

Service Instructions

for use by heating contractor

VIESSMANN®

Vitocrossal 300 with Graphical User Interface HI932

CA3B Series 2.5, 3.0, 3.5, 4.0, 5.0 and 6.0

Gas condensing boiler with cylinder burners

Heating input: 2500 to 6000 MBH
(733 to 1758 kW)



VITOCROSSAL 300



Product may not be exactly as shown

IMPORTANT

**Read and save these instructions
for future reference.**

Safety, Service and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation. Failure to comply with the instructions listed below and details printed in this manual 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).

■ 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.

►For a listing of applicable literature, please see section entitled "Important Regulatory and Safety Requirements".



■ Warranty

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



■ Licensed professional heating contractor

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

►Please see section entitled "Important Regulatory and Installation Requirements".



■ Contaminated air

Air contaminated by chemicals can cause by-products in the combustion process, which are poisonous to inhabitants and destructive to Viessmann equipment.

►For a listing of chemicals which cannot be stored in or near the boiler room, please see subsection entitled "Mechanical room" in this manual.



■ 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, shutdown procedure, and the need for professional service annually before the heating season begins.

■ Carbon monoxide

Improper installation, adjustment, service and/or maintenance can cause flue products to flow into living space. Flue products contain poisonous carbon monoxide gas.

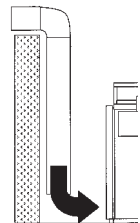
►For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, please see subsection entitled "Mechanical room" and "Venting requirements" in this manual.



■ Fresh air

This equipment requires fresh air for safe operation and must be installed ensuring provisions for adequate combustion and ventilation air exist.

►For information pertaining to the fresh air requirements of this product, please see subsection entitled "Mechanical room" in this manual.



■ Equipment venting

Never operate boiler without an installed venting system. An improper venting system can cause carbon monoxide poisoning.

►For information pertaining to venting and chimney requirements, please see section entitled "Venting Connection". All products of combustion must be safely vented to the outdoors.



WARNING

Installers must follow local regulations with respect to installation of carbon monoxide detectors. Follow the Viessmann maintenance schedule of the boiler contained in this manual.

Safety, Service and Warranty Requirements *(continued)*

Fiberglass wool and ceramic fiber materials



WARNING

Inhaling of fiberglass wool and/or ceramic fiber materials is a possible cancer hazard. These materials can also cause respiratory, skin and eye irritation.

The state of California has listed the airborne fibers of these materials as a possible cancer hazard through inhalation. When handling these materials, special care must be applied.

Suppliers of ceramic fiber products recommend the following first aid measures:

- Respiratory tract (nose and throat) irritation:
If respiratory tract irritation develops, move the person to a dust free location.
- Eye irritation: If eyes become irritated, flush immediately with large amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes.
- Skin irritation: If skin becomes irritated, remove soiled clothing. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and cold water (as warm or hot water may worsen the irritation). Using a skin cream or lotion after washing may be helpful.
- Gastrointestinal irritation: If gastrointestinal tract irritation develops, move the person to a dust free environment.

Suppliers of fiberglass wool products recommend the following precautions be taken when handling these materials:

- Avoid breathing fiberglass dust and contact with skin and eyes.
- Use NIOSH approved dust/mist respirator.
- Wear long-sleeved, loose fitting clothing, gloves and eye protection.
- Wash work clothes separately from other clothing. Rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out and spraying may generate airborne fiber concentration requiring additional protection.

First aid measures

- If eye contact occurs, flush eyes with water to remove dust. If symptoms persist, seek medical attention.
- If skin contact occurs, wash affected areas gently with soap and warm water after handling.



WARNING

Appliance materials of construction, products of combustion and the fuel contain alumina, silica, heavy metals, carbon monoxide, nitrogen oxides, aldehydes and/or other toxic or harmful substances which can cause serious injury or loss of life and which are known to the State of California to cause cancer, birth defects and other reproductive harm. Always use proper safety clothing, respirators and equipment when servicing or working nearby the appliance.

Codes

The installation of this unit shall be in accordance with local codes. In the absence of local codes, use:

CAN/CSA-B149.1 or .2 Installation Codes for Gas Burning Appliances for Canada. For U.S. installations, use the National Fuel Gas Code ANSI Z223.1. Always use latest editions of codes.

In Canada 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 heating contractor must also comply with the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1 where required by the authority having jurisdiction.

Mechanical room

Viessmann recommends installation of an additional electrical disconnect switch and a fuel shut-off valve (if possible) outside the mechanical room or enclosed area of installation.

The maximum room temperature of the mechanical room where the boiler is located must not exceed 104°F (40°C).

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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.



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.



► This symbol indicates that other instructions must be referenced.

Product Information

High efficiency gas-fired hot water condensing boiler.

For operation with modulating boiler water temperatures in closed loop, forced circulation hot water heating systems.

The Vitocrossal 300, CA3B boilers are CSA certified with Viessmann burners which must be used in conjunction with this boiler series.

The proper burner size must be verified and the burners are factory adjusted so that the maximum input of the appropriate boiler size is always observed. The gas burners must always be installed according to the instructions provided by the burner manufacturer.

The boiler model selected should be based on an accurate heat loss calculation of the building. The boiler selected must be compatible with the connected radiation.

The Vitocrossal 300, CA3B boiler is suitable for a maximum operating pressure of 160 psig and a maximum boiler water temperature of 210°F (99°C).

This boiler does not require a flow switch.



WARNING

Exposing the boiler to pressures and temperatures in excess of those listed will result in damages, and will render warranty null and void.

Service Equipment

Tools

- Assortment of flathead and Phillips screwdrivers
- Pipe wrenches
- Open-ended wrenches
- Pipe sealant
- Assortment of Hex keys
- Flashlight
- Approved leak detection fluid for natural gas and propane gas

Cleaning supplies

- Plastic hand brush
- Cleaning/service brush
- Vacuum cleaner
- Clean rags

Testing/analysis equipment

(use only calibrated equipment)

- Flue gas analyzer to measure % CO₂ or O₂ (e.g. Bacharach fluid samplers or a suitable electronic analyzer).
- Multimeter to measure 0-120VAC, 0-25 amps AC and 0-100 microamps DC.
- Pressure gage to measure gas pressure 0 - 28 "w.c. A non-electric Magnehelic pressure gage (0 - 10 psig) may also be used.
- Carbon monoxide measuring equipment (0 - 400 ppm).
- Bacharach calculator or suitable tables to calculate efficiency.
- Stack thermometer dial settings range 0°F to 250°F (0°C to 121°C).
- 1/8 in. NPT male to 1/4 in. barb adaptor fitting, as well as tubing for pressure measurement.

Technical information

The following is a list of literature applicable to the Vitocrossal 300, CA3B boiler:

- Installation Instructions
- Service Instructions
- Operating Instructions
- Technical Data Manual
- Wiring diagrams

For installation of the heating system, please refer also to the technical literature of other Viessmann System Technology devices:

- Installation Instructions for accessories
- Installation Instructions for Viessmann indirect-fired hot water storage tank(s)

Replacement parts

For a complete listing of replacement components, please see Parts List starting on page 137 of these instructions.

Order replacement components from your Viessmann distributor.



CAUTION

Use only original Viessmann recommended components when replacing defective parts. Installation of incorrect replacement parts can cause hazardous operation and will void warranty.

Important Regulatory Requirements

Instructing the system user

The installer of the system is responsible to ensure the system operator/ultimate owner is made familiar with the functioning of the system, its activation, and its shutdown.

Initial start-up

Initial start-up must be performed by a qualified heating contractor. Completion of the Maintenance Record by the heating contractor is also required.

Working on the equipment

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

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

- The following topics must be covered:
Proper system operation sequence. Explain the equipment as well as the need for combustion air.

Demonstrate an emergency shut-down, what to do and what not.

Explain that there is no substitute for proper maintenance to help ensure safe operation.

- The Maintenance Record is located on page 162 of this manual.

- Please carefully read this manual prior to attempting start-up, maintenance or service. Any warranty is null and void if these instructions are not followed.

For information regarding other Viessmann System Technology componentry, please reference documentation of the respective product.

Viessmann offers frequent installation and service seminars to familiarize our partners with our products. Please inquire.

- 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.

Safety Instructions

Target group

These instructions are intended exclusively for qualified contractors.

- Work on gas installations must only be carried out by a licensed professional heating contractor.
- Work on electrical equipment must only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.
- This appliance has not been designed to be operated by individuals other than those qualified and trained.

Regulations

Observe the following when working on this system:

- Statutory regulations regarding the prevention of accidents
- Statutory regulations regarding environmental protection
- Codes of practice of the relevant trade associations.

If you smell gas



WARNING

Escaping gas can lead to explosions which may result in serious injury.

- Do not smoke. Prevent naked flames and sparks. Do not press any switches for lights or electrical appliances.
- Close the gas shut-off valve.
- Open windows and doors.
- Remove all people from the danger zone.
- Notify your gas or electricity supply utility from outside the building.
- Shut off the electricity supply to the building from a safe place (outside the building).

If you smell flue gas



WARNING

Flue gas can lead to life threatening poisoning.

- Shut down the heating system.
- Ventilate boiler room.
- Close all doors in the living space

Working on the system

- Where gas is used as the fuel, close the main gas shut-off valve and safeguard it against unintentional reopening.
- Isolate the system from the power supply (e.g. at the separate fuse or a main switch) and check that it is de-energized.
- Safeguard the system against reconnection.

Note: Electronic assemblies can be damaged by electrostatic discharges. Before beginning work, touch grounded objects, such as heating or water pipes, to discharge static loads.

Repair work

Note: Repairing components that fulfil a safety function can compromise the safe operation of your system. Replace faulty components only with original Viessmann spare parts.

Auxiliary components, spare and wearing parts

Note: Spare and wearing parts that have not been tested together with the system can compromise its function. Installing non-authorized components and making non-approved modifications or conversions can compromise safety and may invalidate our warranty. For replacements, use only original spare parts supplied or approved by Viessmann.

Safety Instructions *(continued)*

Checking the high limit safety cut-out setting

The high limit safety cut-out is preset to 210°F (99°C). If this temperature needs to be changed, this can only be done by changing the coding card.



Refer to the control section of the Installation Instructions.

CSD-1 Field Testing of High Limit Switches for Vitocrossal 300, CA3B boilers – where required by law.

As per ASME Boiler and Pressure Vessel Code, section IV, subsection HG-613 TEMPERATURE CONTROL requirements, Vitocrossal 300, CA3B hot water boilers are protected from over-temperature by two temperature-operated controls. These temperature control devices conform to Standards for Limit Controls, and are accepted by CSA, a nationally recognized testing agency.

Each boiler is equipped with a manual reset high temperature limit control and a temperature control that will cut off fuel supply when the system water temperature reaches a preset operating temperature.

VISSMANN IS NOT RESPONSIBLE FOR ANY DAMAGES THAT THE FOLLOWING TEST PROCEDURE MAY RESULT IN BY OVERHEATING THE SYSTEM.

The Vitocrossal 300, CA3B boilers are equipped with 2 RTD temperature sensors (per boiler section) that when activated on temperature rise (high fixed limit of 210°F (99°C) disable the burners to operate.

The fixed high limit, when tripped, produces a fault that will require manual reset of the boiler control.

Note: Each boiler section is equipped with its own fixed high limit. Each fixed high limit must be tested individually.

Fixed High Limit test procedure:

1. Use the emission test switch on each boiler section to generate call for heat.



Refer to Vitocrossal 300 CA3B Operating Instructions.

2. As described in the table on page 23, adjust item #4 "Max. boiler water temperature" under menu 6 of each burner control (GC310) to a max. setting of 243°F (117°C), as an example, higher than fixed high limit temperature setting [factory default setting is 203°F (95°C)].
For testing of the adjustable limit 'Max. boiler temperature' for a reduced temp. value as required [e.g. 122°F (50°C)].
3. Press/activate emission test switch of the applicable boiler section, the burner will start.
4. Gradually and slowly throttle the water flow to the boiler.
5. Observe temperature on the relative GW6C service display.
6. Once the temperature reached the fixed high limit setting, burner control will have a hard lock out with F2 fault displayed. Burner fan stays on for 10 min. The fault can only be manually reset once the water temperature in the boiler drops.
7. Reset to original settings as needed (item #4 under submenu 6).

Menu item "6" is used to change the following operating parameters: (refer to page 23 for more detail)

Sub-menu Item	Parameter	Units/Scale	Factory set condition
1	Maximum operational input	% of rated input	100%
2	Gas type	0 = NG (natural gas) 1 = LPG (liquid propane gas)	0
3	Not assigned	--	--
4	Maximum boiler water temperature	from 41°F to 260°F (5°C to 127°C)	203°F (95°C)
5	Integral threshold value of controller	In Kmin from 1 to 255	30 Kmin
6	Runtime optimization	0 = minimum pause 1 = integral method	1
0	Reset all operating parameters to their factory set condition.	--	--

Commissioning the System

WARNING

CO build-up as a result of incorrect burner adjustment can have serious health implications. Always carry out a CO test before and after work on gas appliances.

Leak test

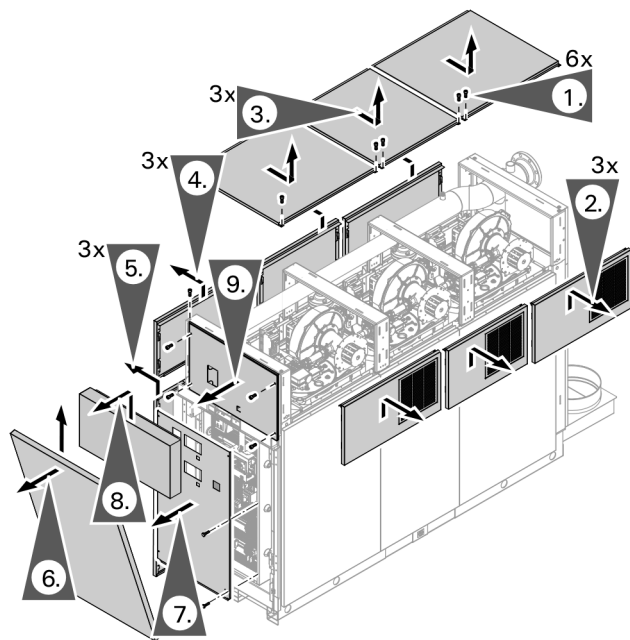
Gaskets on the burner plate and components routing flue gas can be checked during operation with an inspection mirror. If required, remove the thermal insulation components. Condensate traces on the outside of the flue gas collector or on thermal insulation components also indicate leaks.

Note: The burner adjustment has to be checked with the boiler heated to operating temperature (min. 40°C). Perform checks in the partial load range as well.

1. Check the heating system pressure.
Maximum operating pressure: 160 psi (11 bar)
Minimum operating pressure: 8 psi (0.6 bar)

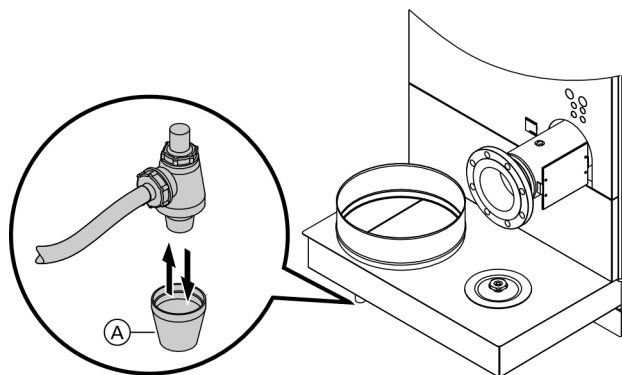
2. For room air dependant operation:
Check that the ventilation facility in the installation room is open.
3. Check the gas supply pressure (for set value refer to page 15).
4. Open the gas line shut-off valves.
5. Check the function of the neutralising system (if installed), including the hydraulic seal in the trap.
 Refer to the control Instructions and Neutralizing system Operating Instructions.
6. Check all gaskets and plugs, and retighten if necessary.
Note: Check all connections on the heating water side for leaks approx. every 500 operating hours.
7. Switch ON the mains isolator (outside the installation room).
8. Start the control unit.

Removing the Boiler Panels



1. Remove the screws from the right side of the top panels.
2. Lift and remove the top right side panels.
3. Slide the top panels toward the right side and remove.
4. Lift and remove the top left side panels.
5. Lift and remove the bottom left side panels.
6. Tilt forward, lift and remove lower front panel.
7. Remove the screws from the lower front cover plate and remove plate.
8. Lift and remove the top front panel (for CA3B 5.0 and 6.0 only).
9. Remove the screws from the top front cover plate and remove plate (for CA3B 5.0 and 6.0 only).

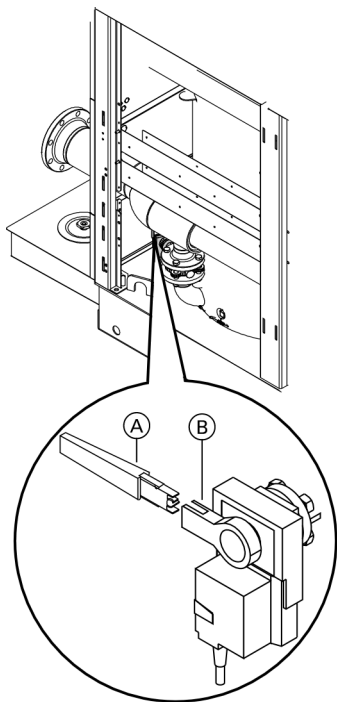
Filling Condensate Trap with Water



1. Remove the siphon cup (A) and fill with water (otherwise flue gas may escape).
2. Check that the condensate can drain freely.
3. Refit the siphon cup (A).

Note: The hose connection to the on-site condensate system or to the neutralizing system must not be permitted to sag; support hose where required.

Filling the Heating System with Water and Ventilating

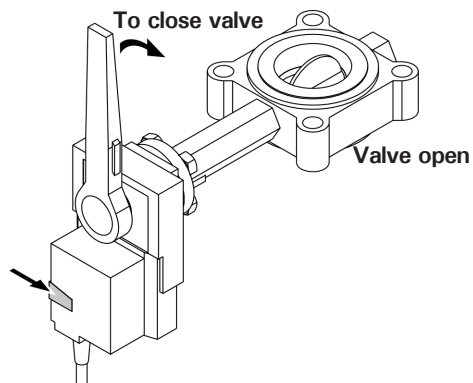
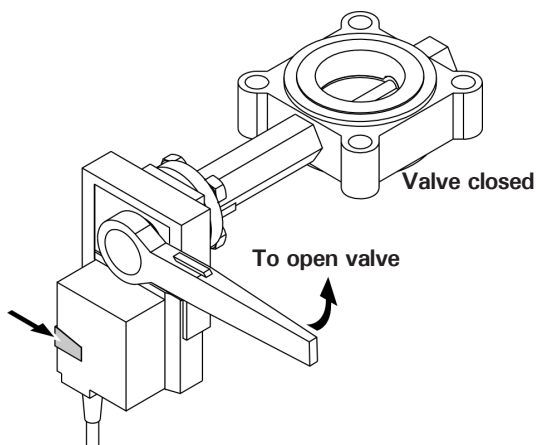


Installing the isolation valve handle

Remove the isolation valve handle (A) from the accessory pack and insert it into the receiver handle (B) of the isolation valve until it locks into place. Repeat for all valves.

Note: The handle is only used for initial installation and for service. The handle must be removed prior to putting the boiler into operation.

Note: Store the handle in a safe place for future use.



IMPORTANT

See page 13 for water quality requirements.

1. Fill Vitocrossal 300, CA3B with fully softened water.
2. Enter the fill quantity, water softness and pH-value in the chart provided on page 161.
3. Before filling push the actuator release button and open each isolation valve (located near the return header of each boiler section).
4. When fill is complete push the actuator release button and close each isolation valve (located near the return header of each boiler section).

Checking the Water Conditions

Water Quality

The lifetime of the entire heating system is influenced by the water quality. A water treatment system will protect against damages caused by corrosion and lime formation.

Hard water conditions (i.e. calcium carbonate) must be avoided as it will cause deposits to accumulate on the heat exchanger surfaces.

If in any doubt about the water quality, please have a proper water analysis done. Check with regional chemical suppliers for boiler water treatment or with Viessmann Manufacturing Company Inc. directly.

Total output (MBH)	Total Hardness (ppm of CaCO ₃)
> 2050	< 150

The pH value of the heating water should be between 8.2 and 9.5

Only fill the boiler with water that conforms with water quality guidelines of VDI 2035-1.

IMPORTANT

Fill Vitocrossal 300 CA3B with fully softened water only!

Water quality requirements

Note: Observing the following requirements is necessary to safeguard your warranty rights. The warranty excludes damage due to corrosion and scaling.

The standard values assume the following:

- The total volume of fill and top-up water during its service life will not exceed three times the water content of the heating system.

Soften the fill and top-up water in heating systems operating under the following conditions:

- The total of alkaline earths in the fill and top-up water exceeds the standard value.
- Higher fill and top-up water volumes are expected.
- In systems > 170 MBH (50 kW), install a water meter to capture the amount of fill and top-up water. Enter the volume of fill water and the water hardness into the boiler maintenance checklists.

Operating information:

- During expansion or repair work, only drain the pipework sections which are crucial.
- Check, clean and activate filters, dirt traps and other blow-down or separating facilities in the heating water circuit frequently after commissioning and in new installations. Thereafter check and maintain as required, depending on the type of water treatment applied (e.g. water softening).
- If the heating system is filled with fully softened water, no other measures for start-up are required. If the heating system is not filled with fully softened water but with water which fulfils the requirements given in the table above, the following should also be considered for commissioning:
- Start the system step by step with a high heating water flow rate, starting with the lowest boiler output. This prevents localized concentration of lime scale deposits on the boiler heating surfaces.
- In multiple boiler systems, start all boilers simultaneously to prevent the entire lime scale deposit settling in the heat exchanger of just one boiler.
- Where water treatment is required, treat the first fill of the heating system prior to start-up. This also applies to any subsequent filling, e.g. when adding top-up water or after a repair, or for any system expansion.
The build-up of lime scale deposits on the heating surfaces will be minimised if these instructions are followed.

Checking the Water Conditions *(continued)***Prevention of damage due to scaling**

Prevent excessive scale build-up (calcium carbonate) on the heating surfaces. For heating systems with operating temperatures up to 212°F (100°C), VDI Guideline 2035 Part 1 "Prevention of damage in water heating installations – Scale formation in domestic hot water supply installations and water heating installations" applies together with the following standard values. See the explanations in the original text of the Guideline.

Avoiding damage caused by water corrosion

The corrosion-resistance on the heating-water side of ferrous materials used in heating systems and heat generators depends on the absence of oxygen in the heating water. The oxygen that enters the heating system upon initial and subsequent filling reacts with the system materials without causing damage. The characteristic blackening of the water after a certain operating time is a sign that there is no longer any free oxygen.

During operation, oxygen can enter due to:

- Open vented expansion vessels due to flow through
- Negative pressure in the system
- Through permeable components

Correctly sized sealed unvented systems operating at the correct pressure, e.g. systems with expansion vessel, offer good protection against the ingress of airborne oxygen. The pressure must be above the pressure of the ambient atmosphere at all times during operation and at every point in the heating system, including the suction side of the pump. Check the precharge pressure of the expansion vessel at least during the annual service.

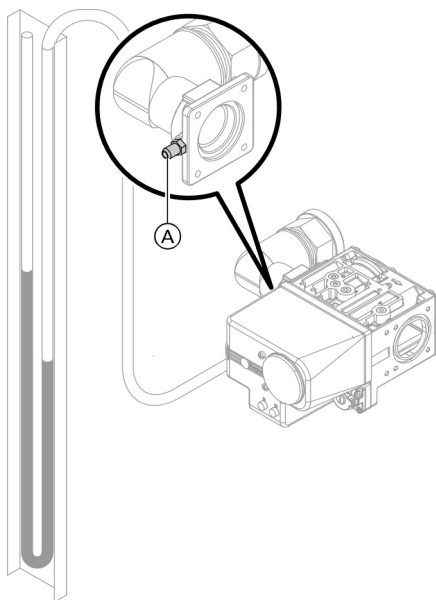
Avoid the use of components permeable to gas, e.g. permeable plastic pipes in underfloor heating systems. If they are used, system separation should be provided. This system separation must separate the water flowing through the plastic pipes from other heating circuits, e.g. from the boiler, by the provision of a corrosion resistant heat exchanger. No other protective measures against corrosion are necessary in corrosion-resistant closed hot water heating systems in which the previous points have been taken into account. However, take additional precautions where there is a risk of oxygen ingress, for example by adding oxygen binder sodium sulphite 5 to 10 ppm (5 to 10 mg/L) into the excess. The pH value of the heating water should be 8.2–9.5.

Different conditions apply to systems that contain aluminium components.

Where chemicals are used as part of the corrosion protection, we recommend that the manufacturer of the chemicals issues a certificate of suitability of the additives with regard to the boiler materials and the materials of other components. Please refer questions regarding water treatment to an appropriate contractor.

Further details can be found in the VDI guideline 2035-2 and EN 14868.

Checking Static and Connection Pressure



IMPORTANT

The burner is automatically ignited and starts operation after a safety time has elapsed.
During initial start-up, the unit may indicate a fault because of air in the gas supply pipe.
After approximately 5 seconds, press the reset button R to reset the burner. The ignition procedure is repeated.
This boiler employs a direct spark ignition system.

! WARNING

Never purge a gas line into a combustion chamber. Never use matches, candles, flame, or other sources of ignition for purpose of checking leakage. Use a soap-and-water solution to check for leakage. Failure to follow this warning could result in fire, explosion, personal injury, or death.

! WARNING

Ensure that there is no open flame in the room.

Static Pressure

1. Close gas shut-off valve.
2. Loosen screw in the measuring connector (A) do not remove.
3. Connect pressure measuring device at measuring connector (A).
4. Open gas shut-off valve.
5. Measure static pressure max. 14 "w.c.
6. Record measurement reading in the maintenance record (on page 162).

IMPORTANT

A CO₂ measurement (see page 67) must be taken before and after working on gas appliances to eliminate risks to health and to guarantee the satisfactory condition of the system.

Supply pressure for NG/LPG

1. Start the burner.

Note: Switch the burner to maximum heating output.
For this, activate the emissions test switch at the boiler control unit.

2. Measure the supply pressure (running pressure).
Use suitable measuring instruments calibrated with a minimum resolution of 0.04 "w.c. Value must be as per the chart below:

Note: The supply pressure should be between 4 "w.c. and 14 "w.c. for NG and 10" w.c. to 14" w.c. for LPG. The gas pressure switch for the inlet pressure test/check is factory set to 4 "w.c. Never alter this setting.

3. Record the actual value in the maintenance record (on page 162).
4. Close the gas shut-off valve.
5. Remove the pressure tester and close test nipple (A).

Supply pressure with:		Corrective action
Natural gas	Liquid propane gas	
under 4 "w.c.	under 10 "w.c.	Do not attempt adjustment. Call local gas utility
4 to 14 "w.c.	10 to 14 "w.c.	Start up boiler.
over 14 "w.c.	over 14 "w.c.	Do not attempt adjustment. Call local gas utility to decrease pressure. Boiler valve must not be exposed to pressure over 14 "w.c.

Checking Heating Water Connections for Leakage



WARNING

Working on pressure loaded parts can be dangerous. Connections around the heating water should only be opened if the boiler is unpressurized.



CAUTION

Under-pressure in the boiler can lead to material damages. Only empty boiler with open ventilation with a suction pump.

IMPORTANT

Ensure that connections for control equipment and minimum pressure monitor (low-water indicator) are also leakage-free.

Checking for Flue Gas Leakage



CAUTION

Failure to ensure that all flue gases have been safely vented to the outdoors can cause property damage, severe personal injury or loss of life. Flue gases may contain deadly carbon monoxide.

Check flue gas collector and boiler body for leakage.

IMPORTANT

Gaskets can be checked with a dew point hygrometer at full load operation. Detach thermal insulation parts if necessary. Traces of condensed water on the exterior of the flue gas collector or on the thermal insulation parts also indicate leakages.

Checking On-site Gas Connections for Leakage

WARNING

Risk of explosion due to gas leakage. Check for gas leakage at the gauge connections.

CAUTION

Use of leak detection spray can lead to operational malfunctioning. Leak detection spray must not come into contact with electrical contacts.

1. Insert and tighten new gaskets at all detached on-site connections.
2. Open gas shut-off valve.
3. Check sealing points at input side of the combination gas valve for leakage.
4. Put boiler into operation (refer to page 18).
5. Check output-side sealing points of combination gas valve, sealing points between fan and burner plate and sealing points between fan and Venturi-tube for leakage.

Instructing the Operator of the System

The system manufacturer must hand over the operating instructions to the system operator and instruct him in its operation.

This includes all accessories that have been installed as components, such as remote controls. The system manufacturer must also provide instruction regarding maintenance work.

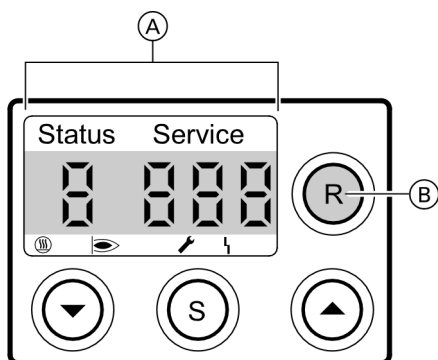
Operating and Service Documents

1. Complete customer information file and separate:
 - Hand over segment for system operator to system operator.
 - Retain segment for heating contractor in files.
2. Assemble all parts lists, operating and service instructions in a file and deliver to the system operator. After installation, the installation instructions will no longer be required and do not need to be retained.

Operating the Burner Control Unit

WARNING

Failure to ensure that all flue gases have been safely vented to the outdoors can cause property damage, severe personal injury, or loss of life. Flue gases may contain deadly carbon monoxide.



See the neutralizing system instructions.

1. Check the heating system pressure.
Max. permissible boiler operating pressure: 160 psi.
Min. permissible boiler operating pressure: 8 psi.
2. Check the gas supply pressure. Permissible gas pressure 4-14 "w.c. (NG) and 10-14 "w.c. (LPG).
3. Open the gas line shut-off valves.
4. Switch ON the internal power disconnect switch.
5. Switch ON the main power (breakers).
6. Switch ON system ON/OFF switch at the control unit.
If fault indicator on the control unit illuminates and burner control unit display (A) flashes, first press reset button R (B) on the burner control unit.

Note: The system can enter a fault state during commissioning if there is insufficient gas in the supply line (the fault indicator on the control unit illuminates). Purge the gas supply line again and reset the burner control unit.
Remove air from the gas line with an approved gas purge burner or vent outdoors.

7. Switch ON the individual section control power switches (the control display will show system activation).
8. Match the coding card at the burner control unit, refer to page 55.

9. Check the function of the neutralizing system.

Note: Neutralizing system operating instructions.



See the control section of the Installation Instructions and neutralizing system Operating Instructions.

10. Check all gaskets and plugs, and retighten if necessary.

Note: We recommend you check all connections on the heating water side for leaks after approximately 500 hours initial run (refer to page 16).

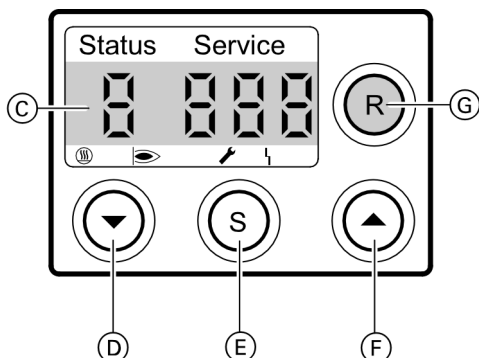
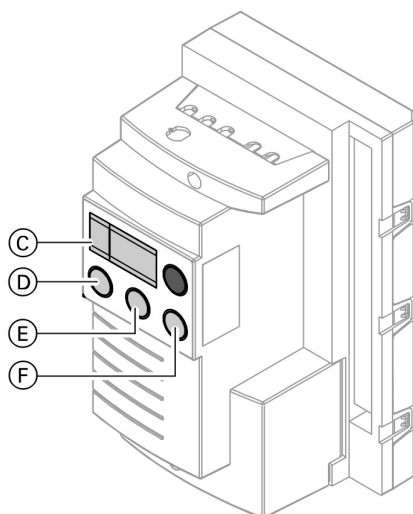
Gas type characteristics

The Vitocrossal 300 CA3B boiler is for use with gases whose characteristics fall within the following ranges.

	Natural Gas	Liquid Propane Gas
Heating value (gross) Btu/ft ³	970 to 1100	2466 to 2542
Specific gravity	0.57 to 0.70	1.522 to 1.574
Ultimate carbon dioxide (CO ₂) %	11.7 to 12.2	13.73 to 13.82

1. The burners are factory set for operation with natural gas.
2. Record gas type in the maintenance record on page 162.
Note: To change gas type refer to page 55.

Operating the Burner Control Unit *(continued)*



Reducing Operational Output (if required)

The burners heating output can be reduced via the individual burner control unit.

As an alternative, the adjustment can be made via the burner control unit.

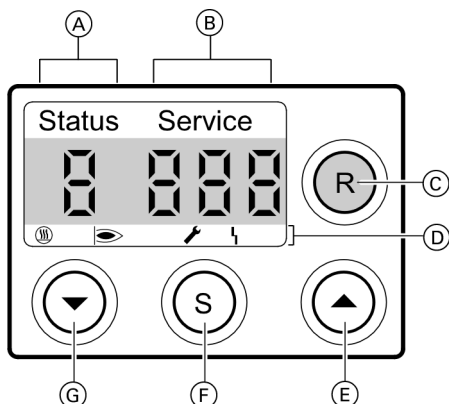
If required, the maximum heating output of the burners can be set at 70% to 100% of the rated heating output.

1. Press button S (E) for longer than 2 sec. 🔧 will blink.
2. Press button ▲ (F) until "6" appears in the display (C) under Service.
3. Press button S (E), "6" appears in the display (C) under Status.
4. Press button S (E), "1" appears in the display (C) under Status and the actual value for the maximum heating output will be indicated in % under Service.
5. Press button ▲ (F) or ▼ (D) for the desired maximum heating output.
6. Press button S (E) to confirm. If successfully completed, "1" appears in the display (C) under Service, a failed attempt results in a "0".
7. Press button S (E) to make a change in operating status indicator.
8. Press button R (G). A system reboot will be initiated.

Burner Control Unit

Display and programming unit

A display and programming unit is integrated into each burner control unit. The display indicates the relevant operating conditions, the service and parameter conditions as well as all fault and error messages, relative to that boiler section.



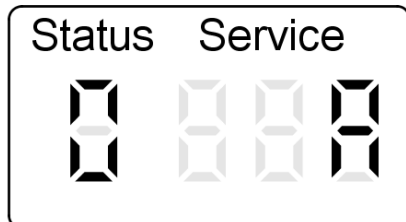
The display comprises four elements of seven segments each. Four buttons enable adjustments to be made at the different operating levels.

- (A) Status display
- (B) Service display
- (C) Reset button
- (D) LEDs, from left: heat demand, flame, maintenance and fault.
- (F) Selection button
- (E)/(G) Cursor button

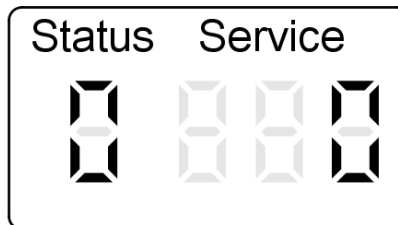
Operating display

In standard mode, the status display shows the current operating conditions. The same applies in a fault state after pressing reset button R (C).

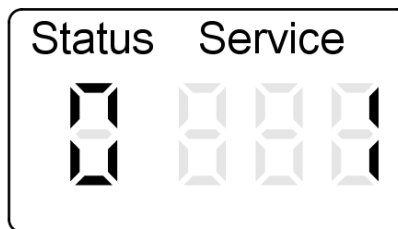
The following displays are scrolled through automatically. In case of faults, see the fault codes starting at page 28. You can exit at any time by pressing and holding the reset button R (C) for 0.5 to 10 seconds.



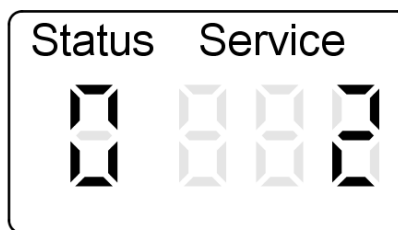
Section start-up
after power supply
is switched ON.



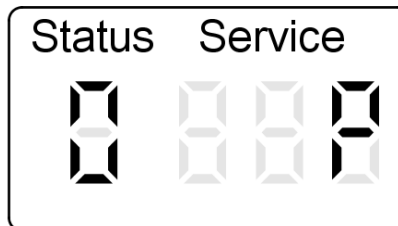
Standby



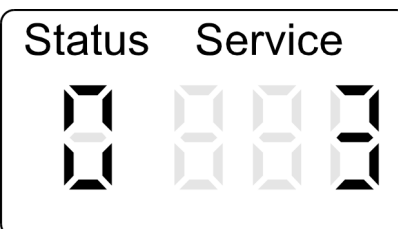
Idle state check
System tests



Fan ramp-up



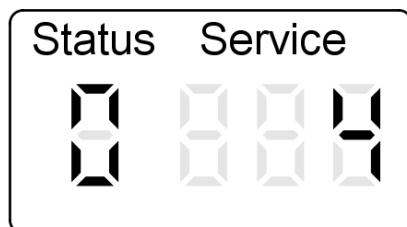
Gas valve and/or
relay test



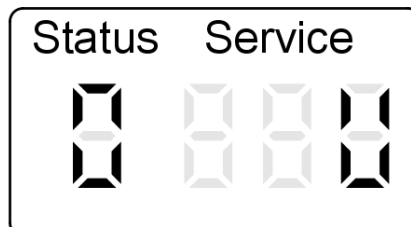
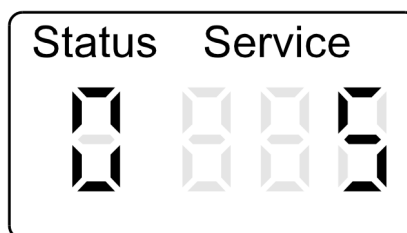
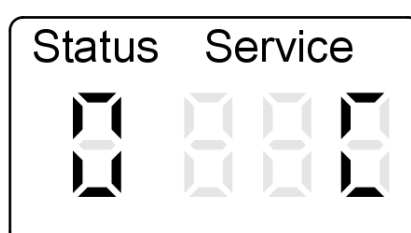
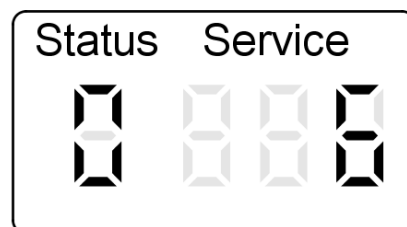
Pre-purge

Burner Control Unit *(continued)*

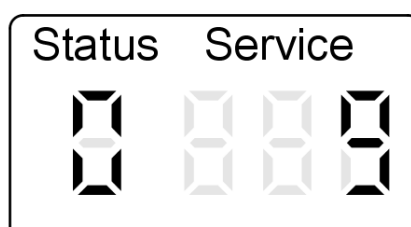
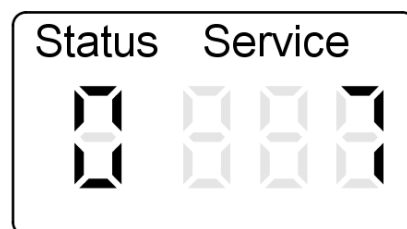
Operating display (continued)



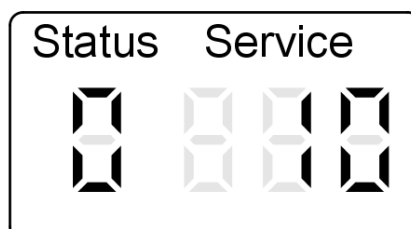
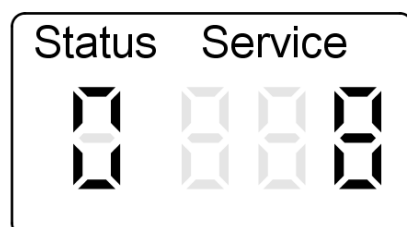
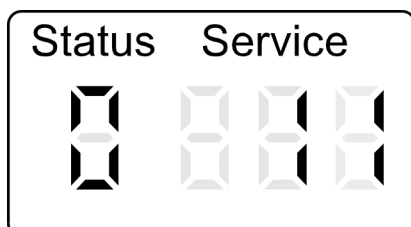
Pre-ignition

Maintenance program
no air pressureIgnition
Safety time
Flame establishedMaintenance program
no gas pressure or
mains under voltage

Flame stabilization

Forced ventilation
when no flame
was recognized

Operation with flame

Safety shutdown
due to flame tear-offReheat
Post-purgeSafety shutdown
due to reaching
maximum boiler
water temperature

Burner Control Unit *(continued)***Information and configuration display**

The information display and the configuration display are activated from the operating display. The menu selection is activated by pressing button **S** for longer than 2 secs. You can scroll through the menu items with **▲▼** buttons. A menu item is selected by pressing button **S** again and will be displayed under Service.

This mode is automatically terminated if no other button is pressed within 20 secs.

Information regarding current meter readings, such as the start counter and permanent hours run meter, can be called up via the information display.

Information

Menu item	Description
1	Continuous meters for start-ups and hours run
2	Meters for start-ups and hours run that can be reset
3	Software version
4	Fault history for the last 10 fault codes

Example: to delete the hours run meter, press the following buttons:

1. **S** longer than 2 seconds "**🔧**" flashes
2. **▲** until "2" is shown under Service.
3. **S** "1" will be displayed under Status
4. **▲** Scroll through Status until "6" is shown under Status:

Status	Description
1	Display of start-up meter with reset, 1 digit
2	Display of start-up meter with reset, 1000 digit
3	Menu item for deleting the start-up meter reading
4	Display of hours run meter with reset, 1 digit
5	Display of hours run meter with reset, 1000 digit
6	Menu item for deleting the hours run meter reading

5. **S** to confirm the deletion. If deleted successfully, "1" will be shown under Service, "0" if it failed.
6. **S** to change to the operating display.

Menu items "5" and "6" are used to adjust configuration settings of the burner control unit.

Note: Only make adjustments when the burner control unit is on standby.

Burner Control Unit *(continued)***Configurations:**

Menu item	Description
5	Changeover from the operating display of the burner control unit phase to other process information
6	Configuration of control function operating parameters

Menu item "5" is used to display the following process information:

Sub-menu Item	Process Information	Units/Scale
0	Phase	1
1	Boiler water temperature	°C
2	Secondary boiler water temperature	°C
3	Ionization current	I in 1/10 μ A
4	Set speed	%
5	PWM actuating variable	%
6	Actual speed	RPM $\times 10/\text{min}$
7	Gas pressure switch 1, GDW1	0 or 1
8	Gas pressure switch 2, GDW2	0 or 1
9	Air pressure switch 1, LDW1	0 or 1
A	Gas valve 1	0 or 1
B	Gas valve 2	0 or 1

Example: to display the ionization current, press the following buttons:

1. **S** longer than 2 seconds "  " flashes.
2. **▲** until "5" is shown under Service.
3. **S** "5" will be displayed under Status
4. **▲** until "3" is shown under Service.
5. **S** "3" is shown under Status and during operation the ionization current is shown under Service (e.g. 30 = 3.0 μ A).
6. To exit the process information menu, press and hold **S** longer than 2 seconds " _ " flashes.
7. **▲** until "5" is shown under Service.
8. **S** "5" will be displayed under Status
9. **▼** until "0" is shown under Service.
10. **S** to change to the operating display.

Menu item "6" is used to change the following operating parameters:

Sub-menu Item	Parameter	Units/Scale	Factory set condition
1	Maximum operational input	% of rated input	100%
2	Gas type	0 = NG (natural gas) 1 = LPG (liquid propane gas)	Coding card dependent
3	Not assigned	--	--
4	Maximum boiler water temperature	from 41°F to 260°F (5°C to 127°C)	203°F (95°C)
5	Integral threshold value of controller	In K min from 1 to 255	30 K min
6	Runtime optimization	0 = minimum pause 1 = integral method	1
7	Not assigned	--	--
8	Behavior in case of low gas level	0 = delayed lockout fault shutdown 1 = delayed safety shutdown	0
0	Reset all operating parameters to their factory set condition.	--	--

Burner Control Unit *(continued)*

Example: to set the maximum operational burner input to between 0 and 100%, press the following buttons:

1. **S** longer than 2 seconds "🔧" flashes.
2. **▲** until "6" is shown under Service.
3. **S** "6" will be displayed under Status.
4. **S** "1" will be shown under Status and the current value for the maximum operational output in % is shown under Service.
5. **▲/▼** for required maximum operational output.
Note: Observe the modulation range (refer to page 67).
6. **S** to confirm. If applied successfully, "1" will be shown under Service, "0" if it failed.
7. **S** to change to the operating display.

Resetting Operating Parameters to Factory Settings

To reset all operating parameters to factory settings, press the following buttons:

1. **S** longer than 2 seconds "🔧" flashes.
2. **▲** until "6" is shown under Service.
3. **S** "6" will be displayed under Status.
4. **▲** until "0" is shown under Service.
5. **S** "1" is shown under Status and "dEL" under Service.
6. **S** to confirm. If reset successfully, "1" will be shown under Service, "0" if it failed.
7. **S** to change to the operating display.

