VITOTRONIC 200

Vitotronic 200
Model KW2
Weather-responsive indoor/outdoor, digital boiler control
for heating systems with one or more heating circuits
Safety Instructions

Safety, Installation and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation and operation. Failure to comply with the instructions listed below and details printed in these instructions can cause product/property damage, severe personal injury, and/or loss of life. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

- **Licensed professional heating contractor**
  The installation, adjustment, service, and maintenance of this equipment must be performed by a licensed professional heating contractor.

- **Advice to owner**
  Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shut-down procedure, and the need for professional service annually before the heating season begins.

- **Product documentation**
  Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

- **Warranty**
  Information contained in this and related product documentation must be read and followed. Failure to do so renders warranty null and void.

For a listing of applicable literature, please see section entitled “Safety”.
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Important Precautions

Safety

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 page 5 for details.

Approvals
Viessmann boilers, burners and controls are approved for sale in North America by CSA International.

Codes
The installation of this unit shall be in accordance with local codes. In the absence of local codes, use:
- CSA C22.1 Part 1 and/or local codes in Canada
- National Electrical Code ANSI/NFPA 70 in the U.S.
Always use latest editions of codes.

Working on the equipment
The installation, adjustment, service, and maintenance of this product must be done by a licensed professional heating contractor who is qualified and experienced in the installation, service, and maintenance of hot water boilers. There are no user serviceable parts on the boiler, burner, or control.

Ensure main power supply to equipment, the heating system, and all external controls has been deactivated. Close main oil or gas supply valve.
Take precautions in both instances to avoid accidental activation of power during service work.

Technical literature
Literature applicable to all aspects of the Vitotronic 200:
- Technical Data Manual
- Installation Instructions
- Service Instructions
- Operating Instructions
- Instructions of other Viessmann products utilized and installed
- Installation codes mentioned in this manual

Turn off electric power supply before servicing. Contact with live electric components can cause shock or loss of life.

WARNING

The completeness and functionality of field supplied electrical controls and components must be verified by the heating contractor. These include low water cut-offs, flow switches (if used), staging controls, pumps, motorized valves, air vents, thermostats, etc.

Leave all literature at the installation site and advise the system operator/ultimate owner where the literature can be found. Contact Viessmann for additional copies.
Important Regulatory and Installation Requirements

Power supply
Install power supply in accordance with the regulations of the authorities having jurisdiction or, in the absence of such requirements, in accordance with National Codes. Viessmann recommends the installation of a disconnect switch to the 120 VAC power supply outside of the boiler room. The installer must provide maximum 15 A overcurrent protection for the 120 VAC power supply (fuse or circuit breaker).

Working with an open control
No static discharge to the internal componentry must ever occur when working with opened control equipment.

About these Installation 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.

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

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

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

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

IMPORTANT

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

→ This symbol indicates that additional, pertinent information is to be found in column three.

→ This symbol indicates that other instructions must be referenced.
Heating System Types

Application Example 1

System with one direct-connected heating circuit without mixing valve

---

**Required Equipment**

<table>
<thead>
<tr>
<th>Description</th>
<th>Qty</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitotronic 200</td>
<td>1</td>
<td>Z001 230</td>
</tr>
</tbody>
</table>

**Available System Accessories**

- Vitotrol remote control
- Room temperature sensor
- Switching Module-V for expanding the range of control functions
- Sensor/burner fault indication

- KM-BUS Expansion Module
- Flue gas temperature sensor

---

*1 Included in standard equipment
Application Example 2

System with one heating circuit with mixing valve

Connections

- Outdoor temperature sensor
- Supply temperature sensor (accessory)
- Boiler temperature sensor
- DHW tank temperature sensor
- Return water temperature sensor (accessory)
- KM-BUS participant
- Expansion module for 2-stage/modulating burner
- Heating circuit pump
- Mixing valve circuit
- DHW pump (accessory)
- DHW recirculation pump
- Power supply
- Burner, 1st stage
- Burner, 2nd stage/modulating

Required Equipment

<table>
<thead>
<tr>
<th>Description</th>
<th>Qty</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitotronic 200</td>
<td>1</td>
<td>Z001 230</td>
</tr>
<tr>
<td>Mixing Valve Actuator Accessory Kit (mixing valve</td>
<td>1</td>
<td>7133 390</td>
</tr>
</tbody>
</table>

Available System Accessories

- Vitotrol remote control
- Room temperature sensor
- Return water temperature sensor
- Switching Module-V for expanding the range of control functions
- Sensor/burner fault indication
- KM-BUS Expansion Module
- Flue gas temperature sensor

