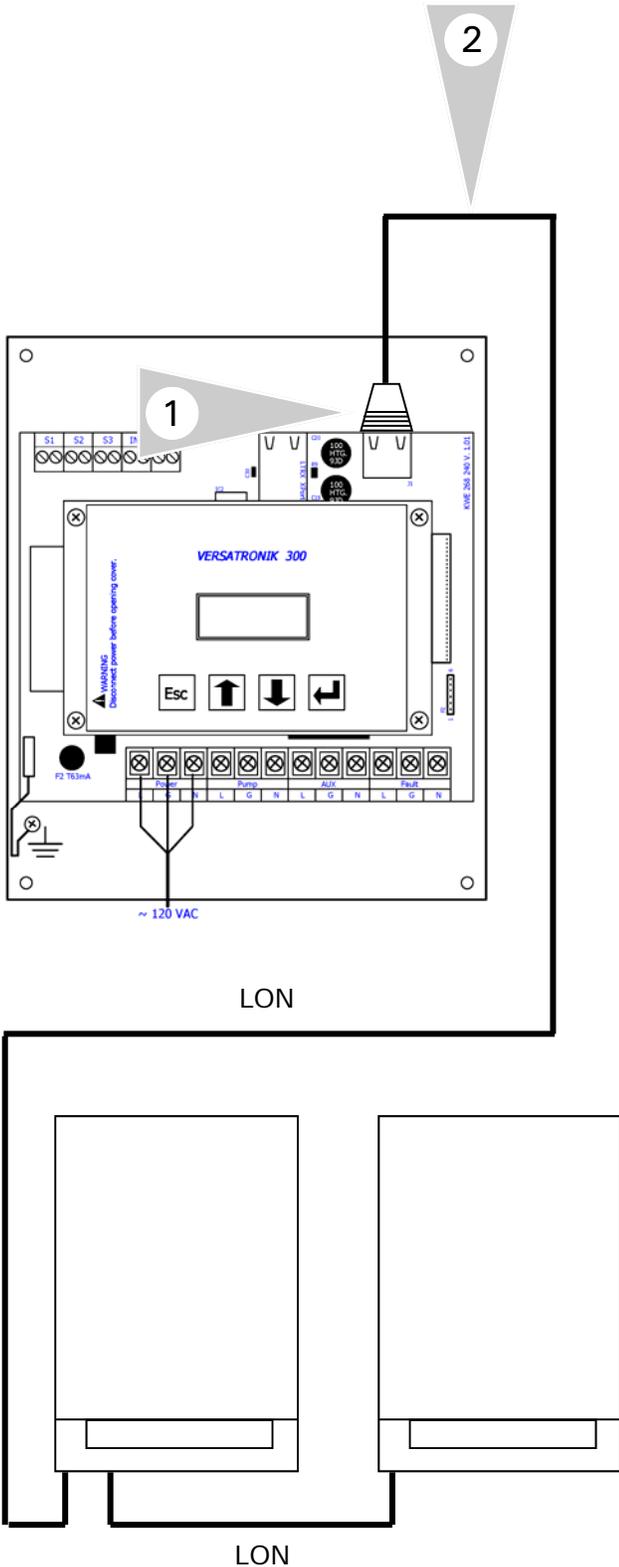
Communication connections—Vitodens 200, B2HA with new GUI

Connection Overview

The communication between the Versatronik 300 control and Viessmann Vitodens is a CAT5e cable with RJ45 ends, non crossover type connection. This cable can made up on site or ordered from Viessmann.

The cable is plugged into the Versatronik 300 and daisy chained from control to control.

1. Plug connection into the J1 receptacle on the PCB in the upper right hand corner of the PCB.
2. CAT5e cable connecting the boiler control LON communication boards.

Boiler Control Programming Considerations

IMPORTANT CONSIDERATIONS
When communicating to a Vitodens B2HA boiler, the outdoor temperature sensor will need to be connected. It can be located inside of boiler housing. An outdoor temperature sensor fault will always appear if it is not connected. An alternate installation method is to use a resistor to simulate an outdoor temperature greater than 68F/20C. A 10Kohm resistor (Brown Black Orange) will set an outdoor temperature of approximately 77F or 25C

The Sun and Moon settings should be adjusted so that the boiler is always in warm weather shutdown mode. A setting of 10C/50F for each is typical.

Boiler coding and LON Settings:
Boiler control LON settings must be made from the factory values. Address 77 is the individual boiler LON addressing. The Versatronik 300 understands addressing from 1 to 16. Ensure that there are no boiler controls programmed with duplicate addresses. Start at LON address 1 and sequentially increase for all of the controls.

Boiler Coding Addresses:
30:0, 3F:2, 76:1, 78:1, 79:0, 98:1,
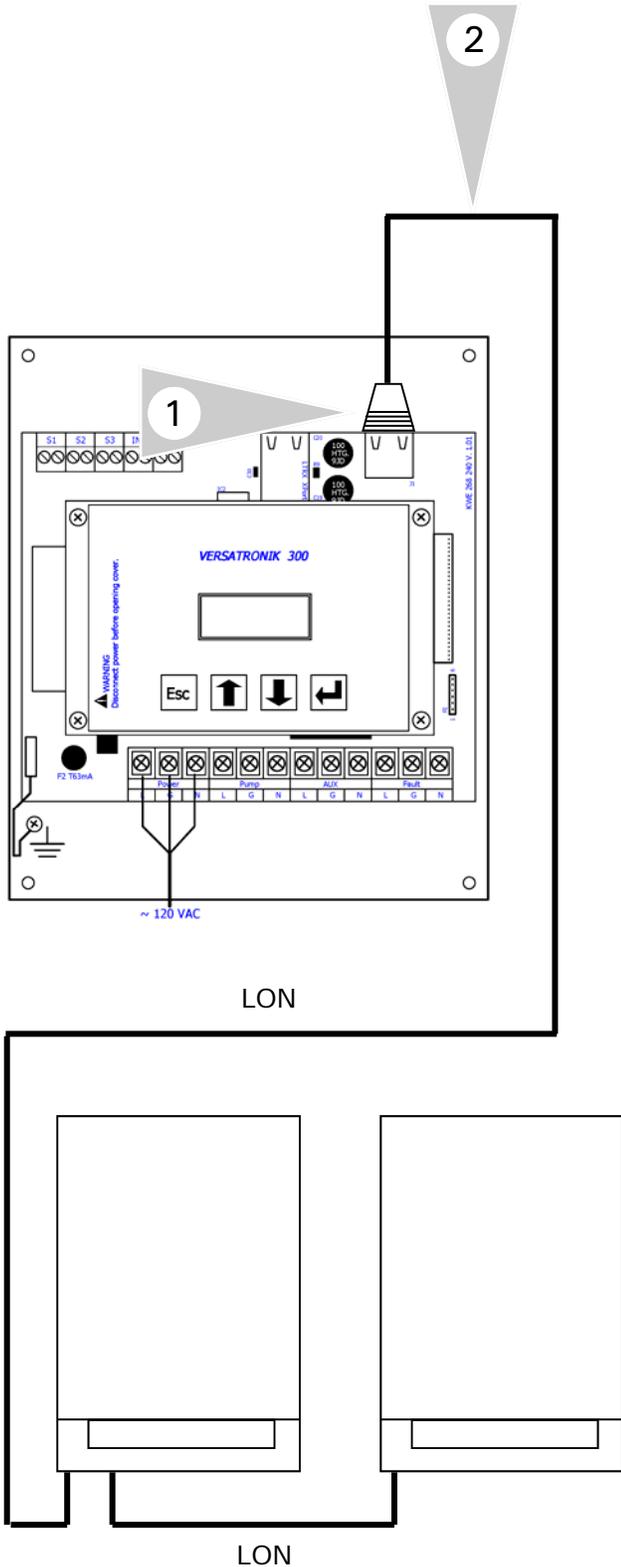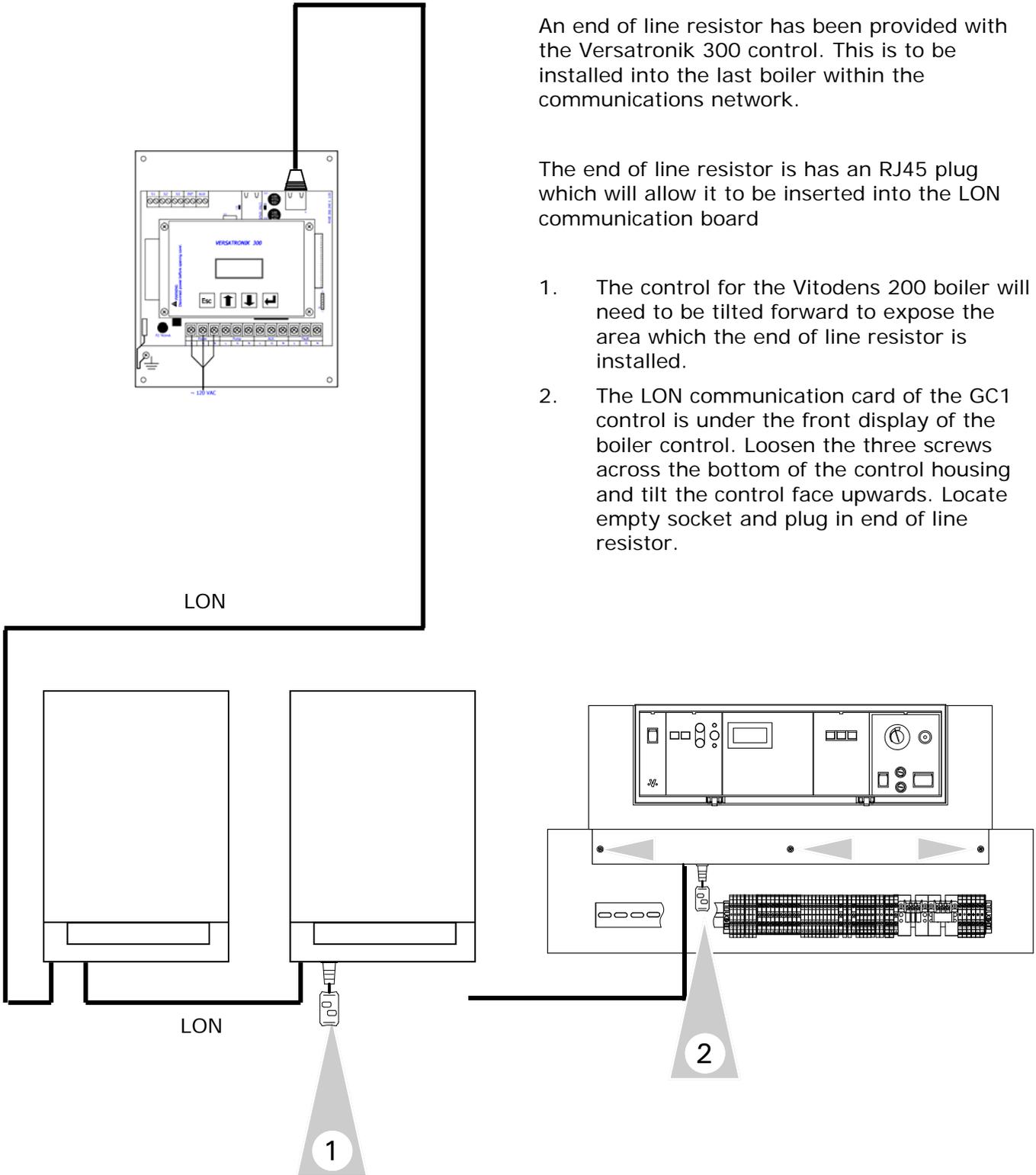
Communications-End of Line Resistor