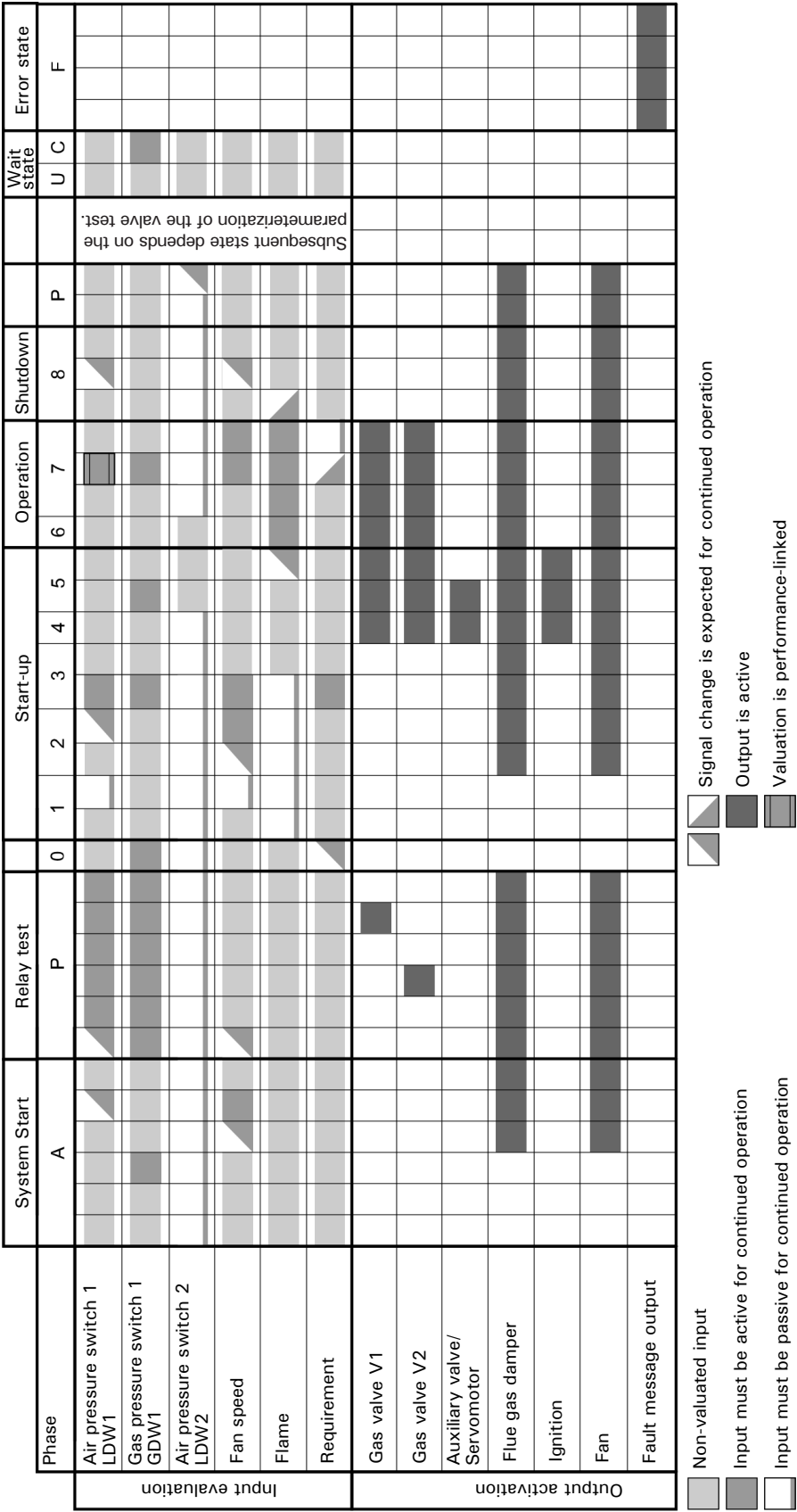
Manual Mode and Service Display

The burner must be running to call up the service display and for manual mode. The service display shows the current level of modulation in %.

Press the following buttons:

1. **▼/S** together for longer than 2 seconds. The burner changes to manual mode, a "P" will be shown under Status and the current modulation level will flash under Service.
2. **▼** for lower heating output, until "0" is shown under Service.
3. **▲** for upper heating output, until "100" is shown under Service.
4. **▼/S** together for longer than 2 seconds. The burner returns to modulating mode.

Burner Control Unit Flow Diagram



Burner Control Unit Flow Diagram *(continued)*

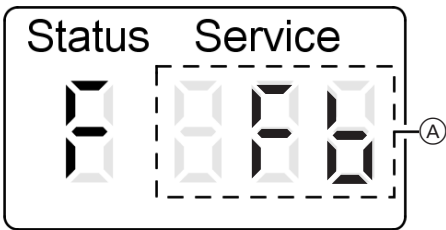
State description:

Phase	Display	Description	Duration
System start	"A"	System start	10 seconds
		Fan ramp-up, system start	max. 20 seconds
		Forced ventilation, system start	20 seconds
Relay test	"P"	Fan ramp-up for valve test	max. 20 seconds
		Safety relay test	0.9 second
		Relay/valve test V1	2 seconds
		Test time V1	1.1 seconds
		Relay/valve test V2	2 seconds
		Test time V2	1.1 seconds
		Start-up meter, initialization	0.1 second
Standby	"0"	Standby	0 ... seconds
Start-up	"1"	Flame signal amplifier, test	max. 50 seconds
		Gas fan, air pressure switch and boiler water temperature sensor test	max. 20 seconds
	"2"	Fan ramp-up	max. 20 seconds
	"3"	Pre-purge	10 seconds
		Adjusting start-up load, test WD1	1.9 seconds
	"4"	Pre-ignition	2 seconds
	"5"	Ignition safety time	2.3 seconds
		Flame detection safety time	max. 0.51 second
Operation	"6"	Flame stabilizing time	15 seconds
	"7"	Start-up partial load	20 seconds
		Modulating operation	0 to 24 hours (burner will restart after 24 hours of continuous operation)
		Adjusting shutdown load	0.1 seconds
Shutdown	"8"	Reheat, test WD2	min. 10 seconds
			max. 60 seconds
		Fan ramp-up, post-purge	max. 20 seconds
		Post-purge	10 seconds
Waiting	"U"	Waiting for restart	5 minutes
	"C"	Waiting mains, gas pressure	5 minutes
Fault states	"9"	Forced ventilation fault	20 seconds
	"10"	Flame tear-off	0 ... seconds
	"11"	Safety shutdown	0 ... seconds
	"F"	Fault shutdown	0 ... seconds

Burner Control Unit Faults

Fault display

The fault display is activated automatically if the burner control unit switches to a fault state. The most recent fault will then be displayed. The fault LED is also illuminated in case of a non-lockout shutdown or flashes together with the fault code in case of a lockout shutdown. Fault codes are also displayed on the boiler section service display.



(A) Fault code of the most recent fault (refer to table starting at page 28).

- 1. Correct the fault. For fault codes and measures (refer to page 28). Carry out measures in the indicated order.
- 2. Press reset button R for longer than 0.5 seconds
The operating display is shown again and the burner control unit is reset.

Fault memory

The ten most recent faults are saved and may be called up. The order of scans ranges from the most recent to the earlier fault codes. The fault memory display is terminated automatically if no key is pressed within 20 seconds.

Note: If the burner does not start up due to a non-lockout fault without displaying a fault code, the fault memory may be able to indicate the cause.

To call up the fault codes, press the following buttons:

- 1. **S** longer than 2 seconds "🔧" flashes.
- 2. **▲** until "4" is shown under Service.
- 3. **S** "4" will be displayed under Status.
- 4. **▲/▼** to scroll through the fault memory display.

Service	Description
1	Display fault codes
2	Detail fault codes
3	Clear fault memory

- 5. **S** the selected fault memory display will appear under Status.
- 6. **▲/▼** to scroll through the fault codes.

To clear the fault memory from the operating display, press the following buttons:

- 1. **S** longer than 2 seconds "🔧" flashes.
- 2. **▲** until "4" is shown under Service.
- 3. **S** "4" will be displayed under Status.
- 4. **▲** until "3" is shown under Service.
- 5. **S** "1" is shown under Status and "dEL" under Service.
- 6. **S** to confirm the deletion. If deleted successfully, "1" will be shown under Service, "0" if it failed.
- 7. **S** to change to the operating display.

Note: For the fault display on the burner display and control unit, every fault code is stored in the fault memory and the last 10 can be read.

Burner Control Unit Fault Codes

General process faults

Fault display on the programming unit of the burner.

Note: Carry out measures in the described order. All fault codes are saved to the fault memory and the last 10 can be called up.

Displayed Fault Code	System Characteristics	Cause	Measures
F 80	Burner control unit in a fault state; system cools down; burner control unit locked out	Short circuit, boiler water temperature sensor, burner control unit	Check lead and dual sensor; replace sensor if required
F 81	Burner control unit in a fault state	Sensor drift, boiler water temperature sensor, burner control unit	Check lead and dual sensor; replace sensor if required
F 88	Burner control unit in a fault state	Lead break, boiler water temperature sensor, burner control unit	Check lead and dual sensor; replace sensor if required
F b1	Burner control unit in a fault state; system cools down; burner control unit locked out	Coding card not inserted in the burner control unit; incorrect or faulty coding card	Insert coding card; check coding card; replace if required
F b1	Type of coding card	Coding card does not match burner control unit	Replace coding card or burner control unit ⚠ Danger Plug-in terminals on the burner control unit are 'live'. Only replace the coding card when the power has been isolated from the burner control unit (via the internal power disconnect inside the GW6C).
F d0	Burner control unit in a fault state	Simultaneous selection of multiple gas types at the burner control unit via plug 90	Check line, check wiring, replace burner control unit, if required.
F E1	Gas pressure switch 2, GDW2 activated (closed on pressure rise)	1st gas valve seat leaking/ GDW2. Gas pressure switch 2 activated/burner test firing valve closed.	Check setting of gas pressure switch 2; check connecting cable; replace gas valve.
F E2	Gas pressure switch 2, GDW2 did not close during control self diagnostics	Gas valve does not open, gas valve leaking, gas pressure switch faulty	Check setting of gas pressure switch 2; check connecting cable; replace gas valve
F E2	Shortage of gas to gas pressure switch 2; valve leak test	Gas valve does not open; gas valve leaking; gas pressure switch 2 faulty.	Replace gas valve

Burner Control Unit Fault Codes *(continued)*

Displayed Fault Code	System Characteristics	Cause	Measures
F E4	Burner shuts down	Multiple detection of under voltage	Check the power supply
F E5	Burner control unit in a fault state	Internal fault of the burner control unit and during test of ionization input	Replace burner control unit
F E7	Burner control unit in a fault state	Short circuit on boiler temperature sensor 2, burner control unit	Check connecting cable and dual sensor; replace sensor if required.
F E8	Burner control unit in a fault state	Sensor drift on boiler temperature sensor 2, burner control unit	Check connecting cable and dual sensor; replace sensor if required.
F E9	Burner control unit in a fault state	Lead break, boiler temperature sensor 2, burner control unit	Check connecting cable and dual sensor; replace sensor if required.
F EA	Burner control unit in a fault state	For boilers with multiple gas types, 1 or more main gas valves leaking.	Check connection line and main gas valves, replace if required.
F Eb	Burner blocked	Burner not enabled by external blocking device	Check blocking device, e.g. flue gas damper.
F EE	Burner control unit in a fault state	Internal error in feedback from gas safety valves; output relay does not respond	Reset burner control unit; replace burner control unit
F EF	Burner control unit in a fault state	Internal error in feedback from gas safety valves; output relay does not respond	Reset burner control unit; replace burner control unit
F F0	Emergency operation according to internal default	Communication error KM BUS burner control unit	Check the KM BUS cable plug for firm seating; check all KM BUS cables
F F2	Burner control unit in a fault state; system cools down	Excessive boiler water temperature	Wait until the boiler water temperature falls below the maximum permissible boiler water temperature. If the burner fan is active check sensor 3A/3B. If the burner fan is not active check sensor 15A/15B. Reset burner control unit.
F F3	Ionization flame monitor reports faulty flame signal during start-up or after the post-purge	Gas valve leaking (flame present); incorrect coding card	Check ionization path; replace coding card; replace gas valve
F F4	No flame formation during safety time; ionization flame monitor reports no flame signal	Ionization electrode incorrectly adjusted; ionization electrode not plugged in. Ground fault of electrode or cable	Insert plug of ionization electrode; check cables; adjust ionization electrode (refer to page 73)

Burner Control Unit Fault Codes *(continued)*

Displayed Fault Code	System Characteristics	Cause	Measures
F F4	No flame formation during safety time; ionization flame monitor reports no flame signal	Ignition electrode not set correctly; electrodes grounded; ignition unit faulty; burner control unit faulty	Adjust ignition electrodes (refer to page 73); replace ignition unit; replace burner control unit
F F4	No flame formation during safety time; ionization flame monitor reports no flame signal	Insulation body of ignition or ionization electrode cracked	Replace ignition or ionization electrode
F F4	Poor start-up characteristics, rotary damper does not close, solenoid valve does not switch	Servomotor faulty, servomotor connecting cable faulty, solenoid valve faulty, burner control unit output relay faulty	Replace connecting cable; replace servomotor; replace solenoid valve; replace burner control unit
F F4	No flame builds during safety time; ionization flame monitor reports no signal	Incorrect gas type selected	Adjust gas type (refer to page 23)
F F4	No flame builds during safety time; ionization flame monitor reports no signal	Gas valve does not open	Check the connecting cable; check the gas valve and replace if required
F F4	No flame builds during safety time; ionization flame monitor reports no signal	Combustion characteristics not ideal	Adjust the burner (refer to pages 67 and 68, if necessary, also adjust the setting screws when the burner is OFF to be able to start the burner)
F F5	Air pressure switch 1, LDW1 shows no air pressure, fan does not operate	Air pressure switch 1, LDW1 faulty, incorrectly connected or incorrectly set	Replace air pressure switch 1, connect or set correctly
F F5	Air pressure switch 1, LDW1 switches off during operation	Flue gas back pressure; condensate built up; air pressure switch 1, LDW1 hose faulty; connecting hose leaking	Remove flue gas back pressure; check if condensate banked up; reset burner control unit; replace hose
F F6	Gas pressure switch 1, GDW1 shows no gas pressure	Gas shut-off valve closed; gas pressure switch faulty; multiple problems with gas supply	Open gas shut-off valve; check gas flow pressure; replace gas filter if required; reset burner control unit; replace gas valve
F F7	Fan pressure is created during the idle state check of air pressure switch 1, LDW1	Wind influence on fan	Check flue outlet or (chimney)
F F7	Contact of air pressure switch 1, LDW1 not closed in idle state	Air pressure switch 1, LDW1 faulty	Replace air pressure switch 1, LDW1
F F8	Flame extinguishes during operation	Burner gauze assembly faulty	Check burner gauze assembly; replace if damaged
F F8	Flame extinguishes during operation	Combustion characteristics not ideal	Adjust burner (refer to pages 67 and 68)

Burner Control Unit Fault Codes *(continued)*

Internal system fault

Internal system faults are created if a fault-free program sequence can no longer be ensured.

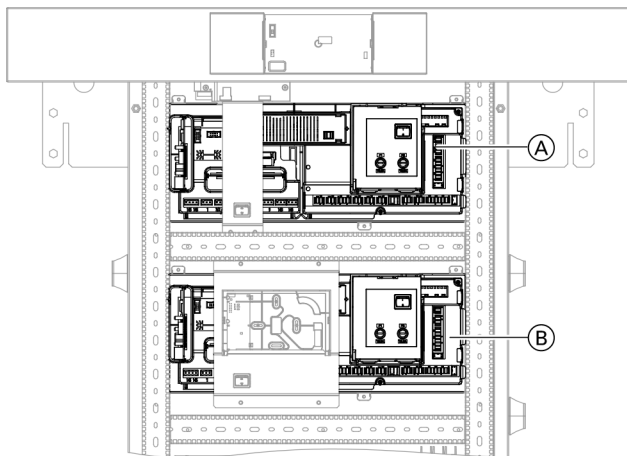
Displayed Fault Code	System Characteristics	Cause	Measures
F F9	Fan not running; fan speed not reached	Fan faulty; cables are faulty or broken	Check cables; replace fan if required
F F9	Status duration too long, fan ramp-up	Internal fault; fan cannot reach its set value	Replace fan or burner control unit
F F9	Varying fan speed	Fan faulty, cable "100A" faulty or broken	Check cable; replace cable "100A" or fan if required
F F9	No fan feedback	Fan faulty; external power supply to fan not connected or faulty; cable "100A" faulty or broken; fan blocked (possibly by a foreign object)	Check cable "100A", check external power supply; replace cable or fan; remove foreign object
F FR	Fan runs without demand; burner control unit in a fault state	Fan has not stopped; cable "100A" faulty; fan faulty; burner control unit faulty	Wind influence on fan; check flue outlet and fan; replace cable "100A", replace fan; replace burner control unit
F Fb	Burner not starting. Combustion chamber pressure too high; burner control unit in a fault state	Flue gas path or condensate path blocked off. Excessive combustion chamber pressure (air pressure switch 2, LDW2)	Check flue gas path or condensate path and clean if required
F Fb	Burner not starting. Combustion chamber pressure too high; burner control unit in a fault state	Motorized burner damper does not open/close	Check motorized burner damper
F ES, F EC, F Ed, F Fd, F FF	Fault around burner control unit	Internal system fault and EMC	Reset burner control unit. Replace the burner control unit if the fault persists.

Burner Control Unit Faults Without Fault Display

Fault	Cause	Measures
Combustion fault through pulsation	Excessive gas input	Adjust gas input in accordance with rated boiler heating output
	Insufficient or excessive air	
	Condensate build up in flue system	Check condensate drain.
	Incorrect flue outlet	Check flue outlet and flue system.
Thermoacoustics/combustion noise	Incorrect CO ₂ settings; insufficient or excessive air	Adjust burner in accordance with the details on pages 67 and 68.
CO ₂ content too low	Incorrect setting	Check that burner has been adjusted and adjust burner in accordance with the details on pages 67 and 68.
CO is formed or burner is very sooty	Insufficient or excessive air	Adjust correctly. Check ventilation of installation room.
	Insufficient draught in flue system	Check flue system.
Flame extinguishes during operation	Inlet strainer of gas valve contaminated	Remove flange and clean strainer.

Operating the System

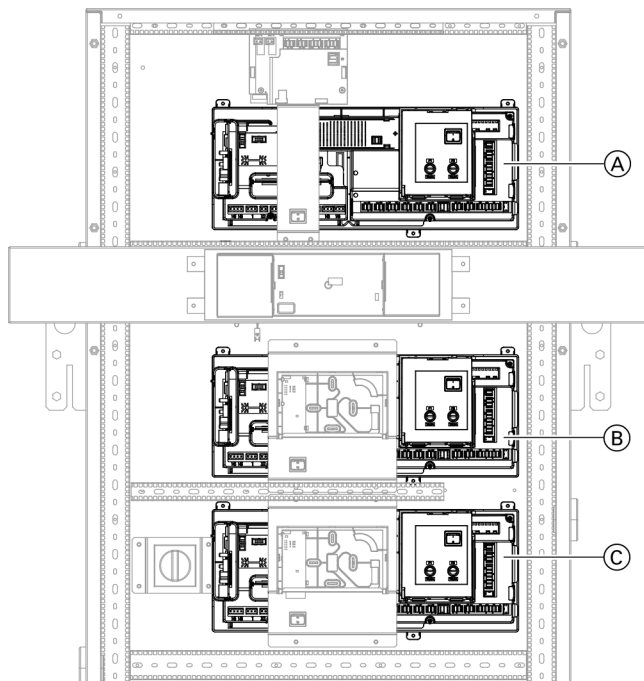
Boiler model 2.5 to 4.0



Legend

- Ⓐ System and lead boiler section 1 control unit
- Ⓑ Boiler section 2 control unit

Boiler model 5.0 and 6.0



Legend

- Ⓐ System and lead boiler section 1 control unit
- Ⓑ Boiler section 2 control unit
- Ⓒ Boiler section 3 control unit

The control unit is pre-set, however several codings must be set individually.

1. Activate the main switch and all network switches on the control units.
2. Activate switch on the control unit. Start-up begins automatically.

The following settings may be changed

- "Language"
- "Date and time"
- "Temperature units"
- "System layout"
- "Elevation"

3. Confirm with **✓**, after which the prompt will appear: "Do you want to make further changes".

IMPORTANT

- With **^/v**, you can switch between codes.
- After you have scrolled through all the codes, a message appears to end operations.

IMPORTANT

Control unit Ⓐ assumes the function of the boiler and heating circuit control and of the system boiler section 1 control unit. Referred to below as Cascade control unit. "Lead boiler + cascade" appears on the display. The other control units assume the function of a lag boiler control unit. Referred to as Boiler section 2/boiler section 3 control unit.

Operating the System *(continued)*

IMPORTANT

During the initial start-up, the equipment can go into a fault state due to insufficient gas in the gas pipe (Fault lamp lights up on the control unit). Ventilate gas line once again and reset burner control unit. See "Burner control unit" chapter.

IMPORTANT

Burner will start up after a 3 min delay.

Adjusting the coding

Check all addresses in Coding level 1 and adjust if required. See "Coding Levels".

If the fault indicator lights up on the control unit and the display on the burner control unit is blinking, reset burner control unit. To reset, press the reset button R on the burner control unit.

If the fault continues, the supply side of the combination gas valve may be blocked due to work on the gas pipe. See the following chapter to adjust coding levels.

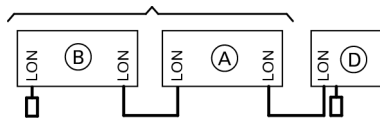
Check the following coding addresses in Coding level 2 and adjust accordingly.

See Chapter "Coding Levels" for procedural steps and overview on code setting.

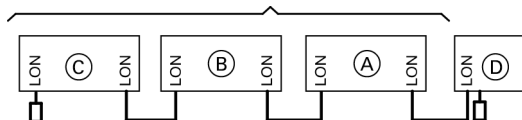
Function	Group	Coding
"Connection at plug 29"	"General"	4D
"Viessmann system number"	"General"	98
"With LON communication module: LON Participants monitoring"	"General"	9C
"With LON communication module" (lead control unit is fault manager)	"General"	79
"Central control of heating circuits"	"General"	7A
"Viessmann system number"	"General"	98
"With LON communication module: Monitoring LON participants"	"General"	9C
"Storage tank heating, hysteresis"	"DHW"	55

Integrating the Control Unit into the LON

Vitotronic 300 GW6C for CA3B 2.5, 3.0, 3.5 and 4.0



Vitotronic 300 GW6C for CA3B 5.0 and 6.0



Legend

- Ⓐ Boiler section 1/ lead control unit
- Ⓑ Boiler section 2/ lag control unit 1
- Ⓒ Boiler section 3/ lag control unit 2 (CA3B 5.0 and 6.0 only)
- Ⓓ External control unit (Vitotronic 200-H HK1B)

Note: Cascade combination of CA3B boilers cannot exceed 8 boiler sections.

- Remove terminal end resistor on Ⓐ to carry on LON connection
- The LON communication module is factory installed.
- Vitotronic 200-H:
The LON communication module (accessory) must be plugged in.



Refer to the Vitotronic 200-H Installation and Service Instructions.

- The same participant number may **not** be assigned twice within a LON.

Example for a multiple-boiler system:

- Within a LON, the system numbers (Coding "98" in the "General" group) must be the same.
- Only one control unit may be encoded as fault manager.
- The data transfer via LON can take up to several minutes.

Ⓐ	Ⓑ	Ⓒ	Ⓓ
Multiple boiler system Set coding "01:2" in the "Boiler" group.	Multiple boiler system Set coding "01:2" in the "Boiler" group	Multiple boiler system Set coding "01:2" in the "Boiler" group.	--
Boiler number 1 Coding "07:1" in the "Boiler" group	Boiler number 2 Set coding "07:2" in the "Boiler" group.	Boiler number 3 Set coding "07:3" in the "Boiler" group	--
Number of connected boilers. Set coding "35:1" to "35:8" in the "Cascade" group.	--	--	--
Participant No. 1. Coding "77:1" in the "General" group.	Participant No. 2. Coding "77:2" in the "General" group.	Participant No. 3. Set coding "77:3" in the "General" group.	Participant No. 10. Coding "77:10" in the "General" group.
Control unit is fault manager. Coding "79:1" in the "General" group.	Control unit is not fault manager. Coding "79:0" in the "General" group.	Control unit is not fault manager. Coding "79:0" in the "General" group.	Control unit is not fault manager. Coding "79:0" in the "General" group.
Control unit transmits time. Coding "7b:1" in the "General" group.	--	--	Control unit receives time. Set coding "81:3" in the "General" group.
Control unit transmits outdoor temperature. Coding "97:2" in the "General" group.	--	--	Control unit receives outdoor temperature. Set coding "97:1" in the "General" group.
Viessmann system number, coding "98:1" in the "General" group.	Viessmann system number, coding "98:1" in the "General" group.	Viessmann system number, coding "98:1" in the "General" group.	Viessmann system number, coding "98:1" in the "General" group.
LON Participant fault monitoring Coding "9C:20" in the "General" group.	LON Participant fault monitoring Coding "9C:20" in the "General" group.	LON Participant fault monitoring Coding "9C:20" in the "General" group.	LON Participant fault monitoring Coding "9C:20" in the "General" group.

Integrating the Control Unit into the LON *(continued)*

Carrying out a LON participant check

The participant check is used to test communication with the system devices connected to the fault manager.

Preconditions:

- The control unit must be programmed as fault manager (coding "79:1" in the "General" group).
- The LON participant no. must be programmed in all control units.
- The LON participant list in the fault manager must be up to date.

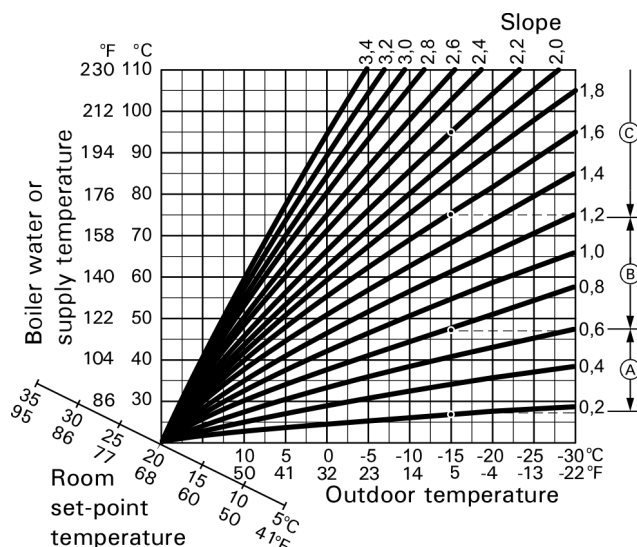
From the home screen tap the following buttons:

1. 
2. "Service"
3. Enter "viservice" password.
4. "Service functions"
5. "LON participant check"
The list of all connected LON participants appears.
6. Select participant and start participant check with "OK".
"Participant ..." appears on the display "Check running".

Note: During the participant check, the display for the relevant participant flashes for approx. 1 min. and displays "Wink".

- Successfully tested participants are designated with "OK".
- Unsuccessfully tested participants are designated with "Subscribe ... Check not OK".
Update the participant list with "New list" in order to carry out another participant check.

Adjusting the Heating Curve



The heating curves represent the relationship between the outdoor temperature and the boiler water or supply temperature.

Simplified:

The lower the outdoor temperature, the higher the boiler water or supply temperature.

The boiler water or supply temperature in turn affects the room temperature.

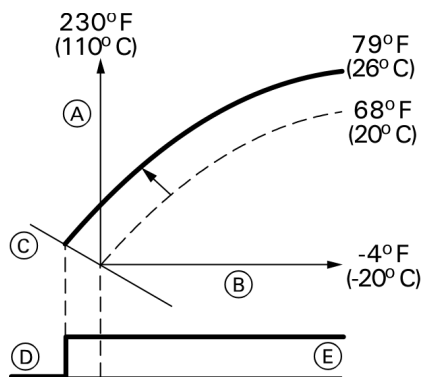
Settings in the factory set condition:

- Slope = 1.4
- Shift = 0

Example for outdoor temperature 5°F (–15°C)

- Ⓐ Underfloor heating system, slope 0.2 to 0.8
- Ⓑ Low temperature heating system, slope 0.8 to 1.6
- Ⓒ Heating systems with a boiler water temperature in excess of 167°F (75°C), slope greater than 1.6

Standard set room temperature



Adjustment of the standard set room temperature from 68°F to 79°F (20°C to 26°C).

Legend

- Ⓐ Boiler water temperature or supply temperature
- Ⓑ Outdoor temperature
- Ⓒ Set room temperature
- Ⓓ Heating circuit pump "Off"
- Ⓔ Heating circuit pump "On"

Selecting the set room temperature

Individually adjustable for each heating circuit. The heating curve is offset along the set room temperature axis. With the heating circuit pump logic function enabled, the curve modifies the starting and stopping characteristics of the heating circuit pump.

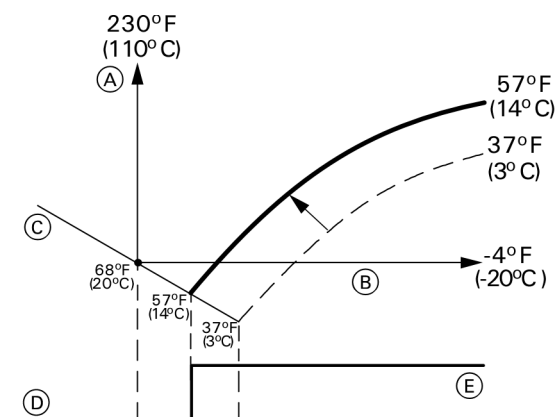
Changing the standard set room temperature



Refer to the Vitocrossal 300 CA3B Operating Instructions.

Adjusting the Heating Curve *(continued)*

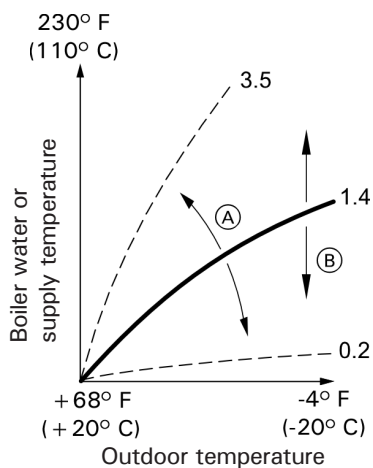
Reduced set room temperature



Adjustment of the reduced set room temperature from 37°F to 52°F (3°C to 14°C).

Legend

- Ⓐ Boiler water temperature or supply temperature
- Ⓑ Outdoor temperature
- Ⓒ Set room temperature
- Ⓓ Heating circuit pump "Off"
- Ⓔ Heating circuit pump "On"



Legend

- Ⓐ Changing the slope
- Ⓑ Changing the shift (vertical parallel offset of the heating curve)

Changing the standard set room temperature



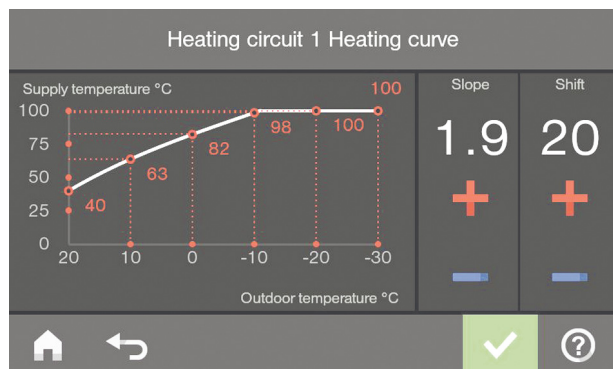
Refer to the Vitocrossal 300 CA3B Operating Instructions.

Changing the slope and shift

Individually adjustable for each heating circuit.

From the home screen tap the following buttons:

- 1.
- 2.
3. "Heating circuit 1", "Heating circuit 2" or "Heating circuit 3" as the required heating circuit.
4. "Heating curve".
5. $\pm$ for the required value for "Slope" or "Shift".
6. to confirm.



Boiler Water Temperature Control

Brief description

- The boiler water temperature is regulated by modulating the burner.
- The set boiler water temperature is determined from the following coding:
 - Set supply temperature of the heating circuits connected to the control unit and the heating circuits connected via the LON BUS
 - External demand
 - DHW temperature target
- When the DHW tank is heated, the default set boiler water temperature is 36°F (20 K) above the set DHW temperature (adjustable via coding “60” in the “DHW” group).

Emissions test function

Enable the emissions test function on all control units.

The following functions are activated:

- Burner start
- Starting all pumps

Note: Only the heating circuit pump is switched ON in the case of boiler section 2/boiler section 3 control (this can be achieved through the relay test function of the lead boiler control).

- Mixing valve remains set to control function
Function duration < 30 min:
The burner operates at 100% output until the temperature limiter in the burner control unit switches off. The burner then cycles, with 100% output, around the value at the temperature limiter.
Function duration > 30 min (continuous):
Boiler water temperature at max. set value, e.g. 194°F (90°C).
The burner is operated in modulating mode.
This prevents excessive cycling if emissions testing is carried out over an extended period.

Heating Circuit Control

Only for single boiler and cascade control units

Brief description

- The control unit features control circuits for one heating circuit without mixing valve A1 (heating circuit 1) and two heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3).
- The set supply temperature of each boiler is determined from the following coding:
 - Outdoor temperature
 - Set room temperature
 - Operating mode
 - Heating curve slope and shift
- The supply temperature of the heating circuit without mixing valve corresponds to the common system supply temperature.
- The supply temperature of the heating circuits with mixing valve is regulated by the stepped opening or closing of the mixing valves.
The mixing valve motor control changes the actuating and pause times subject to the control differential (control deviation).

Functions

The heating circuit without mixing valve is subject to the boiler water temperature and its control range limits.

The heating circuit pump is the only actuator.

The supply temperature of the heating circuits with mixing valve is captured by the supply temperature sensor of the relevant heating circuit.

- Upper control limit:
Electronic maximum supply temperature limit coding address "c6" in the "Heating circuit..." group.
- Lower control range limit:
Electronic minimum supply temperature limit coding address "c5" in the "Heating circuit..." group.

Time program

The control unit switches over according to the time program. In the "Heating and DHW" operating program, the control unit switches between "Central heating with standard room temperature" and "Central heating with reduced room temperature".

Every operating mode has its own set level. 4 time phases per day can be selected.

Outdoor temperature

A heating curve must be set for matching the control unit to the building and the heating system.

The heating curve characteristics determine the set boiler water temperature subject to outdoor temperature.

The control unit uses an average outdoor temperature.

This comprises the actual and the adjusted outdoor temperature.

Room temperature

In conjunction with a remote control and room temperature hook-up (coding "b0" in the "Heating circuit..." group):

Compared with the outdoor temperature, the room temperature has a greater influence on the set boiler water temperature (changed at coding "b2" in the "Heating circuit..." group).

In conjunction with heating circuits with mixing valve: For control differentials (actual value deviation) above 4°F (2 K) room temperature, the influence can be increased further (coding "b6" in the "Heating circuit..." group):

- Quick heat-up
The set room temperature must be raised by at least 4°F (2 K) by the following measures:
 - Enabling comfort mode
 - Changing from central heating with reduced temperature to central heating with standard temperature
 - Start optimization (coding "b7" in the "Heating circuit..." group) Quick heat-up will stop when the set room temperature has been reached.
- Quick setback
The set room temperature must be reduced by at least 4°F (2 K) by the following measures:
 - Activating economy mode
 - Changing from central heating with standard temperature to central heating with reduced temperature
 - Shutdown time optimization (coding address "c1" in the "Heating circuit..." group)
Quick setback ends when the set room temperature has been reached.

Heating Circuit Control *(continued)*

DHW temperature

Priority control

- With priority control: (coding address "a2:2" in the "Heating circuit..." group):
The set supply temperature will be adjusted to 32°F (0°C) during tank heating. The mixing valve closes and the heating circuit pump is switched off.
- Without priority control:
The heating circuit control unit continues to operate with the same set value.
- With modulating priority control in conjunction with heating circuits with mixing valve:
The heating circuit pump remains switched on. During tank heating the set supply temperature of the heating circuit will be reduced until the set boiler water temperature has been reached. The set supply temperature is determined from the following coding:
 - Outdoor temperature
 - Differential between the set and the actual boiler water temperature
 - Heating curve slope and shift
 - Set coding "a2" in the "Heating circuit..." group

Heating circuit pump logic – Economy circuits

The heating circuit pump is switched OFF [set supply temperature set to 32°F (0°C)] if one of the following criteria is met:

- The outdoor temperature selected in coding "a5" in the "Heating circuit..." group exceeds the set value.
- The adjusted outdoor temperature exceeds the value set in coding "a6" in the "Heating circuit..." group.
- The mixing valve has been attempting to close for more than 12 min. (mixing valve economy function, coding "a7" in the "Heating circuit..." group).
- The pump idle time selected in coding "a9" in the "Heating circuit ..." group is reached.
Requirements:
 - There is no risk of frost.
 - Coding "b0" in the "Heating circuit..." group must be set to 0.

Note: If, during the pump idle time, the system is switched to heating mode or the set room temperature is increased, the heating circuit pump is switched ON, even if the time has not yet elapsed.

- The actual room temperature exceeds the value set in coding "b5" in the "Heating circuit ..." group.

System dynamics

The mixing valve control characteristics can be influenced at coding "c4" in the "Heating circuit..." group.

Central control

Coding "7a" in the "General" group enables you to program central control to one heating circuit.

The operating and holiday program then applies to all additional heating circuits of the system.

For these heating circuits, when the operating and holiday program is enabled, "Central control" is displayed. Any holiday programs that may have been set will be deleted.

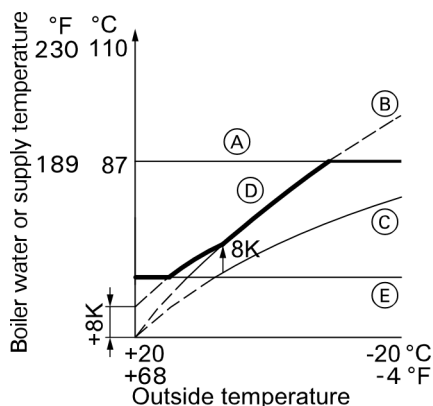
Party and economy modes cannot be enabled on all control units.

Frost protection

The supply temperature is held in accordance with the heating curve for the reduced set room temperature, but at least at 50°F (10°C).

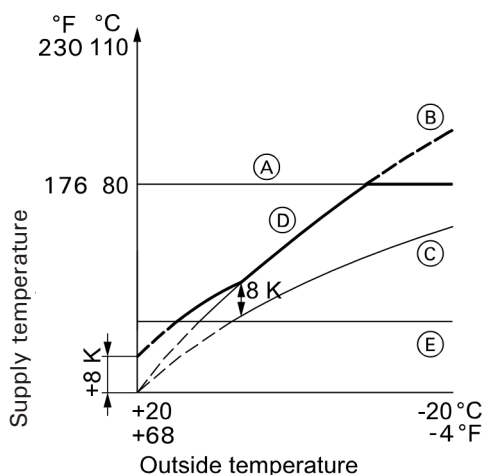
A variable frost limit can be set in line with coding address "a3" in the "Heating circuit..." group.

Heating Circuit Control *(continued)*



Legend

- (A) Max. boiler water temperature
- (B) Slope = 1.8 for heating circuit without mixing valve
- (C) Slope = 1.2 for heating circuit with mixing valve
- (D) Boiler water temperature [with a differential temperature = 15°F (8 K)]
- (E) Lower boiler water temperature, defaulted by the boiler coding card



Legend

- (A) Maximum supply temperature limit (coding "37" in the "Cascade" group)
- (B) Slope = 1.8 for heating circuit without mixing valve
- (C) Slope = 1.2 for heating circuit with mixing valve
- (D) Common supply temperature [at a differential temperature = 15°F (8 K)]
- (E) Lower common supply temperature

Supply temperature control single boiler control unit

Differential temperature:

The differential temperature can be set at coding "9f" in the "General" group, factory set condition: 15°F (8 K). The differential temperature is the minimum value by which the boiler water temperature should be higher than the highest currently required supply temperature of the heating circuit with mixing valve.

- System with only one heating circuit with mixing valve:
The set boiler water temperature will be automatically regulated to 15°F (8 K) above the set supply temperature.
- System with heating circuit without mixing valve and heating circuit with mixing valve:
The set boiler water temperature operates in accordance with its own heating curve. The differential temperature of 15°F (8 K) towards the set supply temperature is set at the factory.

Supply temperature control cascade control unit

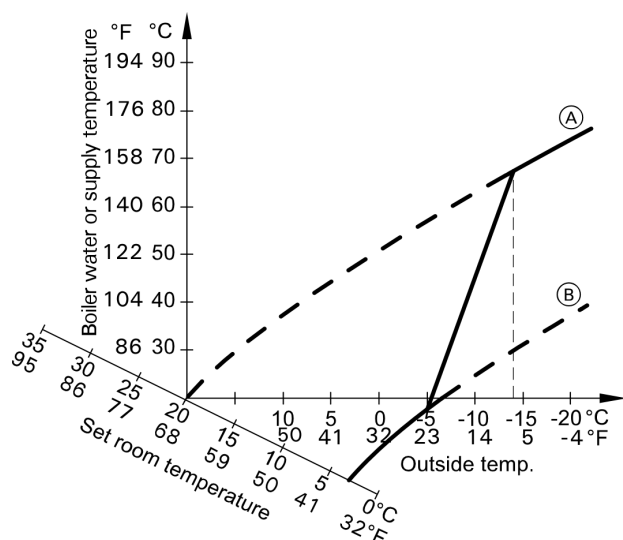
Differential temperature:

The differential temperature can be set at coding "9f" in the "General" group, factory set condition 15°F (8 K). The differential temperature is the value by which the common supply temperature should be higher than the highest currently required supply temperature of the heating circuit with mixing valve.

- System with only one heating circuit with mixing valve:
The common set supply temperature is regulated automatically to 15°F (8 K) above the set supply temperature of the heating circuit with mixing valve.
- System with heating circuit without mixing valve and heating circuits with mixing valve:
The common set supply temperature operates in accordance with its own heating curve. The differential temperature of 15°F (8 K) towards the set supply temperature of the heating circuits with mixing valve is set at the factory.

Heating Circuit Control *(continued)*

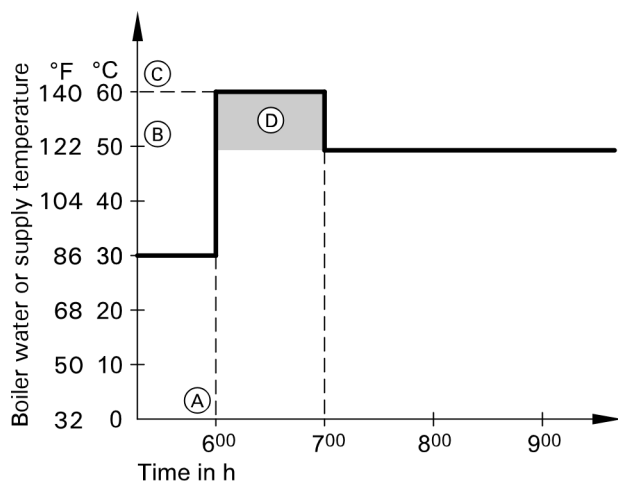
Example using the settings in the factory set condition



Legend

- Ⓐ Heating curve for operation with standard room temperature
- Ⓑ Heating curve for operation with reduced room temperature

Example using the settings in the factory set condition



Legend

- Ⓐ Start of operation with standard room temperature
- Ⓑ Set boiler water or supply temperature in accordance with the selected heating curve
- Ⓒ Set boiler water or supply temperature in accordance with coding "fa":
 $122^{\circ}\text{F} (50^{\circ}\text{C}) + 20\% = 146^{\circ}\text{F} (60^{\circ}\text{C})$
- Ⓓ Duration of operation with higher boiler water or set supply temperature in accordance with coding "fb": 60 min

Raising the reduced room temperature

During operation with reduced room temperature, the reduced set room temperature can be automatically raised subject to the outdoor temperature.

The temperature is raised in accordance with the selected heating curve, but no higher than the set standard room temperature.

The outdoor temperature limits for the start and end of temperature raising can be set in coding "f8" and "f9" in the "Heating circuit..." group.

Reducing the heat-up time

During the transition from operation with reduced room temperature to operation with standard room temperature, the boiler water or supply temperature will be raised in accordance with the selected heating curve. The boiler water or supply temperature increase can be automatically raised.

The value and duration for the additional raising of the boiler water temperature or set supply temperature can be set in coding "fa" and "fb" in the "Heating circuit..." group.

Control sequence

Mixing valve circuit

The mixing valve motor will not be switched within the "neutral zone" $\pm 2^{\circ}\text{F} (\pm 1\text{ K})$.

Supply temperature drops

(Set value $-2^{\circ}\text{F} (-1\text{ K})$)

The mixing valve motor receives the signal "mixing valve open". The signal duration lengthens with an increasing control differential. The duration of pauses reduces with an increasing control differential.

Supply temperature rises

(set value $+2^{\circ}\text{F} (+1\text{ K})$)

The mixing valve motor receives the signal "mixing valve close". The signal duration lengthens with an increasing control differential. The duration of pauses reduces with an increasing control differential.

DHW Tank Temperature Control

Brief description

- The tank temperature control is a constant temperature control function. This is achieved by starting and stopping the DHW pump. The switching differential is $\pm 5^{\circ}\text{F}$ ($\pm 2.5\text{ K}$).
- When the DHW tank is heated, a set supply temperature is specified that is 36°F (20 K) higher than the set DHW temperature (adjustable at coding "60" in the "DHW" group).

Functions

Time program

An automatic or an individual time program may be selected for DHW pump and the DHW recirculation pump. Compared with the heating circuit heatup phase, DHW heating starts 30 min earlier in automatic mode. The individual time program enables up to 4 time phases per day to be set for DHW pump and the DHW recirculation pump for every day of the week. All tank heating sequences will be completed independently of the time program.

In conjunction with coding "7f" in the "General" group

- Detached house
Coding "7f:1":
 - Automatic mode
The heating times for heating circuit 1 are applied to systems with two or three heating circuits.
 - Individual time program
The time phases for DHW pump and the DHW recirculation pump have the same effect on all heating circuits.
- Apartment building
Coding "7f:0":
 - Automatic mode
For systems with two or three heating circuits, the heating times for the respective heating circuit will be applied.
 - Individual time program
The time phases for DHW pump and the DHW recirculation pump can be adjusted individually for each heating circuit.

Frost protection

The DHW tank will be heated to 68°F (20°C) if the DHW temperature falls below 41°F (5°C).

Forth phase heating function

(auxiliary function for DHW heating)

This function is activated by providing a second set DHW temperature at coding "58" in the "DHW" group and activating the fourth DHW phase for DHW heating.

Set DHW temperature

The set DHW temperature can be adjusted between 50°F and 140°F (10°C and 60°C).

Coding "56" in the "DHW" group enables the set range to be extended to 203°F (95°C).

Coding "66" in the "DHW" group enables the set value of the programming unit and/or remote control Vitotrol 300 to be assigned.

Priority control

- With priority control: (coding "a2:2" in the "Heating circuit..." group):
The set supply temperature will be adjusted to 32°F (0°C) during tank heating. The mixing valve closes and the heating circuit pump is switched off.
- Without priority control:
The heating circuit control unit continues to operate with the same set value.
- With modulating priority control in conjunction with heating circuits with mixing valve:
The heating circuit pump remains switched on. During tank heating the set supply temperature of the heating circuit will be reduced until the set boiler water temperature has been reached. The set supply temperature is determined from the following coding:
 - Outdoor temperature
 - Differential between the set and the actual boiler water temperature
 - Heating curve slope and shift
 - Set coding "a2" in the "Heating circuit..." group

DHW recirculation pump

This delivers hot water to the draw-off points at adjustable times. Four time phases can be selected at the control unit for every day.

Auxiliary circuits

DHW heating in conjunction with the heating circuits can be disabled or enabled by changing over the operating program (see coding "d5" in the "Heating circuit..." group).