*1 Flow check valve only required if connection located at coupling.
*2 In connection with underfloor heating when control measures supply and return water temperatures.
*3 Included in standard equipment.
Application Example 3

System with direct-connected heating circuit without mixing valve and one heating circuit with mixing valve

**Required Equipment**

<table>
<thead>
<tr>
<th>Description</th>
<th>Qty</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitotronic 200</td>
<td>1</td>
<td>Z001 230</td>
</tr>
<tr>
<td>Mixing Valve Actuator Accessory Kit (mixing valve actuator and supply temperature sensor)</td>
<td>1</td>
<td>7133 390</td>
</tr>
</tbody>
</table>

**Available System Accessories**

- Vitotrol remote control
- Room temperature sensor
- Return water temperature sensor
- Switching Module-V for expanding the range of control functions
- Sensor/burner fault indication
- KM-BUS Expansion Module
- Flue gas temperature sensor

---

*1Flow check valve only required if connection located at coupling.
*2In connection with underfloor heating when control measures supply and return water temperatures.
*3Included in standard equipment.
The illustration below shows the bottom part of the control unit as viewed from rear.

120 VAC connectors
Interconnections Power/Pump Module
- 20-1 Boiler circuit pump
- 20-2 Mixing valve pump
- 21 DHW pump (accessory)
- 28 DHW recirculation pump (field supplied)
- 40 Power supply
- 52 Mixing valve actuator (accessory)
- 55 External equipment, e.g. additional safety equipment

Burner connections
- 41 Burner connections

Low voltage connectors
- 1 Outdoor temperature sensor
- 2 Supply temperature sensor (accessory)
- 3 Boiler temperature sensor
- 5 DHW tank temperature sensor
- 15 Flue gas temperature sensor (accessory)
- 17 Return water temperature sensor (accessory)
- 175 KM-BUS (accessory)
e.g. for the connection of Vitotrol remote control
- 165 Expansion module for 2-stage or modulating burner (included in standard boiler equipment)

IMPORTANT
The 120 VAC connections are interface connections to the Power/Pump Module. Do not connect any external equipment directly.

IMPORTANT
Take notice of shape and orientation of low voltage connectors when inserting into sockets at rear of control!
See following page for a description of all hard-wired equipment and additional information.
**Vitotronic Connections (continued)**

Legend

- **A** Power supply
  - 120 VAC, 60 Hz, 1 Ph
  - Provide 15 A overcurrent protection and disconnect means!

- **B** Circulating pump system 1
  - Heating circuit without mixing valve
  - 120 VAC, 1 Ph, 3 A max.

- **C** Circulating pump for DHW tank
  - 120 VAC, 1 Ph, 3 A max.

- **D** Circulating pump for domestic hot water recirculation
  - 120 VAC, 1 Ph, 3 A max.

- **E** Circulating pump system 2
  - Heating circuit with mixing valve
  - 120 VAC, 1 Ph, 3 A max.

- **F** Viessmann mixing valve actuator (optional)

**IMPORTANT**

Ensure that main power supply to the Power/Pump Module contains overcurrent protection with a maximum rating of 15 A.

**WARNING**

This equipment must be grounded. Ensure that the following wires are not interchanged:

- "L" and "N"
- L: LINE
- N: Neutral
- G: Ground

Low water cut-off (LWCO) connections

1. Run 3-wire cable between low water cut-off and Power/Pump Module.
2. Remove jumper A on Power/Pump Module board (LWCO connection).
3. Connect wiring as shown.
4. Check LWCO function after installation is complete.
The strain relief clamps are supplied in the accessory pack.

1. Remove breakouts as necessary.

2. Mount lower portion of the strain relief clamp.

3. Insert the cable in the bushing and secure the wires to the plug. Insert bushing into clamp and plug into socket.

4. Fasten top portion of strain relief clamp.

**IMPORTANT**

An additional strain relief is not required for cables which incorporate a molded strain relief clamp.
Sensors

Outdoor temperature sensor

**IMPORTANT**

The outdoor temperature sensor should be mounted 6.6 to 8.2 ft./2 to 2.5 m above ground on the north or northwest wall of the building and for buildings with multiple floors, in the upper part of the second floor. The sensor must not be placed above windows, doors, air vents or immediately underneath a balcony or drainage pipes. The outdoor temperature sensor must not be plastered or painted over. If mounting on an unplastered wall, allow room for plaster or remove sensor before plastering wall.

1. Remove sensor housing.
2. Secure wall-mount base to wall (cable inlet opening to the bottom).
3. Pass cabling through openings in the electrical connection section and the supplied cable bushing.