End of Line Resistor Installation

Connection Overview

An end of line resistor has been provided with the Versatronik 300 control. This is to be installed into the last boiler within the communications network.

The end of line resistor is has an RJ45 plug which will allow it to be inserted into the LON communication board

1. The control for the Vitodens 200 boiler will need to be tilted forward to expose the area which the end of line resistor is installed.

2. The LON communication card of the GC1 control is under the front display of the boiler control. Loosen the three screws across the bottom of the control housing and tilt the control face upwards. Locate empty socket and plug in end of line resistor.

BACnet Communications

BACnet BMS Connection RJ45 Plug

Connection Overview

1. Connect Ethernet cable with RJ45 end, for BACnet communications into the communication port closest to the middle of the Versatronik 300 control.
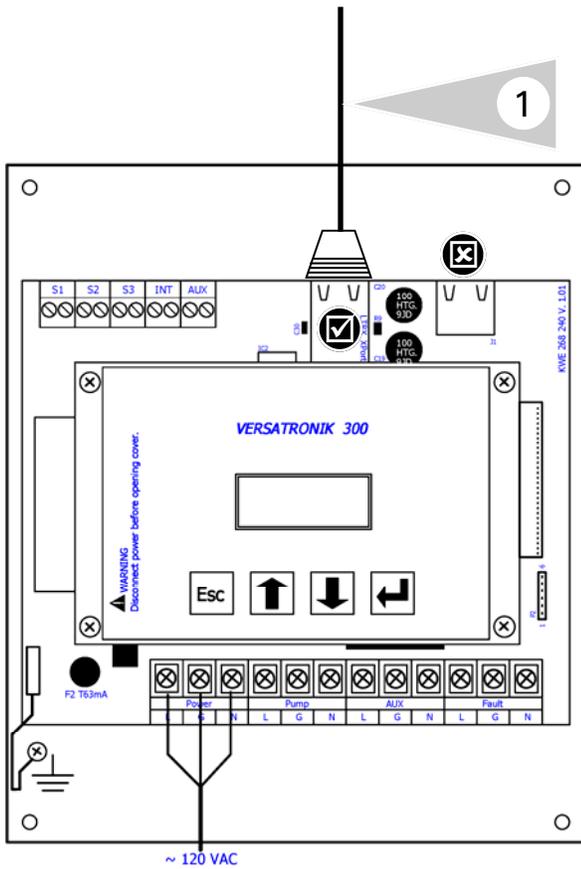
Integration Overview

Refer to following pages regarding the Configuration of the BACnet IP settings and the device settings

Configuration of BACnet: Applicable to Unit 704092 only

Configuring BACnet/IP Settings
Connect your computer DIRECTLY to the BACnet port of the Versatronik 300 device. With no other devices attached (an isolated network). Either set your computer's network connection to automatic IP Address (DHCP), or set your computer's IP address to 192.168.88.90 (subnet mask 255.255.255.0)

Restart the Versatronik 300 by cycling the power off and then on again.

Open a browser window and insert the following URL: http://192.168.88.89/admin
The default user name / password is "**admin**" and "**admin**" (without the quotes). This can be renamed in the Change Password screen. At this point you will see the Configuration pages.

Versatronik 300

- Home
- BACnet/IP Settings
- BACnet Device Settings
- Advanced Settings
- Restore Defaults
- Change Password
- Activate Configuration

BACnet/IP Settings

This page allows you to view current BACnet/IP settings, to change them or to restore them to factory defaults.

Parameter	Value	Description
IP	192.168.0.22	IP address of the BACnet device.
Network Mask	255.255.255.0	IP subnet mask.
Default Gateway	192.168.0.1	IP address of the default gateway.
UDP Port	47808	BACnet/IP UDP port number.

Save   Reset   Defaults

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IMPORTANT: Make sure that you remember any changes made here.

Configuration of BACnet Continued: Applicable to Unit 704092 only

BACnet Device Settings
You can now reconfigure these settings according to your network requirements. Make sure that you press SAVE on every screen where you make changes. The new setting will not take effect until the Activate Configuration screen has been confirmed. These configuration pages can now be accessed through both the 192.168.88.89 Address, as well as the one you have selected.

The BACnet Device Settings screen looks like this:

Versatronik 300

- Home
- BACnet/IP Settings
- BACnet Device Settings
- Advanced Settings
- Restore Defaults
- Change Password
- Activate Configuration

BACnet Device Settings

This page allows you to view current BACnet Device settings, to change them or to restore them to factory defaults.

Parameter	Value	Description
Device ID:	1	BACnet Device Instance Number.
Object Name:		Value of the Device's Object_Name property.
Description:		Value of the Device's Device_Description property.
Location:		Value of the Device's Device_Location property.

Save   Reset   Defaults

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NOTE: The **Device ID** must be unique on the entire BACnet internetwork.

The Restore Defaults and Change Password screens are very simplistic. When you select Activate Configuration, it will ask you if you want to SAVE your settings. This will then store your new settings and reboot automatically.

You can now join the Versatronik 300 to the rest of your network, provided you have not specified a duplicate IP Address. Any Computer on the network should now be able to access these configuration screens.

BACnet Data Points Overview: Applicable to Unit 704092 only

Analogue Inputs
Values which can be read from the Versatronik 300

Point	Point Description	Unit
AI1	Fault Code (See Appendix A)	
AI2	Outdoor Temperature	C/F
AI3	Supply Temperature	C/F
AI4	Return Temperature (Only applicable if sensor installed)	C/F
AI5	Effective Set Point	C/F
AI6	AUX Input (Demand or 0-10VDC signal) The set point temperature will be shown whether it be a demand signal or 0-10VDC signal	C/F
AI101– AI116	Boiler Sequence 01 to 16	
AI201-AI216	Boiler 01-16 Fault Code	
AI301-AI316	Boiler 01-16 Temperature	
AI401-AI416	Boiler 01-16 Set Point Temperature	C/F
AI501-AI516	Boiler 01-16 Modulation %	

Analogue Outputs
Values which can be written to the Versatronik 300

Point	Point Description	Unit
AO1	Slope	
AO2	Shift	
AO3	WWSD Temperature	
AO4	Supply Temperature Setpoint	