System with tank loading system

The above functions also apply in conjunction with tank loading systems.

Set the following coding:

"55:3" in the "DHW" group; "4c:1",

"4e:2" in the "General" group.

The DHW tank is only reheated by the boiler if the temperature falls below this value.

System with solar control unit

A third set DHW temperature can be assigned at coding "67" in the "DHW" group.

The DHW tank is only reheated by the boiler if the temperature falls below this value.

DHW Tank Temperature Control *(continued)*

Controlled sequence single boiler control

Coding "55:0" in the "DHW" group; tank heating
The DHW tank goes cold [set value -5°F (-2.5 K), adjustable via coding "59"]:

- The set boiler water temperature is set 36°F (20 K) higher than the set DHW temperature (adjustable via coding "60").
- Pump on:
 - Starting the DHW pump is subject to boiler water temperature (coding "61:0").
The DHW pump starts when the boiler water temperature is 14°F (7 K) higher than the DHW temperature.
 - Starting the DHW pump for tank heating immediately (coding "61:1").

The DHW tank is hot [set value +5°F (+2.5 K)]:

- The set boiler water temperature is reset to the weather-compensated set value.
- Pump delay off:
The DHW pump runs on after tank heating until one of the following criteria is met:
 - The differential between the boiler water temperature and the DHW temperature is less than 13°F (7 K).
 - The weather-compensated set boiler water temperature has been reached.
 - The set DHW temperature is exceeded by 10°F (5 K).
 - The set max. delay off time is reached (coding "62").
- Without pump delay off (coding "62:0").

Adaptive tank heating

Coding "55:1" in the "DHW" group;

With adaptive tank heating, the speed of the temperature rise during DHW heating is taken into account.

The DHW tank goes cold [set value -5°F (-2.5 K), adjustable via coding "59"]:

- The set boiler water temperature is set 36°F (20 K) higher than the set DHW temperature (adjustable via coding "60").
- Pump on:
 - Starting the DHW pump is subject to boiler water temperature (coding "61:0").
The DHW pump starts when the boiler water temperature is 13°F (7 K) higher than the DHW temperature.
 - Starting the DHW pump immediately (coding "61:1").

The DHW tank is hot:

- The control unit checks whether the boiler will still be required to supply heating energy after the tank has been heated up or whether residual boiler heat should be transferred to the DHW tank.
Accordingly, the control unit determines the burner and DHW pump stop times to prevent the set DHW temperature being substantially exceeded after the tank has been heated up.

Tank temperature control with 2 tank temperature sensors

Coding "55:2" in the "DHW" group;

Tank temperature sensor 1 enables the DHW pump and is evaluated for stop conditions during the pump delay off time.

Tank temperature sensor 2:

Tank heating will start early if a lot of hot water is drawn off. Tank heating will terminate early if no hot water is drawn off.

DHW tank goes cold:

- Set value -5°F (-2.5 K), change at coding "59" or...
- Actual DHW temperature at sensor 2 < set DHW temperature x factor for start time (adjustment at coding "69")

The DHW tank is hot:

- set value 5°F (2.5 K) and...
- Actual DHW temperature at sensor 2 > set DHW temperature x factor for stop time (adjustment at coding "68")

Coding "55:3" in the "DHW" group;

tank temperature control tank loading system

The DHW tank goes cold [set value -5°F (-2.5 K); change at coding "59"]:

- The set boiler water temperature is set 36°F (20 K) higher than the set DHW temperature (adjustable via coding "60").
- The primary pump in the tank loading system starts.
- The 3-way mixing valve opens and then regulates to the specified set value.
- The DHW pump cycles (briefly switches on and off) until the set supply temperature has been reached [set DHW temperature + 10°F (+5 K)].
Then it runs constantly. If, during heating, the actual value falls below the required set temperature, the DHW pump will temporarily cycle again.

The DHW tank is hot:

- Tank temperature sensor 1:
Actual value ≥ set value and...
- Tank temperature sensor 2:
Actual value > set value -3°F (-1.5 K):
- The set boiler water temperature is reset to the weather-compensated set value.
- The DHW pump stops immediately when the 3-way mixing valve is fully opened.
or...
- The DHW pump stops after expiry of the delay off time that is selected at coding "62".

Setting the Boiler Sequence (burner sequence)

Function	Parameter
"Lead boiler or boiler sequence changeover"	38
"Permanent lead boiler"	39
"Permanent last boiler"	3A
"Boiler ECO threshold"...	41 to 44, 65, 6F, 74, 7D

Setting the boiler sequence (burner sequence)

- Every boiler/burner can be blocked or enabled subject to the outside temperature by means of the ECO threshold.
- The ECO threshold has no effect if a boiler is required to achieve the set flow temperature in the case of enabled boilers failing.
- At least the lead boiler remains in operation when all boilers in a system would otherwise be blocked by the ECO threshold.

Tap the following buttons:

1. 
2. "Boiler sequence"
3. Select the required boiler sequence (burner sequence). Confirm with .

Cascade Control Unit

Brief description

The supply temperature is regulated by starting or stopping the burners or by starting/stopping individual burner stages.

- Standalone control
- Sequential control
- Subject to system version, a difference is made between the condensing strategy and 2 conventional boiler strategies

Set supply temperature

The set supply temperature is determined from the following coding:

- Set supply temperature of heating circuit without mixing valve A1 (heating circuit 1) and heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3).
- Set supply temperature of further consumers.
- DHW temperature target.
- External demands.

Upper control range limits:

Maximum system supply temperature limit (coding "37" in the "Cascade" group).

Lower control range limits:

Minimum system supply temperature limit (coding "36" in the "Cascade" group).

Standalone control

Note: Vitocrossal 300, type CA3B, operate in parallel and with condensing strategy

Cascade Control Unit *(continued)*

Boilers connected in parallel	Boilers connected in series
■ Without and with supply temperature sensor (see the following table). ■ The cascade control specifies the set boiler water temperature for all currently active boilers. Every boiler control unit regulates to the specified set value. The following control strategies are available: ■ Condensing strategy (refer to page 47) ■ Conventional boiler strategy 1 (refer to page 47) ■ Conventional boiler strategy 2 (refer to page 47)	■ Without and with supply temperature sensor (see the following table). ■ The control strategy is set automatically to conventional boiler strategy 2, coding "3c:2" in the "Cascade" group (refer to page 84). ■ The cascade control specifies the set boiler water temperature for all currently active boilers. Every boiler control unit regulates to the specified set value. If the boiler section 1 (condensing boiler) does not achieve the specified set value, it will only act to control the return temperature of the conventional boiler downstream. The conventional boiler is started late and is also shut down late.
With supply temperature sensor	Without supply temperature sensor
Set coding "3b:1" or "3b:3" in the "Cascade" group. The control deviation is calculated from the set supply temperature and the actual supply temperature to determine the start and shutdown criteria.	Set coding "3b:0" or "3b:2" in the "Cascade" group. To determine the start and stop criteria, the control deviation is calculated from the set boiler water temperature and the estimated average actual boiler water temperature of the currently active boilers. Only boilers with open motorized isolation valves are taken into consideration.

Sequential control

- With supply temperature sensor.
- Set coding "3b:4" in the "Cascade" group.
- The control strategy is set automatically to conventional boiler strategy 2, coding "3c:2" in the "Cascade" group (refer to page 84).
- The cascade control unit regulates to the specified set supply temperature by stipulating the output for each individual boiler. The boiler section 1 can be operated in modulating mode. All other boilers are operated in two stages via a specified output (incl. modulating burners).

Control strategies

Condensing strategy

Benefit:

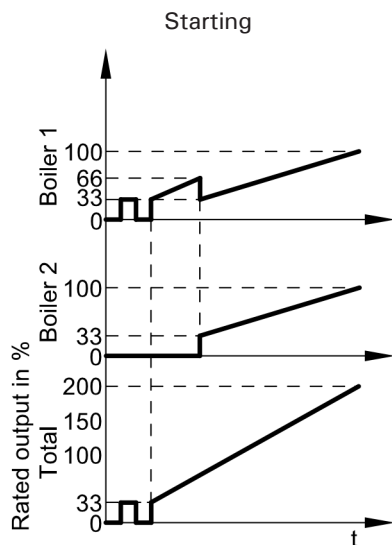
Optimal utilization of the condensing effect and long burner run-times.

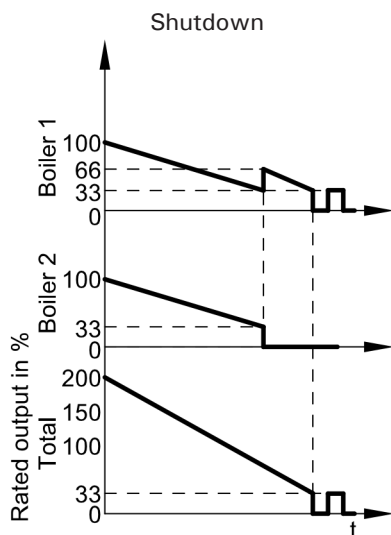
Set coding "3C:0" in the "Cascade" group. It is the aim of the condensing strategy to operate as many boilers as possible at the lowest output level.

■ Starting criterion:

An output statement causes the boilers to start (Coding "3d:1" in the "Cascade" group).

An additional boiler will start if the current heat demand can be covered by the currently active boilers plus the next boiler in the boiler sequence.



Cascade Control Unit *(continued)*

■ **Shutdown criterion:**

The boilers are shut down via a shutdown integral. When the shutdown integral exceeds a limit set at coding "47" in the "Cascade" group, the shutdown criterion is met and the boiler started last will be shut down.

Example (coding "3C:0" in the "Cascade" group)

Two-boiler system with modulating burners:

- Boiler 1: 100% rated heating output (base load set to 33%)
- Boiler 2: 100% rated heating output (base load set to 33%)

Conventional boiler strategies

	Conventional boiler strategy 1	Conventional boiler strategy 2
Benefit	The number of boilers in operation is the lowest possible. Set coding "3C:1" in the "Cascade" group. It is preferable to operate conventional boilers at their upper output range, to reliably prevent formation of condensate when return temperatures are low. An additional boiler will only be started if the maximum output of all currently active burners is insufficient to achieve the supply temperature set value. A boiler will be shut down when the remaining boilers can achieve the required output on their own.	Long burner run times. Set coding "3C:2" in the "Cascade" group (factory set condition). An additional boiler will only be started if the maximum output of all currently active burners is insufficient to achieve the supply temperature set value. A boiler will be shut down if the burners were ramped down to their minimum output because of a major negative control deviation and the output is still too high.
Starting criterion	The boilers are started via a starting integral. The next boiler in the boiler sequence will be started if the value set in coding "45" in the "Cascade" group is exceeded.	The boilers are started via a starting integral. The next boiler in the boiler sequence will be started if the value set in coding "45" in the "Cascade" group is exceeded.
Shutdown criterion	A reduction in output causes the boilers to shut down (Coding "3d:1" in the "Cascade" group). A boiler will be shut down when the currently required output can be achieved without the most recently started boiler.	The boilers are shut down via a shutdown integral. When the shutdown integral exceeds a limit set at coding "47" in the "Cascade" group, the shutdown criterion is met and the boiler started last will be shut down.

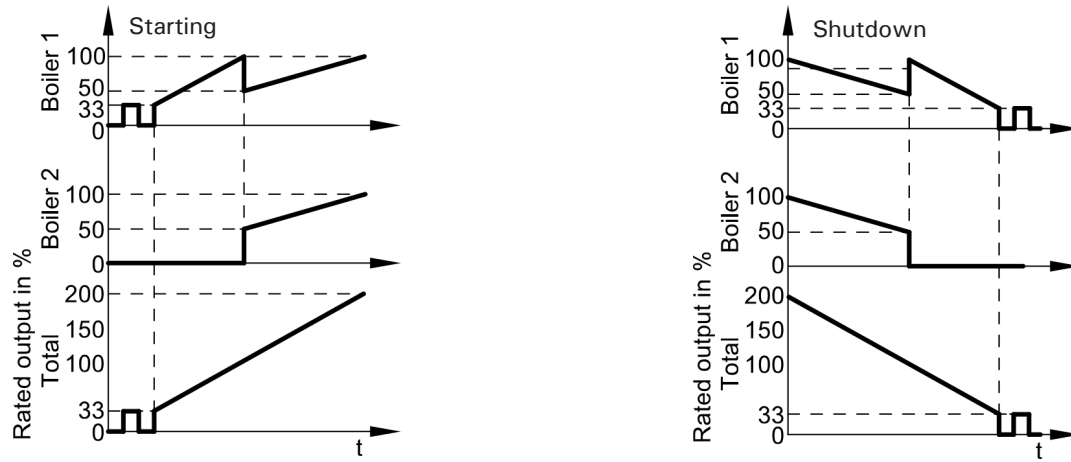
Examples

Two-boiler system with modulating burners:

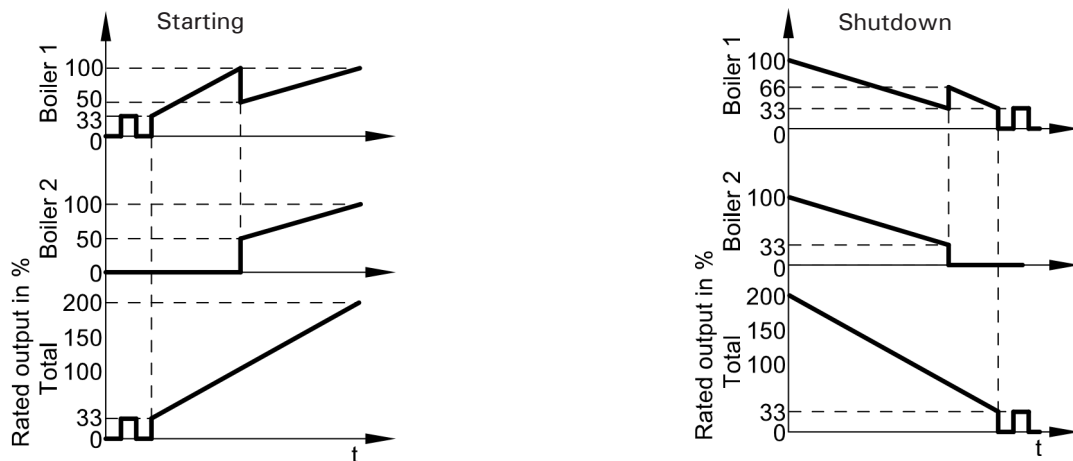
- Boiler 1: 100% rated heating output (base load set to 33%)
- Boiler 2: 100% rated heating output (base load set to 33%)

Cascade Control Unit *(continued)*

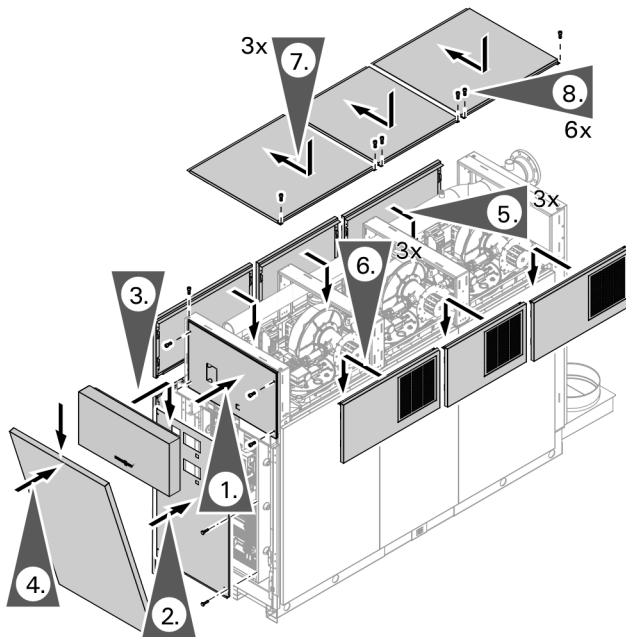
Conventional boiler strategy 1 (coding "3c:1" in the "Cascade" group)



Conventional boiler strategy 2 (coding "3c:2" in the "Cascade" group)



Installing the Boiler Panels



1. Install the top front cover plate with 4 screws (for CA3B 5.0 and 6.0 only).
2. Install the lower front cover plate with 6 screws from the lower front cover plate.
3. Install the top front panel (for CA3B 5.0 and 6.0 only).
4. Insert the bottom of the lower front panel in place and push into place.
5. Install the bottom left side and top left side panels.
6. Install the top right side panels.
7. Slide the top panels toward the left side.
8. Install with screws to the right side of the top panels.

Turning the System Off

1. Turn off main power switch or power supply voltage and ensure against being unintentionally switched on again.



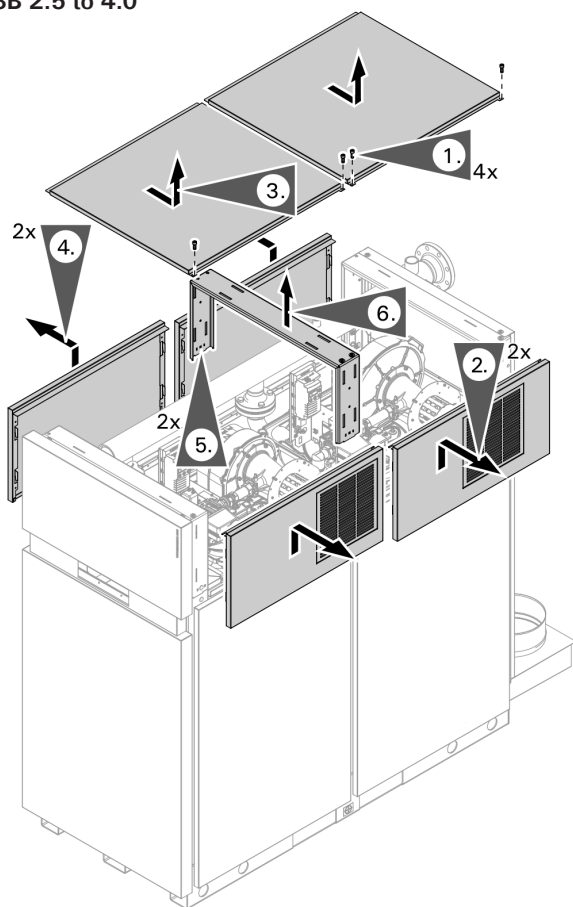
WARNING

Power supply voltage is dangerous and may cause life-threatening injury. The system must be disconnected from the power supply before maintenance work is performed.

2. Close central gas shut-off valve.

Preparing for Service Work

CA3B 2.5 to 4.0



! WARNING

Contact with hot surfaces can lead to burn injuries.
Undertake work on the burner only when the system is cold.

! WARNING

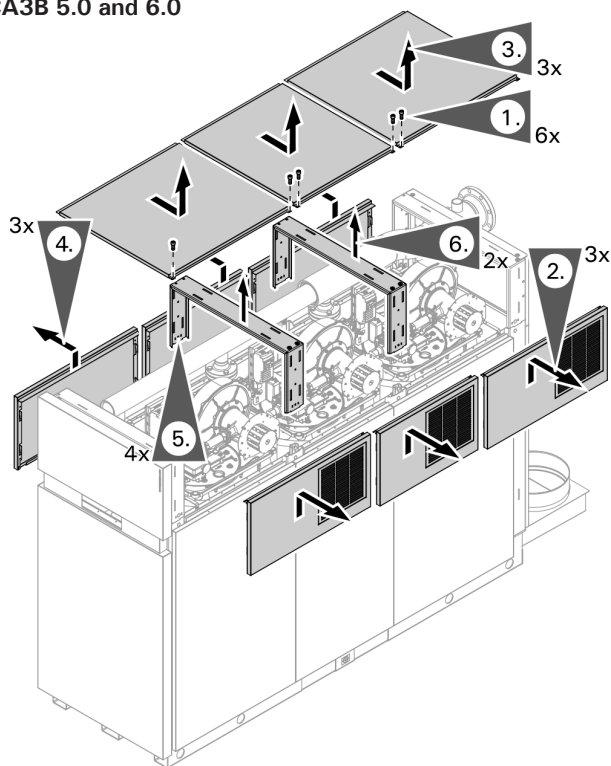
Escaping gas leads to a risk of explosion.
Close the gas shut-off valve.

IMPORTANT

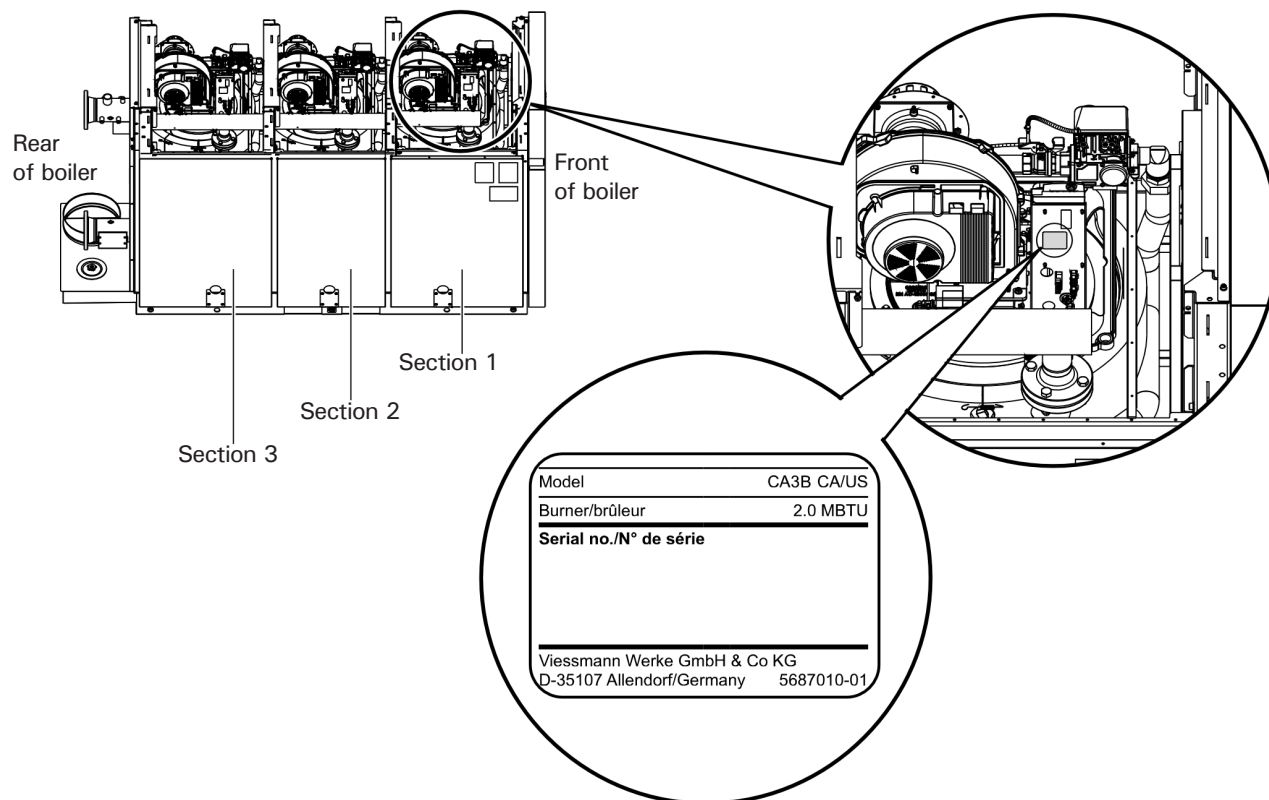
Disconnect power and close the gas shut-off valve to ensure system is shut down during any service work on the burner.

1. Remove the 4 screws from the right side of the top panels.
2. Lift and remove the top right side panels.
3. Slide the top panels toward the right side and remove.
4. Lift and remove the top left side panels.
5. Remove the nut and bolt from each side of the lower portion of the upper frame profiles.
Note: Removal of the upper frame profiles are required when removing the burner.
6. Remove the upper frame profiles.
7. Reinstall upper frame profiles and panels once service is completed.

CA3B 5.0 and 6.0



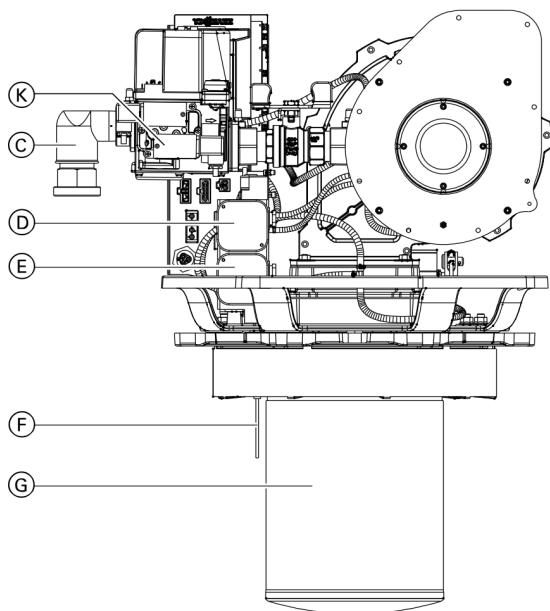
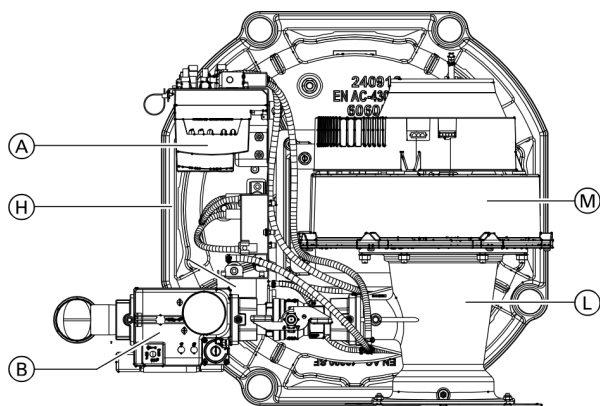
1. Remove the 6 screws from the right side of the top panels.
2. Lift and remove the top right side panels.
3. Slide the top panels toward the right side and remove.
4. Lift and remove the top left side panels.
5. Remove the nut and bolt from each side of the lower portion of the upper frame profiles.
Note: Removal of the upper frame profiles are required when removing the burner.
6. Remove the upper frame profiles.
7. Reinstall upper frame profiles and panels once service is completed.

Preparing for Service Work *(continued)***Burner Identification****Burner Combinations**

CA3B Boiler	Burner Input MBH		
	Section 1 (lead)	Section 2 (lag 1)	Section 3 (lag 2)
2.5	1250 (compact)	1250 (compact)	--
3.0	1500 (compact)	1500 (compact)	--
3.5	1500	2000	--
4.0	2000	2000	--
5.0	1500	1500	2000
6.0	2000	2000	2000

Burner Parts

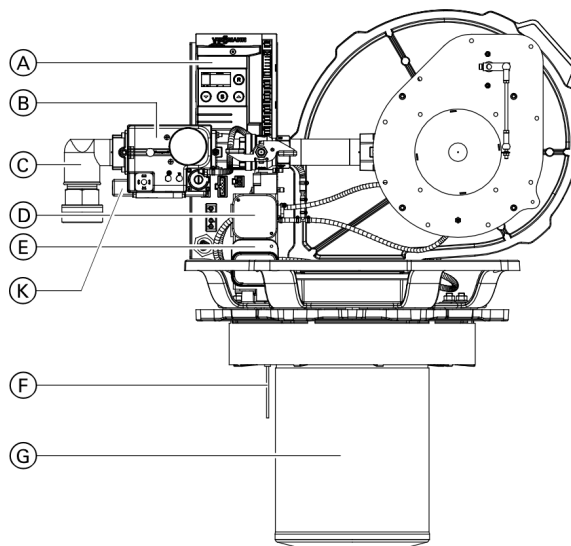
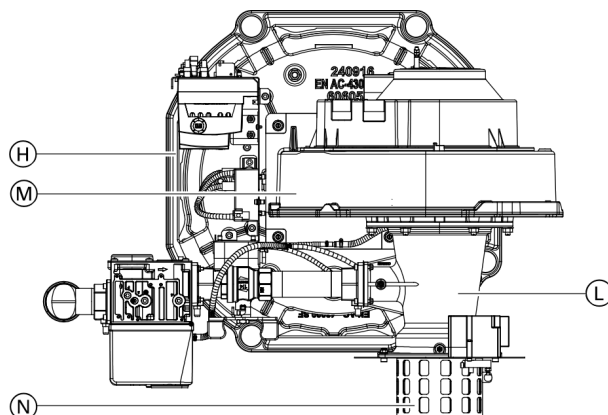
1.25/1.5 MMBH (CA3B 2.5 and 3.0)



Legend

- (A) Burner control unit
- (B) Gas train
- (C) Gas supply pipe
- (D) Air pressure switch 1
- (E) Air pressure switch 2
- (F) Ignition electrodes
- (G) Burner gauze assembly
- (H) Burner frame
- (K) Gas pressure switch
- (L) Venturi mixing pipe
- (M) Burner fan

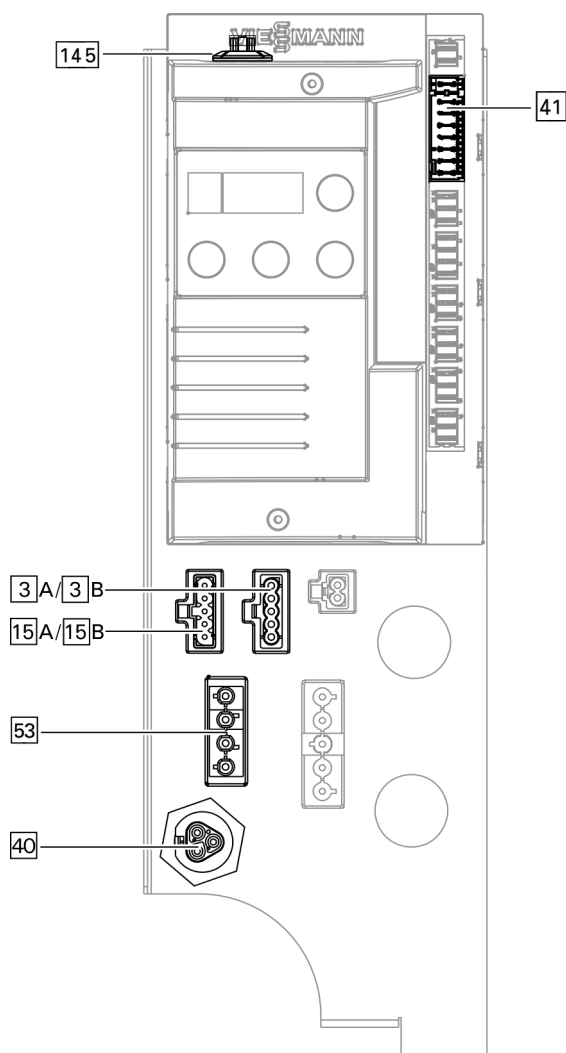
1.5/2.0 MMBH (CA3B 3.5 to 6.0)



Legend

- (A) Burner control unit
- (B) Gas train
- (C) Gas supply pipe
- (D) Air pressure switch 1
- (E) Air pressure switch 2
- (F) Ignition electrodes
- (G) Burner gauze assembly
- (H) Burner frame
- (K) Gas pressure switch
- (L) Venturi mixing pipe
- (M) Burner fan
- (N) Rotary damper with servomotor

Burner Interface Panel



1. Close the gas shut-off valve.
2. Switch OFF the main circuit breaker or the power supply and safeguard against unauthorized reconnection.

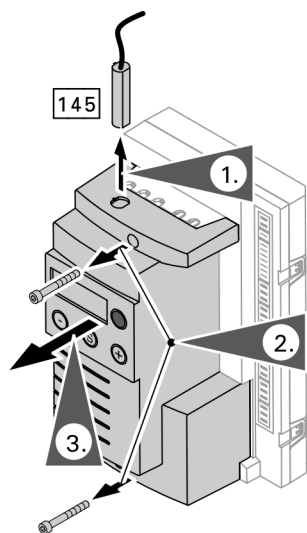


WARNING

Mains voltage can be extremely dangerous.
For maintenance work, isolate the system from the power supply.

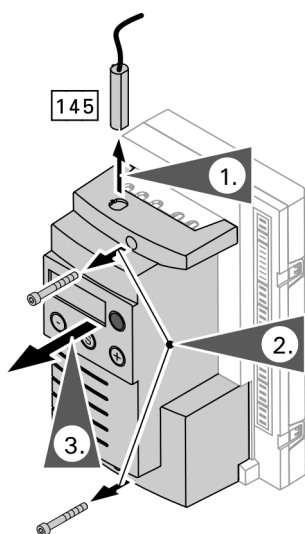
3. Remove the boiler left side panels (refer to page 50).
4. Disconnect power cable with plug **40**. Then disconnect the burner cables with plugs **3 A / 3 B**, **15 A / 15 B**, **41**, **53** and in addition to plug **145** from the burner control unit and pull out of the burner casing.

Display and Programming Unit of Burner Control Unit



1. Disconnect KM-BUS connector 145.
2. Undo 2 mounting screws. Torque when installing: 9 lb.in (1 Nm).
3. Lift the display and programming unit and pull off the connector of the burner control unit connecting cable. Remove the display and programming unit.
4. Install new display and programming unit in reverse order.

Coding Card on Burner Control Unit

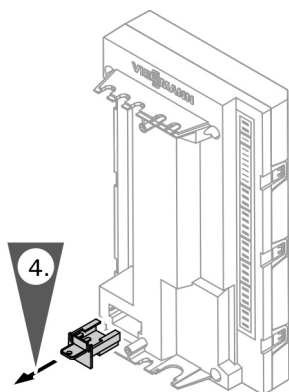


1. Disconnect KM-BUS connector 145.
2. Undo 2 mounting screws. Torque when installing: 9 lb.in (1 Nm).
3. Lift the display and programming unit and pull off the connector of the burner control unit connecting cable. Remove the display and programming unit.
4. Pull the coding card from the burner control unit.
5. Insert new coding card.

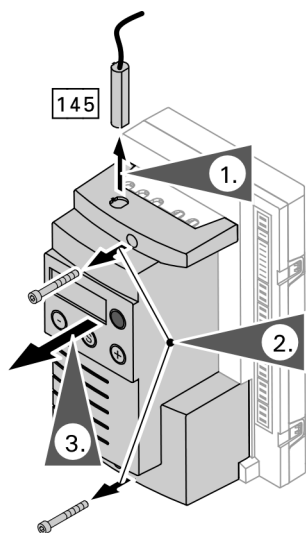
Note: If fault code "E 1" is displayed, check the coding card.



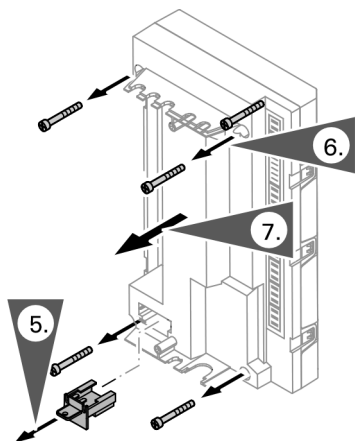
Refer to the Installation Instructions supplied with the burner coding card.



Burner Control Unit



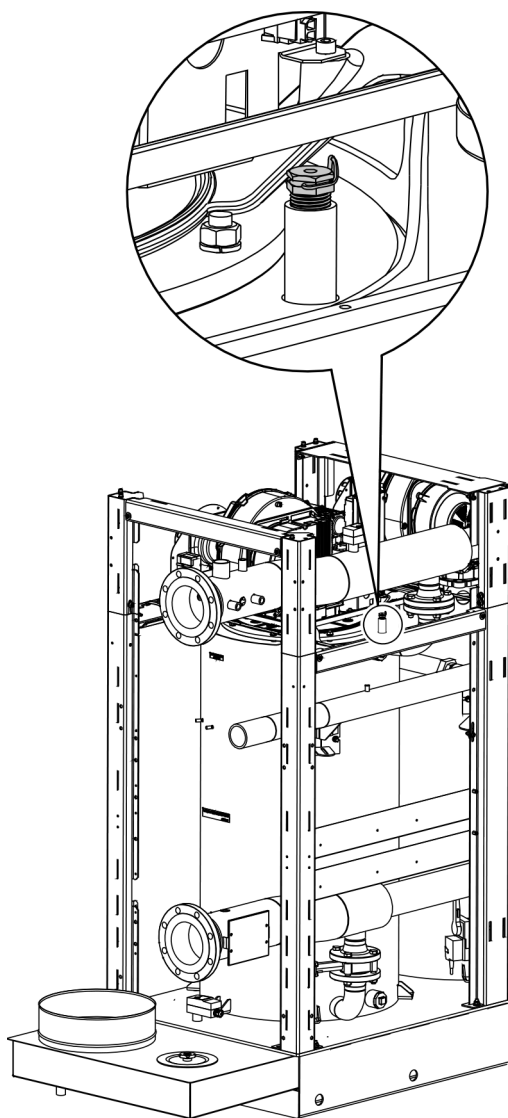
1. Disconnect KM-BUS connector **145**.
2. Undo 2 mounting screws. Torque when installing: 9 lb.in (1 Nm).
3. Lift the display and programming unit and pull off the connector of the burner control unit connecting cable. Remove the display and programming unit.
4. Remove all connecting cables from the burner control unit.
5. Pull the coding card from the burner control unit.
6. Undo 4 mounting screws on the burner control unit.
7. Remove the burner control unit.
8. Install the new burner control unit in reverse order.



Fuel Conversion NG to LPG

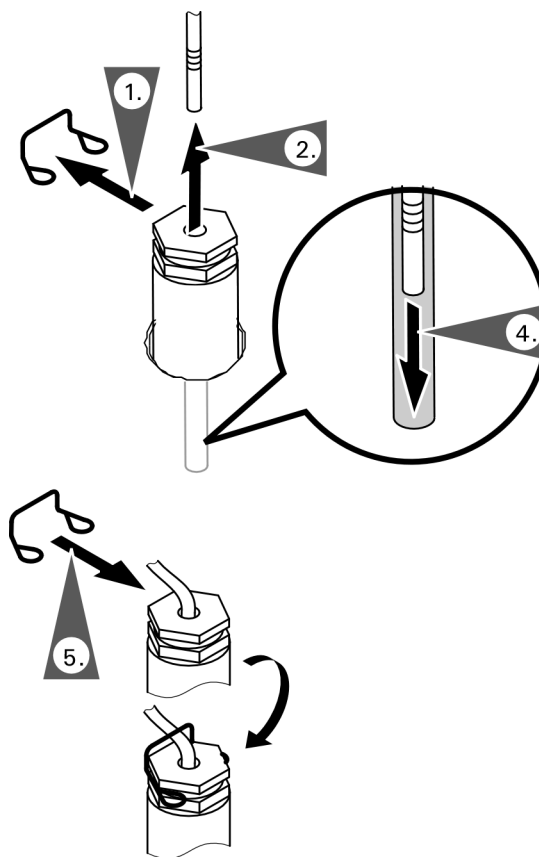


For more information, refer to the Installation Instructions supplied with the Conversion kit.

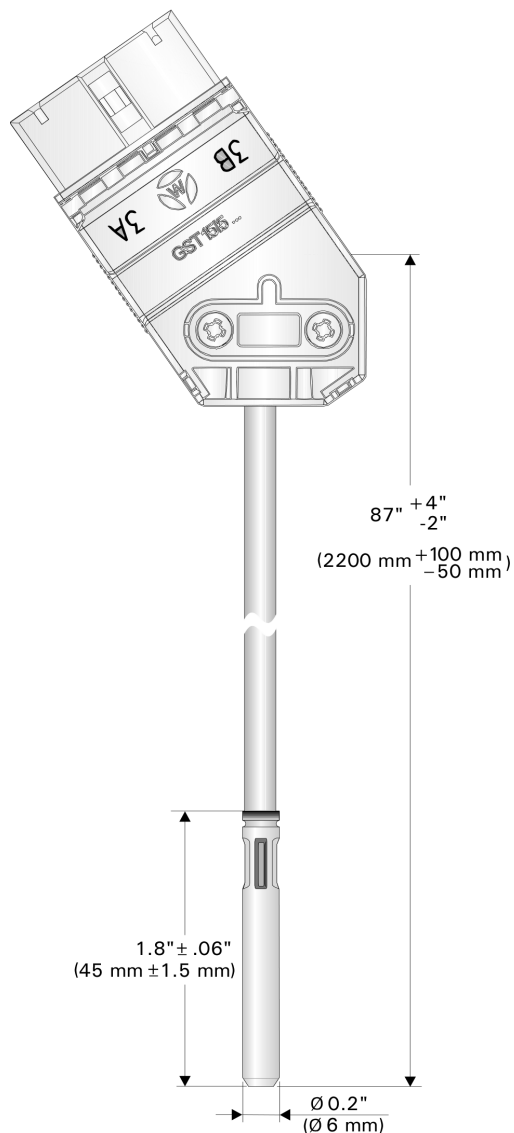
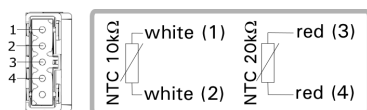
Boiler Water Temperature Sensor

Note: There is a boiler water temperature sensor located on each boiler section.

1. Remove spring clip from the sensor well and set aside.
2. Remove the boiler water temperature sensor from the sensor well.
3. Disconnect sensor cable plugs **3A/3B**.
4. Connect new sensor to sensor cable plugs **3A/3B** and install into the sensor well.
5. Reinstall spring clip.



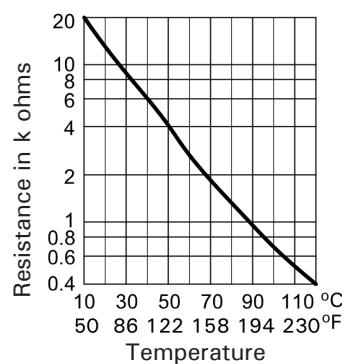
3A and 3B Boiler Temperature Sensor Description



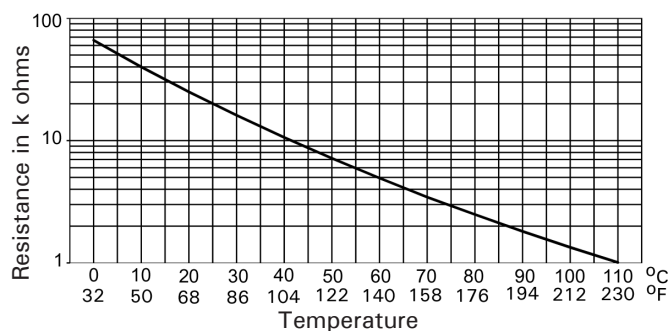
3A sensor (NTC 10kΩ) terminals 1 & 2

3B sensor (NTC 20kΩ) terminals 3 & 4

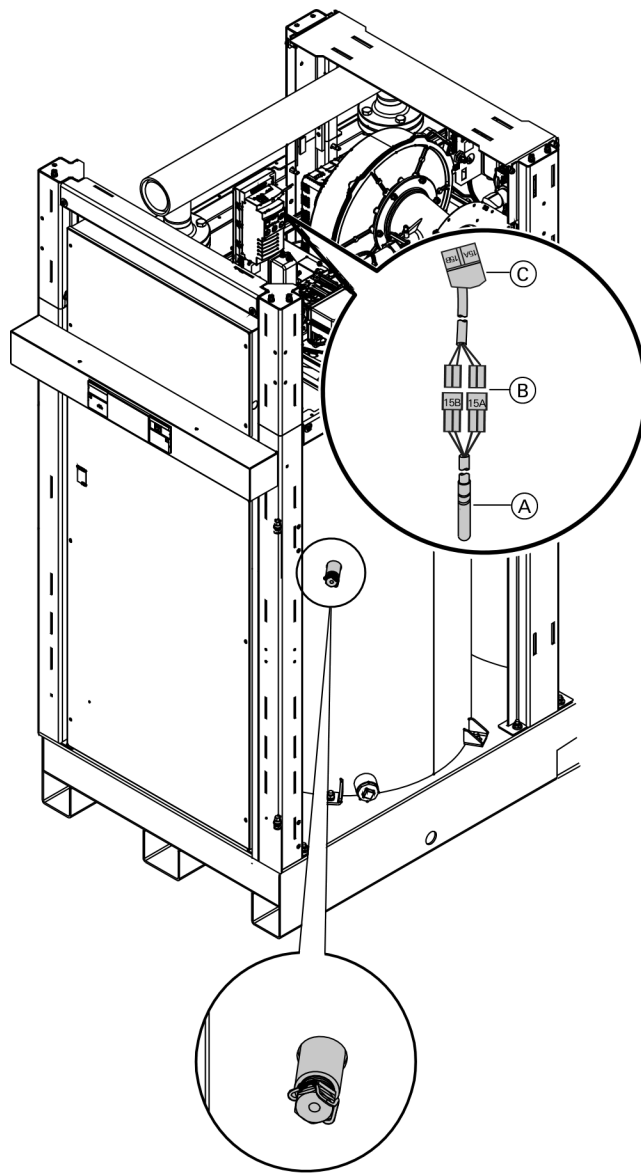
3A sensor (NTC 10kΩ)



3B sensor (NTC 20kΩ)

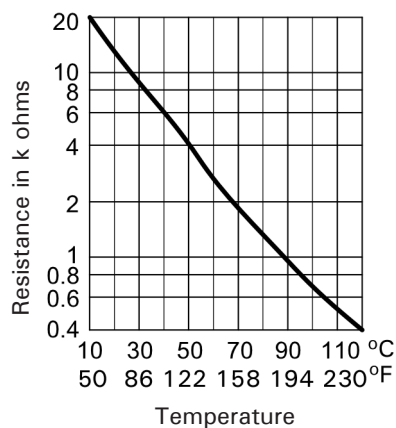


Boiler Secondary Temperature Sensor



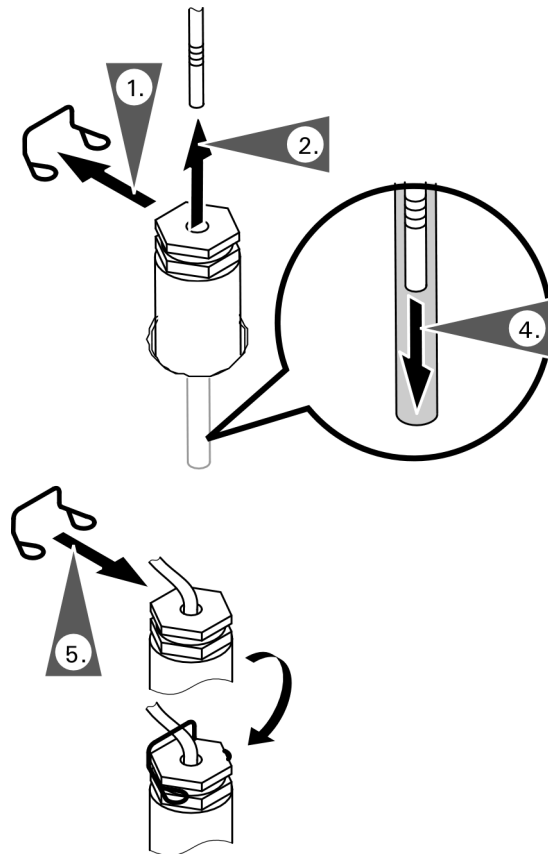
Legend

- (A) Temperature sensor
- (B) Connecting plugs 15A/15B
- (C) Burner control plug



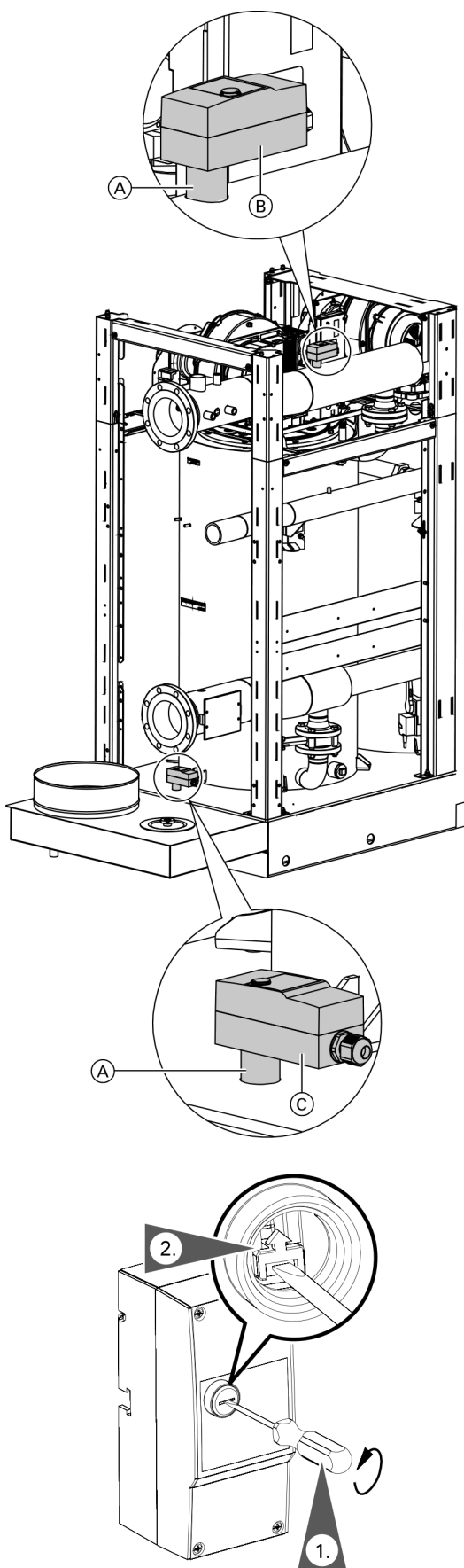
Note: The boiler secondary temperature sensor is located on the boiler section pressure vessel.