**IMPORTANT**

Do not run cable next to line voltage cables.

4. Connect cable wires to terminal. Cable: max. 115 ft./35 m long, AWG copper.
5. Mount outdoor temperature sensor housing.
6. Connect the cable wires from the outdoor temperature sensor to terminals “1” and “2” on plug (the wires are interchangeable).
7. Insert plug into socket “1” and apply strain relief to the cable.
**Boiler temperature sensor**

The boiler temperature sensor is installed at the same time as the boiler insulation.

Insert plug 3 into socket "3" (see page 9) and insert the molded strain relief clamp.

**DHW tank temperature sensor**

**Heating systems without domestic hot water heating**

Do not connect the DHW tank temperature sensor to the control unit.

**Heating systems with domestic hot water heating**

1. Install the DHW tank temperature sensor.

   [Installation Instructions for domestic hot water tank]

   **IMPORTANT**

   When installing the DHW tank temperature sensor in tanks from other manufacturers, ensure that sensor firmly contacts the sensor well wall.

   **IMPORTANT**

   Ensure that the maximum permissible domestic hot water temperature is not exceeded. If necessary, install an additional safety high limit or a tempering valve of approved type.

2. Insert plug 5 into socket "5"; insert molded strain relief clamp.
Sensors (continued)

Sensor connections

A Flue gas temperature sensor  
B Boiler temperature sensor  
C Tank temperature sensor  
D Outdoor temperature sensor  
  (wires may be interchanged)  
  **Installation point for outdoor**  
  **temperature sensor**  
  ■ North or north-western wall, 2 to  
  2.5 m / 6.6 to 8.2 ft above  
  ground level; in multi-storey  
  buildings, in the upper half of the  
  second floor  
  ■ Not above windows, doors or  
  ventilation outlets  
  ■ Not immediately below balcony or  
  gutter  
  ■ Do not render over  

**Connection**  
2-wire cable with a maximum  
length of 35 m / 115 ft and a  
cross-section of 1.5 mm² (copper)
Electrical Connections

Pumps (accessory)

All circulation pumps can be hard-wired to the terminal strip of the Power/Pump Module. Prewired Viessmann circulation pumps can be plugged into the respective Rast-5 terminals on the Power/Pump Module.

Available pump connections

- **20-1**: Boiler circuit pump
- **20-2**: Mixing valve pump
- **21**: DHW pump
- **20**: DHW recirculation pump

See pages 6, 7 and 8.

For underfloor heating system only

An adjustable high limit (AHL) must be provided additionally. Install the fixed high limit in the heating supply pipe downstream of the mixing valve and the heating circuit pump.

See pages 19 and 21 for installation details.

120 VAC pumps (prewired)

1. Insert supplied strain relief through Power/Pump Module breakout and fasten with nut.

2. Connect the Rast-5 connector to the respective plug-in terminal on the Power/Pump Module.

**WARNING**

ONLY Viessmann prewired (plug-in) circulating pumps must be used. Do not connect an additional pump to the respective hard-wired terminal if prewired pumps are used.
**Burner Connection(s)**

The burner cable is included in the standard boiler equipment.

**Terminal codes**

- **L**: Line via safety high limit
- **N**: Neutral conductor to the burner
- **T1, T2**: Control circuit
- **S3**: Connection for burner fault
- **B4**: Connection for operating hours counter

The Vitotronic 200 is prewired with the Viessmann quick-connect plug-in system.

1. Connect the Rast-5 plug-in connector to the main circuit board of the control.
2. Connect 7-pole plug to the counter plug of the burner.

Or

if installing a wall vent system (accessory), connect 7-pole plug to counter plug of wall vent system.

Refer to technical instructions of the burner and/or wall vent system.

**WARNING**

Do not connect the 41-plug from the boiler control directly to the burner if a wall vent or flue damper / vent damper is installed.

See technical instructions of the vent system.
Electrical Connections

Burner Connection(s) (continued)

Electrical connection of 2-stage or modulating burners

Terminal codes

T6, T7, Control circuit "2-stage burner" or "modulation controller" (via two-point controller with 2-stage operation; via three-point controller with modulating operation)

T8

Signal direction:

Control unit → burner

Signal direction:

Burner → control unit

The connection is made via the expansion module for a 2-stage/modulating burner.

Installation Instructions of boiler,
Installation Instructions of expansion module for a 2-stage/modulating burner

A) To control unit

B) To burner

C) Enclosure with potential-free burner control output
Fixed High Limit

The fixed high limit (FHL) is factory preset to 230 °F/110 °C.