Binary Inputs
Status which can be read from the Versatronik 300

Point	Point Description	Unit
BI1	Interlock	True/False

Binary Outputs
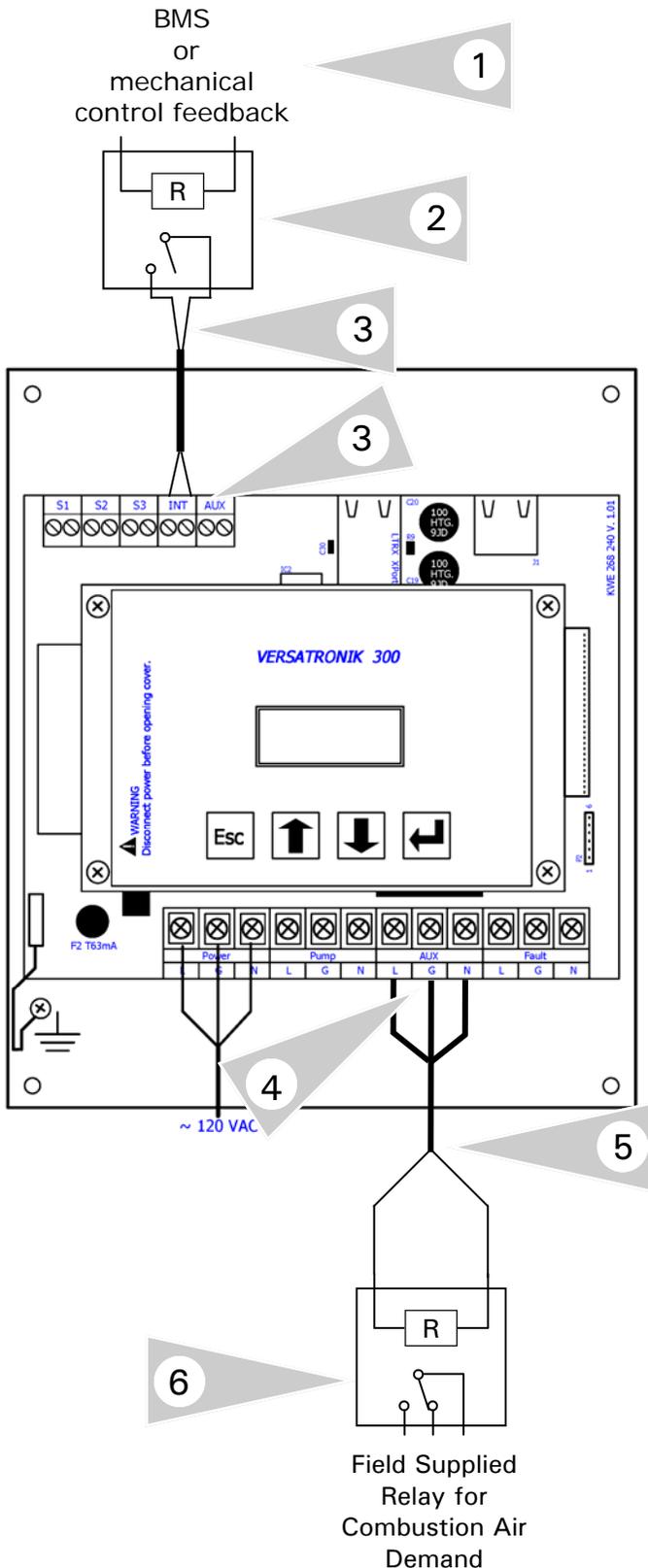Status which can be written to the Versatronik 300

Point	Point Description	Unit
BO1	Units (False=Metric; True=Imperial)	True/False
BO2	Outdoor Reset Enable	True/False
BO3	Network Setpoint Enable	True/False

Outputs-Combustion Air Function

Combustion Air Demand

BMS or mechanical control feedback

Connection Overview

1. Signal from BMS or mechanical device as a status of combustion/exhaust air blower or damper.

2. Field supplied relay.

3. Interconnection to the Versatronik 300 control onto the INT input. Only dry contact status input to the control.

4. Combustion/Exhaust air blower/damper demand signal based on when the control requests the first boiler to fire.

5. Field interconnection.

6. Field supplied relay to provide dry contact to BMS or other device for demand.

⚠ Notice

The Versatronik 300 control may provide a demand to the boiler system for operation, resulting in the operation of the exhaust/damper device without boilers actually operating. If the boiler temperature is above its actual operational set point, the boiler may not fire, even though a call for heat from the Versatronik 300 is present.

Sequence of Operation

1. Versatronik 300 senses drop in common supply temperature below the setpoint, provides set point demand to first boiler and AUX output turns ON.

2. The AUX output triggers demand for combustion/exhaust air operation.

3. Versatronik 300 waits for input signal from BMS or combustion/exhaust system before allowing boilers to receive heat demand.

4. If the combustion air input signal is not sensed in 60 minutes, the control will provide a fault output. This time delay value can be altered from factory value.

⚠ CAUTION

It is possible for the boilers to be demanded ON with the override function and not provide demand signal to the combustion air system in Vitodens systems.

Field Supplied Relay for Combustion Air Demand

23

Output connections for 120VAC
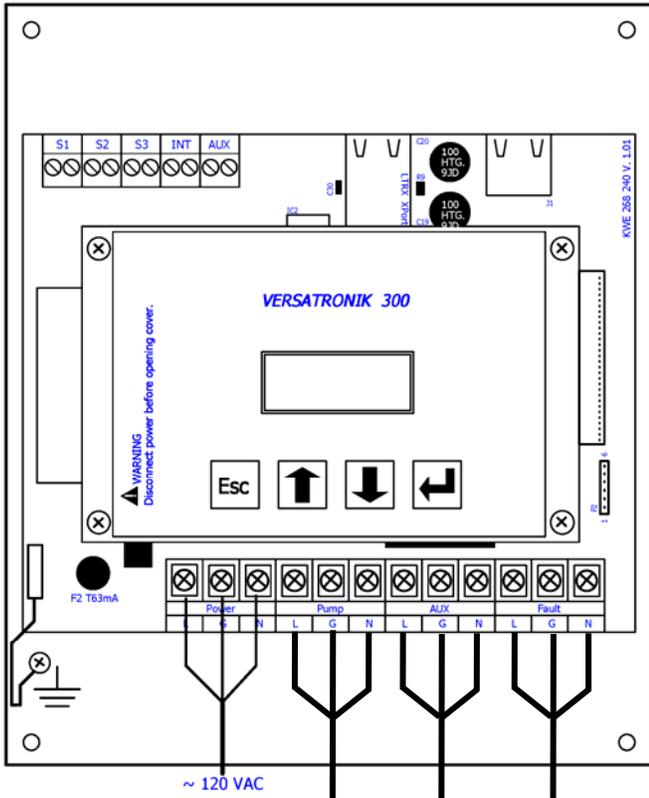
Connection Overview

The Versatronik has three 120VAC outputs for its various functions:

1. The common supply pump is connected to the control at the output marked PUMP. This is a 120VAC output rated at 5FLA. If a larger amperage pump is necessary to be controlled a field supplied motor started should be used, which can be controlled by the pump output.

2. A field supplied 120VAC relay can be trigged from the AUX output for one of two functions:
    External demand of alternate heating sources based on the time/temperature operation of the AUX connection. Alternate function of combustion air demand to external system. Output active when demand present to the boiler plant. This is a 120VAC, 3FLA output.

3. The fault output connection can be connected to various 120VAC loads at a 3FLA maximum. A relay can also be used to control an alternate load.
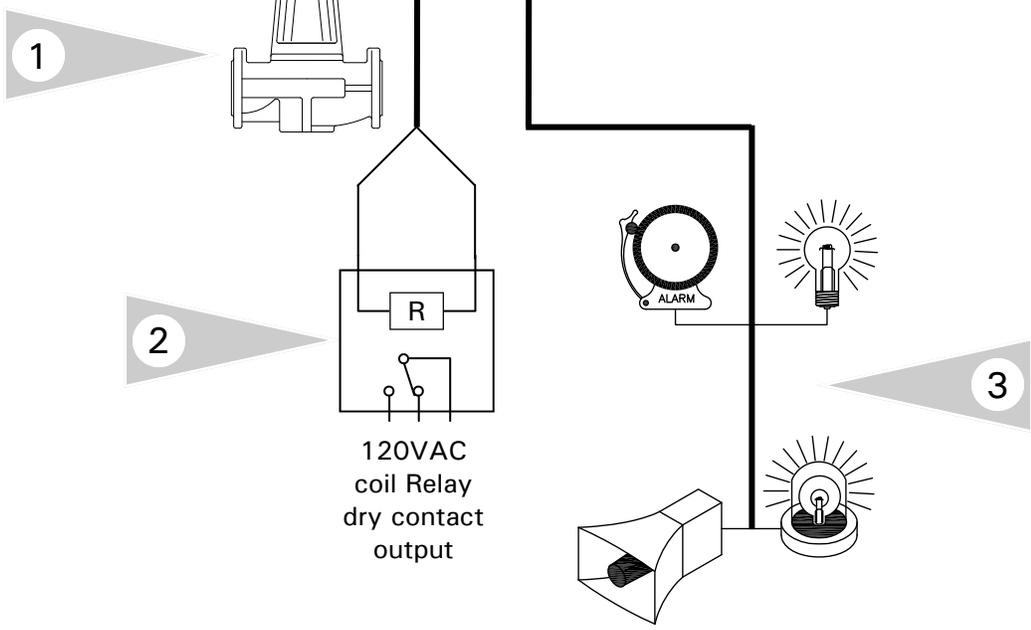
120VAC
coil Relay
dry contact
output

Input-120VAC

Input connections for 120VAC
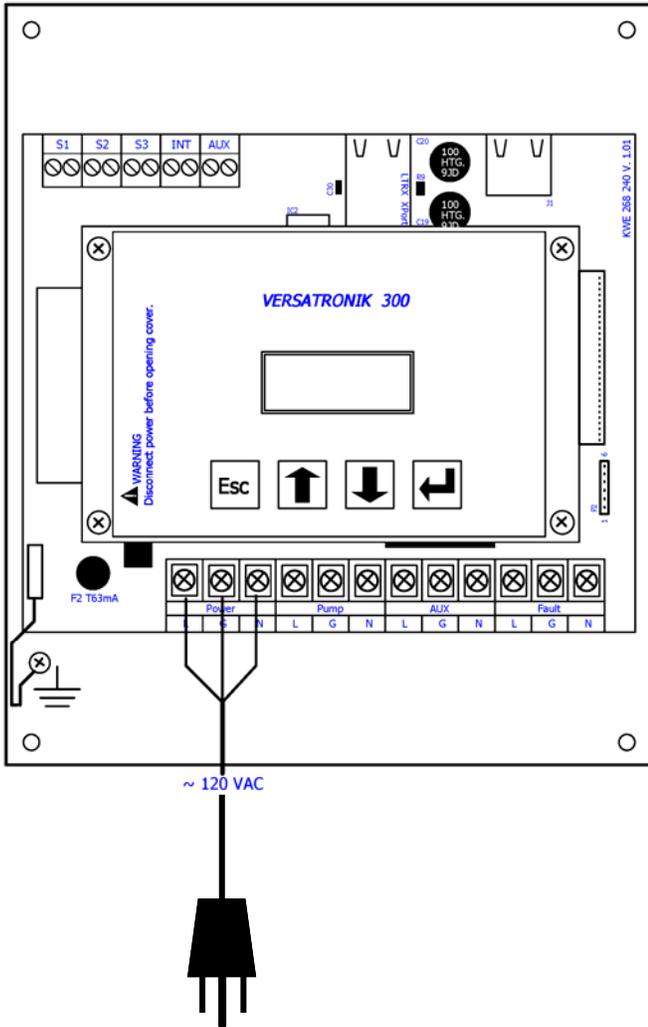
Connection Overview

The Versatronik 300 control come complete with a power cord. Once all of the low voltage and output connections are complete, the unit can be plugged into a standard 120VAC wall outlet.