1. Remove spring clip from the sensor well and set aside.
2. Remove the boiler secondary temperature sensor from the sensor well.
3. Disconnect sensor cable plugs 15A/15B.
4. Connect new sensor to sensor cable plugs 15A/15B and install into the sensor well.
5. Reinstall spring clip.



Note: The sensor is located in each boiler section and the connecting plug is located at the burner control unit, for that boiler section.

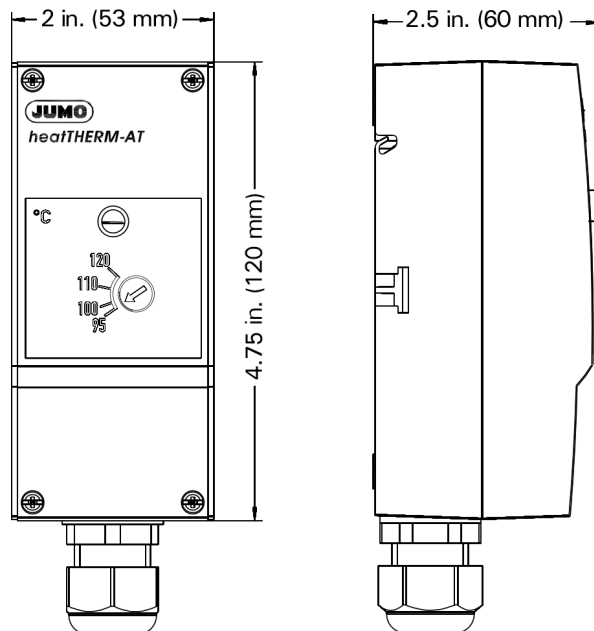
Manual Reset Limits



Temperature limit switch

If the temperature at the probe exceeds the set limit, the snap-action switch is operated, the circuit is opened or closed and the snap-action switch is locked out mechanically.

After the temperature has fallen below the limit temperature by about 14°F (8°C), the snap-action switch can be reset manually.



Legend

- Ⓐ Probe well
- Ⓑ Supply water temperature limit switch
- Ⓒ Flue gas temperature limit switch

IMPORTANT

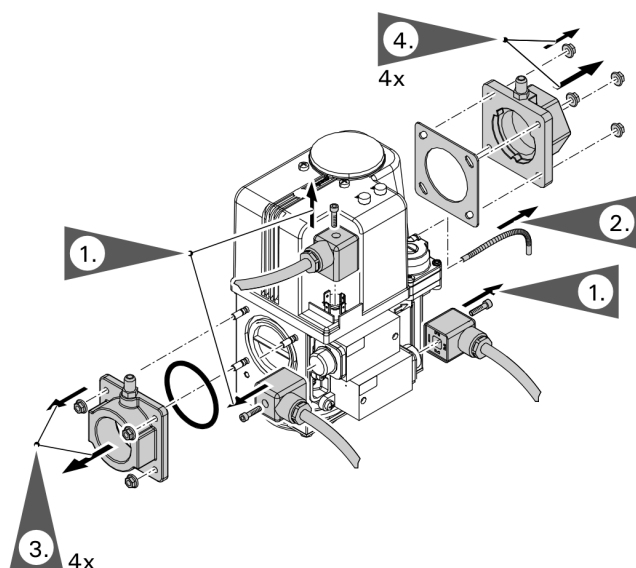
The switches are preset from the factory, do not adjust.

To reset the switch;

1. Unscrew the reset cap and set aside.
2. Reset the switch.
3. Reinstall the reset cap.

Note: If the switch cannot be reset, replace the switch.

Gas Valve



WARNING

Escaping gas leads to a risk of explosion.
Check the fitting for gas tightness.

Note: Reinstalled gas valve in the same orientation as originally installed.

1. Undo screws and pull connectors from the gas valve and both gas pressure switches.
2. Pull the compensation line from the gas valve.
3. Undo nuts on the gas line flange. Remove the flange.
4. Undo nuts on the Venturi flange. Remove the flange.

Assembly

Assembly in reverse order

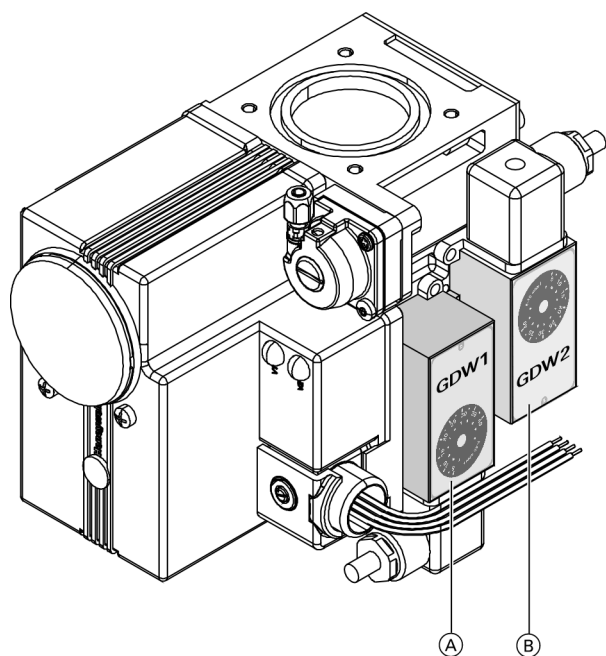
- Check for correct orientation when fitting.
- Replace the gaskets on the inlet and outlet sides.
- Secure the gas valve free from stress on the flange using screws. Torque: 13 lb.in (1.5 Nm)

Note: Never interchange the connecting cables of the two gas pressure switches (GDW 1 and GDW 2).



CAUTION

The use of leak detection spray can result in faulty operation. Leak detection spray must not come into contact with electrical contacts.



Legend

- (A) GDW1 - gas inlet pressure monitoring switch
(B) GDW2 - valve seat gas pressure monitoring switch

Gas inlet pressure monitoring switch - GDW1

The factory default setting for the gas inlet pressure switch is 10 mbar (4" w.c.). This is the minimum gas pressure required for the burner to operate with natural gas fuel.

For liquid propane gas the switch can be left at factory default setting of 10 mbar (4" w.c.) or increased to 22.4 mbar (9" w.c.). This setting can be changed by removing the GDW1 cover and manually setting the dial.

The inlet gas switch GDW1 will trigger a stand still (waiting) state of the burner control unit when the gas pressure drops below the setpoint. The burner will retry after 5 minutes if the gas pressure returns to the setpoint threshold.

Valve seat gas pressure monitoring switch - GDW2

(outlet pressure at first valve seat)

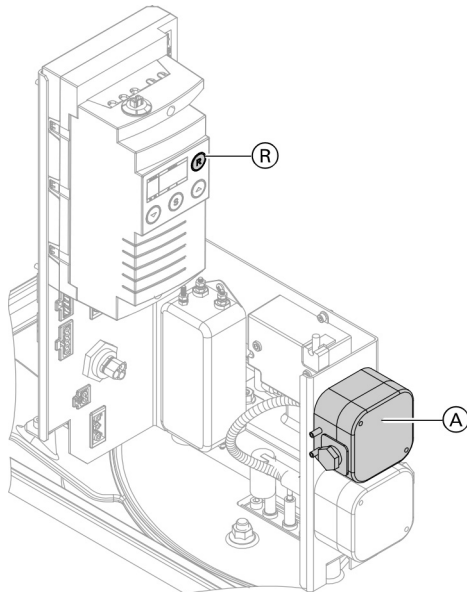
The factory default setting for valve seat gas pressure switch is 10 mbar (4" w.c.).

The switch will trigger an E1 (pressure) or E2 (open circuit during control self diagnostics) faults on the burner control, if activated.

IMPORTANT

Do not adjust this switch.

Air Pressure Switches



Fan pressure monitoring function (LDW1)

The switching threshold of the air pressure switch 1, (LDW1) is monitored in all fan start-up phases and tested during modulating operation of the burner. This way a minimum amount of pre-aeration will be ensured, among other things.

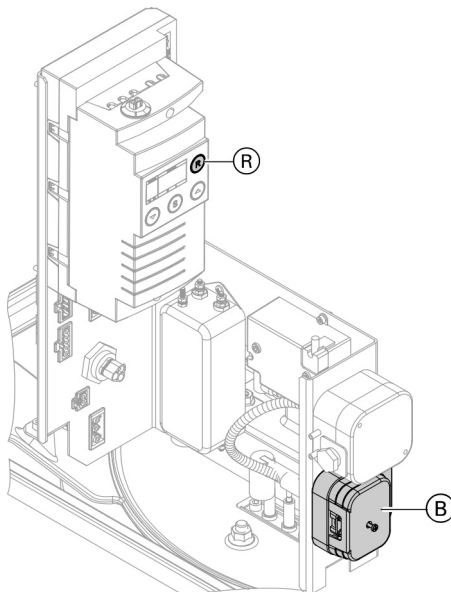
The air pressure switch (A) triggers a fault shutdown on the burner control unit in the following situations:

- If the system cold-state checkup is not successful after approx. 5 minutes,
- If the air pressure during the pre-aeration phase is outside of the permissible range (tolerance period approx. 5 minutes),
- If the air pressure switch fails during normal operation or the air pressure is outside of the permissible range.

A fault shutdown is registered on the burner control unit display (refer to page 30) with fault indicators "F F5" and "F F7".

The fault shutdown can be released by pressing the reset button (R).

CA3B Boiler	Burner model	Setting value LDW1
2.5 and 3.0	1.25 MMBTU	0.4 "w.c. (1 mbar)
	1.5 MMBTU	0.4 "w.c. (1 mbar)
3.5 to 6.0	1.5 MMBTU	0.4 "w.c. (1 mbar)
	2.0 MMBTU	0.4 "w.c. (1 mbar)



Combustion chamber pressure monitoring function (LDW2)

In order to monitor the pressure in the combustion chamber, the switching threshold of the air pressure switch 2 (LDW2) is monitored in all operational phases (with the exception of safety and stabilization times). The air pressure monitor (B) will generate a fault shutdown at the burner control unit in the following situations:

- If the combustion chamber pressure lies outside of the permissible range after two attempts during the pre-aeration phase, normal operation, or the post-purge phase.

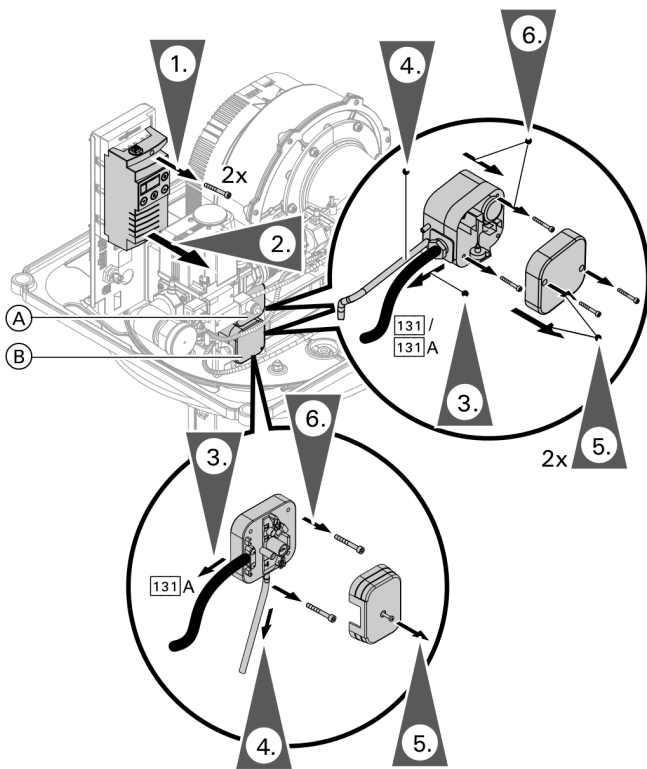
The fault shutdown is registered with the fault indicator "F F6" in the burner control unit display.

The fault shutdown can be released by pressing the reset button (R).

CA3B Boiler	Burner model	Setting value LDW2
2.5 and 3.0	1.25 MMBTU	preset*
	1.5 MMBTU	preset*
3.5 to 6.0	1.5 MMBTU	preset*
	2.0 MMBTU	preset*

* Equipped with a non adjustable pressure switch.

Air Pressure Switches *(continued)*



Legend

- Ⓐ Air pressure switch, fan (LDW1, compensation line on connector marked “-”)
- Ⓑ Air pressure switch, combustion chamber (LDW2, compensation line on connector marked “+”)

1. Undo 2 mounting screws. Torque when installing: 9 lb.in (1 Nm)
 2. Remove the display and programming unit from the burner control unit.
 3. Pull connector 131 (LDW1) and connector 131A (LDW2) from the plug-in strip on the burner control unit.
 4. Pull compensation hose from connector.
 5. Undo the mounting screw(s) on the air pressure switch. Remove the air pressure switch cover. Torque when installing: 9 lb.in (1 Nm).
 6. Undo the base mounting screws and remove the base.
 7. Install new air pressure switch in reverse order. Observe torque settings.
- Note:** Attach the connection hose to the corresponding connector.

Note: Set the new air pressure switch to exactly the same value as that of the replaced air pressure switch.

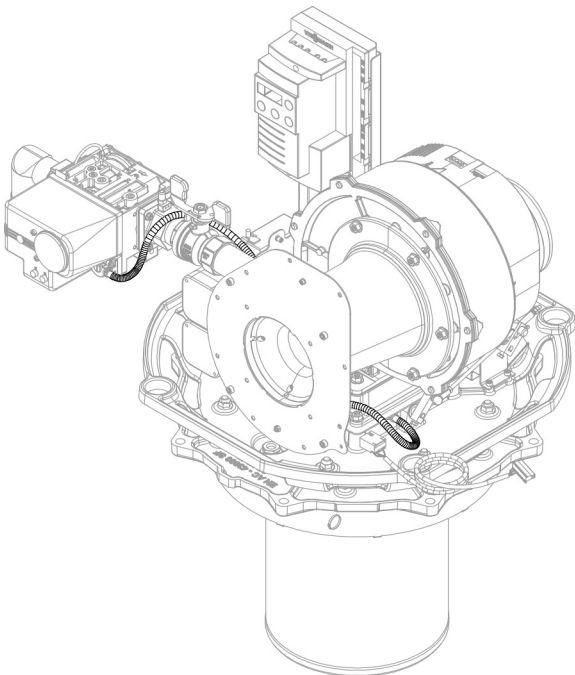
Air pressure switch settings

CA3B Boiler		2.5 and 3.0		3.5 to 6.0	
Burner model		1.25 MMBTU	1.5 MMBTU	1.5 MMBTU	2.0 MMBTU
LDW1	mbar (“w.c.)	1 (0.4)	1 (0.4)	1 (0.4)	1 (0.4)
LDW2	mbar (“w.c.)	preset*	preset*	preset*	preset*

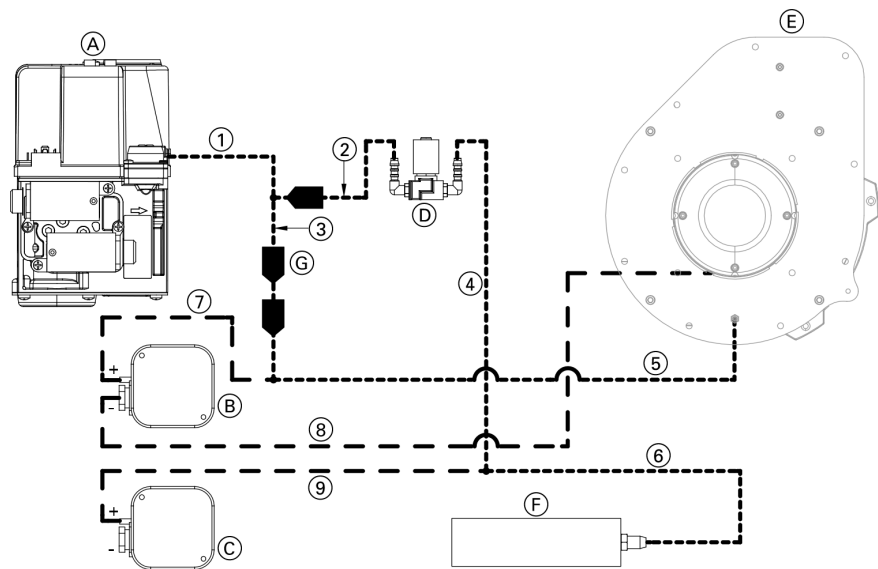
* Equipped with a non adjustable pressure switch.

Compensation lines (burners for CA3B 2.5 and 3.0)

Replacement lines must be cut to length. See following table for required length.



Air Pressure Switches *(continued)*

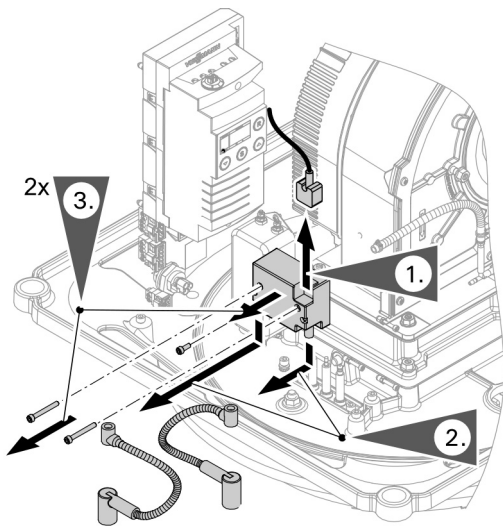


Legend

- Ⓐ Gas train
- Ⓑ Air pressure switch 1
- Ⓒ Air pressure switch 2
- Ⓓ Solenoid valve
- Ⓔ Venturi mixing pipe
- Ⓕ Burner frame
- Ⓖ Gas feed nozzles

Line	Hose length in. (mm)	Hose Dia.
①	11 5/8 (296)	Ø 6 mm
②	22 5/8 (575)	Ø 6 mm
③	2 7/8 (72)	Ø 6 mm
④	24 1/4 (615)	Ø 6 mm
⑤	8 1/2 (214)	Ø 6 mm
⑥	11 1/4 (285)	Ø 4 mm
⑦	8 (201)	Ø 4 mm
⑧	6 1/2 (167)	Ø 4 mm
⑨	5 (125)	Ø 4 mm

Ignition Unit

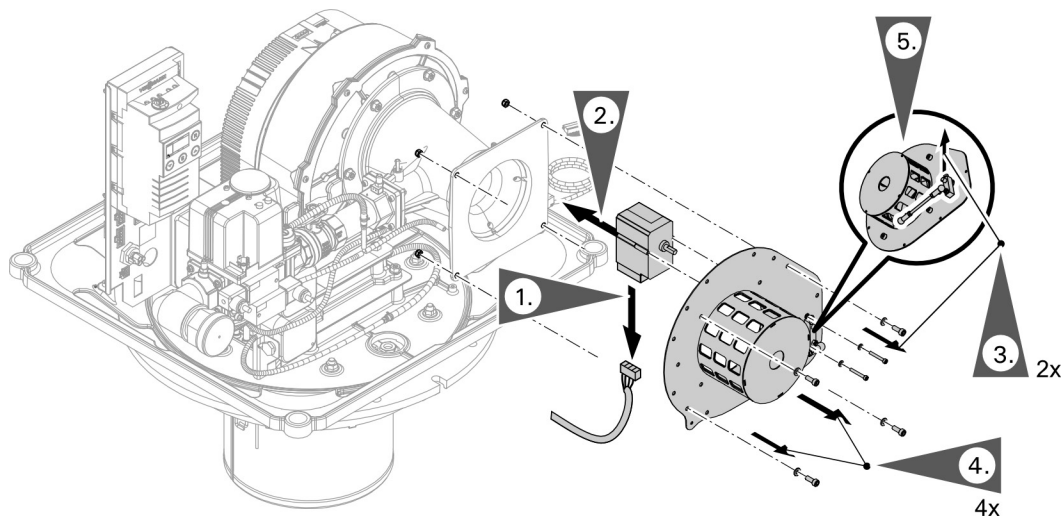


1. Pull the connecting cable from the ignition unit.
2. Pull the ignition cables from the ignition unit.
3. Undo the ignition unit mounting screws. Remove the ignition unit.
4. Install new ignition unit in reverse order.
Torque for mounting screws: 13 lb.in (1.5 Nm).

Ignition Cables

1. Pull the ignition cables from the ignition unit.
2. Pull the ignition connectors from the ignition electrodes.
3. Install new ignition cables in reverse order.

Rotary Damper and Servomotor



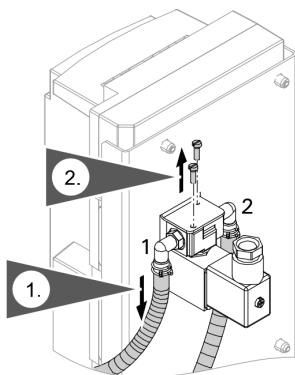
IMPORTANT

An incompletely opened rotary damper can cause malfunctions or indicate incorrect adjustment of the servomotor. The rotary damper must be fully open when the burner is off and during operation. If necessary, adjust it via the articulated rod. See service instructions for servomotor settings.

For CA3B models 3.5 to 6.0

1. Pull the connector from the servomotor.
2. Undo 4 screws from the retaining bracket of the rotary damper. Torque when installing: 13 lb.in (1.5 Nm). Remove rotary damper together with the retaining bracket.
3. Undo 2 screws on the servomotor axis. Torque when installing: 3 lb.ft (4 Nm).
4. Remove the servomotor.
5. Release the articulated rod on the rotary damper with an open-ended wrench.
6. Install new rotary damper, air pressure switch and servomotor in reverse order.

Replacing the Solenoid Valve

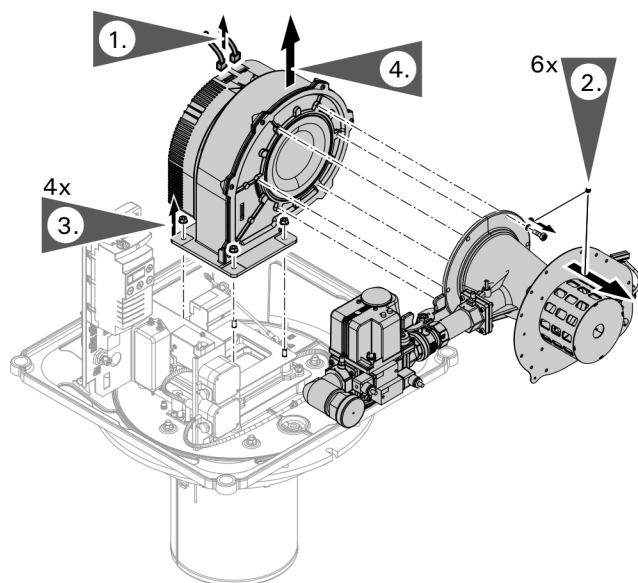


For CA3B models 2.5 and 3.0

1. Undo the hose clips and remove the hoses. Unscrew 2 plastic brackets from the 2/2 directional valve.
2. Unscrew 2 fixing screws and remove 2/2 directional valve.

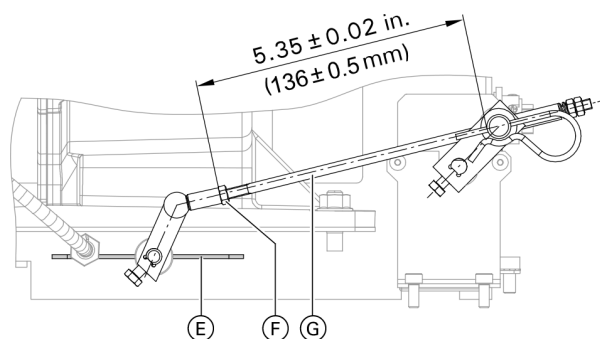
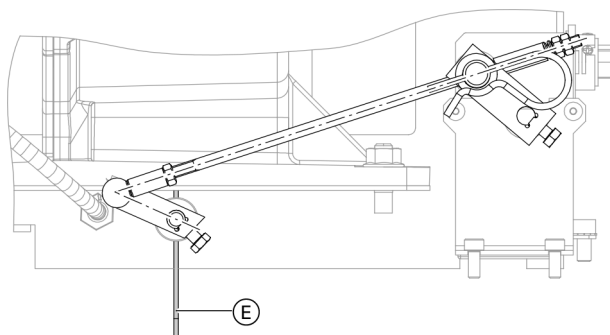
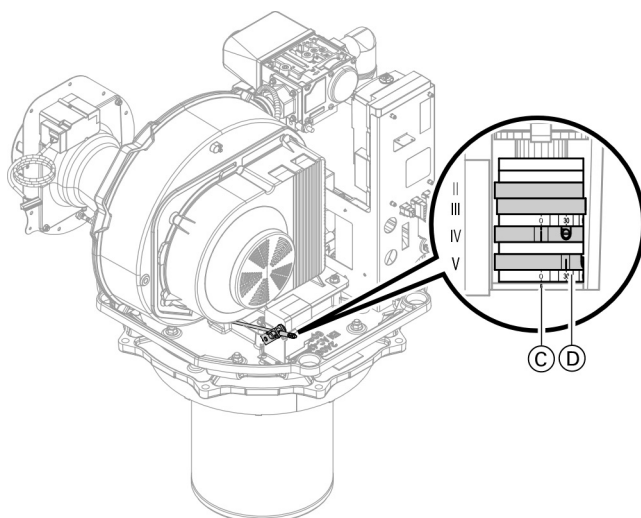
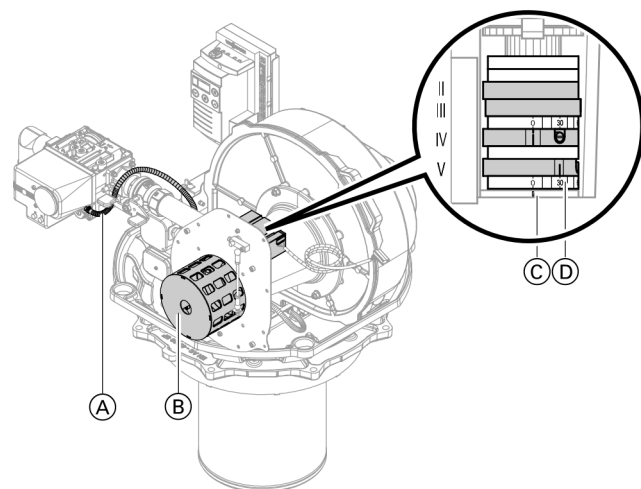
Assemble in reverse order. Torque to: 1.1 lb.ft (1.5 Nm)
Screw the plastic brackets into the new 2/2 directional valve. Fit the hoses and secure with hose clips (observe the mark on the valve: 1 left, 2 right).

Fan



1. Disconnect both connectors from the fan.
2. Remove 6 nuts on the Venturi pipe. Remove the Venturi pipe with the fitted gas valve.
Torque when installing: 4.5 lb.ft (6 Nm).
3. Undo the hexagon nuts from the 4 studs.
4. Remove the fan, noting how the gasket is positioned.
5. Installation in reverse order.
Note: Fit gasket in the correct position.

Checking the Rotary Damper Setting



1. Open gas shut-off valve.
2. Check the rotary damper setting when burners are off. The rotary damper window (B) must be fully opened. The scale ring (D) must be set at "0" on the air damper actuator relative to the marking (C).
3. Check whether the compensating tubing (A) has been connected between the gas valve and venturi mixing pipe.
4. Put burners into operation.
5. Check the setting of the rotary damper during the start-up phase. The rotary damper window (B) must nearly close for approx. 5 sec. The scale ring (D) must be set as follows during this time:

Boiler model	Burner model	Rotary damper setting
2.5 and 3.0	1.25 MMBTU	Not equipped
	1.5 MMBTU	Not equipped
3.5 to 6.0	1.5 MMBTU	20° (close) 0° open
	2.0 MMBTU	20° (close) 0° open

Checking the functioning of the burner damper

Angle position of the switch cams: The servomotor is at setting "0" during standstill. The factory-installed settings may not be changed.

Putting burners into operation

Servomotor moves to 105°, levers and rods move to the left. Burner damper (E) is opened.

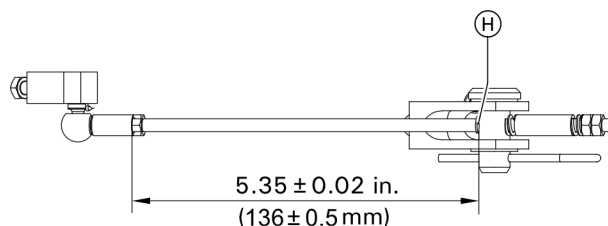
Turning burners off

Servomotor moves to setting "0", burner damper (E) is closed.

The spring on the rod is compressed approx. 0.08 in. to 0.12 in. (2 mm to 3 mm).

The burner damper (E) is pressed against the seat ensuring tightness.

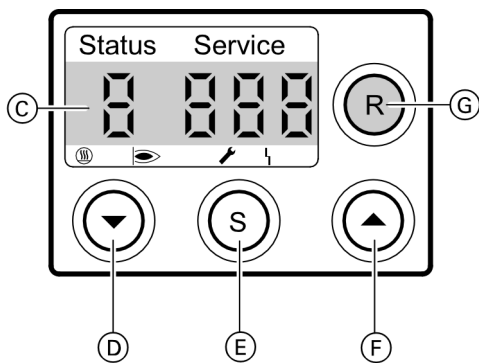
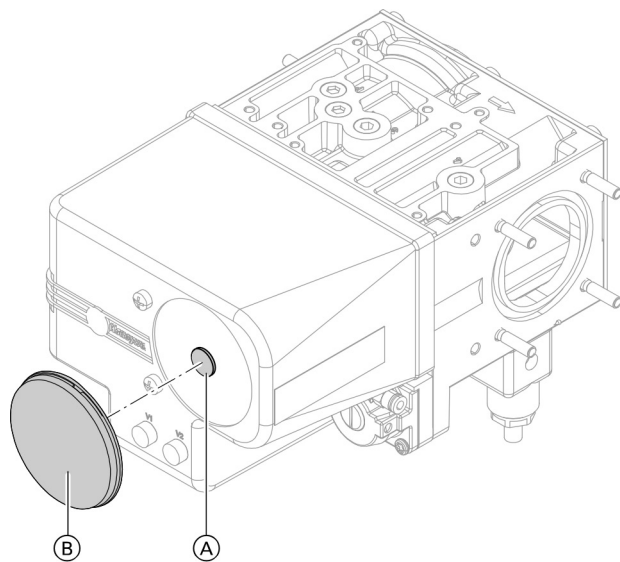
If the actual measurement of dimension is not within tolerance as shown below, loosen lock nut (F), and rotate the rod (G) to attain the dimension shown below. Tighten lock nut (F) to 22 lb.in (2.5 Nm).



Legend

- | | |
|-------------------|--------------------|
| (A) Tubing | (E) Burner damper |
| (B) Damper window | (F) Lock nut |
| (C) Marking | (G) Rod |
| (D) Scale ring | (H) Retaining ring |

Measuring CO₂ Content



Preparing for measurement

IMPORTANT

When adjusting a burner only this one burner may be in operation. The other boiler unit burners must be at standstill. Take measurement readings of burners one after the other.

Checking the CO₂ level

Preparing the test

1. Open the gas shut-off valve.
2. Start the burner with the emissions test switch enabled at the boiler control unit.
3. At the same time, press button **S** (E) and button **▼** (D) and hold for longer than 2 seconds.

The display will then show the following:

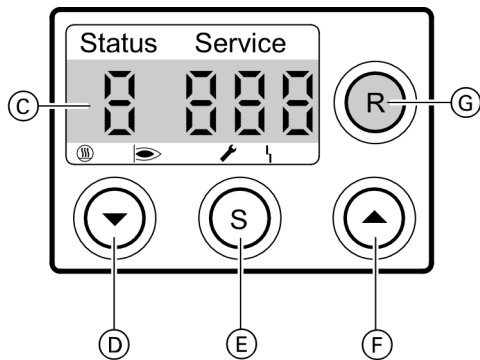
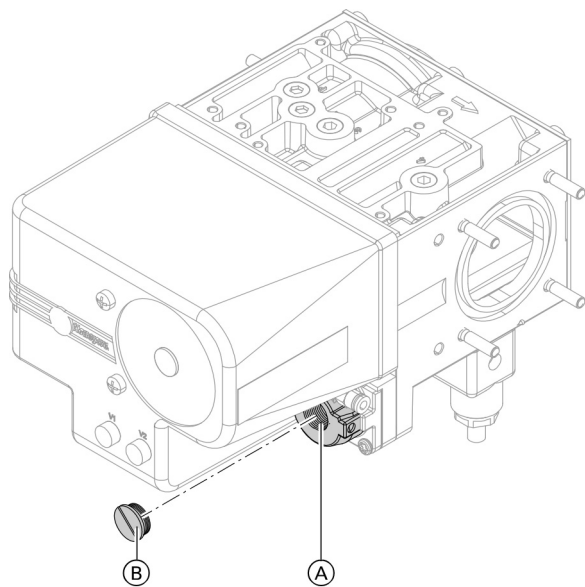
- Under Status (C): "P" (= relay test)
- Under Service (C): Modulation level in %
 "100" = 100% = upper heating input
 "0" = 0% = lower heating input

CO₂ Test at the upper heating input

1. Press button **▲** (F) until the service display (C) has incremented to "100" (= 100%).
2. Check the CO₂ level at the flue pipe.
3. If the CO₂ level must be adjusted:
 - Remove cap (B).
 - Turn adjusting screw (A) in small increments (3 mm Allen key) until the CO₂ level falls within the specified range:
 - Turning clockwise → CO₂ level falls (less gas)
 - Turning counter-clockwise → CO₂ level rises (more gas)
4. Record the actual value in the maintenance report on page 162.

CA3B Boiler	Burner models	Permissible CO ₂ content (%)	
		Natural Gas	Liquid Propane Gas
2.5 and 3.0	1.25 MMBTU	8.8 - 9.2	10.8 - 11.0
	1.5 MMBTU	8.8 - 9.2	10.8 - 11.0
3.5 to 6.0	1.5 MMBTU	8.8 - 9.2	10.8 - 11.0
	2.0 MMBTU	8.8 - 9.2	10.8 - 11.0

Measuring CO₂ Content *(continued)*



Measuring CO₂ at lower heating output

- 1. Press button ▼ (D) until the service indicator has dropped down to "0" (lower heating output).
- 2. Measure CO₂ content at the flue gas pipe.

IMPORTANT

CO₂ content in partial load must always be at least 0.6% lower than in full load.

- 3. If the CO₂ content must be changed:
Unscrew cover cap (B). Turn adjustment screw (A) in small increments (Torx 40) until CO₂ content is at the indicated level:
 - Turning clockwise → CO₂ content increases,
 - Turning counter-clockwise → CO₂ content decreases.
- 4. Record measurement reading in maintenance record on page 162.
Check measurement readings again.
Start up the upper and lower heating output via the burner control unit. If the values do not correspond with the permissible CO₂ contents as per the tables, the steps for the upper and lower heating output must be repeated.
- 5. Press buttons S (E) and ▼ (D) simultaneously for longer than 2 sec. Burner changes to operating mode.

CA3B Boiler	Burner models	Permissible CO ₂ content (%)	
		Natural Gas	Liquid Propane Gas
2.5 and 3.0	1.25 MMBTU	8.1 - 8.4	8.9 - 9.3
	1.5 MMBTU	8.1 - 8.4	8.1 - 8.4
3.5 to 6.0	1.5 MMBTU	8.1 - 8.4	8.1 - 8.4
	2.0 MMBTU	8.1 - 8.4	8.5 - 8.9

Displaying Ionization Current

IMPORTANT

Ionization current must be queried via the burner control unit. An ionization current measurement with Testomatic Gas or a multimeter is not possible.

1. Press button S for approx. 2 sec., „“ will blink.
2. Press button ▲ until “5” appears under Service.
3. Press button S. “5” will appear under Status.
4. Press button ▲ until “3” appears under Service.
5. Press button S. “3” will appear under Status and the ionization current in operation will be indicated under Service (i.e. 30 = 3,0 μ A).
6. Put burners into operation with the emissions test-switch on the GW6C control.



Refer to the Operating Instructions.

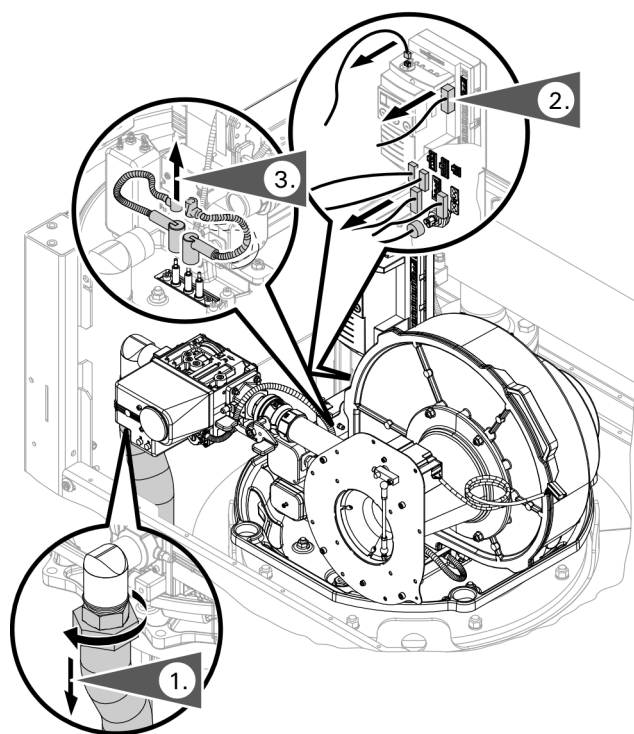
7. Take ionization current reading.

IMPORTANT

The ionization current must reach a minimum of 3 μ A for approximately 2 to 3 sec. after opening of the combination gas valve and while in operation.

8. Record the measurement reading in the maintenance record on page 162.
9. Press button S approx. 2 sec, „“ will blink.
10. Press button ▲ until “5” appears under Service.
11. Press button S. “5” will appear under Status.
12. Press button ▲ until “0” appears under Service.
13. Press button S. The operating status indicator appears again.

Dismantling the Burner

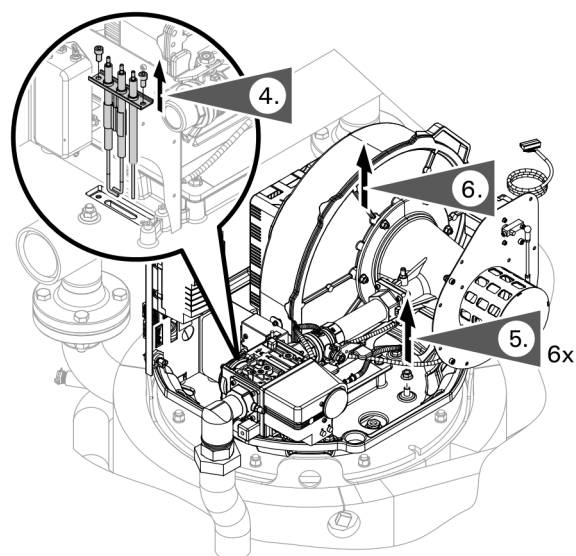


IMPORTANT

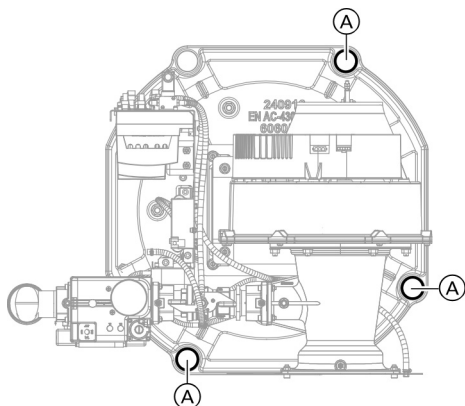
Please observe section "Preparing for service work" on page 50.

Detach upper burner section

1. Disconnect the burner gas line.
2. Disconnect the connectors from the burner control unit.
3. Pull off the ignition electrode connectors.



4. Remove 2 screws on the ignition electrode block.
Lift the electrode block upwards to remove.
5. Remove the 6 nuts around the burner mounting plate.
6. Remove upper burner section.

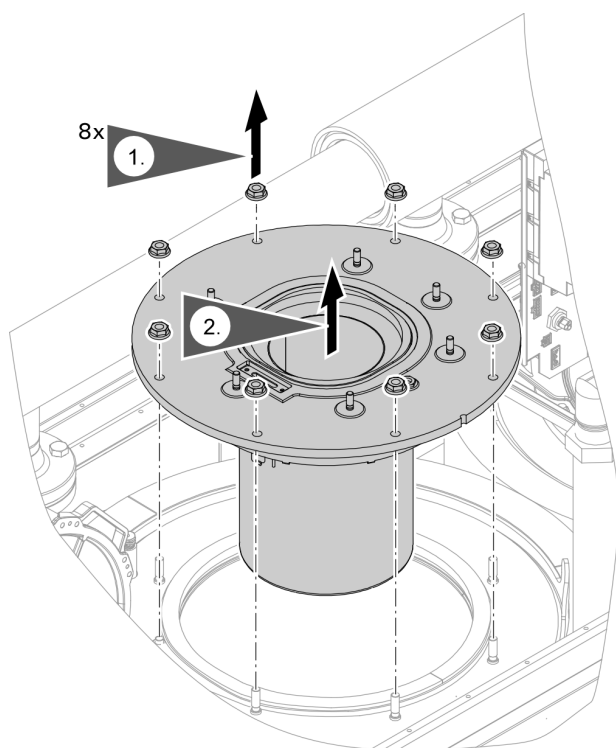
Dismantling the Burner *(continued)***IMPORTANT**

A lifting mechanism is required to remove the burner.



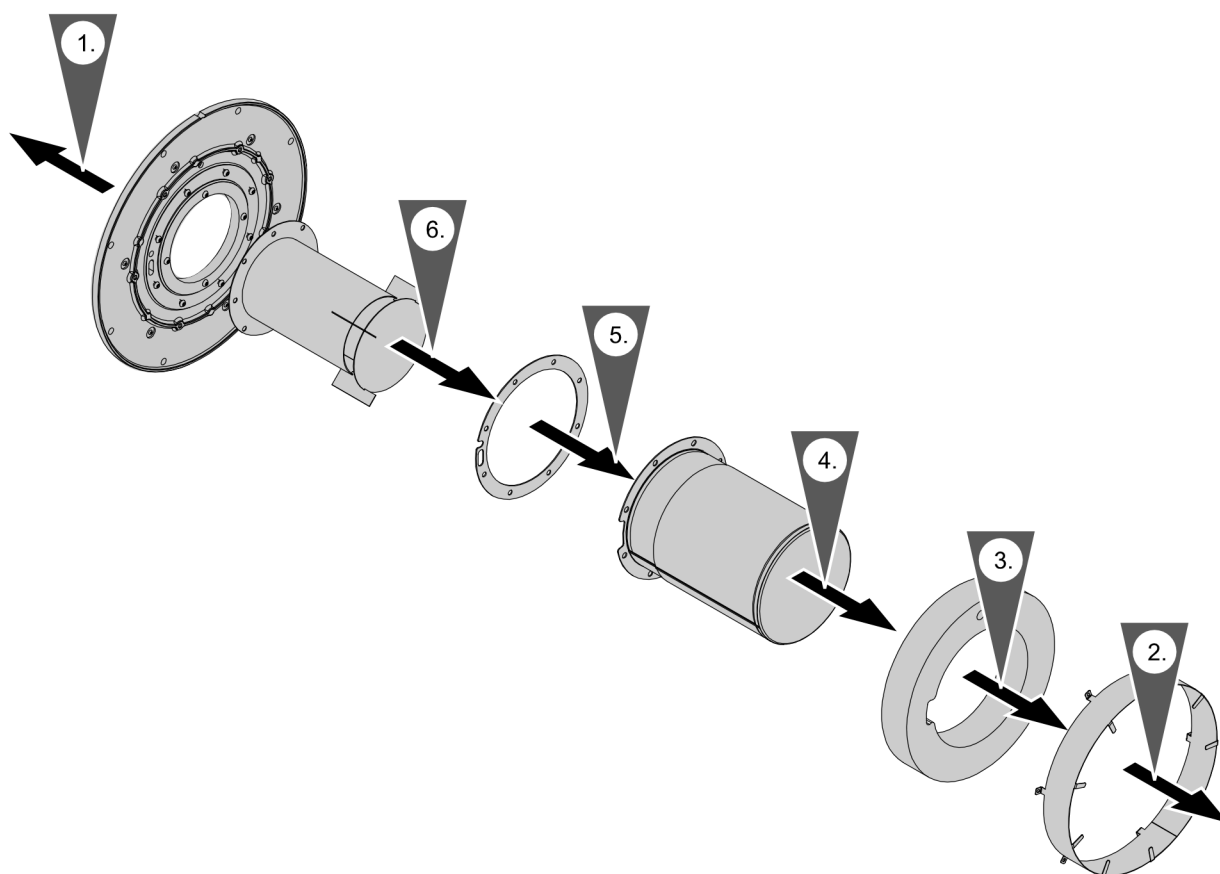
Refer to the Instructions provided with the lifting device.