Adjustment to 212 °F/100 °C
1. Remove the fuse.
2. Unclip the cover at the four snap-in clips and remove.
3. Pull the front panel behind the cover upwards and swing open to the rear.
4. Turn the slotted screw at rear of fixed high limit until the slot points to 212 °F/100 °C (once adjusted, the fixed high limit cannot be reset to 230 °F/110 °C).
5. Put the front cover back in place and replace fuse.
6. Check the box on page 24 of this manual to confirm that the adjustment was made.

CAUTION
If adjusted to 212 °F/100 °C, do not set the adjustable high limit above 165 °F/75 °C.
Fixed High Limit (contd.)

Adjustment to 100 °C (JUMO)

The fixed high limit is factory preset to 230 °F / 110 °C.

CAUTION

If adjusted to 212 °F / 100 °C do not set the adjustable high limit above 167 °F / 75 °C.
### Adjustable High Limit

The adjustable high limit (AHL) is factory preset to 165 °F/75 °C. Do not set the adjustable high limit above 165 °F/75 °C if the fixed high limit has been set to 212 °F/100 °C.

**Adjustment to 189 °F/87 °C**
1. Using a suitable screwdriver, lever out selector knob “[selector knob]” behind the flip-down cover.
2. Using a pair of pointed pliers, break off the respective cams on the dial.
3. Install selector knob “[selector knob]”, so that the marking is between “75” and “90”. Turn selector knob “[selector knob]” fully clockwise.
4. Check the box on page 24 of this manual to confirm that the adjustment was made.

### Boiler Coding Card

Only the boiler coding card supplied with the standard equipment of the boiler may be used. The coding card is enclosed in the accessory pack of the boiler.

1. Push boiler coding card through recess in the cover and insert it into plug-in location “X7”.

### IMPORTANT

If the system is operated in conjunction with a domestic hot water storage tank, ensure that the maximum permissible domestic hot water temperature is not exceeded. If necessary, install an approved safety device for this purpose.

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If the boiler coding card is not installed the following fault code will be displayed on the boiler control: “b7”.
Connecting Top Part of Control Unit

1. Install the rear control housing.

2. Position top of control unit on the bottom and snap together.

3. Cut through sticker A, pull out hinged support bar and pull down until the lower section snaps into place.

4. Snap the end of the hinged support bar in the hold-in clip at the bottom of the control.

5. Insert the flat cable connector into plug-in location “X10” and lay cable under holding clip.

6. Unlock hinged support bar by applying pressure to linkage point B and bring top of control unit down, snapping into bottom of control unit.
Opening the Control Unit

1. Open the flip-down cover.

2. Using a suitable tool, e.g. a Viessmann hexagon socket screw key, unlock the top of the control and raise until hinged support bar snaps into place.
Appendix

Post-Installation

Checklist

Please check the following conditions and correct any deficiencies:

☐ Limit capillaries and sensors correctly inserted into sensor wells?

☐ Electrical connections performed correctly?

☐ All connections properly connected?

☐ Boiler coding card inserted?

☐ Fuse F2 plugged in?

☐ Outdoor temperature sensor mounted correctly and cable connected properly to outdoor temperature sensor and plug 1?

☐ Fixed high limit and adjustable high limit adjusted properly (if required)?

☐ Labelled fields on programming unit according to heating circuit allocation?

Start-up and adjustments

See Vitotronic 200 Service Instructions

Service binder

1. File Installation, Operating and Service Instructions in service binder.

2. Install a protective hanging case near the boiler and store the Service Binder in this location.

Technical Data

<table>
<thead>
<tr>
<th>Rated voltage:</th>
<th>120 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated frequency:</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Rated current:</td>
<td>6 A</td>
</tr>
<tr>
<td>Power consumption:</td>
<td>5 W</td>
</tr>
<tr>
<td>Certification:</td>
<td>CSA certified (in conjunction with a Viessmann boiler only)</td>
</tr>
</tbody>
</table>

Max. ambient temperature
- during operation: 32 to 104 °F
- during storage or transport: -4 to +149 °F
- -20 to +65 °C

For use in living accommodation and boiler rooms (normal ambient conditions)

Relay outputs of Power/Pump Module 120 VAC for
- heating circuit pumps 20-1: 3 FLA *
- DHW pump 20-2: 3 FLA *
- DHW recirculation pump 20-3: 3 FLA *
- mixing valve actuator 20-4: 0.1 FLA *
- burner connection 20-5: 2 FLA
- 2-stage: 0.5 FLA
- modulating: 0.05 FLA
- Total: 12.5 A

* Total max. 10 A