The power supply outlet should not be switch or controlled by a low water cut off.

The control is rated for 120VAC, 10A. Depending on the load of the pump, it may be necessary to have a dedicated 120VAC source.

Configuration of Gateway Overview

Configuration Information

Control Operation

Overview of User Interface Elements

Versatronik® 300

```
ST:   77c

SP:   30cR
```

Esc ↑ ↓ ↵

1

2
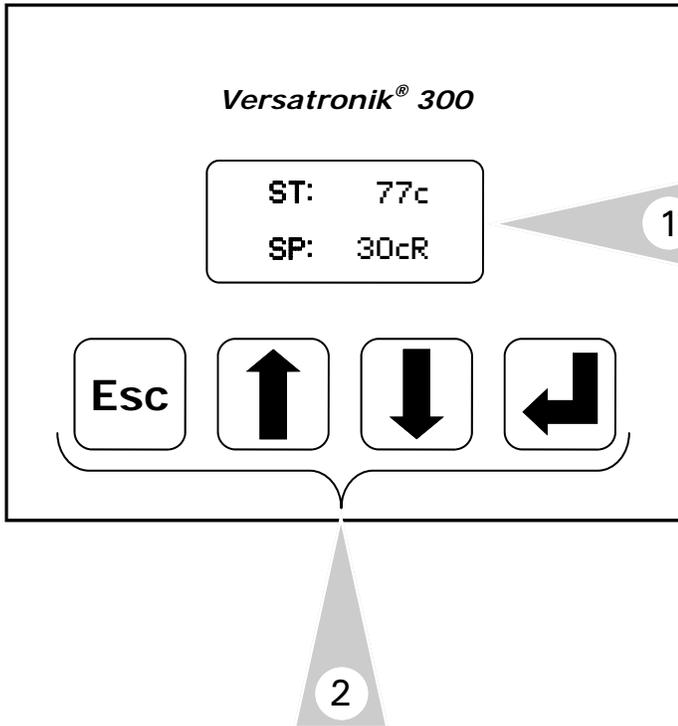
Overview

The Versatronik 300 user interface is comprised of two elements, the screen display and the function buttons.

1. Screen displays information using two lines with multiple characters.
2. Buttons are used to view information, perform relay tests, change set points and perform coding changes.

Buttons:
Esc, Arrow Up, Arrow Down and Enter

Navigation
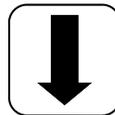
Movement within the various screens is accomplished with the Arrow Up and Arrow Down buttons.

Esc — To exit from a selected screen or menu press the **ESC** button. This button can be pressed to return back to the ST (supply temperature) screen.

The ENTER button is used to access various menu options, adjust set points and access coding level.

Coding Level Accessing

Press and hold the ENTER button for 5 seconds.

Esc — To exit the coding level, press the ESC button.

IMPORTANT

Screen Information
The system information that can be viewed at the screen has been maximized to provide the greatest amount of detail with the least number of characters. On the SP (Set Point line) a letter is shown beside the set point temperature. This value is representative of where the set point is coming from. The table below shows this.

Letter	Set Point
L	Low Limit
H	High Limit
R	Outdoor Reset
A	Auxiliary Input (Demand/0-10V)
N	Network (BACnet)
?	No calculation source (start up)

General Temperature/Status Review

Versatronik® 300

ST: 77c
SP: 30c
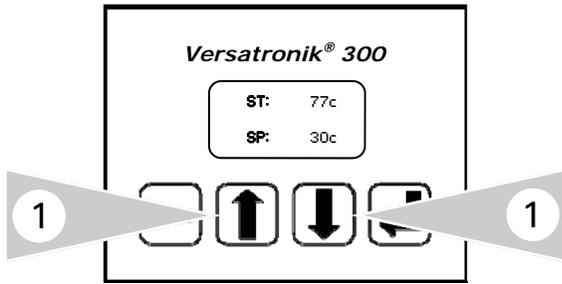
Main Screen Information
Control navigation is accomplished by using the user buttons mounted on the front of the control. With the UP arrow and DOWN arrow you may scroll down trough main display screens.
1. Press UP or DOWN arrows to move temperature/status information.

Shows on the display	Screen Display
ST - Supply Temperature SP – Setpoint Temperature	ST:: 77c SP:: 30c
OT – Outdoor Temperature RT – Return Temperature	OT: 76c RT: 75c
B1 – Boiler Status 1 (LON address) 　　Status On or Off (control feedback) 　　Boiler Temperature 　　Fault Info (00 no fault present)	B1: OFF 43c: F00
Depending on the number of boilers in system will dictate the number of boiler status screens. The control will display the number of boilers it is programmed for. See **Note** Below	
B16 –Boiler Status 16 (LON address) 　　Status On or Off (control feedback) 　　Boiler Temperature 　　Fault Info (00 no fault present)	B16: OFF 43c: F00
Boiler Sequence It is possible to view the current sequence of the boilers. Sequentially, the boilers can be viewed in order of operation. This display shows the first boiler is boiler number 4 based on LON addressing 77	BLR SEQ SEQ 1 4

NOTE:

While in the individual boiler status information screen, pressing the ENTER button will display the boiler set point value and modulation value. Press the ESC button to exit this screen

SP: 54
MOD: 100%
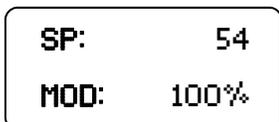
Menu Structure

Access the control menu by pressing and holding the enter button. Navigation is achieved by pressing the up or down arrow keys. Pressing the enter button on a setting will allow you to "Edit" the value. Press enter to allow the new value to take effect. Press the escape button to exit.

Press and hold 5 sec ⏎

Main Screen

ST: Supply Temp
SP: Set Point Temp

OT: Outdoor Temp
RT: Return Temp

Boiler 1 Status On/Off
Temp C/F Fault Code

⬆ ⬇

Boiler 16
Status On/Off
Temp C/F Fault Code

Boiler Sequence
SEQ 1   1

⬆ ⬇

Boiler Sequence
SEQ 16   16

Movement within menu selection

⬆ ⬇

Menu

Software

Relay Test

Sensor Test

Outdoor Reset

Boiler Config

Specifications

Factory Reset

Specifications

Celsius or Fahrenheit selection

High Limit (95C/203F default) (75C/167F to 100C

Low Limit (5C/41F)

PMP Delay (60 to 1 mins and Always ON)

AUX Input Mode (Demand/0-10V)

Demand Set Point (20C/68F to 100C/212F)

AUX Mode (external heat/combustion air function)

AUX Wait Time (1 to 99 mins) (Ex-heat mode)

AUX Min Run Time (1 to 99 mins) (Ex-heat mode)

AUX Error Delta T (1 to 30C) (Ex-heat)

Interlock Enable/Disable (Disabled factory)

Interlock Alarm Yes/No (only Interlock mode)

Return Temp Sensor (Enable)

LON Address

Factory Reset

No/Yes

Software Version

Software VX

Relay Test

Relay Test Off/On

Pump Off/On

AUX Off/On

Fault Off/On

Sensor Test

S1 (Outdoor temperature)

S2 (Supply temperature)

S3 (Return temperature)

INT (Interlock)

AUX (Input)

Outdoor Reset

Enable/Disable

Slope (0.2 to 3.5)

Shift (-15K to 35K)

WWSD (5C/41F to 30C/86F)

Boiler Config

Number of boilers (1 to 16)

Rotation Hours (1 to 99)

Boiler Staging Delay (min)

Minimum Boiler Mod (1 to 99%)

Maximum Boiler Mod (1 to 99%)

Stage On (5C/41F to 30C/86F)

Stage Off (5C/41F to 30C/86F)

Always run lead boiler pump

All Boilers (Yes/No)

Boiler 1 LON Address

Boiler 1 Group (Lead/Lag)

Boiler 1 ECO lock enabled (Yes/No)

Boiler 1 ECO Lock Temp

Boiler 16 LON Address

Boiler 16 Eco Lock (Yes/No)

Operational Overview

Logical Operational Output Information

Pump Output
System pump runs if outdoor temperature is below WWSD (minimum run time). Should the control not be programmed for outdoor reset operation, when the common supply set point is greater than 0C/32F, the common supply pump will operate.

The pump output has a factory set delay time of 10 minutes when there is no set point being calculated. If it is necessary to have the supply pump run continuously, it is possible to program so that it does not shut down.

Boiler Cascading
An additional boiler will be called if any of the following are true:
 The common supply/LLH temperature is more than 5C (adjustable) below the setpoint
 The average modulation for all active boilers exceeds the maximum average modulation (adjustable)

A boiler will be taken off line if any of the following are true:

 The common supply/LLH temperature is more than 5 (this setting is adjustable) above the setpoint.
 The average modulation for all active boilers drops below the minimum average modulation (this setting is adjustable)

Boilers will be brought on/off-line no faster than one boiler every 2 minutes under normal circumstances.