Secure lifting mechanism chains at 3 points (A) on the frame of the upper burner section.



1. Remove 8 nuts from the combustion chamber cover plate.
2. Lift out mounting plate with burner tube.

Checking and Cleaning the Burner Tube



CAUTION

Scratches in the combustion chamber can lead to corrosion. Do not allow any tools or other objects to fall into the combustion chamber.



CAUTION

Contamination of the burner tube can lead to malfunctions. When exchanging the burner tube, ensure that no fibres from the heat insulation block stick to the burner tube.



CAUTION

Improperly executed exchange of the burner tube can lead to contamination of the combustion chamber. Ensure that the combustion chamber is maintained free of insulation fibers.



WARNING

Gas leakage can lead to risk of explosion. Close gas shut-off valve.

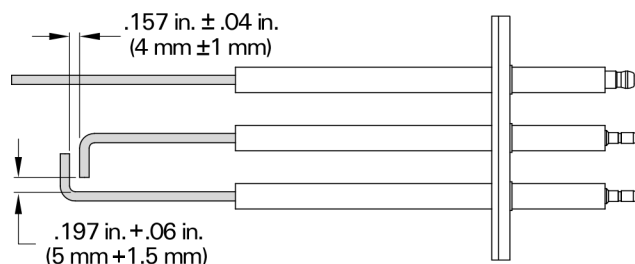


WARNING

Contact with hot surfaces can lead to burn injuries. Undertake work on the burner only when the system is cold.

1. Dismantle the burner. Refer to section starting on page 70.
2. Undo 6 screws from the insulation ring.
Torque when installing: 13 lb.in (1.5 Nm.)
3. Remove the insulation ring.
4. Unscrew the burner gauge assembly.
You can now vacuum or replace the burner gauge assembly. Torque when installing: 7.5 lb.ft (10 Nm.)
5. Replace all gaskets. Reassemble burner tube and burner in reverse order. Torque: 7.5 lb.ft (10 Nm).
6. Remove the insulation ring.

Checking the Ignition Electrodes and Ionization Electrode

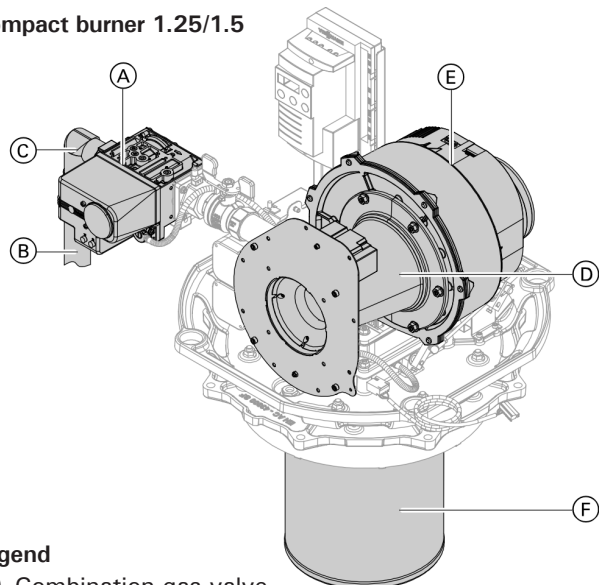


Electrodes

1. The electrode block can be tested or dismantled once the burner plate has been dismantled.
2. Check ignition electrodes and ionization electrode for damages and that they are situated at the correct distance from the burner tube. Replace electrodes if necessary.
3. Install the electrode block in reverse order. Fit new gaskets. Torque: 4.4 lb.ft (6 Nm).

Cleaning the Burners

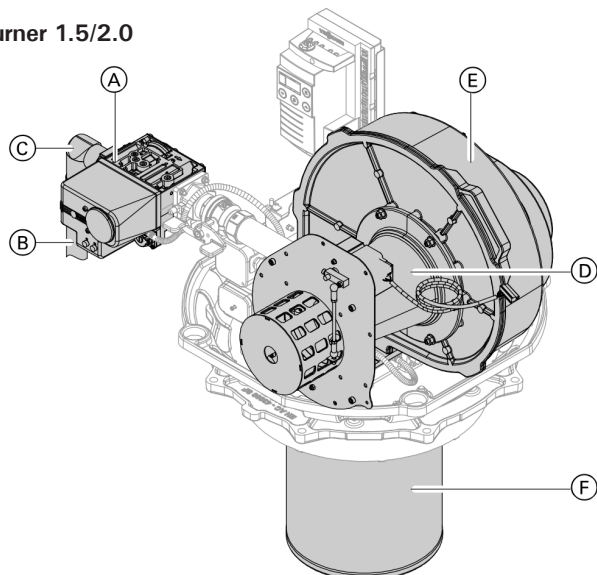
Compact burner 1.25/1.5



Legend

- Ⓐ Combination gas valve
- Ⓑ Gas connector pipe
- Ⓒ Fitting at gas connector pipe
- Ⓓ Venturi-mixing tube
- Ⓔ Burner fan
- Ⓕ Burner tube

Burner 1.5/2.0



IMPORTANT

Close the central gas shut-off valve for all dismantlement work on the burners.

For dismantling the burners refer to section starting on page 70.

1. Disconnect Venturi mixing tube Ⓓ from fan Ⓔ.
2. Detach Venturi mixing tube Ⓓ with combination gas valve Ⓐ and gas connector pipe Ⓑ and if applicable, detach connector pipes.
3. Detach connector 100 and 100A from fan Ⓔ and dismantle fan.
4. Clean fan housing and fan impeller with compressed air.
5. If necessary, vacuum clean burner tube Ⓕ from inside and out.
6. Reassemble in reverse order.

IMPORTANT

Ensure correct positioning of gasket between fan housing and burner plate. Replace gasket if damaged.



WARNING

Risk of explosion due to gas leakage. Check for gas leakage at screws and the gasket between the fan housing and the burner plate.

Cleaning the Combustion Chamber and Heating Surfaces



CAUTION

Scratches in the combustion chamber can lead to corrosion. Do not allow any tools or other objects to fall into the combustion chamber.



CAUTION

Scratches on parts that come into contact with flue gas can lead to corrosion. Use only plastic brushes; do not use metal brushes or sharp objects.

Cleaning the combustion chamber and heating surfaces

1. Clean the combustion chamber by vacuuming loose debris out.
2. Remove embedded sediment from the stainless steel heat exchanger surface by thoroughly rinsing with water or solvent free cleaning agents such as citric acid based cleaners. Consult a cleaning agent manufacturer for a suitable product.
Avoid getting the refractory wet during cleaning.
Note: Discoloration of the heat exchanger surface is the normal result of the combustion process. It has no impact on the functionality or the longevity of the heat exchanger.
3. Use a non-metallic brush if necessary, with a gentle brushing motion to remove the embedded sediment.
It is not recommended to use chemicals to clean the heat exchanger surface.
4. Flush the combustion chamber with water until it runs clear through the condensate trap.
5. Remove and clean out any accumulated debris from condensate trap. Reinstall condensate trap. See page 78 for details.

Checking gaskets and thermal insulation parts

1. Check gaskets and the sealing rope for damage.
2. Check the thermal insulation components for possible damage.
3. Replace any damaged parts.

Burner Reassembly



WARNING

Escaping gas leads to a risk of explosion.
Check the fitting for gas tightness.

1. Position the burner plate with burner mesh assembly on the 8 studs on the boiler section. Tighten nuts with a torque of 7.3 lb.ft (10 Nm).
2. Position the upper burner section above the burner plate. Tighten the M10 nuts with a torque of 7.3 lb.ft (10 Nm).
3. Push on the ignition and ionization electrode connectors.
4. Insert connectors at the plug-in panel and at the burner control unit; insert mains plug **[40]** last.
5. Fit the gas connection pipe.
Note: The use of leak detection spray can result in faulty operation. Leak detection spray must not come into contact with electrical contacts.
6. Start the burner and carry out a function test. Vitocrossal CA3B installation and service instructions.

Automatic Leakage Test for Valves of the Combination Gas Valve



WARNING

Risk of explosion due to gas leakage. Check for gas leakage at the gauge connections.

The burner control unit triggers an automatic leakage check of both valves at burner start-up.
If valves are leak-free the burner shifts into normal operating mode and the burner ignites.
If the first valve leaks, the error code "E 1" will appear in the burner control unit display, if the second valve leaks, "E 2" will appear.
In both cases, the combination gas valve should be replaced.

Taking Final Measurement Reading

1. Take CO₂ measurement reading after each burner dismantling in accordance with the items shown on pages 67 and 68.
2. Record the measurement readings in the maintenance record on page 162.

Checking Expansion Tank and System Pressure



CAUTION

Damage on boiler or other system components may result if these recommendations are not followed.



CAUTION

Carry out all check in accordance with the expansion tank manufacturer's instructions. Limit pressure fluctuations to the lowest possible differential. Cyclical pressure fluctuations and greater pressure differentials indicate a system fault. Immediately remedy such faults, otherwise other heating system components may become faulty.

Check proper expansion tank and system pressures



See expansion tank manufacturer's instructions.

IMPORTANT

The diaphragm expansion tank must be able to hold the heating water expansion volume inside the boiler, and must be properly sized for the system.

This diaphragm expansion vessel reduces the frequency and severity of pressure fluctuations; the service life of the circulating pump is improved and therefore the operational reliability and service life of system components increased.

IMPORTANT

Carry out this test on a cold system.

1. Drain system or close cap valve on the diaphragm expansion tank and reduce the pressure until the pressure gauge indicates "0".
2. 60°F (15.5°C) water fill pressure must equal diaphragm expansion tank pressure.

Mixing Valve Movement and Leak Check

1. Remove motor lever from mixing valve handle.
2. Check mixing valve for ease of movement.
3. Check leak tightness of mixing valve. Replace O-ring if there is a leakage.
4. Engage motor lever.

Checking Air Intake in the Installation Room (visual check)

Check filter and air intake during room-air-dependent operation.

Check the air intake outside the installation room as well during room-air-dependent operation.

Sensors

Tank, supply and room temperature sensors

IMPORTANT

The supply temperature sensor can be used as a surface contact temperature sensor or immersion temperature sensor.



Refer to the Vitotrol 300 Installation and Service Instructions

DHW Tank, supply and room temperature sensor

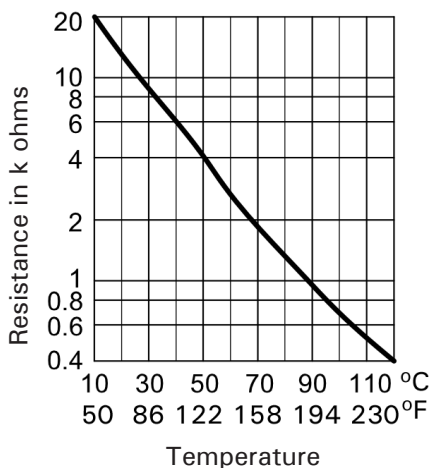
Note: The supply temperature sensor can be used as a contact or immersion temperature sensor.



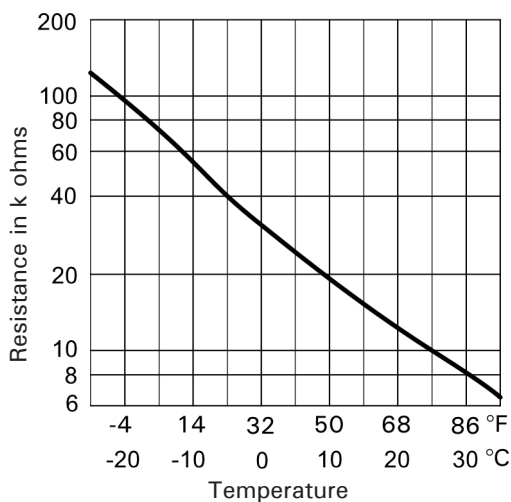
Refer to the Installation and service instructions for Vitotrol 300.

1. Pull corresponding plug.
2. Check the sensor resistance and compare it with the curve.
3. In the case of severe deviation, check the installation and replace the sensor if required.

Viessmann NTC 10 k Ω (blue ID label)



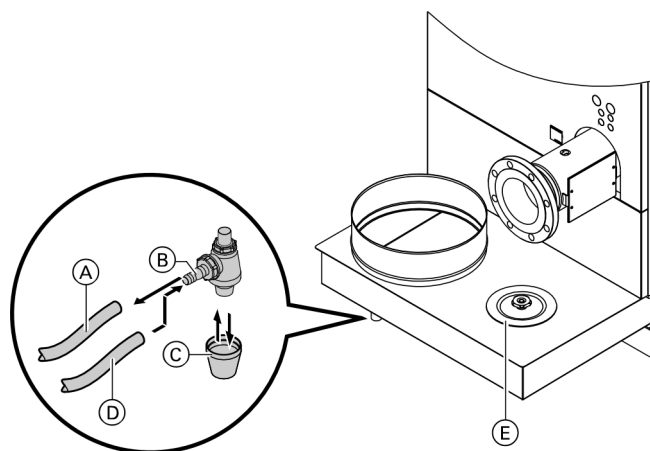
Viessmann NTC 10 k Ω



Outdoor temperature sensor

1. Pull plug 1.
2. Check the sensor resistance across plug terminals "1" and "2" and compare with the curve.
3. If the results are very different from the curve, disconnect the wires from the sensor and repeat the test on the sensor.
4. Depending on the result, replace the lead or the outdoor temperature sensor.

Cleaning of Condensate Drainage System



Note: Clean the inside of the condensate drain system at least annually.

1. Pull drain or cleaning hose (D) off.
2. Clean the inside of the condensate drain system (hose, pipe).
3. Clean the neutralizing system (if installed) in accordance with the manufacturer's instructions.



See Neutralization System Operating Instructions.

Note: You can obtain the neutralizing granulate from Viessmann.

4. Release and flush lower part (C) of siphon cup (B).
5. Fill lower part (C) of siphon cup (B) with water and reassemble.
6. Install hose (A) of the neutralizing system to the siphon.

Checking the condensate drain and the neutralizing system (if installed)

Add water to the flue gas collector through the inspection port (E).

Note: The water must flow from the condensate drain without back pressure.

If necessary, clean the condensate drain again.

IMPORTANT

If the condensate does not drain freely, the condensate will accumulate in the bottom part of the boiler, resulting in burner shut-down (fault message).

Check neutralization unit (if installed)

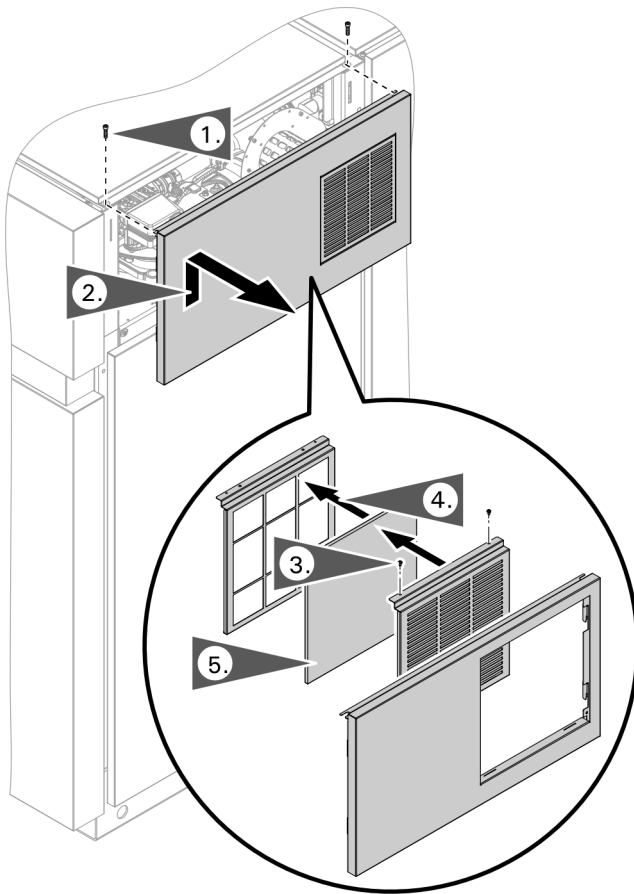
1. Check the pH value of the condensate with a pH measuring strip (field supplied). If the pH value is less than 6.5, replace granulate.
2. If contaminated - rinse the neutralization unit with tap water.
3. Add granulate as marked.

IMPORTANT

The granulate is consumed as it neutralizes the condensate. The red marking indicates the minimum filling level.



See Neutralization Unit "Installation Instructions".

Replacing the Supply Air Filter (for room air dependant operation)

1. Remove screws from the top panel.
2. Lift and remove the top right panel.
3. Remove screws from the air filter frame.
4. Disassemble the air filter frame.
5. Replace air filter.
6. Reassemble panel in reverse order.

Calling up Coding Levels

- The coding indicators are preset by the configuration of the heating system.
- Coding is split into the following groups:
 - “General”
 - “Burner control unit”
 - “DHW”
 - “Solar”
 - “Heating circuit 1/2/3”
 - “Boiler”
 - “Cascade”
 - “All coding”

In this group, all coding in the coding levels is listed in ascending order (except the coding in the “Solar” group).
- Heating systems with one heating circuit without mixing valve and one or two heating circuits with mixing valve:

In the following, the heating circuit without mixing valve is designated “Heating circuit 1” and the heating circuits with mixing valve as “Heating circuit 2” or “Heating circuit 3”.
- The selected designation appears if the heating circuits have been designated individually.

From the home screen tap the following buttons:

1. 
2. “Service”
3. Enter “viservice” password.
4. “System configuration”
5. “Coding level 1”
or...
“Coding level 2”:
Enter “viexpert” password.
6. Select group.
7. 
8.  for the required value in line with the following tables.
9.  to accept.

Resetting Coding to their Factory Set Condition

From the home screen tap the following buttons:

1. 
2. “Service”
3. Enter “viservice” password.
4. “System coding”
5. “Coding level 1”
or...
“Coding level 2”:
Enter “viexpert” password.
6. “Reset coding”

"General" Group

Coding

Coding in the factory set condition		Possible change	
System design			
00:1	System version 1: One heating circuit without mixing valve A1 (heating circuit 1), without DHW heating	00:2 to 00:10	For system schemes, see the following table:
Value address 00:	Description		
...			
2	One heating circuit without mixing valve A1 (heating circuit 1), with DHW heating; recognized automatically.		
3	One heating circuit with mixing valve M2 (heating circuit 2), without DHW heating.		
4	One heating circuit with mixing valve (heating circuit 2), with DHW heating		
5	One heating circuit without mixing valve A1 (heating circuit 1), one heating circuit with mixing valve M2 (heating circuit 2), without DHW heating; recognized automatically.		
6	One heating circuit without mixing valve A1 (heating circuit 1), one heating circuit with mixing valve M2 (heating circuit 2), with DHW heating; recognized automatically.		
7	Two heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3), without DHW heating.		
8	Two heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3), with DHW heating.		
9	One heating circuit without mixing valve A1 (heating circuit 1), two heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3), without DHW heating; recognized automatically.		
10	One heating circuit without mixing valve A1 (heating circuit 1), two heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3), with DHW heating; recognized automatically.		
Coding in the factory set condition		Possible change	
Servomotor runtime			
40:125	Actuator runtime at plug 52 A1 125 sec. Do not adjust!	40:5 to 40:199	Adjustable from 5 to 199 sec.
LON participant no.			
77:1	LON Participant number Boiler section 1 set to 1, boiler section 2 set to 2 boiler section 3 set to 3. IMPORTANT If coding is to be set to the factory set condition, the participant number must be reset.	77:1 to 77:99	Adjustable from 1 to 99: 1 to 8 = Boiler section 10 - 96 = Vitotronic 200-H 97 = Vitogate 300 98 = Vitogate 99 = Vitocom
“Detached house/apartment building”			
7f:1	Detached house	7F:0	Apartment building Separate adjustment of holiday program and time program for DHW heating possible.

"General" Group *(continued)*

Coding in the factory set condition		Possible change	
“Automatic summer/wintertime changeover”			
81:1	Automatic summer/wintertime changeover.	81:0	Manual summer/wintertime changeover
		81:2	Do not adjust!
		81:3	With LON communication module: The control unit receives the time.
“Summer time starts: Month”			
82:3	March	82:1 to 82:12	January to December
“Summer time starts: Week of the selected month”			
83:2	Week 2 of the selected month.	83:1 to 83:5	Week 1 to week 5 of the selected month.
		83:6	Last week - 1 week
		83:7	Last week - 2 weeks
		83:8	Last week - 3 weeks
		83:9	Last week - 4 weeks
		83:10 to 83:14	Special function
“Summer time starts: Day of the selected week”			
84:7	Last Sunday of the selected month.	84:1 to 84:7	Monday to Sunday.
“Wintertime starts: Month”			
85:11	November	85:1 to 85:12	January to December
“Wintertime starts: Week of the selected month”			
86:1	Week 1 of the selected month.	86:1 to 86:5	Week 1 to week 5 of the selected month.
“Wintertime starts: Day of the selected week”			
87:7	Last Sunday of the selected month.	87:1 to 87:7	Monday to Sunday
“Operation enabled/blocked”			
8f:0	Do not adjust!	--	--
“Set supply temperature for external demand”			
9b:70	Set to 158°F (70°C)	9b:0 to 9b:127	Adjustable from 32°F to 261°F (0°C to 127°C) (limited by boiler specific coding).

"Combustion Controller" Group

Coding

Coding in the factory set condition		Possible change	
“Max operational output”			
02:100	100% of rated heating output.	02:0 to 02:100	Adjustable from 0% to 100% (0% represents burner minimum firing rate).
“Gas type”			
03:0	Natural gas	03:1	Liquid Propane Gas
“Altitude”			
04:0	LA: ≤ 5000 ft. (1500 m) above sea level	04:1	HA: > 5000 ft. (1500 m) above sea level
“Max boiler temperature”			
06:95	Set to 203°F (95°C).	06:5 to 06:127	Adjustable from 41°F to 261°F (5°C to 127°C). IMPORTANT Supply temperature limit switch common supply, [set to 210°F (99°C)] [tolerance -11°F (-6K)].
“Integral threshold value of controller”			
08:30	Set to 30 Kmin.	08:1 to 08:255	Adjustable from 1 to 255 K min
“Runtime optimization”			
09:1	Integral method	09:0	Minimum pause

"Boiler" Group

Coding in the factory set condition		Possible change	
"Single boiler and multi boiler system"			
01:2	Multi-boiler system with Viessmann-cascade or LON-cascade.	01:1	Do not adjust!
		01:3	Do not adjust!
"Consecutive boiler number in multi boiler systems"			
07:1	Consecutive boiler section number in multi boiler systems.	07:2 to 07:8	Adjustable from 1 to 8 7:1 Lead boiler section 7:2-8 Lag boiler sections
"Flue gas temperature sensor"			
1f:0	Do not adjust!	--	--
"Service interval"			
21:0	No service interval (hours run) selected.	21:1 to 21:100	The number of hours run before the burner should be serviced is adjustable from 100 to 10000 h; 1 step $\triangleq$ 100 h.
"Interval for service"			
23:0	No interval for service.	23:1 to 23:24	Adjustable from 1 to 24 months.
"Service" display"			
24:0	No "Service" display	24:1	"Service" is displayed (the address is automatically set and must be manually reset after a service has been carried out).

"Cascade" Group

Coding

Coding in the factory set condition		Possible change	
"Number of boilers connected to the cascade"			
35:2 to 3	Boiler sections Factory set conditions: CA3B 2.5/3.0/3.5/4.0: 2 CA3B 5.0/6.0: 3	35:1 to 35:8	1 to 8 boiler sections connected to lead control
"Minimum system supply temperature limit"			
36:0	Electronic minimum system supply temperature limit set to 32°F (0°C).	36:1 to 36:127	Adjustable from 32°C to 261°C (0°C to 127°C) (only when operating with standard room temperature).
"Maximum system supply temperature limit"			
37:80	Electronic maximum system supply temperature limit set to 176°F (80°C).	37:20 to 37:127	Adjustable from 68°F to 261°F (20°C to 127°C). Note: Value must be lower than the lowest value of coding "06" in the "Combustion controller" group of every control unit.
"Boiler section 1 or boiler sequence changeover"			
38:0	No boiler section boiler sequence changeover Do not adjust!	38:1	Boiler section 1 changeover: Every first day of the month, the boiler with the shortest number of hours run by its burner becomes the boiler section 1.
		38:2 to 38:200	Boiler section 1 changeover after 200 to 20,000 hours run 1 step ≙ 100 hours run.
"Permanent boiler section 1"			
39:0	No permanent lead boiler section. Do not adjust!	39:1 to 39:3	Permanent lead boiler section is 1, 2, 3, 4, 5, 6, 7 or 8.
"Permanent last boiler"			
3a:0	No permanent last boiler section. Do not adjust!	3a:1 to 3a:3	Permanent last boiler section is 1, 2, 3, 4, 5, 6, 7 or 8.

"Cascade" Group *(continued)*

Coding in the factory set condition		Possible change	
"Type of control"			
3b:1	Standalone parallel boiler circuit: With supply temperature sensor (refer to page 45).	3b:0	Standalone parallel boiler circuit: Without supply temperature sensor (refer to page 45).
		3b:2	Standalone serial boiler circuit: Without supply temperature sensor (refer to page 45).
		3b:3	Standalone serial boiler circuit: With supply temperature sensor (refer to page 45).
		3b:4	Sequential control method with supply temperature sensor (refer to page 45).
"Control strategy"			
3c:0	Condensing strategy (see page 46).	3c:1	Conventional boiler strategy 1 (refer to page 47).
		3c:2	Conventional boiler strategy 2 (refer to page 47).
"Output statement"			
3d:1	Output statement for condensing strategy and conventional boiler strategy 1.	3d:0	No output statement Note: Control only in accordance with conventional boiler strategy 2.
"ECO threshold boiler 1"			
41:31	No ECO threshold boiler 1. Do not adjust!	41: - 30 to 41: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"ECO threshold boiler 2"			
42:31	No ECO threshold boiler 2. Do not adjust!	42: - 30 to 42: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"ECO threshold boiler 3"			
43:31	No ECO threshold boiler 3. Do not adjust!	43: - 30 to 43: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"ECO threshold boiler 4"			
44:31	No ECO threshold boiler 4. Do not adjust!	44: - 30 to 44: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).

"Cascade" Group *(continued)*

Coding in the factory set condition		Possible change	
"Stop differential"			
47:15	Set to 27°F (15 K).	47:2 to 47:30	Adjustable from 4°F to 54°F (2 K to 30 K). Note: One boiler or one burner stage will be shut down if the actual supply temperature exceeds the set supply temperature by this value.
"ECO threshold boiler 5"			
65:31	No ECO threshold boiler 5. Do not adjust!	65: - 30 to 65: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"ECO threshold boiler 6"			
6F:31	No ECO threshold boiler 6. Do not adjust!	6F: - 30 to 6F: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"ECO threshold boiler 7"			
74:31	No ECO threshold boiler 7. Do not adjust!	74: - 30 to 74: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"ECO threshold boiler 8"			
7d:31	No ECO threshold boiler 8. Do not adjust!	7d: - 30 to 7d: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).

"DHW" Group

Coding

Coding in the factory set condition		Possible change	
“Storage tank heating, hysteresis”			
55:0	Tank heating hysteresis ± 5°F (2.5 K).	55:1	Adaptive storage tank heating enabled (refer to page 44).
		55:2	Storage tank temperature control with 2 temperature sensors (refer to page 44).
		55:3	Storage tank temperature control, storage tank loading system. Do not adjust!

"DHW" Group *(continued)*

Coding in the factory set condition		Possible change	
"For solar DHW heating: DHW temperature target"			
67:40	DHW setpoint temperature 104°F (40°C). Reheating is suppressed above the selected set temperature (DHW heating blocked by the boiler).	67:0 to 67:95	Adjustable from 32°F to 203°F (0°C to 95°C) (limited by boiler-specific coding).
"DHW recirculation pump"			
73:0	ON according to time program	73:1 to 73:6	"ON" from once per hour for 5 min up to 6 times per hour for 5 min during the time program.
		73:7	Permanently ON

"Solar" Group

Note: The "Solar" group is only displayed if a solar control module, type SM1, is connected.

Coding

Coding in the factory set condition		Possible change	
"Solar circuit pump speed control"			
02:0	Solar circuit pump is not speed controlled.	02:1	Variable speed solar circuit pump with wave packet control.
		02:2	Solar circuit pump speed controlled with PWM control.
"Maximum storage tank temperature"			
08:60	DHW setpoint temperature (maximum tank temperature) 140°F (60°C).	08:10 to 08:90	Adjustable from 50°F to 194°F (10°C to 90°C).
"Stagnation time reduction"			
0a:5	Temperature differential for stagnation time reduction (reduction in the speed of the solar circuit pump to protect system components and heat transfer medium) 11 °F (5 K).	0a:0	Stagnation time reduction disabled.
		0a:1 to 0a:40	Temperature differential adjustable from 2°F to 72°F (1 K to 40 K).
"Solar circuit flow rate"			
0f:70	Solar circuit flow rate at maximum pump speed 1.8 USG/min (7 L/min).	0f:1 to 0f:255	Adjustable from 0.02 USG/min to 6.7 USG/min (0.1 L/min to 25.5 L/min), 1 step ≙ 0.02 USG/min (0.1 L/min).

"Solar" Group *(continued)*

Coding in the factory set condition		Possible change	
"Extended control function"			
20:0	No extended control function enabled.	20:1	Additional function for DHW heating.
		20:2	Differential temperature control 2.
		20:3	Differential temperature control 2 and auxiliary function.
		20:4	Differential temperature control 2 for central heating backup.
		20:5	Thermostat function
		20:6	Thermostat function and auxiliary function.
		20:7	Solar heating via external heat exchanger without additional temperature sensor.
		20:8	Solar heating via external heat exchanger with additional temperature sensor.
		20:9	Solar heating of two DHW storage tanks.

"Heating Circuit ..." Group

Coding

Coding in the factory set condition		Possible change	
"Storage tank priority"			
a2:2	Tank priority control for heating circuit pump and mixing valve.	a2:0	Without storage tank priority applicable to heating circuit pump and mixing valve.
		a2:1	Storage tank priority only applicable to mixing valve.
		a2:3 to a2:15	Modulating priority applies to mixing valves, i.e. the heating circuit receives a reduced amount of heat.
"Heating circuit pump logic function (economy control)"			
a5:5	With heating circuit pump logic function (economy control): heating circuit pump OFF when the outdoor temperature (OT) is 2°F (1 K) higher than the set room temperature (RTset) OT > RTset + 2°F (1 K).	a5:0	Without heating circuit pump logic function.
		a5:1 to a5:15	With heating circuit pump logic function: Heating circuit pump OFF, see the following table.

Coding address	With heating circuit pump logic function:
a5:...	Heating circ pump OFF
1	OT > RTset + 9°F (+ 5 K)
2	OT > RTset + 7°F (+ 4 K)
3	OT > RTset + 5°F (+ 3 K)
4	OT > RTset + 4°F (+ 2 K)
5	OT > RTset + 2°F (+ 1 K)
6	OT > RTset
7	OT > RTset - 2°F (- 1 K)
to	
15	OT > RTset - 16°F (- 9 K)

"Heating Circuit ..." Group *(continued)*

Coding in the factory set condition		Possible change	
"Extended economy mode"			
a6:36	Extended economy mode disabled.	a6:5 to a6:35	Extended economy mode enabled, i.e. the burner and heating circuit pump will stop and the mixing valve will be closed at a variable value, adjustable between 41 °F to 95 °F (5 °C and 35 °C) plus 2 °F (1 °C). The base value is the adjusted outdoor temperature. This value is based on the actual outdoor temperature and a time constant, which takes the cooling down of an average building into consideration.
"Mixing valve economy function"			
a7:0	Only for heating circuits with mixing valve: Without mixing valve economy function.	a7:1	With mixing valve economy function: Heating circuit pump also OFF: ■ Mixing valve tries closing for more than 20 min. Heating circuit pump ON: ■ Mixing valve in control mode.
"Pump idle time"			■ If there is a risk of frost
a9:0	Without pump idle time.	a9:7	With pump idle time (heating circuit pump turned off). Refer to function description on page 40. Note: The maximum idle time is 10 h.
		a9:1 to a9:15	Pump idle time adjustable from 1 to 15. 1: Short idle time 15: Long idle time
"Room temperature hook-up"			
b0:0	With remote control: * 1 Heating mode/reduced mode: Weather-compensated	b0:1	Heating mode: Weather-compensated Reduced mode: with room temperature hook-up
		b0:2	Heating mode: with room temperature hook-up Reduced mode: Weather-compensated
		b0:3	Heating mode/reduced mode: with room temperature hook-up.
"Room temperature-dependent heating circuit pump logic function"			
b5:0	With remote control: No room temperature-dependent heating circuit pump logic function.	b5:1 to b5:8	For heating circuit pump logic function, see the following table:

* 1 Only change the coding for the heating circuit without mixing valve A1 for boilers without lower temperature limit or for heating circuits with mixing valve if a remote control is connected to them.

"Heating Circuit ..." Group *(continued)*

Coding address b5:...	With heating circuit pump logic function: Heating circ pump OFF	Heating circuit pump on	
1	RTactual > RTset + 9°F (+ 5 K)	RTactual < RTset + 7°F (+ 4 K)	
2	RTactual > RTset + 7°F (+ 4 K)	RTactual < RTset + 5°F (+ 3 K)	
3	RTactual > RTset + 5°F (+ 3 K)	RTactual < RTset + 4°F (+ 2 K)	
4	RTactual > RTset + 4°F (+ 2 K)	RTactual < RTset + 2°F (+ 1 K)	
5	RTactual > RTset + 2°F (+ 1 K)	RTactual < RTset	
6	RTactual > RTset	RTactual < RTset -2°F (-1 K)	
7	RTactual > RTset -2°F (– 1 K)	RTactual < RTset -4°F (-2 K)	
8	RTactual > RTset -4°F (– 2 K)	RTactual < RTset -5°F (-3 K)	

Coding in the factory set condition		Possible change	
“Minimum supply temperature limit”			
c5:20	Electronic supply temperature minimum limit 68°F (20°C) (only for operation with standard room temperature).	c5:1 to c5:127	Adjustable from 34°F to 261°F (1°C to 127°C) (limited by boiler specific coding).
“Maximum supply temperature limit”			
c6:75	Electronic maximum supply temperature limit set to 167°F (75°C).	c6:10 to c6:127	Adjustable from 50°F to 261°F (10°C to 127°C) (limited by boiler specific coding).

“External operating program changeover”			
d5:0	With external operating program changeover (observe setting of coding “5d”, “5e”, “5f” and “91” in the “General” group). Changeover “Constant central heating with reduced room temperature” or “Standby mode” (subject to set reduced room temperature).	d5:1	Changeover to “Constant operation with standard room temperature”.

“EA1 extension: Operating program changeover”			
d8:0	No operating program changeover.	d8:1	Operating program changeover via input DE1.
		d8:2	Operating program changeover via input DE2.
		d8:3	Operating program changeover via input DE3.

“Slab curing”			
f1:0	Slab curing function not active. Do not adjust!		

"Heating Circuit ..." Group *(continued)*

Coding in the factory set condition		Possible change	
"Time limit for comfort mode"			
f2:8	Time limit for comfort mode or external operating program changeover via push button: 8 h.	f2:0	No time limit
	Note: Observe setting of coding "5d", "5e", "5f" in the "General" group, as well as "d5" and "d8" in the "Heating circuit..." group.	f2:1 to f2:12	Time limit adjustable from 1 to 12 h.
"Temperature limit for terminating reduced mode"			
f8:–5	Temperature limit for terminating reduced mode 25°F (-5°C), refer to example on page 42. Observe coding "a3".	f8: + 10 to f8:–60	Adjustable from 50°F to -76°F (+ 10°C to -60°C).
		f8:–61	Function disabled
"Temperature limit for raising the reduced room temperature target"			
f9:–14	Temperature limit for raising the reduced room temperature target 7°F (-14°C). Refer to example on page 42.	f9: + 10 to f9:–60	Adjustable from 50°F to -76°F (+ 10°C to -60°C).
"Raising the set boiler water or supply temperature when changing from operation with reduced room temperature to operation with standard room temperature"			
fa:20	Raising the set boiler water or supply temperature when changing from operation with reduced room temperature to operation with standard room temperature by 20%. Refer to example on page 42.	fa:0 to fa:50	Adjustable from 0 to 50%.
"Duration for raising the set boiler water or supply temperature"			
fb:60	Duration for raising the set supply temperature (see coding "fa") 60 min. Refer to example on page 42.	fb:0 to fb:300	Adjustable from 0 to 300 min.

"General" Group

Coding

Coding in the factory set condition		Possible change	
System design			
00:1	System version 1: One heating circuit without mixing valve A1 (heating circuit 1), without DHW heating.	00:2 to 00:10	For system schemes, see the following table:
Value address 00: ...	Description		
2	One heating circuit without mixing valve A1 (heating circuit 1), with DHW heating; recognized automatically.		
3	One heating circuit with mixing valve M2 (heating circuit 2), without DHW heating.		
4	One heating circuit with mixing valve (heating circuit 2), with DHW heating.		
5	One heating circuit without mixing valve A1 (heating circuit 1), one heating circuit with mixing valve M2 (heating circuit 2), without DHW heating; recognized automatically.		
6	One heating circuit without mixing valve A1 (heating circuit 1), one heating circuit with mixing valve M2 (heating circuit 2), with DHW heating; recognized automatically.		
7	Two heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3), without DHW heating.		
8	Two heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3), with DHW heating.		
9	One heating circuit without mixing valve A1 (heating circuit 1), two heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3), without DHW heating; recognized automatically.		
10	One heating circuit without mixing valve A1 (heating circuit 1), two heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3), with DHW heating; recognized automatically.		
Coding in the factory set condition		Possible change	
"With EA1 extension: DHW recirculation pump runtime for brief operation"			
12:5	DHW recirculation pump runtime for brief operation: 5 min.	12:1 to 12:60	Adjustable from 1 to 60 min.
"With EA1 extension: Temperature demand"			
1E:0	Analog input 0-10V: Temperatur demand from 32°F to 212°F (0°C to 100°C): 1V ≙ 32°F (0°C) 10 ≙ 212°F (100°C)	1E:1	Adjustable from 86°F to 248°F (30°C to 120°C): 1V ≙ 86°F (30°C) 10V ≙ 248°F (120°C)
2f:0	Do not adjust!		
"AM1 extension"			
32:0	Without AM1 extension	32:1	With AM1 extension
"Function output A2 at AM1 extension"			
33:1	Heating circuit pump, heating circuit without mixing valve A1 (heating circuit 1).	33:0	DHW recirculation pump
		33:2	DHW loading pump
		33:3	Circulation pump neutralizing system or flue gas/water-heat exchanger.

"General" Group *(continued)*

Coding in the factory set condition		Possible change	
"Function output A1 at AM1 extension"			
34:0	DHW recirculation pump.	34:1	Heating circuit pump without mixing valve A1 (Heating circuit 1).
		34:2	Tank loading pump
		34:3	Circulation pump neutralizing system or flue gas/water-heat exchanger.
"Servomotor runtime"			
40:125	Servomotor runtime at plug 52 A1 125 sec Do not adjust!	40:5 to 40:199	Adjustable from 5 sec. to 199 sec.
"Sensor 17A"			
4a:0	Do not adjust!	--	--
"Sensor 17B"			
4b:0	No sensor 17 B installed.	4b:1	Sensor 17 B installed (e.g. temperature sensor T2); automatic recognition.
"Connection at plug 20A1"			
4c:0	Connection on plug 20 A1: Heating circuit pump	4c:1	Primary pump, tank loading system.
		4c:2	Thermal control switch contact .
"Connection at plug 29"			
4d:1	Connection at plug 29 : Shunt pump.	4d:0	System pump
		4d:2	Boiler pump
		4d:3	Boiler pump with isolation valve function.
"Connection at plug 52A1"			
4e:0	Motor isolation valve.	4e:1	Motor for 3-way mixing valve for return temperature control.
		4e:1 to 4e:3	Do not adjust!
"Delay off time, shunt or system pump"			
4f:5	Delay off time system pump 5 min.	4f:0	No pump delay off.
		4f:1 to 4f:60	Adjustable from 1 to 60 min.
"Supply temperature sensor for hydraulic low loss header"			
52:0	Do not adjust!		
"Solar thermal system"			
54:0	Without solar thermal system.	54:1 to 54:3	Do not adjust!
		54:4	With solar control module, type SM1, with auxiliary function, e.g. central heating backup; automatic recognition.
"EA1 extension"			
5b:0	Without EA1 extension.	5b:1	With EA1 extension; automatic recognition.

"General" Group *(continued)*

Coding in the factory set condition		Possible change	
"Function output 157 at EA1 extension"			
5c:0	Function output 157 at EA1 extension: Central fault message	5c:1	Feed pump
		5c:2	No function
		5c:3	Heating circuit pump, heating circuit without mixing valve A1 (heating circuit 1), switched to low speed (reduced mode).
		5c:4	Heating circuit pump, heating circuit with mixing valve M2 (heating circuit 2), switched to low speed (reduced mode).
		5c:5	Heating circuit pump, heating circuit with mixing valve M3 (heating circuit 3), switched to low speed (reduced mode).
"Function input DE1 at EA1 extension"			
5d:0	No function	5d:1	Operating program changeover
		5d:2	External demand with minimum set supply temperature. Set value adjustment at coding "9b" in the "General" group.
		5d:3	External blocking
		5d:4	External blocking with fault message.
		5d:5	Fault message input.
		5d:6	Brief operation, DHW recirculation pump (push button function) Set DHW recirculation pump runtime at coding "12" in the "General" group.
"Function input DE2 at EA1 extension"			
5e:0	No function	5e:1	Operating program changeover
		5e:2	External demand with minimum set supply temperature Set value adjustment at coding "9b" in the "General" group.
		5e:3	External blocking
		5e:4	External blocking with fault message.
		5e:5	Fault message input
		5e:6	Brief operation, DHW recirculation pump (push button function) Set DHW recirculation pump runtime at coding "12" in the "General" group.

"General" Group *(continued)*

Coding in the factory set condition		Possible change	
"Function input DE3 at EA1 extension"			
5f:0	No function	5f:1	Operating program changeover.
		5f:2	External demand with minimum set supply temperature Set value adjustment at coding "9b" in the "General" group.
		5f:3	External blocking
		5f:4	External blocking with fault message.
		5f:5	Fault message input
		5f:6	Brief operation, DHW recirculation pump (push button function) Set DHW recirculation pump runtime at coding "12" in the "General" group.
"Shutdown delay neutralization system output 1 AM1"			
6c:0	Delay off time circulation pump neutralizing system: None	6c:1 to 6c:255	Adjustable from 1 to 255 sec
"Shutdown delay neutralization system output 2 AM1"			
6d:0	Delay off time circulation pump neutralizing system: None	6d:1 to 6d:255	Adjustable from 1 to 255 sec
"Display correction for outdoor temperature"			
6e:50	No display correction for outdoor temperature.	6e:0 to 6e:49	Display correction -9°F (-5 K) to Display correction -0.2°F (-0.1 K)
		6e:51 to 6e:99	Display correction +0.2°F (+0.1 K) to Display correction +9°F (+4.9 K)
"LON communication module"			
76:1	With LON communication module; automatic recognition.	76:0	Without LON communication module.
"LON participant number"			
77:1	LON participant number Boiler section 1 set to 1, boiler section 2 set to 2 boiler section 3 set to 3. IMPORTANT If coding is to be set to the factory set condition, the participant number must be reset.	77:2 to 77:99	Adjustable from 1 to 99: 1 to 8 = Boiler section 10 - 96 = Vitotronic 200-H 97 = Vitogate 300 98 = Vitogate 99 = Vitocom
"LON communication"			
78:1	LON communication enabled	78:0	LON communication disabled

"General" Group *(continued)*

Coding in the factory set condition		Possible change	
"With LON communication module"			
79:1	Control unit is fault manager.	79:0	Control unit is not fault manager IMPORTANT Must be set for boiler section 2/boiler section 3, refer to page 34.
"Central control of heating circuits"			
7a:0	Without central control of heating circuits.	7a:1	With central control Heating circuit without mixing valve A1 (heating circuit 1).
		7a:2	Heating circuit with mixing valve M2 (heating circuit 2).
		7a:3	Heating circuit with mixing valve M3 (heating circuit 3).
"LON communication module: Time"			
7b:1	Control unit transmits the time.	7b:0	No time transmission IMPORTANT Must be set for boiler section 2/boiler section 3, refer to page 34.
"Detached house/apartment building"			
7f:1	Detached house	7F:0	Apartment building Separate adjustment of holiday program and time program for DHW heating possible.
"Fault message"			
80:6	A fault message is issued if a fault occurs for at least 30 sec.	80:0	Immediate fault message.
		80:2 to 80:199	Adjustable from 10 to 995 sec, 1 step $\triangleq$ 5 sec.
"Automatic summer/wintertime changeover"			
81:1	Automatic summer/wintertime changeover.	81:0	Manual summer/wintertime changeover
		81:2	Do not adjust!
		81:3	With LON communication module: The control unit receives the time.
"Summer time starts: Month"			
82:3	March	82:1 to 82:12	January to December

"General" Group *(continued)*

Coding in the factory set condition		Possible change	
"Summer time starts: Week of the selected month"			
83:2	Week 2 of the selected month.	83:1 to 83:5	Week 1 to week 5 of the selected month.
		83:6	Last week – 1 week
		83:7	Last week – 2 week
		83:8	Last week – 3 week
		83:9	Last week – 4 week
		83:10 to 83:14	Special function
"Summer time starts: Day of the selected week"			
84:7	Last Sunday of the selected month.	84:1 to 84:7	Monday to Sunday
"Wintertime starts: Month"			
85:11	November	85:1 to 85:12	January to December
"Wintertime starts: Week of the selected month"			
86:1	Week 1 of the selected month.	86:1 to 86:5	Week 1 to week 5 of the selected month.
"Wintertime starts: Day of the selected week"			
87:7	Last Sunday of the selected month.	87:1 to 87:7	Monday to Sunday
"Temperature displayed"			
88:0	Temperature unit °C (Celsius).	88:1	Temperature unit °F (Fahrenheit)
"Test display conditions"			
8a:175	Do not adjust!	--	--
"Identification KM bus combustion controller"			
8b:1	ID exists	8b:0	ID does not exist
"Operation enabled/blocked"			
8f:0	Do not adjust!	--	--
"Time constant for calculating adjusted outdoor temperature"			
90:36	Time constant 6 h.	90:1 to 90:199	Fast (low values) or slow (high values) matching of the supply temperature, subject to the set value when the outdoor temperature changes 1 step $\triangleq$ 10 min.

"General" Group *(continued)*

Coding in the factory set condition		Possible change	
"Connection at terminals 1 and 2 in plug 143"			
91:0	Connection disabled (external operating program changeover).	91:1	Contact affects the following heating circuits: Heating circuit without mixing valve A1 (heating circuit 1).
		91:2	Heating circuit with mixing valve M2 (heating circuit 2).
		91:3	Heating circuit without mixing valve A1 (heating circuit 1) and heating circuit with mixing valve M2 (heating circuit 2).
		91:4	Heating circuit with mixing valve M3 (heating circuit 3).
		91:5	Heating circuit without mixing valve A1 (heating circuit 1) and heating circuit with mixing valve M3 (heating circuit 3).
		91:6	Heating circuit with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3).
		91:7	Heating circuit without mixing valve A1 (heating circuit 1) and heating circuits with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3).
"Central fault message during emissions test function/service display"			
93:0	Does not affect central fault.	93:1	Affects central fault message
"Communication interface"			
95:0	Without Vitocom 100 communication interface.	95:1	With Vitocom 100 communication interface; automatic recognition.
"Extension for heating circuits 2 and 3 with mixing valve"			
96:1	With PCB extension for heating circuits 2 and 3 Heating circuit is recognized automatically.	96:0	Without PCB extension for heating circuits 2 and 3.
"With LON communication module: Outdoor temperature"			
97:2	The control unit sends the outdoor temperature to the Vitotronic 200-H.	97:0	The outdoor temperature of the sensor connected to the control unit is only utilized internally.
		97:1	The control unit receives the outdoor temperature from the Vitotronic 200-H.
"Viessmann system number"			
98:1	Viessmann system number in conjunction with monitoring of several systems within one LON system with Vitocom 300.	98:1 to 98:5	Adjustable from 1 to 5

"General" Group *(continued)*

Coding in the factory set condition		Possible change	
"Connection at terminals 2 and 3 in plug 143"			
99:0	Connection disabled	99:1	No function
		99:2	External "mixing valve closed" Heating circuit with mixing valve M2 (heating circuit 2).
		99:3	No function
		99:4	External "mixing valve closed" Heating circuit with mixing valve M3 (heating circuit 3).
		99:5	No function
		99:6	External "mixing valve closed" Heating circuit with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3).
		99:7	No function
		99:8	External blocking
		99:9	No function
		99:10	External blocking/External "mixing valve closed" Heating circuit with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3).
		99:11	No function
		99:12	External blocking/External "mixing valve closed" Heating circuit with mixing valve M3 (heating circuit 3).
		99:13	No function
		99:14	External blocking/External "mixing valve closed" Heating circuit with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3).
		99:15	No function
"Connection at terminals 1 and 2 in plug 143"			
9a:0	Connection disabled.	9a:1	No function
		9a:2	External "mixing valve open" Heating circuit with mixing valve M2 (heating circuit 2).
		9a:3	No function
		9a:4	External "mixing valve open" Heating circuit with mixing valve M3 (heating circuit 3)
		9a:5	No function
		9a:6	External "mixing valve open" Heating circuit with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3).
		9a:7	No function
"Set supply temperature for external demand"			
9b:70	Set to 158°F (70°C).	9b:0 to 9b:127	Adjustable from 32°F to 261°F (0°C to 127°C) (limited by boiler specific coding).

"General" Group *(continued)*

Coding in the factory set condition		Possible change	
"With LON communication module: Monitoring LON participants"			
9c:20	Monitoring LON participants If there is no response from a participant after 20 min, the values specified inside the control unit are used. Only then will a fault message be issued.	9c:0	No monitoring.
		9c:5 to 9c:60	Time adjustable from 5 to 60 min.
"Differential temperature"			
9f:8	Differential temperature 8 K only in connection with heating circuit with mixing valve M2 (heating circuit 2) and M3 (heating circuit 3).	9f:0 to 9f:40	Adjustable from 0 to 40 K

"Combustion Controller" Group**Coding**

Coding in the factory set condition		Possible change	
"Max operational output"			
02:100	100% of rated heating output.	02:0 to 02:100	Adjustable from 0% to 100% (0% represents burner minimum firing rate).
"Gas type"			
03:0	Natural gas	03:1	Liquid Propane Gas
"Altitude"			
04:0	LA: ≤ 5000 ft. (1500 m)	04:1	HA: > 5000 ft. (1500 m)
"Max boiler temperature"			
06:95	Set to 203°F (95°C)	06:5 to 06:127	Adjustable from 41°F to 261°F (5°C to 127°C) IMPORTANT Supply temperature limit switch common supply, set to 210°F (99°C) [tolerance -11°F (-6K)].
"Integral threshold value of controller"			
08:30	Set to 30 K min	08:1 to 08:255	Adjustable from 1 to 255 K min.
"Runtime optimization"			
09:1	Integral method	09:0	Minimum pause.
"Flue gas damper"			
0a:0	Without	0a:1	Do not adjust!

"Boiler" Group

Coding

Coding in the factory set condition		Possible change	
“Single boiler and multi boiler system”			
01:2	Multi-boiler system with Viessmann-cascade or LON-cascade.	01:1	Do not adjust!
		01:3	Do not adjust!
“Consecutive boiler number in multi boiler systems”			
07:1	Consecutive boiler section number in multi boiler systems.	07:2 to 07:8	Adjustable from 1 to 8 7:1 Lead boiler section 7:2-8 Lag boiler sections
“Therm Control”			
Od:0	Without	Od:1	Do not adjust!
		Od:2	Do not adjust!
“Flue gas temperature sensor”			
1f:0	Do not adjust!		
“Service interval”			
21:0	No service interval (hours run) selected.	21:1 to 21:100	The number of hours run before the burner should be serviced is adjustable from 100 to 10000 h; 1 step ≙ 100 h
“Interval for service”			
23:0	No interval for service.	23:1 to 23:24	Interval adjustable from 1 to 24 months.
“Service” display”			
24:0	No “Service” display.	24:1	“Service” display. The address is automatically set and must be manually reset after a service has been carried out.
“Maximum preheating time of isolation valve”			
2b:5	Preheating time 5 min.	2b:1 to 2b:60	Maximum preheating time of isolation valve, adjustable from 1 to 60 min.
“Maximum shutdown delay of isolation valve”			
2c:5	Shutdown delay 5 min.	2c:1 to 2c:60	Maximum shutdown delay of isolation valve, adjustable from 1 to 60 min.

"Cascade" Group

Coding

Coding in the factory set condition		Possible change	
“Number of boilers connected to the cascade”			
35:2 or 3	Boiler sections Factory set condition: CA3B 2.5/3.0/3.5/4.0: 2 CA3B 5.0/5.0: 3	35:1 to 35:8	1 to 8 sections connected to the lead control

"Cascade" Group *(continued)*

Coding in the factory set condition		Possible change	
"Minimum system supply temperature limit"			
36:0	Set to 32°F (0°C).	36:1 to 36:127	Adjustable from 32°F to 261°F (0°C to 127°C) (only when operating with standard room temperature).
"Maximum system supply temperature limit"			
37:80	Set to 176°F (80°C).	37:20 to 37:127	Adjustable from 68°F to 261°F (20°C to 127°C). Note: Value must be lower than the lowest value of coding "06" in the "Combustion controller" group of every control unit.
"Boiler section 1 or boiler sequence changeover"			
38:0	No boiler section boiler sequence changeover Do not adjust!	38:1	Boiler section 1 changeover: Every first day of the month, the boiler with the shortest number of hours run by its burner becomes the boiler section 1.
		38:2 to 38:200	Boiler section 1 changeover after 200 to 20,000 hours run 1 step ≙ 100 hours run.
"Permanent boiler section 1"			
39:0	No permanent lead boiler section. Do not adjust!	39:1 to 39:8	Permanent lead boiler section is 1, 2, 3, 4, 5, 6, 7 or 8.
"Permanent last boiler"			
3a:0	No permanent last boiler section. Do not adjust!	3a:1 to 3a:8	Permanent last boiler section is 1, 2, 3, 4, 5, 6, 7 or 8.
"Type of control"			
3b:1	Standalone parallel boiler circuit: With supply temperature sensor (refer to page 45).	3b:0	Standalone parallel boiler circuit: Without supply temperature sensor (refer to page 45).
		3b:2	Standalone serial boiler circuit: Without supply temperature sensor (refer to page 45).
		3b:3	Standalone serial boiler circuit: With supply temperature sensor (refer to page 45).
		3b:4	Sequential control method with supply temperature sensor (refer to page 45).
"Control strategy"			
3c:0	Condensing strategy (see page 46).	3c:1	Conventional boiler strategy 1 (refer to page 47).
		3c:2	Conventional boiler strategy 2 (refer to page 47).
"Output statement"			
3d:1	Output statement for condensing strategy and conventional boiler strategy 1.	3d:0	No output statement Control only in accordance with conventional boiler strategy 2.

"Cascade" Group *(continued)*

Coding in the factory set condition		Possible change	
"System pump"			
3e:0	System pump will only run if there is a heat demand.	3e:1	System pump always runs; shutdown through "External blocking" signal.
"Tank priority control for system pump"			
3f:0	Without tank priority control for system pump.	3f:1	With tank priority control for system pump.
"ECO threshold boiler 1"			
41:31	No ECO threshold boiler 1. Do not adjust!	41: – 30 to 41: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"ECO threshold boiler 2"			
42:31	No ECO threshold boiler 2. Do not adjust!	42: – 30 to 42: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"ECO threshold boiler 3"			
43:31	No ECO threshold boiler 3. Do not adjust!	43: – 30 to 43: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"ECO threshold boiler 4"			
44:31	No ECO threshold boiler 4. Do not adjust!	44: – 30 to 44: + 30	Adjustable from -22°F to 86°F (-30°C to +30°C).
"Stop differential"			
47:15	Set to 15 K.	47:2 to 47:30	Adjustable from 4°F to 54°F (2 K to 30 K) Note: One boiler or one burner stage will be shut down if the actual supply temperature exceeds the set supply temperature by this value.
"ECO threshold boiler 5"			
65:31	No ECO threshold boiler 5. Do not adjust!	65: – 30 to 65: + 30	Adjustable from -22°F to +86°F (-30°C to +30°C).

"Cascade" Group *(continued)*

Coding in the factory set condition		Possible change	
"ECO threshold boiler 6"			
6f:31	No ECO threshold boiler 6. Do not adjust!	6f: − 30 to 6f: + 30	Adjustable from -22°F to 86°F (-30°C to + 30°C).
"ECO threshold boiler 7"			
74:31	No ECO threshold boiler 7. Do not adjust!	74: − 30 to 74: + 30	Adjustable from -22°F to 86°F (-30°C to + 30°C).
"ECO threshold boiler 8"			
7d:31	No ECO threshold boiler 8. Do not adjust!	7d: − 30 to 7d: + 30	Adjustable from -22°F to 86°F (-30°C to + 30°C).

"DHW" Group

Coding

Coding in the factory set condition		Possible change	
"Storage tank heating, hysteresis"			
55:0	Tank heating, hysteresis ±5°F (±2.5 K).	55:1	Adaptive storage tank heating enabled (refer to page 44).
		55:2	Storage tank temperature control with 2 tank temperature sensors (refer to page 44).
		55:3	Storage tank temperature control, storage tank loading system. Do not adjust!
"DHW temperature target"			
56:0	Set DHW temperature adjustable from 50°F to 140°F (10 to 60°C).	56:1	Adjustable from 50°F to above 140°F (10°C to above 60°C). Note: Observe the max. permissible DHW temperature.
"Additional function for DHW heating"			
58:0	Without additional function for DHW heating.	58:10 to 58:60	Input of a second set DHW temperature; adjustable from 50°F to 203°F (10°C to 95°C). (observe coding "56").
"Tank heating: Set start point"			
59:0	Set start point -5°F (-2.5 K) Set stop point +5°F (+2.5 K)	59:1 to 59:10	Adjustable from 1 K to 10 K below set value.
"For DHW heating"			
5a:0	The set supply temperature is determined by the highest system supply temperature demand. Scan of the temperature in the "Diagnosis" menu, "General" ("Common demand temp.").	5a:1	The supply temperature target is determined by the DHW tank supply temperature demand. Scan of the temperature in the "Diagnosis" menu, "General" ("Common demand temp.").

"DHW" Group *(continued)*

Coding in the factory set condition		Possible change	
"Boiler temperature during DHW heating"			
60:20	During DHW heating, the boiler water temperature is up to 36°F (20 K) higher than the set DHW temperature.	60:10 to 60:50	The differential between the common supply temperature and the set DHW temperature is adjustable from 11°F to 90°F (10 K to 50 K).
"DHW pump"			
61:1	DHW pump starts immediately.	61:0	DHW pump starts subject to boiler temperature.
"DHW pump delay off"			
62:10	DHW pump with a delay off time of up to 10 min after tank heating.	62:0	No DHW pump delay off
		62:1 to 62:15	Delay off time adjustable from 1 to 15 min.
"In comfort mode and after external changeover to constant operation with the standard room temperature"			
64:2	Enable constant DHW heating and DHW pump "ON".	64:0	No DHW heating; DHW pump "OFF"
		64:1	DHW heating and DHW pump "ON" according to time program.
"Input of the set DHW temperature"			
66:4	At the programming unit of the control unit and all installed Vitotrol 300A remote controls.	66:0	At the programming unit of the control unit.
		66:1	At the programming unit of the control unit and remote control unit of the heating circuit without mixing valve A1 (heating circuit 1).
		66:2	At the programming unit of the control unit and remote control unit of the heating circuit with mixing valve M2 (heating circuit 2).
		66:3	At the programming unit of the control unit and remote control unit of the heating circuit with mixing valve M3 (heating circuit 3).
		66:5	At the remote control of the heating circuit without mixing valve A1 (heating circuit 1).
		66:6	At the remote control of the heating circuit with mixing valve M2 (heating circuit 2).
		66:7	At the remote control of the heating circuit with mixing valve M3 (heating circuit 3).
"For solar DHW heating: DHW temperature target"			
67:40	DHW setpoint temperature 104°F (40°C). Reheating is suppressed above the selected set temperature (DHW heating by the boiler only if solar energy is not sufficient).	67:0	No set value 3
		67:10 to 67:95	DHW setpoint temperature adjustable from 50°F to 203°F (10°C to 95°C) (limited by boiler-specific coding). Observe setting of coding "56".
"With 2 tank temperature sensors: Tank heating stop point"			
68:8	With 2 tank temperature sensors (coding "55:2"): Tank heating stop point at set value x 0.8.	68:2 to 68:10	Factor adjustable from 0.2 to 1 1 step ≙ 0.1

"DHW" Group *(continued)*

Coding in the factory set condition		Possible change	
"With 2 tank temperature sensors: Tank heating start point"			
69:7	With 2 tank temperature sensors (coding "55:2"): Tank heating start point at set value x 0.7.	69:1 to 69:9	Factor adjustable from 0.1 to 0.9 1 step $\triangleq$ 0.1.
"Runtime, actuator, mixing valve, heat exchanger set			
6A:75	Runtime, servomotor, mixing valve, heat exchanger set: 75 sec.	6A:10 to 6A:255	For heat exchanger set: 113 sec. Runtime adjustable from 10 to 255 sec.
"DHW recirculation pump"			
70:0	DHW recirculation pump "ON" according to time program when DHW heating is enabled.	70:1	DHW recirculation pump "ON" according to time program.
71:0	DHW recirculation pump "ON" according to time program.	71:1	"OFF" during DHW heating to set value 1.
		71:2	"ON" during DHW heating to set value 1.
72:0	DHW recirculation pump "ON" according to time program.	72:1	"OFF" during DHW heating to set value 2.
		72:2	"ON" during DHW heating to set value 2.
73:0	DHW recirculation pump "ON" according to time program.	73:1 to 73:6	"ON" from once per hour for 5 min up to 6 times per hour for 5 min during the time program.
		73:7	Constantly "ON"
75:0	DHW recirculation pump "ON" according to time program.	75:1	DHW recirculation pump "OFF" during economy mode.

"Solar" Group

Only in conjunction with solar control module, type SM1.

Coding in the factory set condition		Possible change	
"Differential between the actual DHW temperature and the start point for the solar circuit pump"			
00:8	Start temperature differential for solar circuit pump 14°F (8 K)	00:2 to 00:30	Adjustable from 4°F to 72°F (2 K to 30 K).
"Differential between the actual DHW temperature and the stop point of the solar circuit pump"			
01:4	Stop temperature differential for solar circuit pump 7°F (4 K)	01:1 to 01:29	Adjustable from 2°F to 52°F (1 K to 29 K).
"Solar circuit pump speed control"			
02:0	Solar circuit pump is not speed-controlled	02:1	Variable speed solar circuit pump with wave packet control.
		02:2	Solar circuit pump speed controlled with PWM control.

"Solar" Group *(continued)*

Coding in the factory set condition		Possible change	
"Temperature differential between the collector temperature and actual DHW temperature"			
03:10	Temperature differential for the start of speed control 18°F (10 K).	03:5 to 03:20	Adjustable from 9°F to 36°F (5 K to 20 K).
"Controller amplification of the speed control"			
04:4	Controller amplification of the speed control 4%/K.	04:1 to 04:10	Adjustable from 1% to 10%/K.
"Minimum speed of the solar circuit pump"			
05:10	Minimum speed of the solar circuit pump 10% of the maximum speed.	05:2 to 05:100	Adjustable from 2% to 100%.
"Maximum speed of the solar circuit pump"			
06:75	Maximum speed of the solar circuit pump 75% of maximum possible speed.	06:1 to 06:100	Adjustable from 1% to 100%.
"Interval function of the solar circuit pump"			
07:0	Interval function of the solar circuit pump switched off.	07:1	Interval function of the solar circuit pump switched on. To capture the collector temperature more accurately, the solar circuit pump starts for short cycles.
"Maximum storage tank temperature"			
08:60	DHW setpoint temperature (maximum tank temperature) 140°F (60°C).	08:10 to 08:90	Adjustable from 50°F to 194°F (10°C to 90°C).
"Maximum collector temperature"			
09:130	Maximum collector temperature (to protect system components) 266°F (130°C).	09:20 to 09:200	Adjustable from 68°F to 392°F (20°C to 200°C).
"Stagnation time reduction"			
0a:5	Temperature differential for reducing the stagnation time (reduction in solar circuit pump speed to protect system components and heat transfer medium) 11°F (5 K).	0a:0	Stagnation time reduction disabled.
		0a:1 to 0a:40	Adjustable from 2°F to 72°F (1 K to 40 K).
"Frost protection function for solar circuit"			
0b:0	Frost protection function for solar circuit switched off.	0b:1	Frost protection function for solar circuit switched on (not required with Viessmann heat transfer medium).
"Delta T monitoring"			
0c:1	Delta T monitoring switched on. No flow rate captured in the solar circuit, or flow rate too low.	0c:0	Delta T monitoring switched off.

"Solar" Group *(continued)*

Coding in the factory set condition		Possible change	
"Night circulation monitoring"			
Od:1	Night circulation monitoring switched on. Unintentional flow in the solar circuit is captured (e.g. at night).	Od:0	Night circulation monitoring switched off.
"Calculation of solar yield"			
Oe:1	Heat statement in conjunction with Viessmann heat transfer medium	Oe:2	Do not adjust!
		Oe:0	No heat statement.
"Solar circuit flow rate"			
Of:70	Solar circuit flow rate at maximum pump speed 1.8 USG/min (7 L/min)	Of:1 to Of:255	Flow rate adjustable from 0.02 USG/min to 6.7 USG/min (0.1 L/min to 25.5 L/min) 1 step $\triangleq$ 0.02 USG/min (0.1 L/min).
"Target temperature control"			
10:0	Target temperature control OFF (see coding address "11")	10:1	Target temperature control switched on.
"Set solar DHW temperature"			
11:50	Set solar DHW temperature 122°F (50°C) ■ Target temperature control switched on (code "10:1"): Temperature at which the water in the DHW tank heated by solar energy is to be stratified. ■ Code "20:9" (heating of two DHW tanks) selected: When one DHW tank reaches its set DHW temperature, the second DHW tank is heated.	11:10 to 11:90	Adjustable from 50°F to 194°F (10°C to 90°C).
"Minimum collector temperature"			
12:20	Minimum collector temperature (minimum solar circuit pump start temperature) 68°F (20°C).	12:0	No minimum limit
		12:1 to 12:90	Adjustable from 34°F to 194°F (1°C to 90°C).

"Solar" Group *(continued)*

Coding in the factory set condition		Possible change	
"Extended control function"			
20:0	No extended control function enabled.	20:1	Additional function for DHW heating.
		20:2	Differential temperature control 2.
		20:3	Differential temperature control 2 and auxiliary function.
		20:4	Differential temperature control 2 for central heating backup.
		20:5	Thermostat function
		20:6	Thermostat function and auxiliary function.
		20:7	Solar heating via external heat exchanger without additional temperature sensor.
		20:8	Solar heating via external heat exchanger with additional temperature sensor.
		20:9	Solar heating of two DHW storage tanks [Solar heating of two DHW tanks].
"Start temperature differential for central heating backup"			
22:8	Start temperature differential with central heating backup 14°F (8 K) (code "20:4" must be set).	22:2 to 22:30	Start temperature differential adjustable from 4°F to 54°F (2 K to 30 K).
"Stop temperature differential for central heating backup"			
23:4	Stop temperature differential with central heating backup 7°F (4 K) (code "20:4" must be set).	23:2 to 23:30	Stop temperature differential adjustable from 2°F to 52°F (1 to 29 K).
"Start temperature for thermostat function"			
24:40	Start temperature for thermostat function 104°F (40°C) (coding "20:5" or "20:6" must be set).	24:0 to 24:100	Adjustable from 0°F to 180°F (0 K to 100 K).
"Stop temperature for thermostat function"			
25:50	Stop temperature for thermostat function 122°F (50°C) (coding "20:5" or "20:6" must be set).	25:0 to 25:100	Adjustable from 0°F to 180°F (0 K to 100 K).
"Priority for DHW storage tank 1"			
26:1	Priority for DHW storage tank 1 with cyclical heating (code "20:9" must be set).	26:0	Priority for DHW storage tank 1 without cyclical heating.
		26:2	Priority for DHW storage tank 2 without cyclical heating.
		26:3	Priority for DHW storage tank 2 with cyclical heating.
		26:4	Alternate heating without priority for one of the DHW storage tanks .

"Solar" Group *(continued)*

Coding in the factory set condition		Possible change	
"Alternate heating time"			
27:15	Alternate heating time 15 min The DHW tank without priority is heated at most for the duration of the set cyclical heating duration if the DHW tank with priority is already heated up.	27:5 to 27:60	Adjustable from 5 to 60 min.
"Alternate pause time"			
28:3	Alternate pause time 3 min After the selected cyclical heating duration for the DHW tank without priority has expired, the rise in collector temperature is captured during the cyclical pause time.	28:1 to 28:60	Adjustable from 1 to 60 min..

"Heating Circuit ..." Group**Coding**

Coding in the factory set condition		Possible change	
"Remote control"			
a0:0	Without remote control.	a0:1	With Vitotrol 200, recognized automatically.
		a0:2	Recognized automatically with Vitotrol 300.
"Blocking remote control"			
a1:0	All possible settings at the remote control can be accessed.	a1:1	Only comfort mode can be set at the remote control.
"Storage tank priority"			
a2:2	Tank priority for heating circuit pump and mixing valve.	a2:0	Without storage tank priority applicable to heating circuit pump and mixing valve
		a2:1	Storage tank priority only applicable to mixing valve.
		a2:3 to a2:15	Modulating priority applies to mixing valves, i.e. the heating circuit receives a reduced amount of heat.
"Temperature limits frost protection function"			
a3:2	Outdoor temperature below 34°F (1 °C): Heating circ pump switched on. Outdoor temperature above 37°F (3 °C): Heating circ pump switched off.	a3:–9 to a3:15	Heating circuit pump ON/OFF (see the following table).

**CAUTION**

If a value below 34°F (1°C) is selected, there is a risk that pipes outside the thermal envelope of the house could freeze up. Standby mode in particular should be taken into consideration, e.g. during holidays.

"Heating Circuit ..." Group *(continued)*

Coding address a3:...	Heating circuit pump	
	Heating circuit pump "ON"	Heating circuit pump "OFF"
-9	14°F (–10°C)	18°F (–8°C)
-8	16°F (–9°C)	19.5°F (–7°C)
-7	18°F (–8°C)	21°F (–6°C)
-6	19.5°F (–7°C)	23°F (–5°C)
-5	21°F (–6°C)	25°F (–4°C)
-4	23°F (–5°C)	27°F (–3°C)
-3	25°F (–4°C)	28.5°F (–2°C)
-2	27°F (–3°C)	30°F (–1°C)
-1	28.5°F (–2°C)	32°F (0°C)
0	30°F (–1°C)	34°F (+1°C)
1	32°F (0°C)	36°F (+2°C)
2	34°F (+1°C)	27°F (+3°C)
to	to	to
15	57°F (+14°C)	61°F (+16°C)

Coding in the factory set condition		Possible change	
“Frost protection”			
a4:0	With frost protection	a4:1	No frost protection; this setting is only possible if code a3:-9 has been selected. Note: “Important” also coding address “a3”.
“Heating circuit pump logic function (economy control)”			
a5:5	With heating circuit pump logic function (economy control): heating circuit pump OFF when the outdoor temperature (OT) is 2°F (1 K) higher than the set room temperature (RTset) OT > RTset 2°F (1 K).	a5:0	Without heating circuit pump logic function.
		a5:1 to a5:15	With heating circuit pump logic function: Heating circuit pump OFF, see the following table.

Coding address a5:...	With heating circuit pump logic function: Heating circuit pump "OFF"
1	OT > RTset 9°F (+ 5 K)
2	OT > RTset 7°F (+ 4 K)
3	OT > RTset 5°F (+ 3 K)
4	OT > RTset 4°F (+ 2 K)
5	OT > RTset 2°F (+ 1 K)
6	OT > RTset
7	OT > RTset 2°F (– 1 K)
to	
15	OT > RTset 16°F (– 9 K)

"Heating Circuit ..." Group (continued)

Coding in the factory set condition		Possible change	
“Extended economy mode”			
a6:36	Extended economy mode disabled.	a6:5 to a6:35	Extended economy mode enabled, i.e. the burner and heating circuit pump will stop and the mixing valve will be closed at a variable value, adjustable between 41°F to 95°F (5°C and 35°C) plus 2°F (1°C). The base value is the adjusted outdoor temperature. This value is based on the actual outdoor temperature and a time constant, which takes the cooling down of an average building into consideration.
“Mixing valve economy function”			
a7:0	Only for heating circuits with mixing valve: Without mixing valve economy function.	a7:1	With mixing valve economy function: Heating circuit pump also OFF: ■ Mixing valve switched on to heating circuit pump longer than 20 min: ■ Mixing valve in control mode ■ If there is a risk of frost
“Pump idle time”			
a9:0	Without pump idle time.	a9:1 to a9:15	Pump idle time adjustable from 1 to 15. 1: Short idle time 15: Long idle time
“Output reduction”			
aa:2	With output reduction through temperature sensor 17 A .	aa:0	Without output reduction.
		aa:1	No function.
“Room temperature hook-up”			
b0:0	With remote control: *1 Heating mode/reduced mode: Weather-compensated.	b0:1	Heating mode: Weather-compensated Reduced mode: with room temperature hook-up
		b0:2	Heating mode: with room temperature hook-up Reduced mode: Weather-compensated
		b0:3	Heating mode/reduced mode: with room temperature hook-up.
“Room influence factor”			
b2:8	With remote control and for the heating circuit, operation with room temperature hook-up must be programmed: Room influence factor 8.	b2:0	Without room influence.
		b2:1 to b2:31	Adjustable from 1 to 31.
“Room temperature-dependent heating circuit pump logic function”			
b5:0	With remote control: No room temperature-dependent heating circuit pump logic function.	b5:1 to b5:8	For heating circuit pump logic function, refer to the table on page 113.

*1 Only change the coding for the heating circuit without mixing valve A1 for boilers without lower temperature limit or for heating circuits with mixing valve if a remote control is connected to them.

"Heating Circuit ..." Group *(continued)*

Coding address b5:...	With heating circuit pump logic function:	
	Heating circuit pump "OFF"	Heating circuit pump "ON"
1	RTactual > RTset + 9°F (+ 5 K)	RTactual < RTset + 7°F (+ 4 K)
2	RTactual > RTset + 7°F (+ 4 K)	RTactual < RTset + 5°F (+ 3 K)
3	RTactual > RTset + 5°F (+ 3 K)	RTactual < RTset + 4°F (+ 2 K)
4	RTactual > RTset + 4°F (+ 2 K)	RTactual < RTset + 2°F (+ 1 K)
5	RTactual > RTset + 2°F (+ 1 K)	RTactual < RTset
6	RTactual > RTset	RTactual < RTset - 2°F (- 1 K)
7	RTactual > RTset - 2°F (- 1 K)	RTactual < RTset - 4°F (- 2 K)
8	RTactual > RTset - 4°F (- 2 K)	RTactual < RTset - 5°F (- 3 K)

Coding in the factory set condition		Possible change	
“Quick heat-up/quick setback”			
b6:0	With remote control: Without quick heat-up/quick setback.	b6:1	With quick heat-up/quick setback. (refer to function description on page 39).
“Start optimization”			
b7:0	With remote control and for the heating circuit, operation with room temperature. hook-up must be programmed: Without start optimization.	b7:1	With start optimization, max. heat-up time offset 2 h 30 min.
		b7:2	With start optimization, max. heat-up time offset 15 h 50 min.
“Heat-up gradient start optimization”			
b8:10	With remote control and for the heating circuit, operation with room temperature hook-up must be programmed: Heat-up gradient start optimization 10 min/K.	b8:11 to b8:255	Adjustable from 11 min/K to 255 min/K
“Learning start optimization”			
b9:0	With remote control and for the heating circuit, operation with room temperature hook-up must be programmed: Without learning start optimization.	b9:1	With learning start optimization
“Shutdown time optimization”			
c0:0	With remote control: Without shutdown time optimization.	c0:1	With stop optimization, max. setback time offset 1 h.
		c0:2	With stop optimization, max. setback time offset 2 h.
“Stop optimization of setback time offset”			
c1:0	With remote control: Without shutdown time optimization.	c1:1 to c1:12	With stop optimization of setback time offset adjustable from 10 min. to 120 min. 1 step $\triangleq$ 10 min.
“Learning shut-down time optimization”			
c2:0	With remote control: Without learning shutdown time optimization.	c2:1	With learning shut-down time optimization.

"Heating Circuit ..." Group *(continued)*

Coding in the factory set condition		Possible change	
"Mixing valve runtime"			
c3:125	Only for heating circuits with mixing valve: Mixing valve runtime 125 sec.	c3:10 to c3:255	Adjustable from 10 sec. to 255 sec.
"System dynamics mixing valve"			
c4:1	System dynamics: Mixing valve control characteristics.	c4:0 to c4:3	Controller responds too quickly (cycles between "Open" and "Closed"): Select a lower value. Controller responds too slowly (temperature is not held sufficiently): select a higher value.
"Minimum supply temperature limit"			
c5:20	Electronic minimum supply temperature limit 68°F (20°C) (only when operating with standard room temperature).	c5:1 to c5:127	Adjustable from 34°F to 261°F (1°C to 127°C) (limited by boiler specific coding).
"Maximum supply temperature limit"			
c6:75	Electronic maximum supply temperature limit set to 167°F (75°C).	c6:10 to c6:127	Adjustable from 50°F to 261°F (10°C to 127°C) (limited by boiler specific coding).
"Room influence limit"			
c8:31	With remote control and for the heating circuit, operation with room temperature hook-up must be programmed: No room influence limit	c8:1 to c8:30	Adjustable from 2°F to 54°F (1 K to 30 K).
"External operating program changeover"			
d5:0	With external operating program changeover (observe setting of coding "5d", "5e", "5f" and "91" in the "General" group). Changeover "Constant central heating with reduced room temperature" or "Standby mode" (subject to set reduced room temperature).	d5:1	Changeover to "Constant operation with standard room temperature".
"EA1 extension: Operating program changeover"			
d8:0	No operating program changeover.	d8:1	Operating program changeover via input DE1.
		d8:2	Operating program changeover via input DE2.
		d8:3	Operating program changeover via input DE3.
"Day temperature target"			
e1:1	Do not adjust!		
"Display correction of the actual room temperature"			
e2:50	With remote control: No display correction of the actual room temperature.	e2:0 to e2:49	Display correction -9°F (-5 K) to Display correction -0.2°F (-0.1 K)
		e2:51 to e2:99	Display correction +0.2°F (+0.1 K) to Display correction +9°F (+4.9 K)

"Heating Circuit ..." Group *(continued)*

Coding in the factory set condition		Possible change	
"Slab curing"			
f1:0	Slab curing function not active. Do not adjust!		
"Time limit for comfort mode"			
f2:8	Time limit for comfort mode or external operating program changeover via pushbutton: 8 h. Note: Observe setting of coding "5d", "5e", "5f" in the "General" group, as well as "d5" and "d8" in the "Heating circuit..." group.	f2:0	No time limit* 2
		f2:1 to f2:12	Time limit adjustable from 1 h to 12 h*2.
"Temperature limit for terminating reduced mode"			
f8:-5	Temperature limit for terminating reduced mode 23°F (-5°C), see example on page 42. Observe coding "a3".	f8: + 10 to f8:-60	Adjustable from + 50°F to -76°F (+ 10°C to -60°C).
		f8:-61	Function disabled
"Temperature limit for raising the reduced room temperature target"			
f9:-14	Temperature limit for raising the reduced room temperature target 7°F (-14°C), refer to example on page 42.	f9: + 10 to f9:-60	Limit for raising the set room temperature to the value selected for standard mode, adjustable from + 50°F to -76°F (+ 10°C to -60°C).
"Raising the set boiler water or supply temperature when changing from operation with reduced room temperature to operation with standard room temperature"			
fa:20	Raising the set boiler water or supply temperature when changing from operation with reduced room temperature to operation with standard room temperature by 20%. Refer to example on page 42.	fa:0 to fa:50	Adjustable from 0 to 50%.
"Duration for raising the set boiler water or supply temperature"			
fb:60	Duration for raising the set supply temperature (see coding "fa") 60 min. Refer to example on page 42.	fb:0 to fb:300	Adjustable from 0 to 300 min.

Calling up the Service Menu

From the home screen tap the following buttons:

- 1. 
- 2. "Service"
- 3. Enter "viservice" password.
- 4. Select the required menu range.

Overview of menu structure

"Service main menu"	
"Diagnosis"	
	"General"
	"Cascade"
	"DHW"
	"Heating circuit 1/2/3"
	"Solar energy"
	"Short query"
	"Reset data"
"Actuator test"	
"System configuration"	
	"Coding level 1"
	"Coding level 2"
"History of faults"	
"Service functions"	
	"LON participant check"
	"System log"
	"Vitocom PIN input"
"Startup"	
	"The heating system is reset to the factory state"
"Change passwords"	
	"Service level"
	"Coding level 2"
	"Reset all passwords"
"Exit service"	

Note:

- "Coding level 2" is only displayed if this level has been enabled: Enter "viexpert" password.
- Tap  to return to the "Service main menu"

Leaving the Service Menu

From the service main menu tap the following buttons:

1. "Exit service"

Note: The system exits the service menu automatically after 30 min.

Change Passwords

In the factory set condition, the following passwords have been assigned:

- "viservice" for access to the "Service main menu"
- "viexpert" for access to "Coding level 2"

From the home screen tap the following buttons:

1. 
2. "Service"
3. Enter "viservice" password.
4. "Change passwords"
5. "Service level" or "Coding level 2"
6. Enter current password.
7. Confirm with .
8. Enter new password.
9. .

Resetting all Passwords to Factory Settings

From the home screen tap the following buttons:

1. Request the master password from the Technical Service at the Viessmann Group.
2. 
3. "Service"
4. Enter "viservice" password.
5. "Change passwords"
6. "Reset all passwords"
7. Enter master password. This must be requested from the service hotline.
8. Confirm with .

Scanning Operating Data

Operating data can be scanned in various areas. Operating data on heating circuits with mixing valves and a solar thermal system can only be scanned if the relevant components are installed in the system.

For further information on operating data, see chapter "Brief scan".

Note:

"- - -" appears on the display if a scanned sensor is faulty.

From the home screen tap the following buttons:

1. 
2. "Service"
3. Enter "viservice" password.
4. "Diagnosis"
5. Select required group, e.g. "General".

Resetting Operating Data

Saved operating data (e.g. hours run) can be reset to 0. The value "Dampened outdoor temp" is reset to the actual value.

From the home screen tap the following buttons:

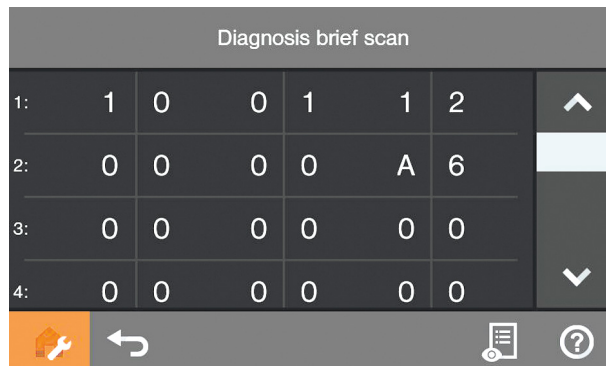
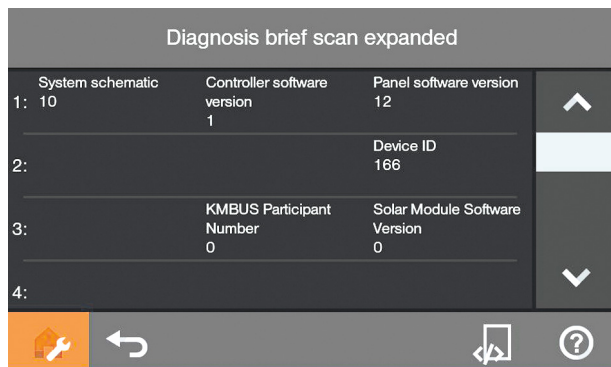
1. 
2. "Service"
3. Enter "viservice" password.
4. "Diagnosis"
5. "Reset data"
6. Select required value or "All data".

Brief Scan

From the home screen tap the following buttons:

- 1.
2. "Service"
3. Enter "viservice" password.
4. "Diagnosis"
5. "Brief scan"

6. An overview of brief scans appears with 11 lines and 6 fields. / for the required brief scan in line with the following tables.



	1	2	3	4	5	6
1:	System schemes 01 to 10		Control unit software version		Software version, programming unit	
2:	0	0	0		Appliance identification CU-ID	
3:	0	0	Number of KM BUS participants		Software version	
4:	0	0	0	0	Solar control module type SM1	
5:	0	0	0	0	0	0
6:	Connection on plug .1/2 0: Contact open 1: Contact closed	Connection on plug .2/3 0: Contact open 1: Contact closed	0	0	Software version, AM1 extension	Software version, EA1 extension
7:	LON subnet address/system number		LON node address		0	0
8:	SNVT config. 0: Auto 1: Tool	Software version Communic. coproc.	Neuron Chip Software version		Participant number	
	Heating circuit HC1		Heating circuit HC2		Heating circuit HC3	
9:	Remote control 0: Without 1: Vitotrol 200A 2: Vitotrol 300A	Software version Remote control	Remote control 0: Without 1: Vitotrol 200A 2: Vitotrol 300A	Software version Remote control	Remote control 0: Without 1: Vitotrol 200A 2: Vitotrol 300A	Software version Remote control
10:	0	0	0	0	0	0
11:	0	0	Software version, extension for heating circuits 2 and 3 with mixing valve	0	Software version, extension for heating circuits 2 and 3 with mixing valve	0

Note: The displays in fields 3 and 5 are the same.

Carrying Out an Actuator Test

From the home screen tap the following buttons:

1. 
2. "Service"
3. Enter "viservice" password.
4. "Actuator test"

Note: Before an actuator is selected, all actuators are switched off.

The actuators listed in the table can be tested at the relay outputs subject to system equipment level and control unit configuration (lead control or service control).

Display		Explanation
"All actuators"	OFF	All actuators have been switched off.
"Output 20"	ON	Actuator at output 20 A1
"Output 52"	Open	Actuator at output 52 A1
"Output 52"	Neutral	
"Output 52"	Close	
"DHW tank primary pump"	ON	Actuator at output 21
"DHW circ pump"	ON	Actuator at output 28
"Output 29"	ON	Actuator at output 29
"Central fault message"	ON	Central fault message facility at output 50
"Htg circ pump HC2"	ON	Actuator at output 20 M2
"Mixing valve HC2"	Open	Actuator at output 52 M2
	Close	
"Htg circ pump HC3"	ON	Actuator at output 52 M3
"Mixing valve HC3"	Open	Actuator at output 52 M3
	Close	
"EA1 output 1"	ON	Contact "P - S" on plug 157 of EA1 extension closed.
"AM1 output 1"	ON	Actuator at output A1
"AM1 output 2"	ON	Actuator at output A2
"Solar circuit pump"	ON	"Solar circuit pump" On Solar circuit pump at output 24 at solar control module, type SM1
"Solar circ pump min"	ON	"Solar circ pump min" On Solar circuit pump at output 24 at solar control module, type SM1 set to min. speed.
"Solar circ pump max"	ON	"Solar circ pump min" On Solar circuit pump at output 24 at solar control module, type SM1 set to max. speed.
"SM1 output 22"	ON	Actuator at output sS at solar control module type SM1

Information regarding the mixing valve motor rotational direction.

The supply temperature must rise when the mixing valve opens. If the temperature drops, either the motor is turning in the wrong direction or the mixing valve set is incorrectly fitted (observe the mixing valve installation instructions).

Checking Sensors

From the home screen tap the following buttons:

1. 
2. "Service"
3. Enter "viservice" password.
4. "Diagnosis"
5. Select group.
6. Scan actual temperature of the relevant sensor.

Maintenance Display

Set limits in coding "21" and "23" in the "Boiler" group. Once these values have been reached, "Service" and symbol  appear on the display.

Tap the following buttons:

1. "Confirm" The footer shows .
2. 

Note: After tapping  the following will be displayed if your heating system has several fault messages simultaneously:

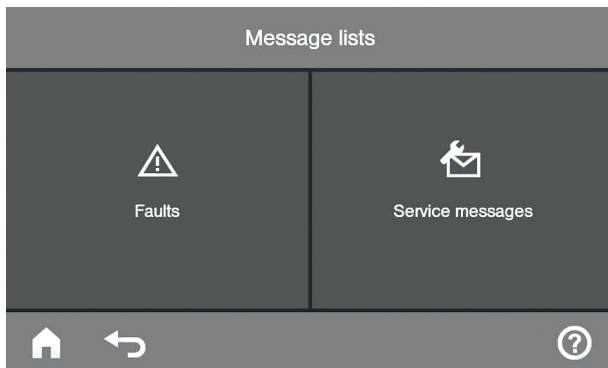
3. "Service messages"
The service messages appear orange in a list.

After maintenance has been carried out

From the home screen tap the following buttons:

1. 
2. "Service"
3. Enter "viservice" password.
4. "Service functions"
5. "Reset service" The set service coding for hours run and interval restart at 0 and coding "24" in the "Boiler" group is set to "24:0".

Note: If a service is carried out prematurely, set coding "24:1" in the "Boiler" group to "24:0". The selected maintenance coding for hours run and time intervals restart at 0. If coding "24" is not reset, "Service" will be displayed again on the following Monday.

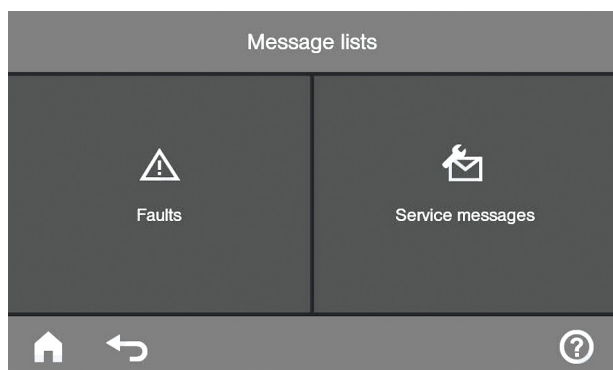


Fault Display

In the event of a fault, the red fault display flashes at the control unit. The display shows symbol  and "Fault".

Note: If a central fault message facility is connected, this is started.

For an explanation of fault messages, see chapter "Fault messages".



Calling up acknowledged fault messages

Tap the following buttons:

1. 

Note: After tapping  the following will be displayed if your heating system has several fault messages simultaneously:

2. "Faults" The fault messages appear in red and in chronological order in a list.

Calling up fault codes from the fault memory (fault history)

The 10 most recent faults (including those remedied) are saved and can be scanned. Faults are sorted by date.

From the home screen tap the following buttons:

1. 
2. "Service"
3. Enter "viservice" password.
4. "Fault history"
5. Call up further information in the relevant fault with .
6.  to delete the list.

Boiler System Fault Codes

Displayed fault code	System characteristics	Cause	Measures
Of	Control mode.	Service "Of" is only displayed in the fault history.	Service required Note: After servicing, set code "24:0".
10	Operates as if the outdoor temperature was 32°F (0°C).	Short circuit, outdoor temperature sensor.	Check outdoor temperature sensor.
18	Operates as if the outdoor temperature was 32°F (0°C).	Lead break, outdoor temperature sensor.	Check outdoor temperature sensor.
20	Standalone control unit without supply temperature sensor (possibly supply temperature not high enough)	Short circuit, common supply temperature sensor	Check the supply temperature sensor.
28	Standalone control unit without supply temperature sensor (possibly supply temperature not high enough)	Lead break, common supply temperature sensor	Check the supply temperature sensor.
30	■ With DHW tank: DHW pump ON, boiler is maintained at set tank temperature. ■ Without DHW tank: Boiler is regulated by the temperature controller.	Short circuit, boiler water temperature sensor	Check boiler water temperature sensor.
38	■ With DHW tank: DHW pump ON, boiler is maintained at set tank temperature. ■ Without DHW tank: Boiler is regulated by the temperature controller.	Lead break, boiler water temperature sensor	Check boiler water temperature sensor.
40	Mixing valve is being closed.	Short circuit, supply temperature sensor, heating circuit with mixing valve M2 (heating circuit 2).	Check supply temperature sensor.
44	Mixing valve is being closed.	Short circuit, supply temperature sensor, heating circuit with mixing valve M3 (heating circuit 3).	Check supply temperature sensor.
48	Mixing valve is being closed.	Lead break, supply temperature sensor, heating circuit with mixing valve M2 (heating circuit 2).	Check supply temperature sensor.