Boilers will be brought on in the following sequence:
 All boilers not listed below
 Eco-lock boilers
 Boilers reporting a fault
 Boilers to which do not appear to be communicating

If all non-Eco lock boilers are online or faulted AND the set point can't be met, turn on the AUX output.

AUX Output-Heat Demand
If all boilers are online (or faulted) and setpoint can't be met; turn on AUX Output. The AUX Output is function of not being able to be within the set differential for a set period time. Once the AUX Output is energized, it will be on for the set minimum amount of time until the set differential temperature is achieved.

AUX will switch on when all non-faulted, non-eco lock boilers are running and the common supply temperature drops below the setpoint. It must drop to or below the differential specified in the setup menu. It must have been below this temperature for at least the amount of time specified in the configuration menu

Once running, it will run until the minimum amount of time specified in the setup menu has elapsed and either of the following conditions are met:
 The common supply temperature is satisfied
 Either of the non-faulted, non-eco lock boilers stages off

AUX Output-Combustion Air Function
The AUX output can be alternately programmed for a combustion air device function. When there is a call for heat, the AUX Output will turn on. This output can be used to demand some device such as a damper or blower rated for 120VAC.

A proving signal is then sensed by the INT input as a confirmation that the combustion air system is functional and then will allow the boiler plant to continue operation. This signal can only be in the form of a dry contact.

As part of the combustion air function, there is an AUX Wait timer function that if the proving signal has not been sensed by the control in 60 minutes (adjustable) an alarm will be triggered.

Operational Overview

Logical Operational Output Information Continued

INT Input
When the interlock mode is enabled through the set up menu and the INT contact is closed, the boiler plant will be allowed to operate. Should the INT contact open for whatever reason, the boiler plant will shut down via communications and a C1 failure code will be present in the display of the control. As soon as the contact is again closed, the fault will clear and the boiler plant will again to stage on the boilers.

An alarm function is also possible which is set in coding. Should the control sense that the INT is open, the Fault output will turn on. As soon as the INT input is sensed, the fault will clear automatically.

Boiler Rotation
Boilers will rotate on the hours programmed into the control. Rotation will take place on the set accumulated time when the common supply set point is satisfied.

Operational Overview

Configuration Information

Boiler Configuration	Detail
Number of boilers (1 to 16)	The number of boilers which the Versatronik 300 communicates with should be set here.
Rotation Hours (1 to 99)	The rotation hours from when the boilers rotate lead boiler is set here. The boilers will rotate as long as the common supply/LLH set point is satisfied
Boiler Staging Delay (min)	A boiler staging delay can be adjusted here to provide sufficient time before bringing on another boiler. This allows the boilers to be able to satisfy the current load requirements.
Minimum Boiler Mod (1 to 99%)	Boiler minimum modulation setting has a factory value of 30%. This value is the factory default.
Maximum Boiler Mod (1 to 99%)	Maximum boiler modulation setting allows the cascade control to only bring on another boiler should a currently running boiler exceeds this value. This is dependent on system operating temperatures
Stage ON (5C/41F to 30C/86F)	The Stage ON function is based on when another boiler is forced ON if the current boiler load is not sufficiently satisfying the common supply temperature. Should the common supply actual temperature drop below the set point plus this value, a boiler will be brought on.
Stage Down (5C/41F to 30C/86F)	As the common supply set point is satisfied by this amount, boilers will start to be staged off in conjunction with a 2 minute delay
Always run lead boiler pump	By default, the lead boiler pump will always operate. By selecting the alternate function, the lead boiler pump will turn off if there is no boiler call for heat.
All Boilers (Yes/No)	This setting allows the control to bring on all boilers, including ECO Lock boilers to achieve the common supply set point.
Boiler 1 LON Address	Boiler LON address. This is based on the value programmed in at address 77 for all LON based boilers. Ensure that there are no boilers which have address 77 duplicated.
Boiler 1 Group (Lead/Lag)	It is possible to select a "lead" group of boilers which are all of the boilers which are to function before the "lag" boilers. The boilers in both the lead and lag will rotate. The lag boiler group should never operate before the lead group.
Boiler 1 Eco Lock (Yes/No)	It is possible to put a boiler into ECO lock mode which is a function of the current outdoor temperature. As the outdoor temperature drops below the ECO Lock setting, the boiler will be allowed to be part of the cascade function of the Versatronik 300 control.
Boiler 1 ECO Lock Temperature	The programmed outdoor temperature at which the ECO lock boiler is enabled to function as part of the cascaded boilers
Boiler 2-16 LON Address	Boiler LON address for boilers 2-16
Boiler 2-16 Group (Lead/Lag)	Selection of boilers whether they are part of the "lead" boiler group or the "lag" boiler group.
Boiler 2-16 Eco Lock (Yes/No)	ECO Lock function for boilers 2-16
Boiler 2-16 ECO Lock Temperature	The programmed outdoor temperature at which the ECO lock boiler is enabled to function as part of the cascaded boilers for boilers 2-16

Operational Overview

Specifications Information

Specifications	Detail
Celsius or Fahrenheit selection	Selection of Celsius or Fahrenheit temperature display
High Limit (95C/203F)	Electronic high limit of control limiting the calculation of common supply set point
Low Limit (5C/41F)	Electronic minimum set point of common supply
AUX Input Mode (Demand/0-10V)	Selection of either demand set point or 0-10VDC input
Demand Set Point (20C/68F to 100C/212F)	Set point temperature of demand function
AUX Mode (external heat/combustion air function)	Selection of external AUX heat demand output based on time temperature relationship of the common supply set point and actual temperature OR combustion air device function with status input into the INT input
AUX Wait Time (1 to 99 mins) (Ex-heat mode)	External AUX heat demand output function
AUX Min Run Time (1 to 99 mins) (Ex-heat mode)	External AUX heat demand output function minimum run time when activated.
AUX Error Delta T (1 to 30C) (Ex-heat)	External AUX heat demand output function temperature
Interlock Enable/Disable	Interlock Enable/Disable selection can operate as system control On/Off
Interlock Alarm Yes/No (only Interlock mode)	Interlock alarm only when enabled
Return Temp Sensor (Enable)	Return temperature sensor
LON Address	LON address of Versatronik 300 control

Control Commissioning

Start Up Information

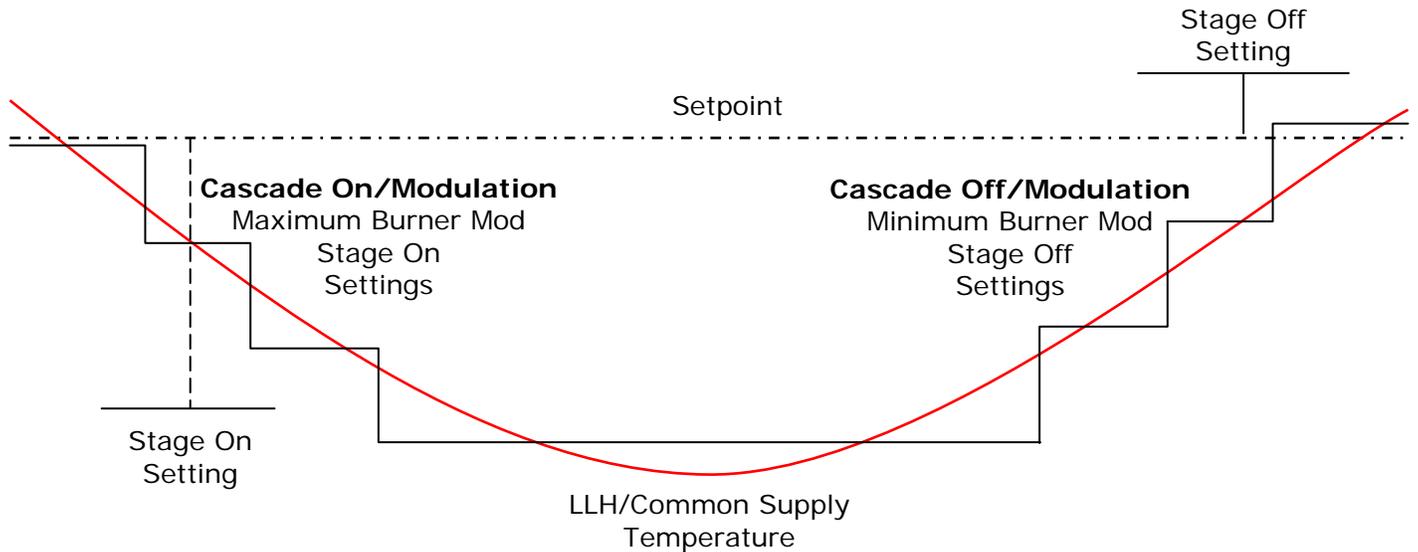| Step	Description
1	Mount unit on surface with field supplied hardware

2	Connect required sensors
	    Outdoor sensor (If required)
	    Common Supply/LLH sensor
	    Return temperature sensor (if desired)

3	Low Voltage External Connections (If required)
	    Demand function
	    0-10VDC input signal
	    Interlock disable

4	120VAC Output Connections
	    Supply pump
	    AUX output (heat demand or combustion air)
	    Fault output

5	Programming selection
	    Outdoor Reset Menu
	        Enable/Disable
	        Slope/Shift/WWSD settings
	    Boiler Configuration
	        Number of boilers
	        Boiler LON addresses for number of programmed boilers
	        Control addresses specific to control pages
	    Specifications
	        Celsius/Fahrenheit selection
	        AUX mode selection (demand or 0-10VDC)
	        Demand set point if necessary
	        Interlock (enable/disable)
	        Return Temperature sensor (enable/disable)

What to expect during operation

Observations
A set-point temperature will be show on the screen display of the control. This set point temperature is function of either outdoor reset, demand input, BACnet or 0-10VDC The set point temperature will have a R for reset or a A for AUX
If the boilers are able to function, the control will provide a setpoint to the boiler control. The boiler should fire based on the temperature demand The setpoint that is being sent to the boilers can be viewed in the main menu The setpoint can also be viewed at the boiler control too in the diagnosis mode Boiler modulation is a function of the boiler not the Versatronik 300 control Boiler cascading is a function of modulation settings, temperature and time delays.