Boiler System Fault Codes *(continued)*

Displayed fault code	System characteristics	Cause	Measures
4c	Mixing valve is being closed.	Lead break, supply temperature sensor, heating circuit with mixing valve M3 (heating circuit 3).	Check supply temperature sensor.
50	Tank loading pump on: DHW temperature target = set supply temperature Priority control is cancelled.	Short circuit, tank temperature sensor 1	Check tank temperature sensor.
52	Control mode	Short circuit, supply temperature sensor low loss header.	Check supply temperature sensor.
58	Tank loading pump on: DHW temperature target = set supply temperature Priority control is cancelled.	Lead break, DHW tank temperature sensor 1.	Check DHW tank temperature sensor.
5a	Control mode	Lead break, low loss header supply temperature sensor.	Check supply temperature sensor (see page 57). Without supply temperature sensor: Set code "52:0" in the "General" group.
60	Boiler with maximum temperature, no output reduction, mixing valve return temperature control open	Short circuit, temperature sensor 17 A .	Check temperature sensor.
68	Boiler with maximum temperature, no output reduction, mixing valve return temperature control open	Lead break, temperature sensor 17 A .	Check temperature sensor. Without temperature sensor: Set coding "4a:0" in the "General" group.
70	Shunt pump constantly ON. With tank loading system: close 3-way mixing valve; no DHW heating	Short circuit, temperature sensor 17 B .	Check temperature sensor.
78	Shunt pump constantly ON With tank loading system: close 3-way mixing valve; no DHW heating	Lead break, temperature sensor 17 B .	Check temperature sensor. Without temperature sensor: Set code "4b:0" in the "General" group.
80	If a fault occurs 3 x in 15 min., fault is displayed. Burner control unit goes into a fault state, system cools down, burner control unit locked out.	Short circuit, boiler water temperature sensor, burner control unit	Check connection cable and dual sensor; replace sensor if required.
81	Burner control unit in a fault state	Sensor drift, boiler water temperature sensor, burner control unit	Check connection cable and dual sensor; replace sensor if required.

Boiler System Fault Codes *(continued)*

Displayed fault code	System characteristics	Cause	Measures
88	Burner control unit in a fault state	Lead break, boiler water temperature sensor, burner control unit	Check connection cable and dual sensor; replace sensor if required.
90	Control mode	Short circuit, temperature sensor 7 connection at solar control module, type SM1.	Check temperature sensor 7 (see separate installation and service instructions).
91	Control mode	Short circuit, temperature sensor 10 , connection at solar control module, type SM1.	Check temperature sensor 10 (see separate installation and service instructions).
92	No solar DHW heating.	Short circuit, collector temperature sensor, connection of temperature sensor 6 at solar control module, type SM1 or sensor at S1 of the Vitosolic.	Check sensor at the solar control unit (see separate installation and service instructions).
93	Control mode.	Short circuit, temperature sensor, connection at S3 of the Vitosolic.	Check sensor at the solar control unit (see separate installation and service instructions).
94	No solar DHW heating.	Short circuit, DHW tank temperature sensor, connection of temperature sensor 5 at solar control module, type SM1 or sensor at S2 of the Vitosolic.	Check sensor at the solar control unit (see separate installation and service instructions).
98	Control mode	Lead break, temperature sensor 7 , connection at solar control module, type SM1.	Check temperature sensor 7 (see separate installation and service instructions). Check coding address "20" in the "Solar" group.
99	Control mode	Lead break, temperature sensor 10 , connection at solar control module, type SM1.	Check temperature sensor 10 (see separate installation and service instructions). Check coding address "20" in the "Solar" group.
9a	No solar DHW heating.	Lead break, collector temperature sensor, connection of temperature sensor & at solar control module, type SM1 or sensor at S1 of the Vitosolic.	Check sensor at the solar control unit (see separate installation and service instructions).

Boiler System Fault Codes *(continued)*

Displayed fault code	System characteristics	Cause	Measures
9b	Control mode	Lead break, temperature sensor, connection to S3 of the Vitosolic.	Check sensor at the solar control unit (see separate installation and service instructions).
9c	No solar DHW heating.	Lead break, DHW tank temperature sensor, connection of temperature sensor [5] at solar control module, type SM1 or sensor at S2 of the Vitosolic.	Check sensor at the solar control unit (see separate installation and service instructions).
9e	Control mode	No supply rate in solar circuit or flow rate too low, or temperature limiter has responded.	Check solar circuit. Acknowledge fault message (see separate installation and service instructions).
9f	Control mode	Fault, solar control module, type SM1 or Vitosolic. Displayed if a fault occurs at these devices that has no fault message in the Vitotronic.	Check solar control unit (see separate installation and service instructions).
a0	Boiler cools down	Fault, safety equipment at "X7" of plug-in adapter 2 for external safety equipment	Check safety equipment, reset if required.
a1	Boiler cools down	Fault, safety equipment at "X3" of plug-in adapter 2 for external safety equipment	Check safety equipment, reset if required.
a2	Boiler cools down	Fault, safety equipment at "X2" of plug-in adapter 2 for external safety equipment	Check safety equipment, reset if required.
a3	Boiler cools down	Fault, safety equipment at "X1" of plug-in adapter 2 for external safety equipment	Check safety equipment, reset if required.
a7	Control mode	Programming unit fault	Replace the programming unit.
ab	Control mode, DHW tank may be cold	Tank loading system configuration fault: Coding "55:3" in the "DHW" group has been set, but plug [17] [B] is not plugged in and/or codes "4c:1" and "4e:2" in the "General" group have not been set.	Insert plug [17] [B] and check codes.
b1	Control mode	Communication error, programming unit	Check connections, and replace the programming unit if required.
b5	Control mode	Internal fault	Check PCB is plugged in correctly.

Boiler System Fault Codes *(continued)*

Displayed fault code	System characteristics	Cause	Measures
b6	Constant mode	Invalid hardware recognition	Check coding address "92" in the "General" group; ■ 161: Single boiler system ■ 190: Cascade control unit ■ 166: Boiler section 2/boiler section 3 control unit Note: Coding "8a:176" in the "General" group must be set in order for coding "92" to be able to be displayed.
b7	Boiler water temperature control	Coding card fault	Plug in or replace the boiler coding card.
b8	Control mode	Lead break, flue gas temperature sensor	Replace temperature sensor. Set code "1F:0" in the "Boiler" group.
ba	Mixing valve close	Communication error, PCB, extension for heating circuits 2 and 3 with mixing valve.	Check that the PCB and ribbon cable are plugged in correctly, and replace PCB if required.
bc	Control mode without remote control.	Communication error, Vitotrol remote control unit, heating circuit without mixing valve A1 (heating circuit 1).	Check connections, lead (see separate installation and service instructions) and coding address "a0" in the "Heating circuit..." group.
bd	Control mode without remote control	Communication error, Vitotrol remote control unit, heating circuit with mixing valve M2 (heating circuit 2)	Check connections, lead (see separate installation and service instructions) and coding address "a0" in the "Heating circuit..." group.
be	Control mode without remote control	Communication error, Vitotrol remote control unit, heating circuit with mixing valve M3 (heating circuit 3)	Check connections, lead (see separate installation and service instructions) and coding address "a0" in the "Heating circuit..." group.
bf	Control mode No communication via LON	Incorrect LON communication module.	Replace LON communication module.
c1	Boiler cools down	External safety equipment at plug 150 .	Check connection and external safety equipment.
c2	Control mode	Lead break, KM BUS to solar control module, type SM1 or Vitosolic.	Check KM BUS cable and appliance. Without solar control unit: Set code "54:0" in the "General" group.
c3	Control mode	Communication error, AM1 extension	Check connections. Without AM1 extension: Set coding "32:0" in the "General" group.
c8	Boiler cools down.	Fault, low water indicator at "X7" of plug-in adapter 1 for external safety equipment.	Check system water level, reset low water indicator.

Boiler System Fault Codes *(continued)*

Displayed fault code	System characteristics	Cause	Measures
c9	Boiler cools down.	Fault, maximum pressure limiter at "X3" of plug-in adapter 1 for external safety equipment	Check system pressure, reset maximum pressure limiter.
cA	Boiler cools down.	Fault, minimum pressure limiter or maximum pressure limiter 2 at "X2" of plug-in adapter 1 for external safety equipment	Check system pressure, reset minimum pressure limiter or maximum pressure limiter 2.
cB	Boiler cools down.	Fault at additional safety temperature limiter or temperature monitor at "X1" of plug-in adapter 1 for external safety equipment	Check system temperature, reset safety temperature limiter.
cF	Control mode No communication via LON, boiler at a configurable temperature set point	Communication error, control unit LON communication module.	Check LON communication module and replace if required. If no LON communication module is installed, set code "76:0" in the "General" group.
d1	Boiler cools down.	Burner in fault mode	Check burner
d2	Control mode	Communication fault, Plug-in adapter 2 for external safety equipment	Check plug-in adapter , if no plug-in adapter is available, adjust coding "31:0" in "General" group.
d3	Control mode	Communication error, extension EA1.	Check connections (refer to the installation manual). Without extension EA1: Set code "5b:0" in the "General" group.
d4	Boiler cools down	MCB F2 has responded. Connection plug 151 broken.	Check MCB F2 and jumper on plug 151 . Fuse F2 has tripped or check connection to Plug 151 , possibly plug 151 not inserted.
d5	Boiler ramps up to the electronic maximum boiler water temperature limit.	No communication between boiler circuit control unit and cascade control unit.	Check communication via participants check. Check configuration of cascade participants.
d6	Control mode	Input DE1 at extension EA1 reports a fault.	Remove fault at appliance concerned.
d7	Control mode	Input DE2 at extension EA1 reports a fault.	Remove fault at appliance concerned.
d8	Control mode	Input DE3 at extension EA1 reports a fault.	Remove fault at appliance concerned.
da	Control mode without room influence.	Short circuit, room temperature sensor, heating circuit without mixing valve A1 (heating circuit 1).	Check room temperature sensor (refer to page 77).
db	Control mode without room influence	Short circuit, room temperature sensor, heating circuit with mixing valve M2 (heating circuit 2).	Check room temperature sensor (refer to page 77).

Boiler System Fault Codes *(continued)*

Displayed fault code	System characteristics	Cause	Measures
dc	Control mode without room influence.	Short circuit, room temperature sensor, heating circuit with mixing valve M3 (heating circuit 3).	Check room temperature sensor (refer to page 77).
dd	Control mode without room influence.	Lead break, room temperature sensor, heating circuit without mixing valve A1 (heating circuit 1).	Check room temperature sensor (refer to page 77).
de	Control mode without room influence.	Lead break, room temperature sensor, heating circuit with mixing valve M2 (heating circuit 2).	Check room temperature sensor (refer to page 77).
df	Control mode without room influence.	Lead break, room temperature sensor, heating circuit with mixing valve M3 (heating circuit 3).	Check room temperature sensor (refer to page 77).

Burner Fault Codes

Fault display on the display interface of the control unit, to service burner refer to burner section starting on page 28.

Displayed fault code	System characteristics	Cause	Measures
E1	Burner control unit in a fault state.	Valve 1 not tight / gas pressure switch 2 does not open.	Check setting of gas pressure switch 2; check connecting cable; replace gas valve.
E2	Burner control unit in a fault state.	Valve 2 not tight; gas pressure switch 2 does not close.	Check setting of gas pressure switch 2; check connecting cable; replace gas valve.
	Shortage of gas to gas pressure switch 2; valve leak test.	Gas valve does not open; gas valve leaking; gas pressure switch 2 faulty.	Replace gas valve.
E4	Burner shuts down	Multiple detection of undervoltage with return and renewed undervoltage.	Check the power supply.
E5	Burner control unit in a fault state.	Internal fault of the burner control unit and during test of ionization input.	Replace burner control unit.
EE	Burner control unit in a fault state.	Internal error in feedback from gas safety valves; output relay does not respond.	Reset burner control unit; replace burner control unit.
EF	Burner control unit in a fault state.	Internal error in feedback from gas safety valves; output relay does not respond.	Reset burner control unit; replace burner control unit.
F0	Operation according to internal burner control unit defaults.	Communication error, burner control unit.	Check plug and KM BUS to burner control unit.

Burner Fault Codes *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F2	Burner control unit in a fault state; system cools down.	Excessive boiler water temperature.	Wait until the boiler water temperature falls below the maximum permissible boiler water temperature. If the burner fan is active check sensor 3A/3B. If the burner fan is not active check sensor 15A/15B. Reset burner control unit.
F3	Ionization flame monitor reports faulty flame signal during start-up or after the post-purge.	Gas valve not gas tight (gas is escaping and burning); incorrect coding card.	Check ionization path; replace coding card; replace gas valve.
F4	No flame formation during safety time; ionization flame monitor reports no flame signal.	Ionization electrode incorrectly adjusted; ionization electrode not plugged in. Ground leakage of electrode or cable.	Insert plug of ionization electrode; check cables; adjust ionization electrode (see boiler service instructions)
	No flame formation during safety time; ionization flame monitor reports no flame signal.	Ignition electrodes incorrectly adjusted, electrodes grounded, faulty ignition unit, faulty burner control unit.	Adjust ignition electrodes (see boiler service instructions); replace ignition unit; replace burner control unit.
	No flame formation during safety time; ionization flame monitor reports no flame signal.	Insulation body of ignition or ionization electrode cracked.	Replace ignition or ionization electrode
	Poor start-up characteristics; rotary damper does not close.	Servomotor faulty, servomotor connecting cable faulty, output relay faulty (burner control unit).	Replace connecting cable; replace servomotor; replace burner control unit.
	Flame does not build during the safety time, no signal captured by the ionization flame monitor.	Incorrect gas type selected.	Select gas type (see boiler service instructions).
	Flame does not build during the safety time, no signal captured by the ionization flame monitor.	Gas valve does not open.	Check connecting cable; check gas valve and replace if required.
	Flame does not build during the safety time, no signal captured by the ionization flame monitor.	Combustion characteristics not ideal.	Adjust the burner (see boiler service instructions); if necessary also adjust the setting screws when the burner is off to be able to start the burner).

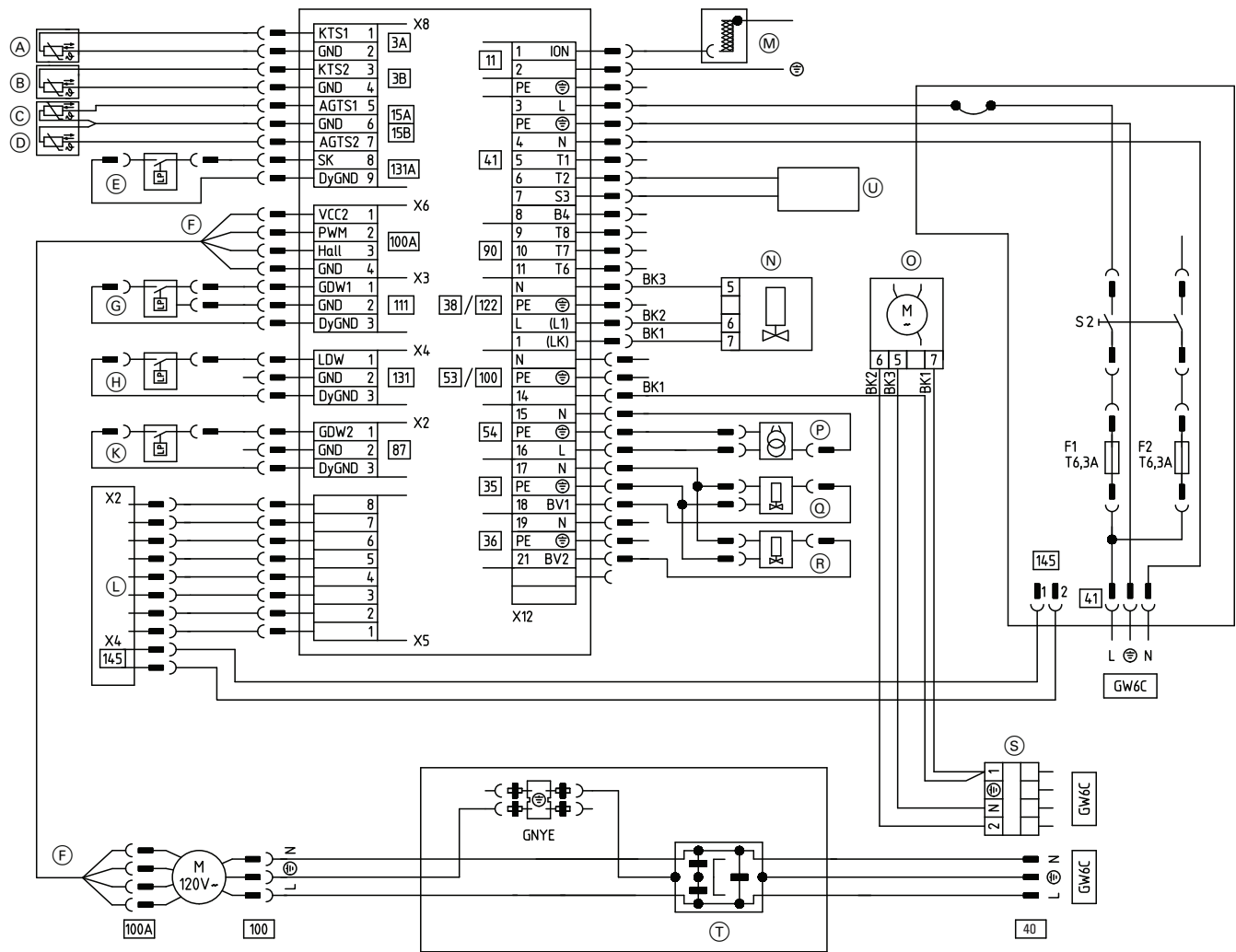
Burner Fault Codes *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F5	Air pressure switch shows no air pressure, fan not running.	Air pressure switch is faulty, incorrectly connected or incorrectly set.	Replace air pressure switch, connect or set correctly.
	Air pressure switch switches off during operation.	Flue gas back pressure; condensate backed up; air pressure switch hose faulty; connecting hose leaking.	Remove flue gas back pressure; check if condensate backed up; reset burner control unit; replace hose.
F6	Gas pressure switch notifies no gas pressure.	Gas shut-off valve closed; gas pressure switch faulty; multiple problems with gas supply.	Open gas shut-off valve; check gas flow pressure; replace gas filter if required; reset burner control unit; replace gas valve.
F7	Fan pressure is produced during the air pressure switch idle state check.	Wind influence on fan.	Check the flue draught (chimney)
	Air pressure switch contact is not in the idle state.	Air pressure switch faulty.	Replace the air pressure switch.
F8	Flame extinguishes during operation.	Burner gauze assembly faulty.	Check burner gauze assembly; replace if damaged.
	Flame extinguishes during operation.	Combustion characteristics not ideal.	Adjust burner (see boiler service instructions).
F9	Fan not running; fan speed not reached.	Fan faulty; cables are faulty or broken.	Check cables and replace the fan if required
	Status duration too long, fan ramp-up.	Internal fault; fan cannot reach its set value.	Replace fan or burner control unit.
	Varying fan speed	Fan faulty, cable 100 A faulty or broken. Check cable 100 A ; check external power supply; replace the cable or fan; remove foreign bodies.	Check cable; replace cable 100 A or fan.
	No fan feedback.	Fan faulty, external fan power supply not connected or faulty cable 100 A or cable broken, fan blocked (poss. by foreign bodies).	Check cable 100 A ; check external power supply; replace cable or fan; remove foreign bodies.
Fa	Fan runs without demand; burner control unit in a fault state.	Fan does not reach idle state, cable 100 A faulty, fan faulty, faulty burner control unit.	Fan subject to wind influence, check flue outlet and fan, replace cable 100 A , replace fan, replace burner control unit.
Fd	Burner control unit in a fault state; system cools down; burner control unit locked out.	Burner control unit in a fault state.	Read off fault at the burner control unit display and programming unit (boiler service instructions).

Fault message to the burner control unit:

Note: If LON participant faults occur, "Fault participant"... is displayed.

Burner Control Unit Connection Diagram



WARNING

Disconnect power inside the boiler junction box, before servicing boiler.

CAUTION

Provide disconnect means and overload protection as required.

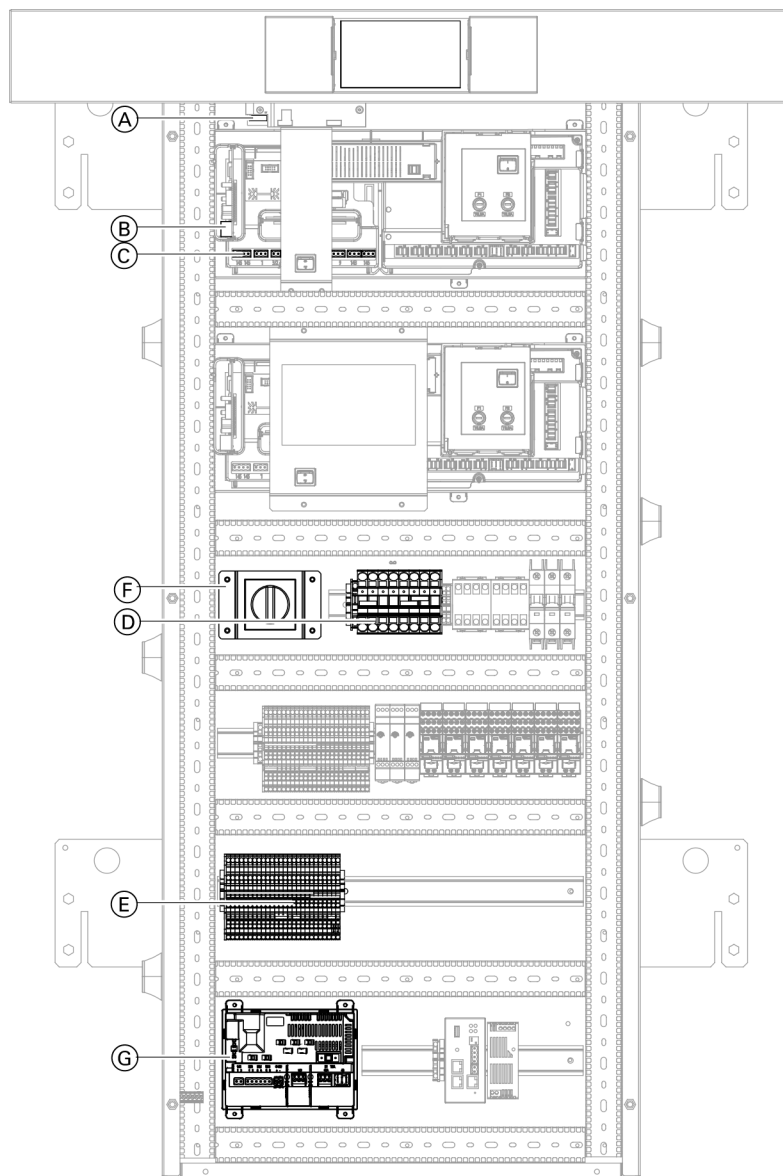
Legend

- (A) Boiler temperature sensor 1 [3] A
- (B) Boiler temperature sensor 2 [3] B
- (C) Secondary boiler water temperature sensor 1 [15] A
- (D) Secondary boiler water temperature sensor 2 [15] B
- (E) Overfire pressure switch [131] A (APS2)
- (F) Fan motor with PWM control and feedback [100] A
- (G) Inlet gas pressure switch [111] GDW1
- (H) Inlet fan pressure switch [131] (APS1)
- (K) Gas pressure switch (outlet pressure at first valve seat) [87] GDW2
- (L) Burner display and programming unit

- (M) Flame sensor [11]
- (N) Solenoid valve
- (O) Burner damper
- (P) Ignition unit [54]
- (Q) Gas valve V1 [35]
- (R) Gas valve V2 [36]
- (S) Vitotronic control unit
- (T) AC-EMI suppression filter device
- (U) Message: Air damper open
- F1/F2 Fuse

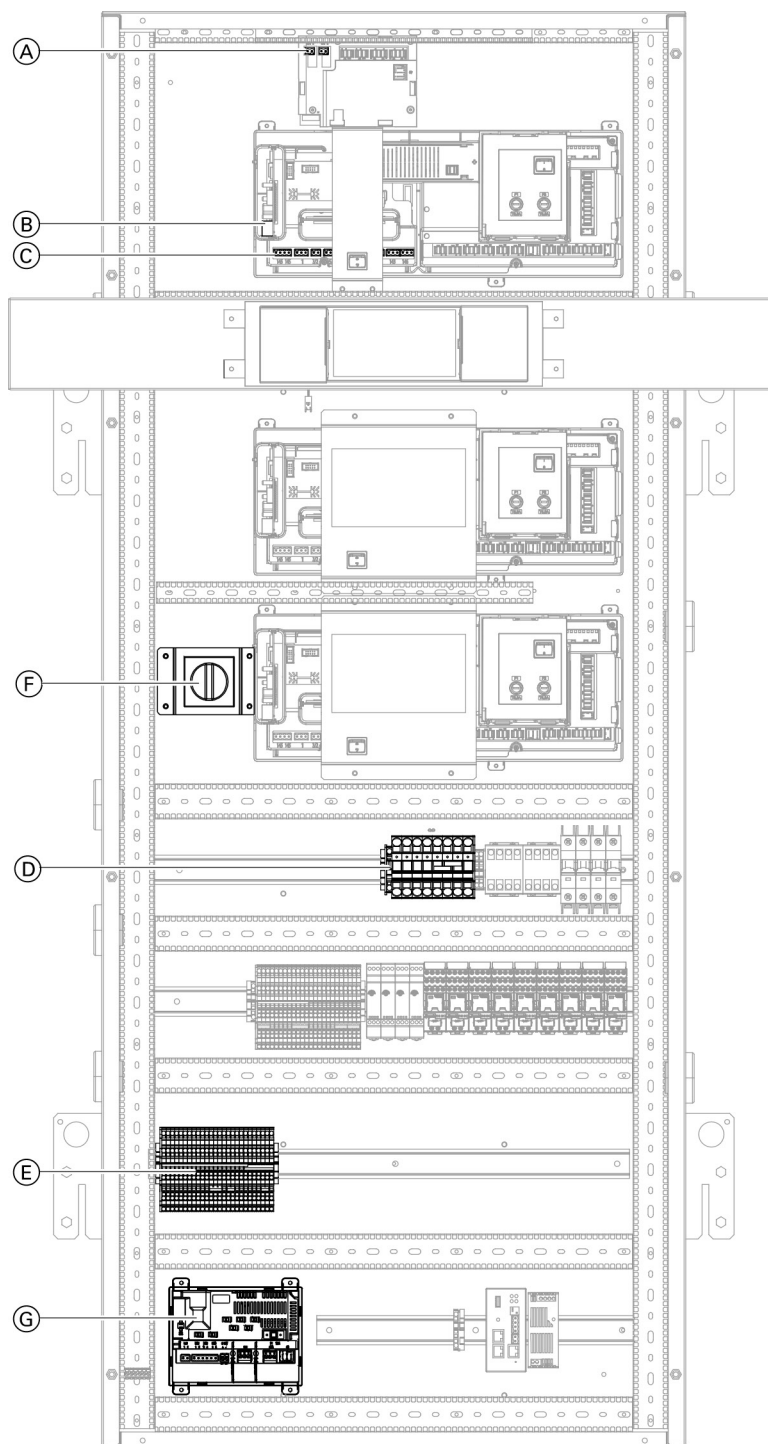
Boiler Connections

Connection overview for CA3B 2.5 to 4.0 models



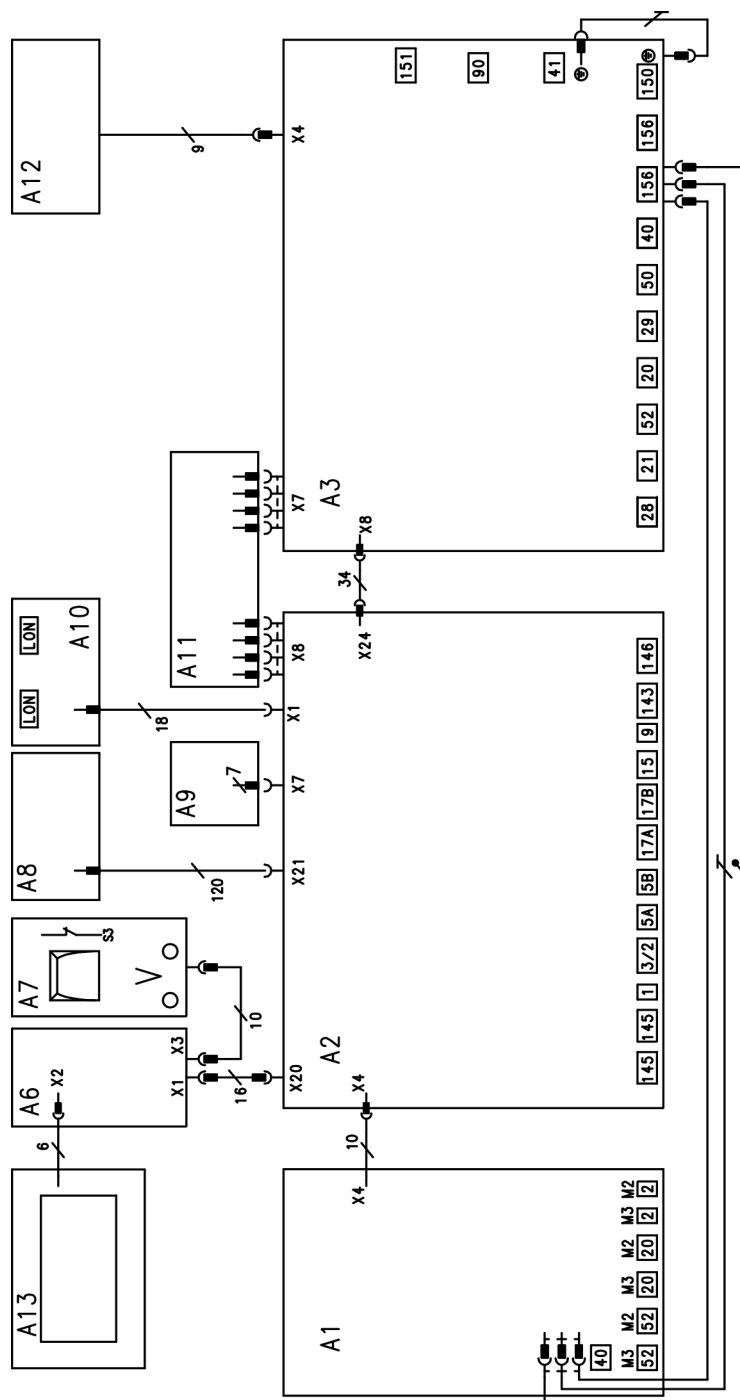
Legend

- (A) Supply temperature sensors heating circuits M2/M3
- (B) External LON participants (i.e. Vitotronic 200-H)
- (C) Low voltage/sensor connections
- (D) Boiler power supply connection
- (E) Pumps/mixing valve connections
- (F) Disconnect switch with lockout provision
- (G) EA1 extension

Boiler Connections *(continued)***Connection overview for CA3B 5.0 to 6.0 models****Legend**

- Ⓐ Supply temperature sensors heating circuits M2/M3
- Ⓑ External LON participants (i.e. Vitotronic 200-H)
- Ⓒ Low voltage/sensor connections
- Ⓓ Boiler power supply connection
- Ⓔ Pumps/mixing valve connections
- Ⓕ Internal disconnect switch (with lockout provision)
- Ⓖ EA1 extension

Overview



Legend

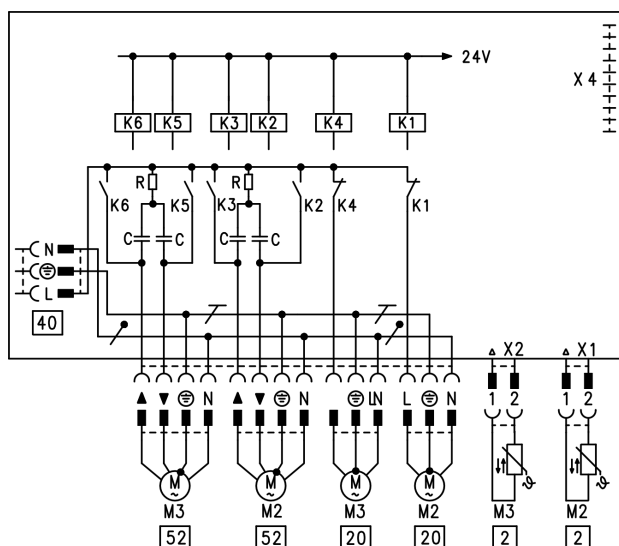
- | | |
|----|---|
| A1 | PCB extension for heating circuits 2 and 3 with mixing valve, boiler section 1 control only |
| A2 | PCB, low voltage |
| A3 | PCB, 120 V ~ |
| A6 | Programming unit connection PCB |
| A7 | Optolink PCB / emissions test switch |

- | | |
|-----|--------------------------------|
| A8 | PCB |
| A9 | Coding card |
| A10 | LON communication module |
| A11 | Power supply unit PCB |
| A12 | Programming unit ON/OFF switch |
| A13 | Programming unit |
| X | Electrical interfaces |

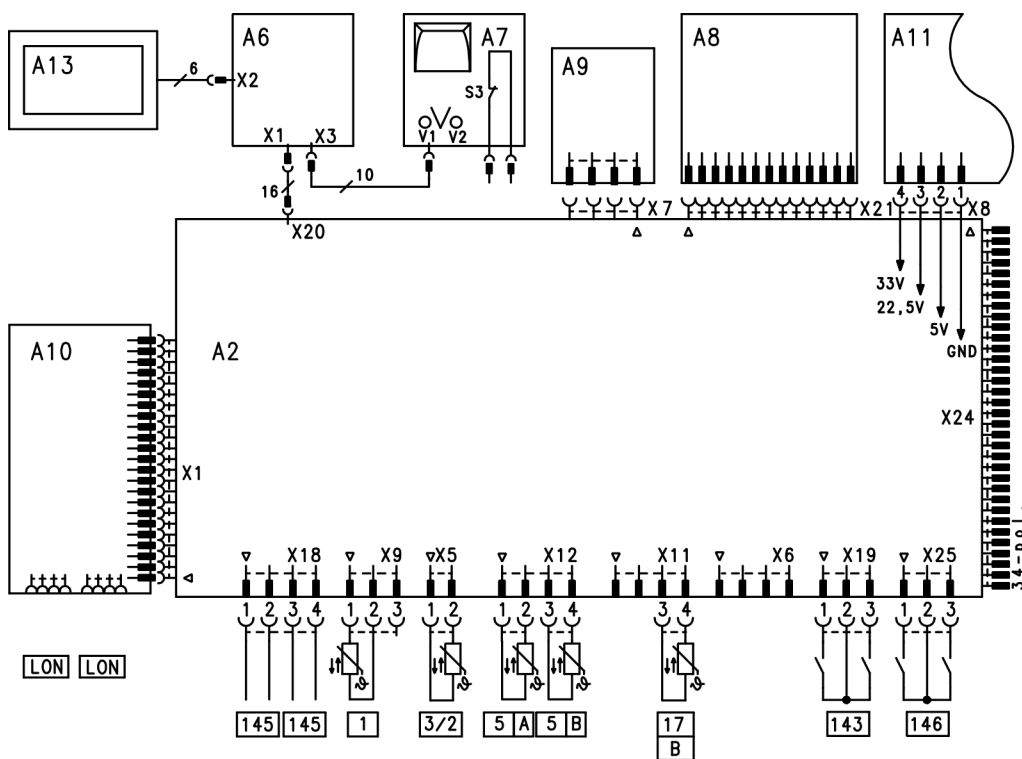
PCB Extension for Heating Circuits 2 and 3 with Mixing Valve

PCB, extension for heating
circuits 2 and 3 with mixing valve

- 2 M2/M3 Supply temperature sensors
 20 M2/M3 Heating circuit pumps
 40 Power supply
 52 M2/M3 Mixing valve motors
 K1-K6 Relay
 X Electrical interfaces



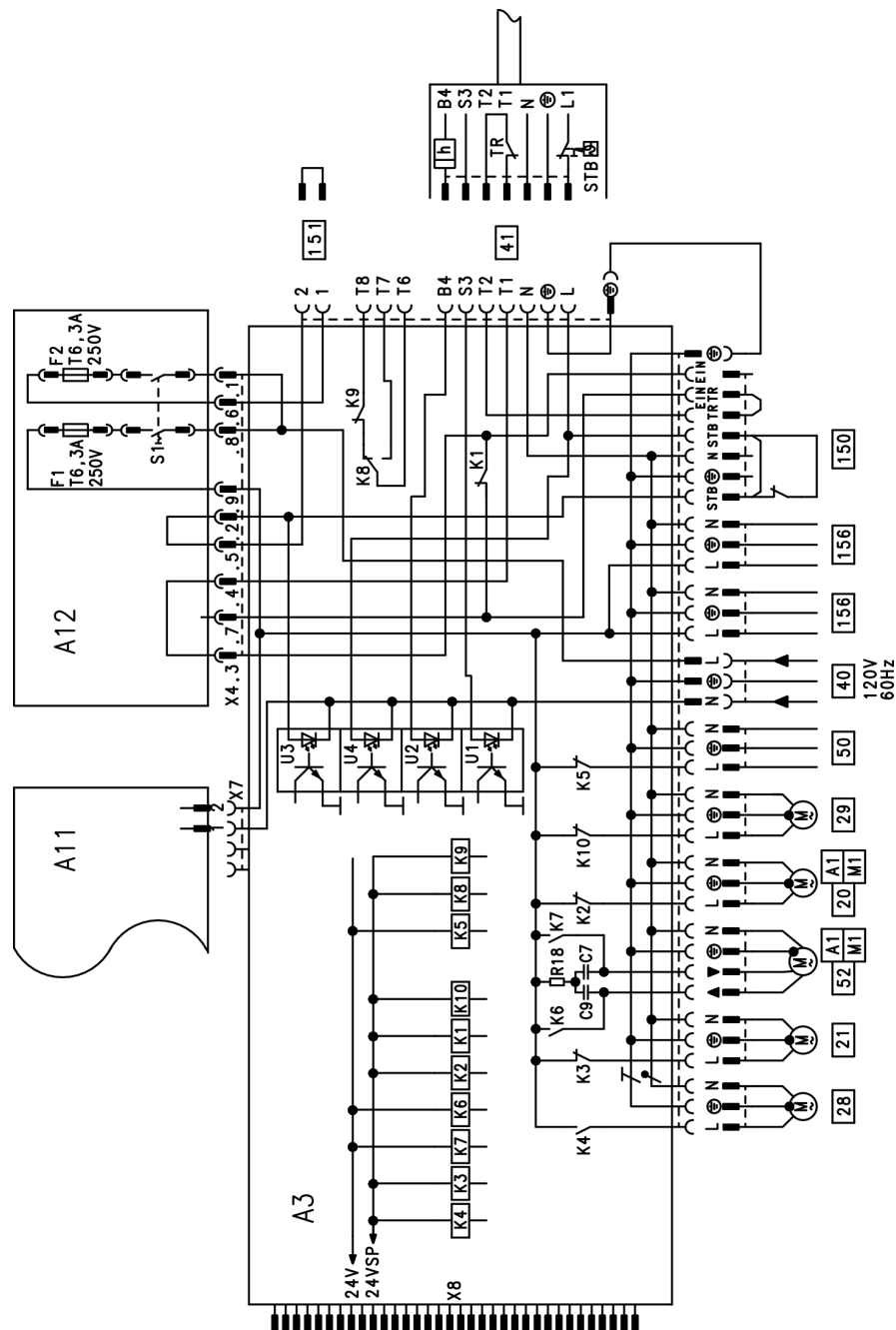
PCB, Low Voltage



Legend

- | | | | |
|------|--|-----|--|
| 1 | Outdoor temperature sensor | 145 | KM-BUS participants |
| 2/3 | Supply temperature sensor / common system supply temperature | 146 | External connections |
| 5 A | DHW Tank temperature sensor | LON | Connecting cable for data exchange (accessory) |
| 5 B | DHW tank temperature sensor for tank loading system | S3 | Emissions test switch |
| 17 B | Temperature sensor, DHW tank loading system | V1 | Fault display (red) |
| 143 | External connections | V2 | Operating mode display (green) |
| | | X | Electrical interfaces |

PCB 120V ~



Legend

20	Heating circuit pump or primary pump, tank loading system	150	External connections (remove jumper when connecting)
21	Circulation pump for DHW tank heating (accessory)	151	Safety chain (potential free)
28	DHW recirculation pump (on-site)	156	Power supply for accessories
29	Boiler circuit pump or distributor pump (on-site)	F	MCB/fuse
40	Power supply, 120 V/60 Hz	K2-K10	Relays
41	Burner	S1	On/off switch
50	Output for central fault message	X	Electrical interfaces
52	Motor for 3-way mixing valve, primary store system		

Parts Lists

Model No.	Serial No.
CA3B 2.5 Boiler	7745189□□□□□□□□
CA3B 3.0 Boiler	7745190□□□□□□□□

Ordering Replacement Parts:

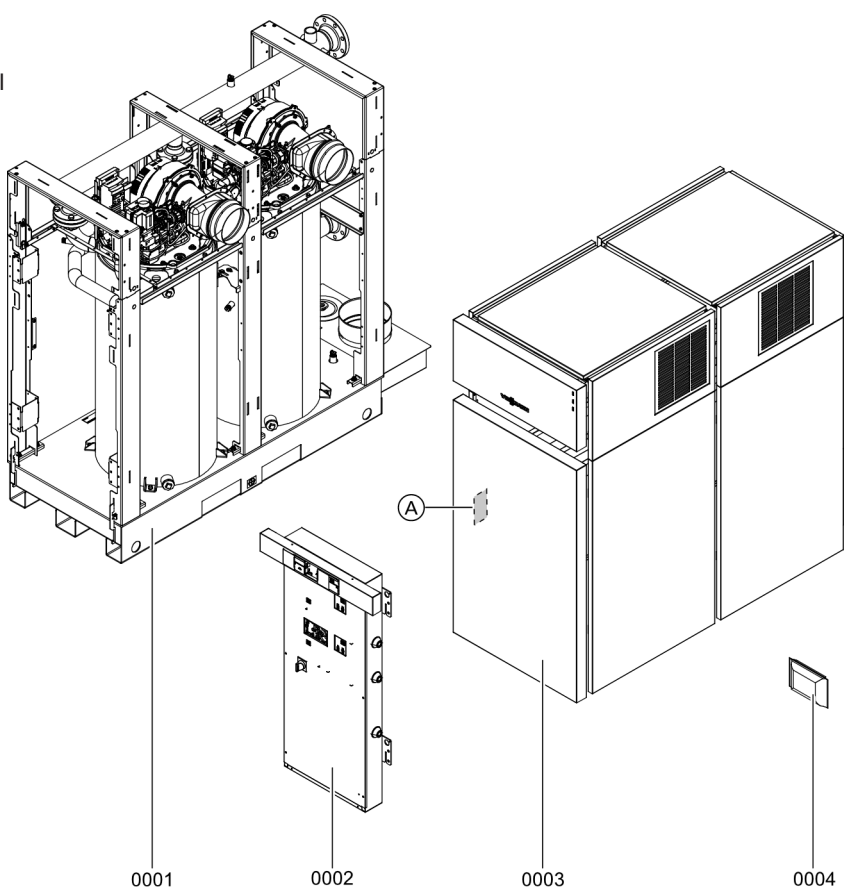
Please provide Model and Serial Number from CSA rating plate (A) when ordering replacement parts.

Order replacement components from your Viessmann distributor.

Parts for CA3B 2.5 and 3.0

- 0001 Vitocrossal 300 CA3B boiler
- 0002 Vitotronic 300 GW6C control panel
- 0003 Boiler enclosure assembly
- 0004 Other Parts

(A) Rating Plate



Parts Lists *(continued)*

Model No.	Serial No.
CA3B 2.5 Boiler	7745189□□□□□□□□
CA3B 3.0 Boiler	7745190□□□□□□□□

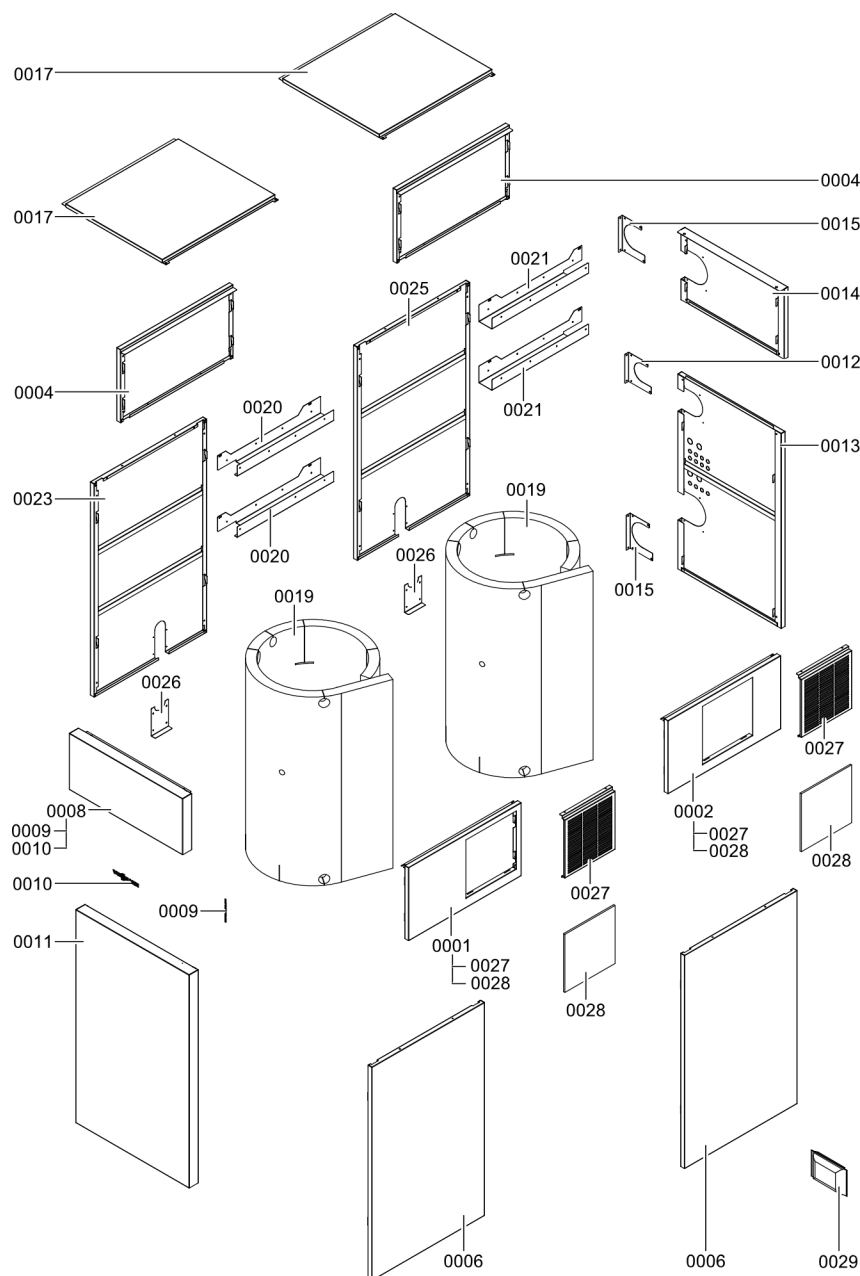
Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.