Cascade Function

Cascade Overview

Stage Off
Setting

Setpoint

Cascade On/Modulation
Maximum Burner Mod
Stage On
Settings

Cascade Off/Modulation
Minimum Burner Mod
Stage Off
Settings

Stage On
Setting

LLH/Common Supply
Temperature

Overview Description
The boiler cascading operation of the Versatronik 300 control is based on time/temperature/ modulation functions. The digital communications between the boiler controls and the 300 provide information regarding the current percentage of burner modulation. The 300 control uses the burner modulation to be able to bring on another boiler should the % setting be exceeded. Because of this logic, it is possible to have a larger number of boilers on at a lower firing rate. The opposite of this is also true. By programming a higher % value, it is also possible to have the boilers function at a greater modulation level.

Burner modulation is a function of the boilers and not controlled by the Versatronik 300 control. As the individual boiler temperature set point is being satisfied, the boilers themselves will modulate down.

Cascading Sample Graph
The above picture shows a typical cascading ON and OFF of boilers to achieve the set point demand from either outdoor reset, heat demand or 0-10VDC input.

As the actual common supply or LLH temperature drops below the set point, a call for heat will be provided to the lead boiler. This call for heat takes place approximately 2C below the set point. The set point, which can be seen on the screen of the

Versatronik 300 control, is provided to the boiler. The boiler control will process this signal and based on the current boiler water temperature, will decided to fire the burner or not. Since the pump will be on and the actual boiler water temperature will decrease, the burner will fire. Burner modulation will take place as a function of the internal PID operations of the control. The enabling of another boiler is a function of the Maximum Boiler Modulation % setting and the Stage On setting, which is a temperature setting.

If the Maximum Boiler Modulation % is exceeded, the next boiler will be provided the set point and again it is responsible for its own modulation to achieve boiler set point.
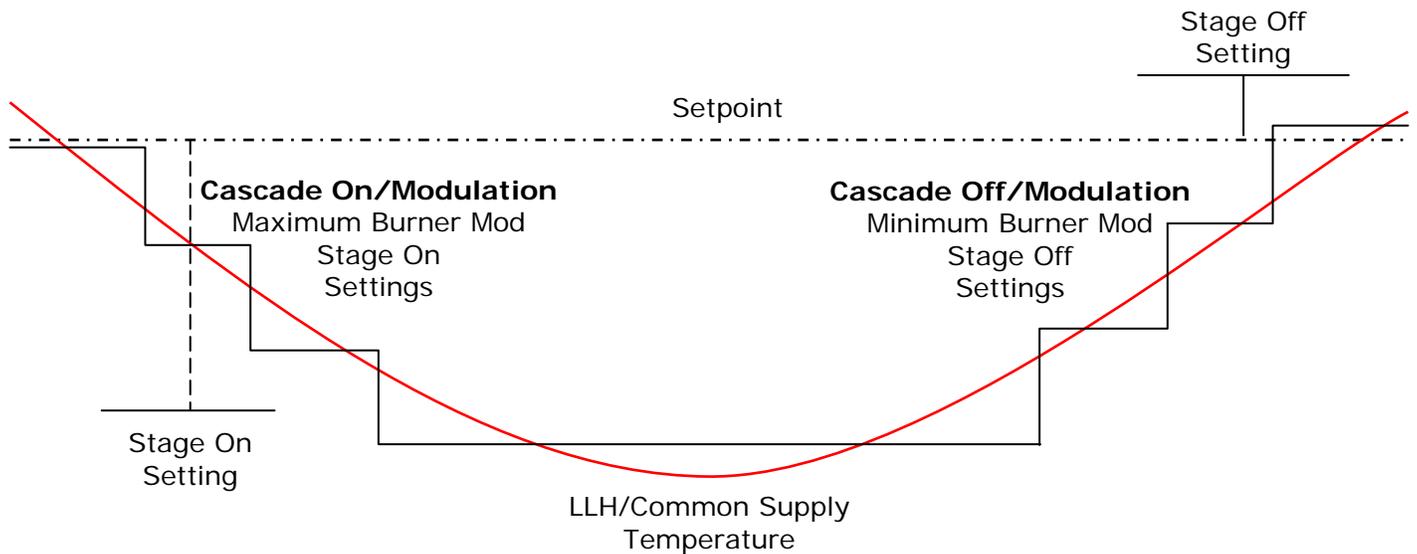
The operation of the boilers and the modulation is a function of the flows through the boiler and internal PID functions. Should the common supply temperature drop because of extra loading, the Stage On setting may be exceeded which will force another boiler on as a way to ensure that the common supply set point is achieved.

As the common supply starts coming up in temperature as a result of the boiler operation and modulation, the boilers themselves will start to modulate down. Based on the number of currently running boilers and the Minimum Boiler Modulation setting, the boilers may start to be staged off. As well, it is possible that the

Cascade Overview Continued

Stage Off Setting

Setpoint

Cascade On/Modulation
Maximum Burner Mod
Stage On
Settings

Cascade Off/Modulation
Minimum Burner Mod
Stage Off
Settings

Stage On
Setting

LLH/Common Supply
Temperature

boilers themselves have modulated down and turned off but still have a call for heat in the form of a boiler temperature set point.

Depending on the current operation of the system, the Versatronik 300 control looks at the Minimum Burner Modulation of the active boilers. Should the average modulation of the currently active boilers be equal to or less than this setting, a boiler will be staged off in conjunction with a 2 minute delay.

Cascade Adjustment Strategies
Pure Modulation Staging
Cascade operation as a function of burner/boiler loading, increase the Stage On value so as to not force boilers on earlier as a function of temperature. This may be upwards to a value of 10C/18F or 15C/27F. Adjust the Maximum Burner Modulation setting to a value where the next boiler should be brought on. Each successive boiler will come on at the Max Modulation value.

To have the boilers stage off earlier, set the Minimum Burner Modulation to a value higher than the default value of 30%.

Temperature Dependant
By either leaving the Stage On value at its factory default setting or lowering it to a smaller value, successive boilers will be brought on quicker. Each boiler will modulate again to achieve the boiler temperature set point.

Outdoor Rest Function

Operational Information

Menu
Software
Relay Test
Sensor Test
Outdoor Reset
Boiler Config
Specifications
Factory Reset

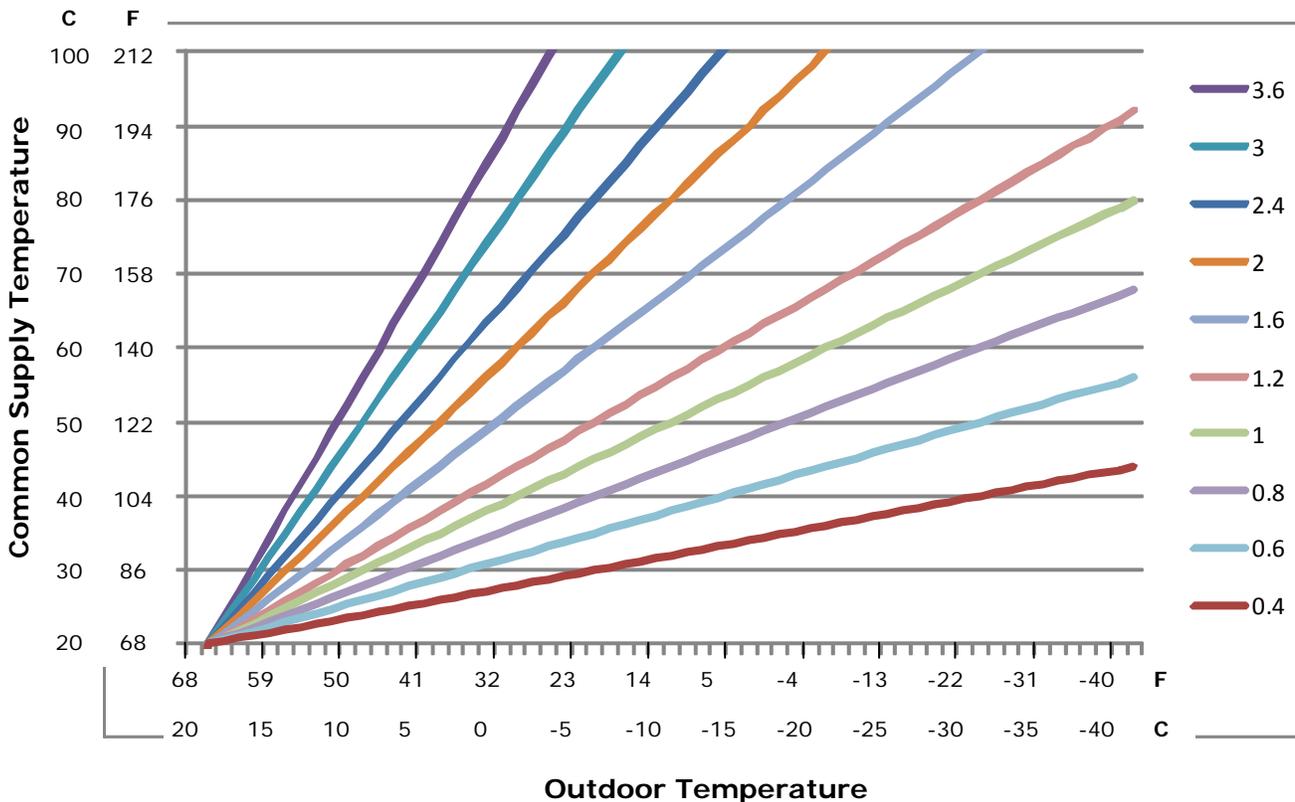| Outdoor Reset |
| --- |
| Enable/Disable |
| Slope (0.2 to 3.5) |
| Shift (-15K to 35K) |
| WWSD (5C to 30C) |

Operation Instruction

With the outdoor reset function enabled, it is possible to make a slope, shift and WWSD function adjustment.

Press and hold the ENTER button for approximately 5 seconds. Navigate the main menu with the arrow up or down key to select the Outdoor reset menu.

There are three settings for outdoor reset adjustment: Slope, Shift and WWSD (warm weather shutdown). Select the value to be changed by pressing the ENTER button. The word EDIT will appear in the screen and press the arrow up or down to program a new value. Press the ENTER button to accept the new value and the ESC button will exit to the main menu.

The table below shows various slope settings at a WWSD of 20C/68F.

Diagnosis and Technical Information

Technical Information

Appendix A—Fault Codes
Error codes for Viessmann control units based on controls/equipment installed

Fault Code (hex)	Fault Code (Dec)	Description
0	0	System without fault
0F	15	Perform maintenance check-up
10	16	Short circuit, outdoor temperature sensor
18	24	Open circuit, outdoor temperature sensor
19	25	Communication External Outdoor temperature sensor
20	32	Short circuit, supply temperature sensor HC1/system
28	40	Open circuit, supply temperature sensor HC1/system
30	48	Short circuit, boiler water temperature sensor
38	56	Open circuit, boiler water temperature sensor
40	64	Short circuit, supply temperature sensor heating circuit 2
41	65	Short circuit, return temperature sensor heating circuit 2
44	68	Short circuit, supply temperature sensor heating circuit 3
45	69	Short circuit, return temperature sensor heating circuit 3
48	72	Open circuit, supply temperature sensor heating circuit 2
49	73	Open circuit, return temperature sensor heating circuit 2
4C	76	Open circuit, supply temperature sensor heating circuit 3
4d	77	Open circuit, return temperature sensor heating circuit 3
50	80	Short circuit, DHW tank temperature sensor
51	81	Short circuit, DHW tank temperature sensor 2
52	82	Short circuit, Buffer tank sensor 9
54	84	Error Boiler 5
55	85	Error Boiler 6
56	86	Error Boiler 7
57	87	Error Boiler 8
58	88	Open circuit, DHW tank temperature sensor 5A
59	89	Open circuit, DHW tank temperature sensor 2
5A	90	Open circuit, Buffer tank
5C	92	Failure boiler 5
5D	93	Failure boiler 6
5E	94	Failure boiler 7
5F	95	Failure boiler 8
60	96	Short circuit, return temperature sensor 17A
68	104	Open circuit, return temperature sensor 17A
70	112	Short circuit, supply/return temperature sensor 17B
78	120	Open circuit, supply/return temperature sensor 17B
80	128	Short circuit, burner control, boiler temperature limit sensor
81	129	Sensor differential (drift), burner control, boiler temperature limit sensor
82	130	Short circuit, burner control, flue gas temperature limit sensor
83	131	Sensor differential (drift), burner control, flue gas temperature limit sensor
84	132	Error boiler 1
85	133	Error boiler 2
86	134	Error boiler 3
87	135	Error boiler 4
88	136	Open circuit, burner control, boiler temperature limit sensor
89	137	Open circuit, burner control, flue gas temperature limit sensor
8C	140	Failure boiler 1
8D	141	Failure boiler 2

Appendix A—Fault Codes Continued
Error codes for Viessmann control units based on controls/equipment installed

Fault Code (hex)	Fault Code (Dec)	Description
8E	142	Failure boiler 3
8F	143	Failure boiler 4
90	144	Short circuit, Solarmodule sensor 3 (SM1 Sensor 7)
91	145	Short circuit, Solarmodule sensor 4 (SM1 Sensor 10)
92	146	Short circuit Solar: collector temperature sensor
93	147	Short circuit Solar: collector return temperature sensor
94	148	Short circuit Solar: collector DHW tank temperature sensor
98	152	Open circuit, Solarmodule sensor 3 (SM1 Sensor 7)
99	153	Open circuit, Solarmodule sensor 4 (SM1 Sensor 10)
9A	154	Open circuit Solar: collector temperature sensor
9B	155	Open circuit Solar: collector return temperature sensor
9C	156	Open circuit Solar: DHW tank temperature sensor
9E	158	Solarmodule Delta-T Monitoring Failure Solar control
9F	159	Solar: general fault message
A0	160	Fault/Failure module 2: safety device input 1
A1	161	Fault/Failure module 2: safety device input 2
A2	162	Fault/Failure module 2: safety device input 3
A3	163	Fault/Failure module 2: safety device input 4
A4	164	Fault/Failure module 2: External
A7	167	Fault control unit wireless clock module
AA	170	Configuration failure TSA Function
AB	171	Configuration failure heat exchanger setting
AC	172	Configuration failure return temperature control
AD	173	Configruation failure isolation valve control
AE	174	Internal fault mixing valve
AF	175	Internal fault mixing valve
b0	176	Short circuit, flue gas temperature sensor
b1	177	Communication fault, programming unit (internal)
b4	180	Internal fault
b5	181	Internal fault
b6	182	Internal fault, invalid hardware recognition
b7	183	Internal fault, boiler protection coding card
b8	184	Open circuit, flue gas temperature sensor
b9	185	Failure plausibility test
bA	186	Fault, mixing valve module (KM-BUS)
bC	188	Fault, Vitotrol heating circuit 1 (KM-BUS)
bD	186	Fault, Vitotrol heating circuit 2 (KM-BUS)
bE	190	Fault, Vitotrol heating circuit 3 (KM-BUS)
bF	191	Copatibility failure LON Module
C1	193	External fault indication, boiler (Low Water Cut Off)
C2	194	Communication fault solar control unit (KM-BUS)
C3	195	Communication failure AM1 Module

Appendix A—Fault Codes Continued
Error codes for Viessmann control units based on controls/equipment installed

Fault Code (hex)	Fault Code (Dec)	Description
C4	196	Communication failure 0-10V Module
C5	197	Fault, speed controlled pump heating circuit 1 (KM-BUS)
C6	198	Fault, speed controlled pump heating circuit 2 (KM-BUS)
C7	199	Fault module, External failure
C8	200	Fault, water level control input 1
C9	201	Fault, maximum pressure input 2
CA	202	Fault, minimum pressure/maximum pressure 2 input 3
Cb	203	Fault, maximum pressure 2 input 4
CC	204	Reserved, external periphery
Cd	205	Communication fault, Vitocom 100/300 (KM-BUS)
CE	206	Communication fault, fault indicator module (KM-BUS)
CF	207	Communication fault: wrong LON module
d1	209	Burner fault, boiler
d2	210	Communications failure fault module 2
d3	211	Communications failure EA1 Module
d4	212	Fixed high limit fault, boiler
d5	213	Cascade: boiler is not responding
d6	214	External fault 1, plug-in adaptor
d7	215	External fault 2, plug-in adaptor
d8	216	External fault 3, plug-in adaptor
dA	218	Short circuit, room temperature sensor heating circuit 1
db	219	Short circuit, room temperature sensor heating circuit 2
dC	220	Short circuit, room temperature sensor heating circuit 3
dd	221	Open circuit, room temperature sensor heating circuit 1
dE	222	Open circuit, room temperature sensor heating circuit 2
dF	223	Open circuit, room temperature sensor heating circuit 3
E0	224	Fault, external participant/device connected to LON
E1	225	Gas valve 1/gas pressure monitoring 1
E2	226	Gas valve 2/gas pressure monitoring 2
E3	227	Error safety chain
E4	228	Fault 24volt power supply voltage
E5	229	Internal fault combustion control unit
E6	230	Flue gas/air supply system blocked
EC	236	Fault safety relay
ED	237	Fault ignition relay
EE	238	Internal error in feedback from gas safety valves
EF	239	Internal error in feedback from gas safety valves
F0	240	Communication fault combustion control unit KM-BUS
F1	241	Flue gas temperature limit has tripped
F2	242	Boiler temperature limit has tripped
F3	243	Flame signal is present at burner start or incorrect coding card
F4	244	Flame signal is not present (number of other faults possible)

Appendix A—Fault Codes Continued

Error codes for Viessmann control units based on controls/equipment installed

Fault Code (hex)	Fault Code (Dec)	Description
F5	245	Air pressure switch not open for burner start
F6	246	Gas pressure switch not open for burner start
F7	247	Air pressure sensor short circuit or offset value outside of tolerances
F8	248	Fuel valve closure delayed
F9	249	Blower speed too low at burner start
FA	250	Blower speed too high at burner start
FC	252	Control of modulation valve defective
FD	253	Fault combustion control unit
FE	254	Coding plug defective or wrong EMV error
FF	255	Internal fault

## Additional Alarm/Fault Information

The Versatronik 300 show fault codes in hexadecimal format to conserve screen space on the user interface.

In which base-format this fault can be displayed depends on your BMS software. This example shows how to display this fault code in hexadecimal, and Text format in Niagara AX.

To display in hex, you can use the KitControl -> Util "Numeric Bit And" object's mask input.

To display the equivalent fault text value, you can use the KitControl -> Conversion "Numeric To Enum" object and type out the enum range for all Viessmann error codes.
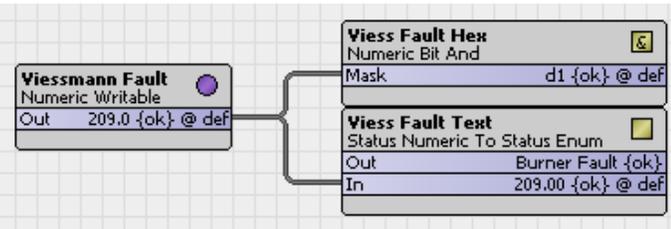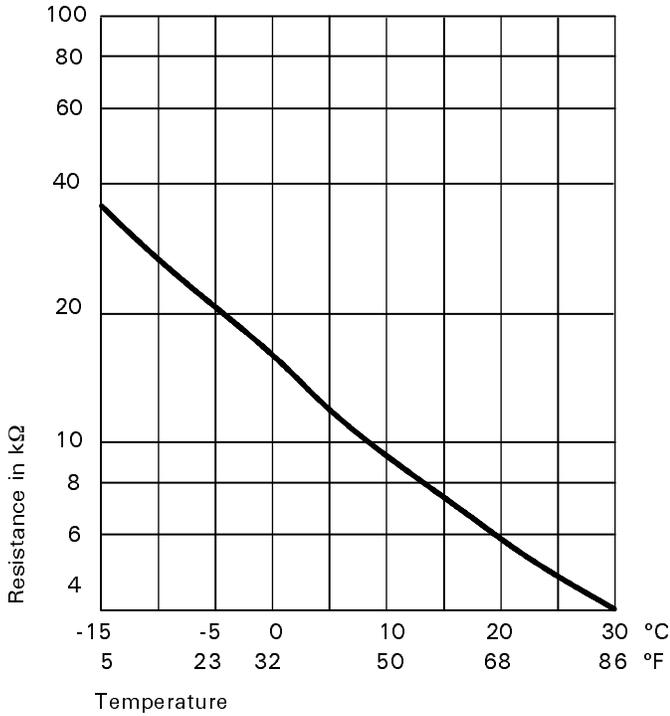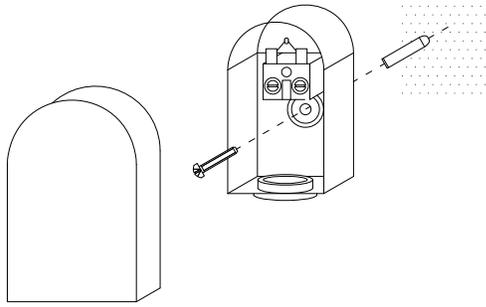
These values can now be displayed on a px webpage by pointing a Bound Label to the appropriate slot values.

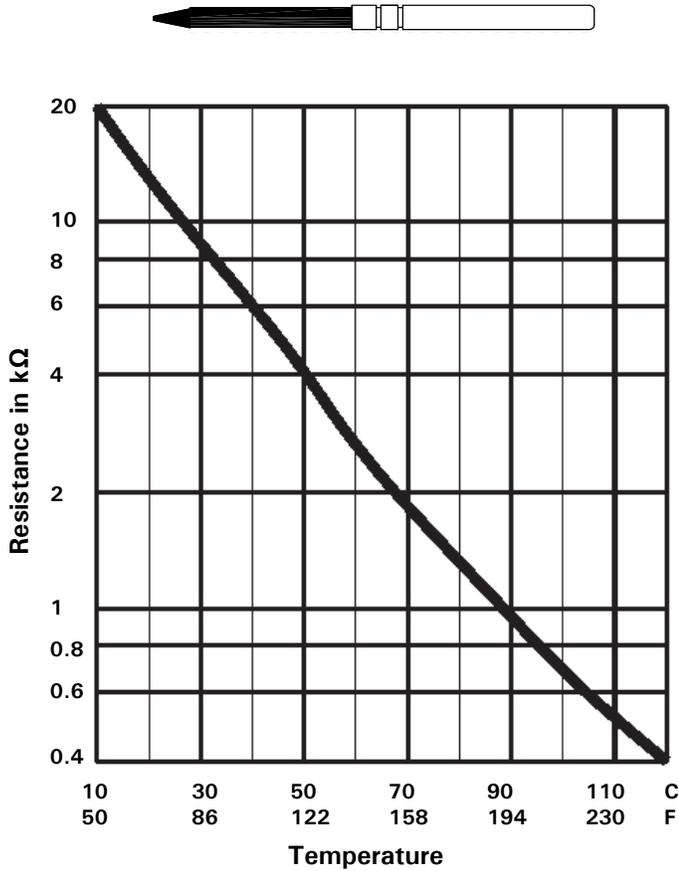Fault Code: d1 (Burner Fault)

Outdoor Temperature Technical Information

Temperature Resistive Table		
Temperature		5Kohm NTC
-60°C	-76°F	698961
-50°C	-58°F	333908
-40°C	-40°F	167835
-30°C	-22°F	88340
-20°C	-4°F	48487
-10°C	14°F	27648
0°C	32°F	16325
10°C	50°F	9952
20°C	68°F	6247
25°C	77°F	5000
30°C	86°F	4028
40°C	104°F	2662
50°C	122°F	1801
60°C	140°F	1244
70°C	158°F	876
80°C	176°F	628
90°C	194°F	458
100°C	212°F	339
110°C	230°F	255
120°C	248°F	194

Technical Information
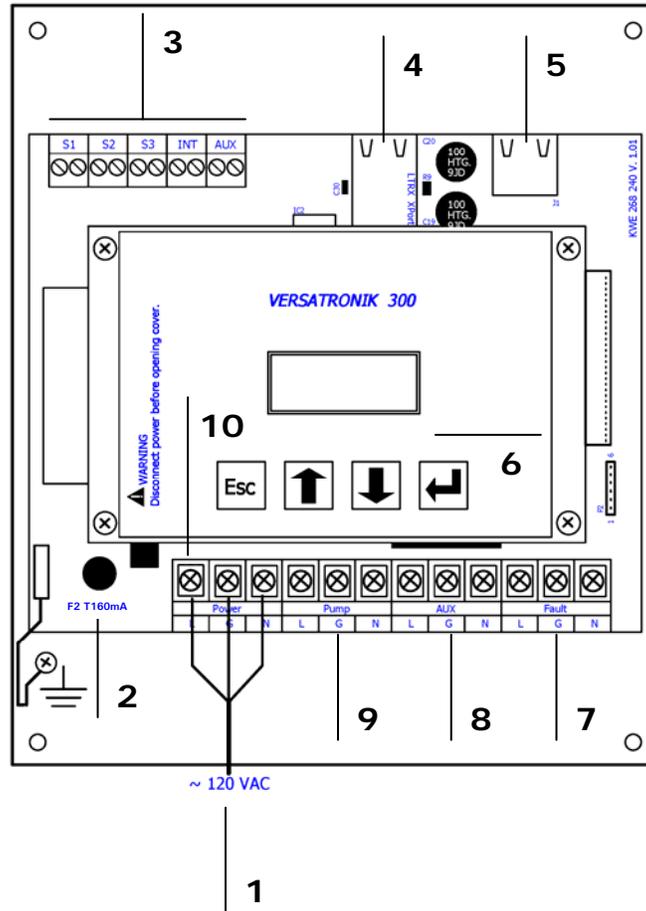
Technical data: Supply and Return Temperature Sensor

Resistance in kΩ

20
10
8
6
4
2
1
0.8
0.6
0.4

| 10 | 30 | 50 | 70 | 90 | 110 | C |
| 50 | 86 | 122 | 158 | 194 | 230 | F |

Temperature

Temperature Resistive Table		
Temperature		10Kohm NTC
0C	32F	32,650
5C	41F	25,394
10C	50F	19,903
15C	59F	15,714
20C	68F	12,493
25C	77F	10,000
30C	86F	8,056
35C	95F	6,530
40C	104F	5,325
45C	113F	4,367
50C	122F	3,601
55C	131F	2,985
60C	140F	2,487
65C	149F	2,082
70C	158F	1,752
75C	167F	1,480
80C	176F	1,256
85C	185F	1,070
90C	194F	916
95C	203F	787
100C	212F	678
105C	221F	587
110C	230F	510
115C	239F	444
120C	248F	388
125C	257F	341

VERSATRONIK 300

Esc

S1 S2 S3 INT AUX

F2 T160mA

Power G N   Pump L G N   AUX L G N   Fault L G N

~ 120 VAC

KWE 268 240 V. 1.01

100 HTG. 9JD

PCB Identifiers

1	120VAC Power Supply Connections
2	Fuse (low voltage) 100mA Time Delay
3	Service Button
4	BMS Communications BACnet
5	LON Communication to boilers
6	Display and keyboard
7	120VAC Fault Output 3FLA
8	120VAC AUX Output 3FLA
9	120VAC Pump Output 3FLA
10	Fuse Pump Outputs 10A

Specifications

Voltage Requirements	120VAC
Fuse Rating (low V)	160mA Time Delay
Power	4VA
Fuse Rating (pump)	10A 250VAC

Dimensions:
Width 167mm/6.5in
Height 206mm/8in
Depth 42mm/1.62in

Clearance:
100mm Left & Right side to loosen cover screws

⚠ CAUTION

Static sensitive components may be damaged by improper handling or work within the control. Ensure all possible measures are taken to eliminate build-up of static electricity.

46

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