Order replacement components from your Viessmann distributor.

Parts for Enclosure Assembly

0001	Side panel, right top front
0002	Side panel, right top rear
0004	Side panel, left top
0006	Side panel, right bottom
0008	Front panel, top
0009	Nameplate, "Vitocrossal 300"
0010	Nameplate, "Viessmann"
0011	Front panel, bottom
0012	Rear panel 1, bottom
0013	Rear panel 2, bottom
0014	Rear panel, top
0015	Cover plate
0018	Top panel
0020	Insulation blanket
0021	Cable channel, front
0022	Cable channel, rear
0024	Cable clasp
0025	Side panel, left front bottom
0027	Side panel, left rear bottom
0028	Cover panel
0029	Filter, grill
0030	Filter, air
0031	Accessory pack, fasteners
0032	Access key for control panel



Parts Lists *(continued)*

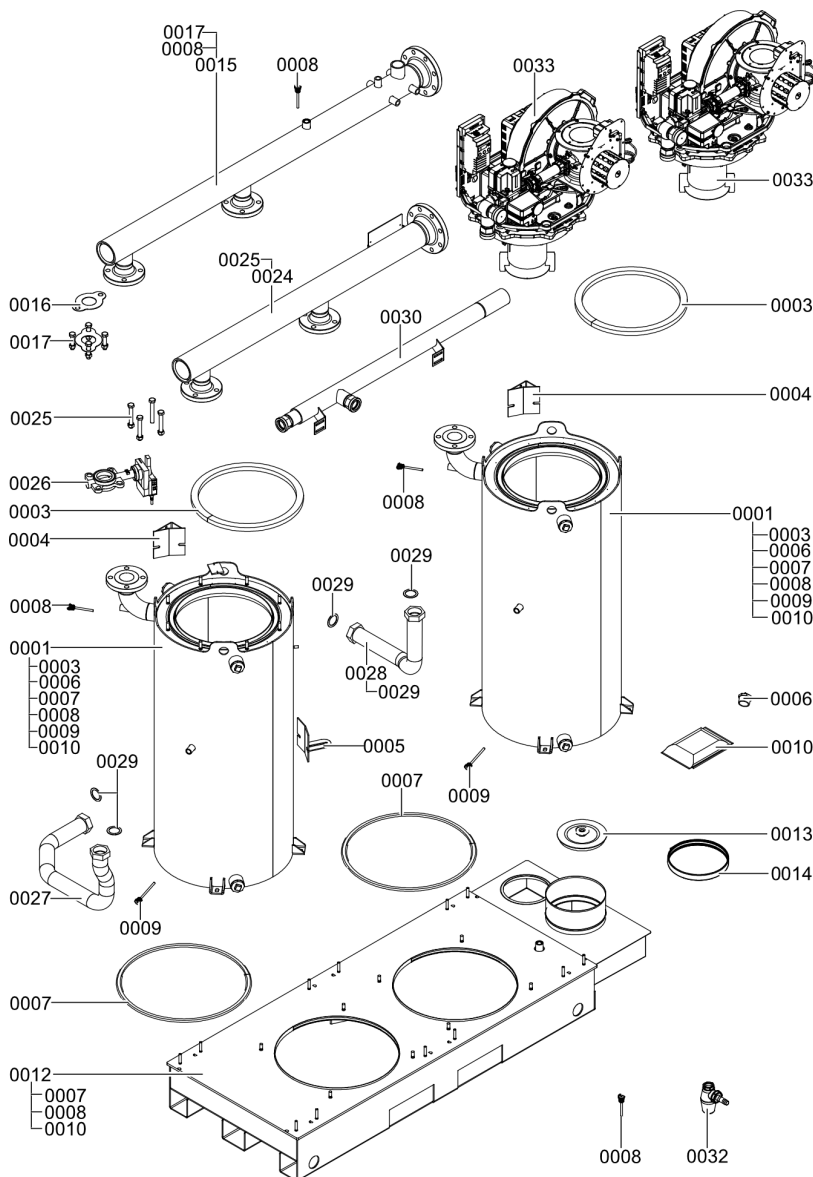
Model No.	Serial No.
CA3B 2.5 Boiler	7745189□□□□□□□□
CA3B 3.0 Boiler	7745190□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

Parts for CA3B 2.5 and 3.0 Boiler Assembly

0002	Boiler section
0003	Gasket, 30 x 20 L=1500
0004	Support bracket 1
0005	Support bracket 2
0006	Plug, 1½ in.
0007	Fiber rope seal, 18x2100 mm
0008	Sensor well, G½ L=100 with clip
0009	Sensor well, G½ L=150 with clip
0010	Accessory pack, boiler sections, 1.25 MMBH and 1.5 MMBH
0012	Boiler stand
0013	Cover with tension gasket
0014	Locking band, 10 in. with gasket
0015	Boiler supply header
0016	Gasket, PN10 DN2"
0017	Accessory pack for supply, DN65
0024	Boiler return header
0025	Accessory pack for return, DN65
0026	Servomotor, SR230A-5
0027	Connection pipe 1, NG/LP with gaskets
0028	Connection pipe 2, NG/LP with gaskets
0029	Gasket, A46x62x2
0030	Connection pipe 3, NG/LP
0032	Condensate syphon, G1 1/4 x G1 1/2
0033	CA3B Cylinder Burner 1.25 MMBH



Parts Lists *(continued)*

Model No.	Serial No.
CA3B 3.5 Boiler	7745191□□□□□□□□
CA3B 4.0 Boiler	7745192□□□□□□□□

Ordering Replacement Parts:

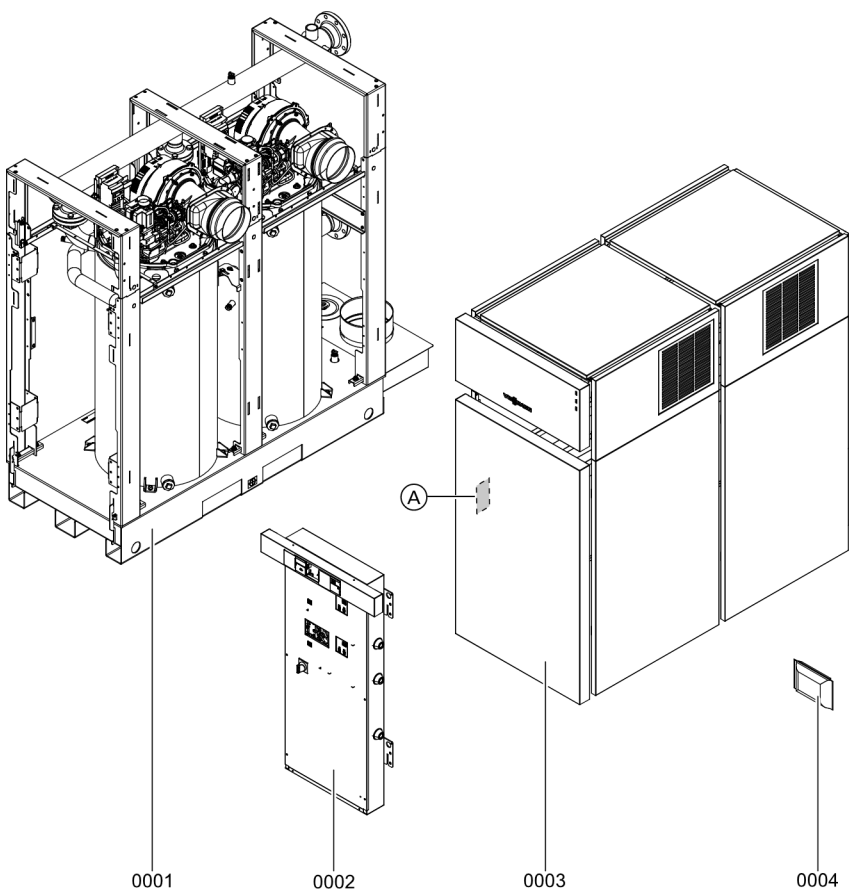
Please provide Model and Serial Number from CSA rating plate (A) when ordering replacement parts.

Order replacement components from your Viessmann distributor.

Parts for CA3B 3.5 and 4.0 Boilers

- 0001 Vitocrossal 300 CA3B boiler
- 0002 Vitotronic 300 GW6C control panel
- 0003 Boiler enclosure assembly
- 0004 Other Parts

(A) Rating Plate



Parts Lists *(continued)*

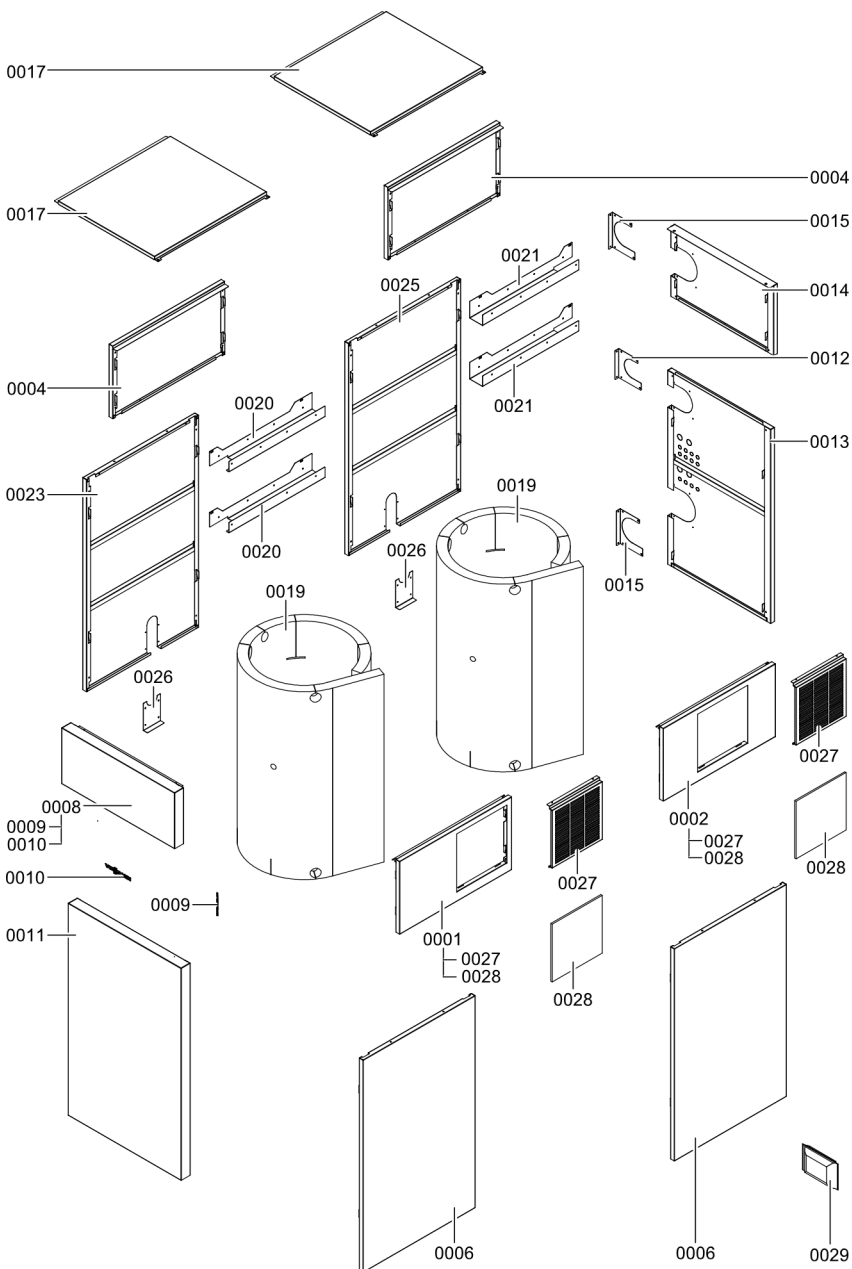
Model No.	Serial No.
CA3B 3.5 Boiler	7745191□□□□□□□□
CA3B 4.0 Boiler	7745192□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

Parts for Enclosure Assembly

0001	Side panel, right top front
0002	Side panel, right top rear
0004	Side panel, left top
0006	Side panel, right bottom
0008	Front panel, top
0009	Nameplate, "Vitocrossal 300"
0010	Nameplate, "Viessmann"
0011	Front panel, bottom
0012	Edge protection
0013	Rear panel, bottom
0014	Rear panel, top
0015	Edge protection
0017	Top panel
0019	Thermal insulation jacket
0020	Cable channel, front
0021	Cable channel, rear
0023	Side panel, left front bottom
0025	Side panel, left-hand rear bottom
0026	Cover panel
0027	Filter, grill
0028	Filter, air
0029	Other parts



Parts Lists *(continued)*

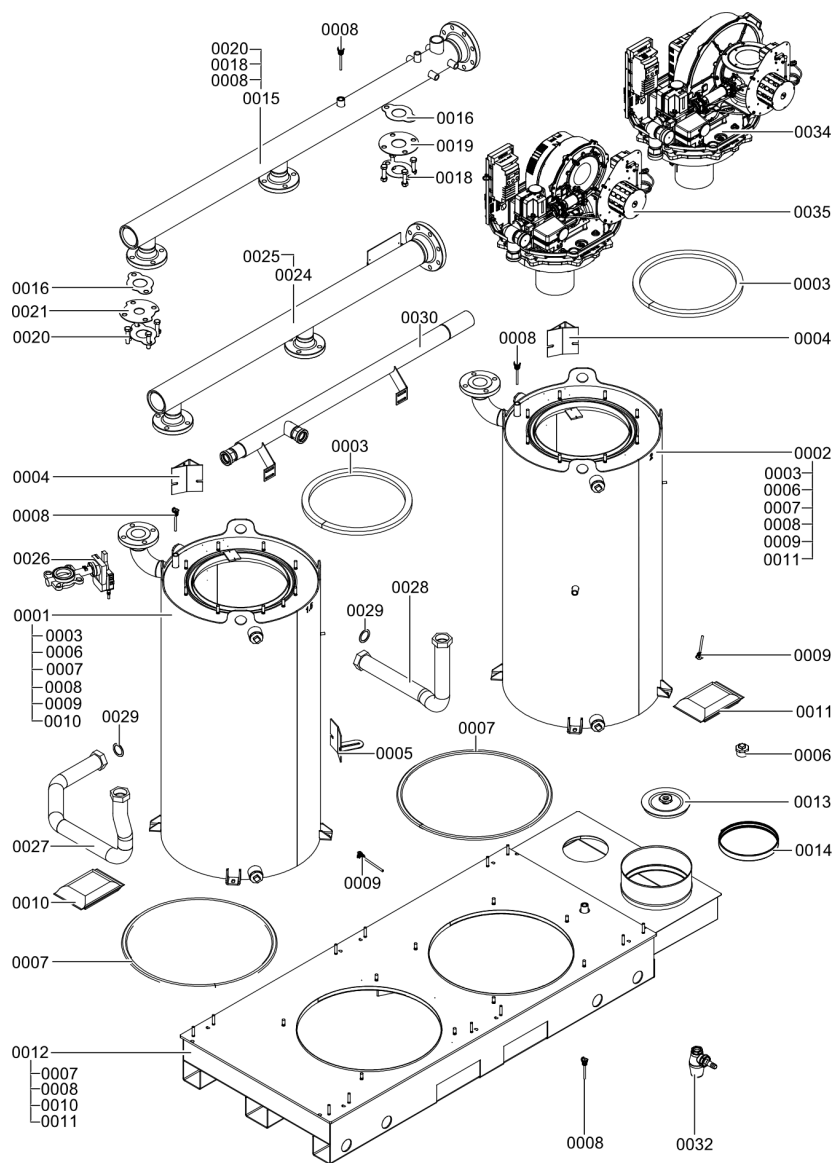
Model No. CA3B 3.5 Boiler
Serial No. 7745191□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
 Order replacement components from your Viessmann distributor.

Parts for CA3B 3.5 Boiler Assembly

- 0001 Boiler section, 1.5 MMBH
- 0002 Boiler section, 2.0 MMBH
- 0003 Fiber rope seal, 25x15x1500 mm
- 0004 Support bracket 1
- 0005 Support bracket 2
- 0006 Plug, 1½ in.
- 0007 Fiber rope seal, 18x2100 mm
- 0008 Sensor well, G½ L=100 with clip
- 0009 Sensor well, G½ L=150 with clip
- 0010 Accessory pack, boiler section, 1.25 MMBH and 1.5 MMBH
- 0011 Accessory pack, boiler section, 2.0 MMBH
- 0012 Boiler stand
- 0013 Cover with tension gasket
- 0014 Locking band, 12 in. with gasket
- 0015 Boiler supply header
- 0016 Gasket, PN10 DN2"
- 0018 Accessory pack, DN65
- 0019 Flow regulator 1, DN65
- 0020 Accessory pack, DN65
- 0021 Flow regulator 2, DN65
- 0024 Boiler return header
- 0025 Accessory pack for return, DN65
- 0026 Servomotor, SR230A-5
- 0027 Connection pipe 1, NG/LP with gasket
- 0028 Connection pipe 2, NG/LP with gasket
- 0029 Gasket, A46x62x2
- 0030 Connection pipe 3, NG/LP with gasket
- 0031 CA3B Burner Harness and Sensors
- 0032 Condensate syphon, G1 1/4 x G1 1/2
- 0034 CA3B Cylinder Burner 2.0 MMBH
- 0035 CA3B Cylinder Burner 1.5 MMBH



Parts Lists *(continued)*

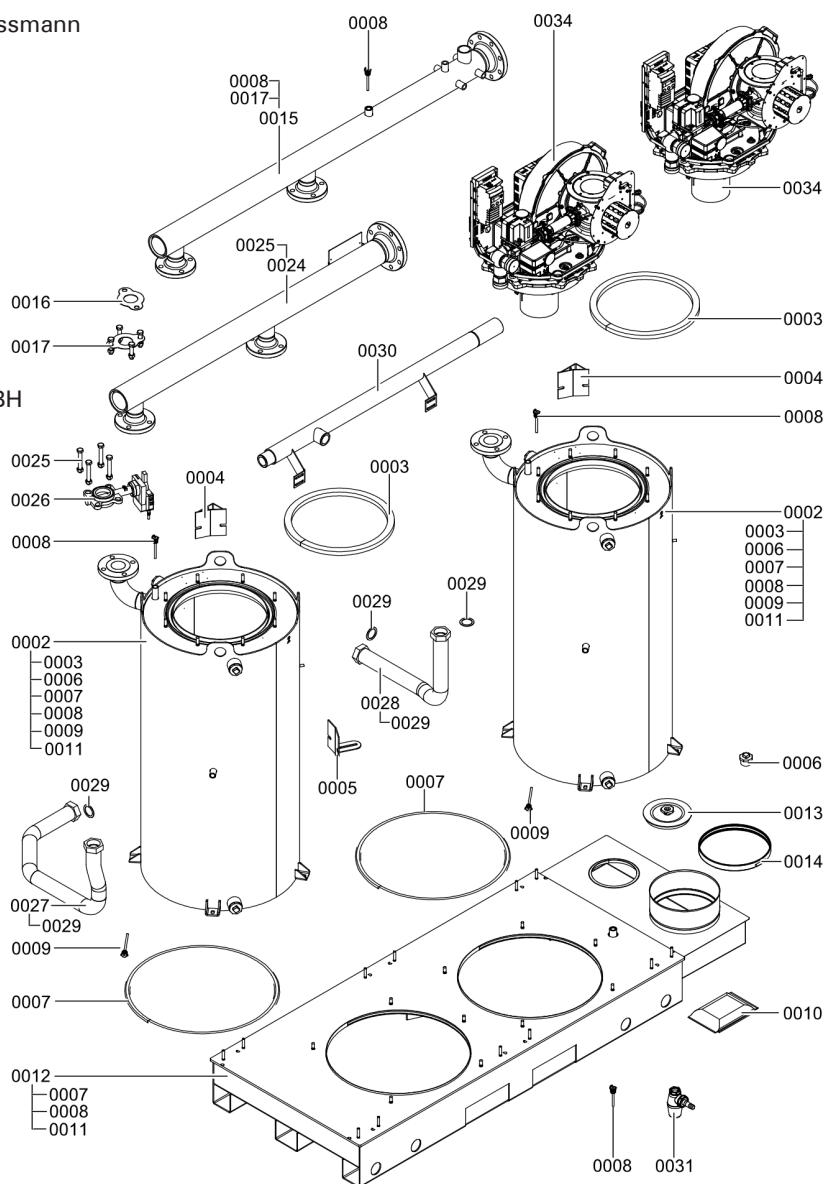
Model No. **Serial No.**
 CA3B 4.0 Boiler 7745192□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
 Order replacement components from your Viessmann distributor.

Parts for CA3B 4.0 Boiler Assembly

- 0002 Boiler section, 2.0 MMBH
- 0003 Fiber rope seal, 25x15x1500 mm
- 0004 Support bracket 1
- 0005 Support bracket 2
- 0006 Plug, 1½ in.
- 0007 Fiber rope seal, 18x2100 mm
- 0008 Sensor well, G½ L=100 with clip
- 0009 Sensor well, G½ L=150 with clip
- 0011 Accessory pack boiler section, 2.0 MMBH
- 0012 Boiler stand
- 0013 Cover with tension gasket
- 0014 Locking band, 12 in. with gasket
- 0015 Boiler supply header
- 0016 Gasket, PN10 DN2"
- 0017 Accessory pack for supply, DN65
- 0024 Boiler return header
- 0025 Accessory pack for return, DN65
- 0026 Servomotor, SR230A-5
- 0027 Connection pipe 1, NG/LP with gaskets
- 0028 Connection pipe 2, NG/LP with gaskets
- 0029 Gasket, A46x62x2
- 0030 Connection pipe 3, NG/LP with gaskets
- 0031 CA3B Burner Harness and Sensors
- 0032 Condensate syphon, G1 1/4 x G1 1/2
- 0034 CA3B Cylinder Burner 2.0 MMBH



Parts Lists *(continued)*

Model No.	Serial No.
CA3B 5.0 Boiler	7745193□□□□□□□□
CA3B 6.0 Boiler	7745194□□□□□□□□

Ordering Replacement Parts:

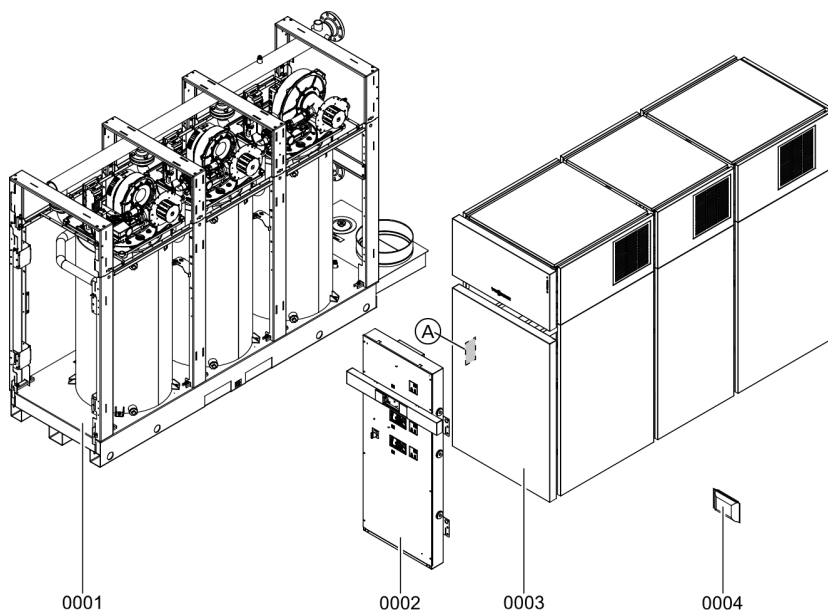
Please provide Model and Serial Number from CSA rating plate (A) when ordering replacement parts.

Order replacement components from your Viessmann distributor.

Parts for CA3B 5.0 and 6.0 Boilers

- 0001 Vitocrossal 300 CA3B boiler
- 0002 Vitotronic 300 GW6C control panel
- 0003 Boiler enclosure assembly
- 0004 Other Parts

(A) Rating Plate



Parts Lists *(continued)*

Model No.	Serial No.
CA3B 5.0 Boiler	7745193□□□□□□□□
CA3B 6.0 Boiler	7745194□□□□□□□□

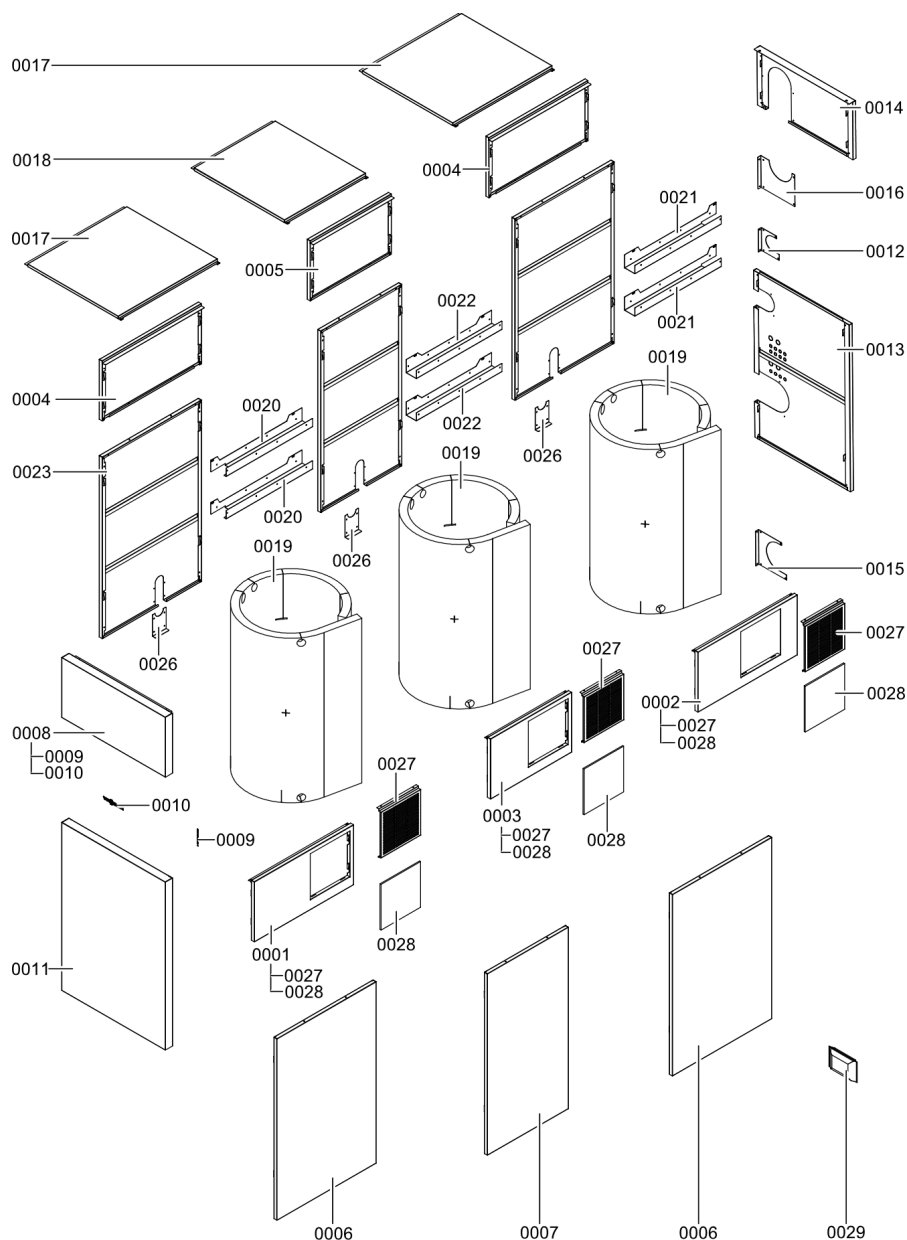
Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.

Order replacement components from your Viessmann distributor.

Parts for Enclosure Assembly

- 0001 Side panel, right top front
- 0002 Side panel, right top rear
- 0003 Side panel, right top mid
- 0004 Side panel, left top
- 0005 Side panel, left top mid
- 0006 Side panel, right bottom
- 0007 Side panel, right mid bottom
- 0008 Front panel, top
- 0009 Nameplate, "Vitocrossal 300"
- 0010 Nameplate, "Viessmann"
- 0011 Front panel, bottom
- 0012 Gas pipe edge protection
- 0013 Rear panel 1, bottom
- 0014 Rear panel 2, top
- 0015 Cover plate 2
- 0016 Cover plate 1
- 0017 Top panel
- 0018 Top panel, mid
- 0019 Insulation blanket
- 0020 Cable channel 1
- 0021 Cable channel 2
- 0022 Cable channel 3
- 0023 Side panel, left front bottom
- 0024 Side panel, left mid bottom
- 0025 Side panel, left rear bottom
- 0026 Cover panel
- 0027 Filter, grill
- 0028 Filter, air
- 0029 Accessory pack, fasteners



Parts Lists *(continued)*

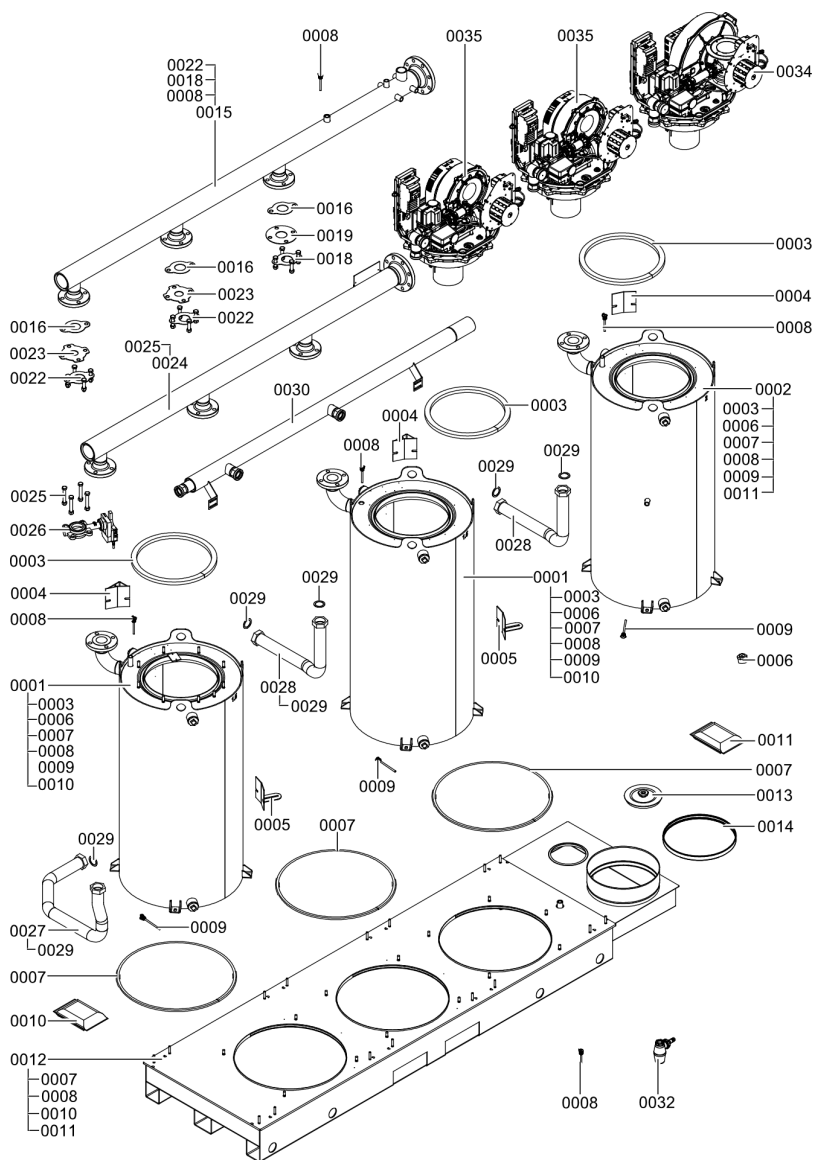
Model No. CA3B 5.0 Boiler
Serial No. 7745193□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
 Order replacement components from your Viessmann distributor.

Parts for CA3B 5.0 Boiler Assembly

- 0001 Boiler section, 1.5 MMBH
- 0002 Boiler section, 2.0 MMBH
- 0003 Fiber rope seal, 25x15x1500mm
- 0004 Support bracket 1
- 0005 Support bracket 2
- 0006 Plug, 1½ in.
- 0007 Fiber rope seal, 18x2100 mm
- 0008 Sensor well, G½ L=100 with clip
- 0009 Sensor well, G½ L=150 with clip
- 0010 Accessory pack boiler section, 1.25 MMBH and 1.5 MMBH
- 0011 Accessory pack boiler section, 2.0 MMBH
- 0012 Boiler stand
- 0013 Cover with tension gasket
- 0014 Locking band, 16 in. with gasket
- 0015 Boiler supply header
- 0016 Gasket, PN10 DN2"
- 0018 Accessory pack, DN65
- 0019 Flow regulator, DN65
- 0022 Accessory pack, DN65
- 0023 Orifice, DN65
- 0024 Boiler return header
- 0025 Accessory pack for return, DN65
- 0026 Servomotor, SR230A-5
- 0027 Connection pipe 1, NG/LP with gaskets
- 0028 Connection pipe 2, NG/LP with gaskets
- 0029 Gasket, A46x62x2
- 0030 Connection pipe 3, NG/LP with gaskets
- 0031 CA3B Burner Harness and Sensors
- 0032 Condensate syphon, G1 1/4 x G1 1/2
- 0034 CA3B Cylinder Burner 2.0 MMBH
- 0035 CA3B Cylinder Burner 1.5 MMBH



Parts Lists *(continued)*

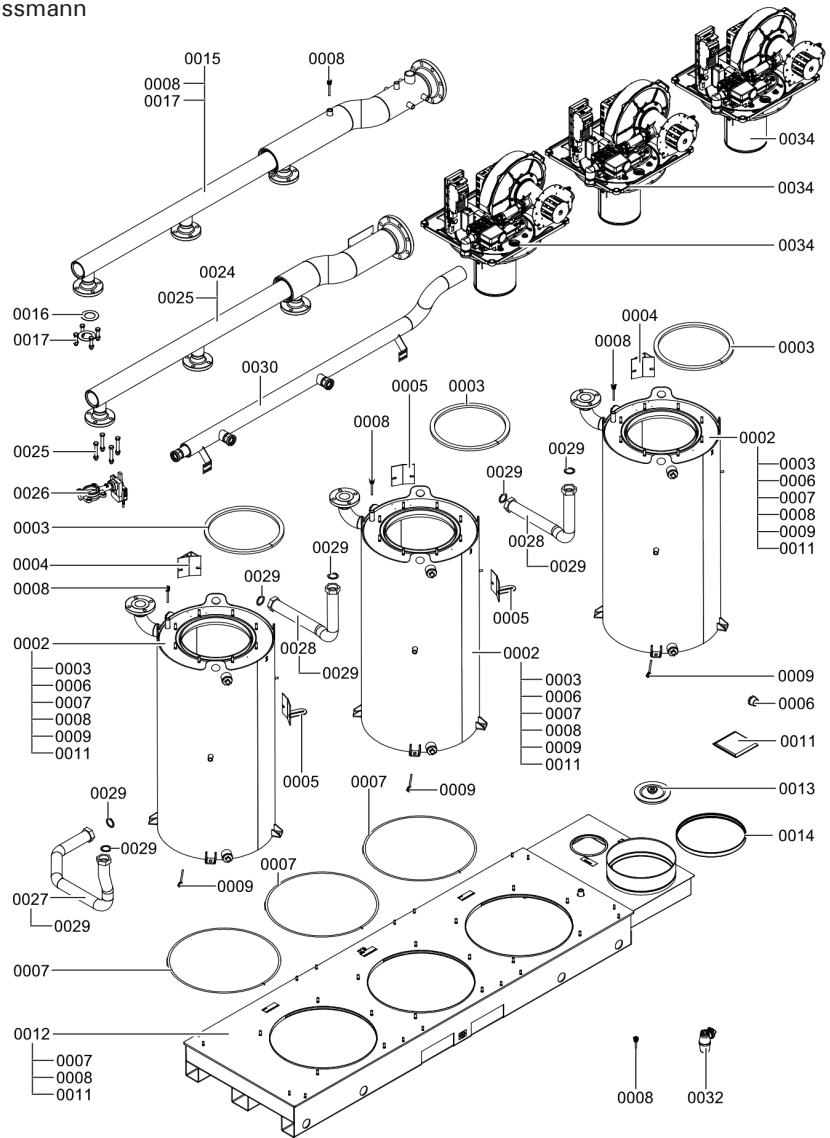
Model No. **Serial No.**
 CA3B 6.0 Boiler 7745194□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
 Order replacement components from your Viessmann distributor.

Parts for CA3B 6.0 Boiler Assembly

- 0002 Boiler section, 2.0 MMBH
- 0003 Fiber rope seal, 25x15x1500 mm
- 0004 Support bracket 1
- 0005 Support bracket 2
- 0006 Plug, 1½ in.
- 0007 Fiber rope seal, 18x2100 mm
- 0008 Sensor well, G½ L=100 with clip
- 0009 Sensor well, G½ L=150 with clip
- 0011 Accessory pack boiler section, 2.0 MMBH
- 0012 Boiler stand
- 0013 Cover with tension gasket
- 0014 Locking band, 16 in. with gasket
- 0015 Boiler supply header
- 0016 Gasket, PN10 DN2"
- 0017 Accessory pack for supply, DN65
- 0024 Boiler return header
- 0025 Accessory pack for return, DN65
- 0026 Servomotor, SR230A-5
- 0027 Connection pipe 1, NG/LP with gaskets
- 0028 Connection pipe 2, NG/LP with gaskets
- 0029 Gasket, A46x62x2
- 0030 Connection pipe 3, NG/LP with gaskets
- 0031 CA3B Burner Harness and Sensors
- 0032 Condensate syphon, G1 1/4 x G1 1/2
- 0034 CA3B Cylinder Burner 2.0 MMBH



Parts Lists *(continued)*

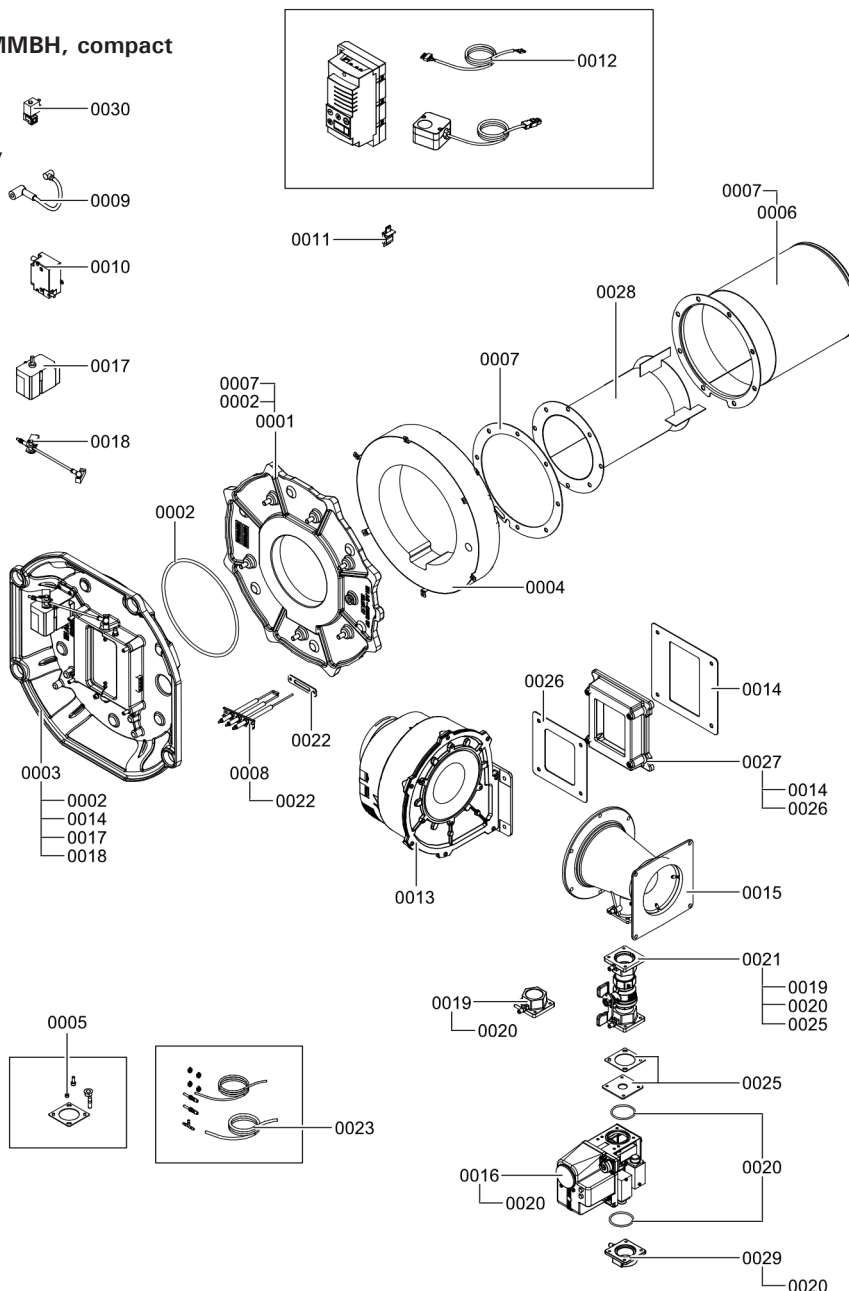
Model No.	Serial No.
CA3B 2.5 Boiler	7745189□□□□□□□□
CA3B 3.0 Boiler	7745190□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

Parts for Burner Assembly, 1.25 and 1.5 MMBH, compact

0001	Burner plate
0002	Burner gasket
0003	Burner chassis, compact
0004	Combustion chamber door refractory
0005	Accessory pack, small burner parts
0006	Burner tube
0007	Gasket, burner tube
0008	Electrodes
0009	Ignition cable
0010	Ignition transformer
0011	Coding plug, burner
0012	CA3B Burner Control
0013	Fan, G3G200 120/1/60
0014	Gasket, fan
0015	Venturi mixing pipe
0016	Gas valve, V4734C1010-1100
0017	Servomotor, burner damper STA
0018	Linkage M5, burner damper
0019	Flange, 1¼ in., gas valve
0020	O-ring, gas valve, 52x3.5
0021	Connection pipe, fuel NG/LP
0022	Gasket, triple-electrode
0023	Hose set
0025	Orifice with gasket, NG
0026	Gasket, fan
0027	Fan adaptor
0028	Burner tube kit, D245
0029	Flange, 1¼ in., gas valve
0030	2/2 way solenoid valve



Parts Lists *(continued)*

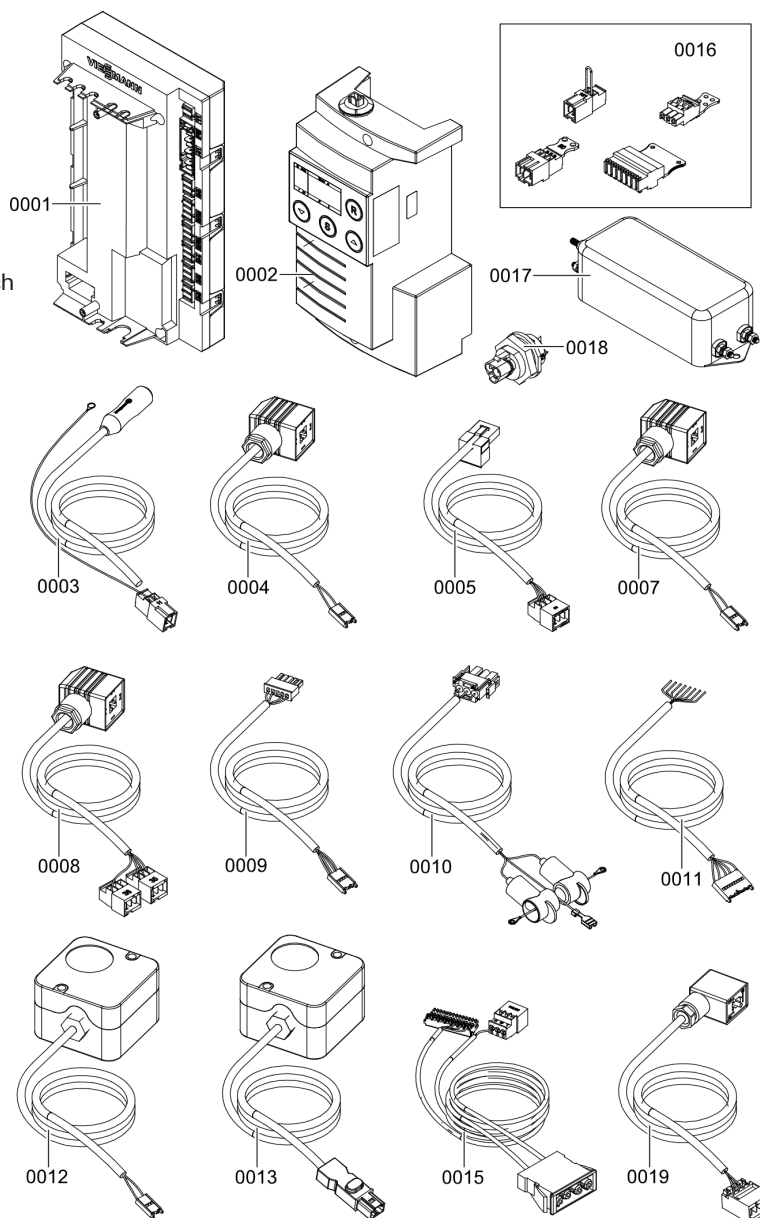
Model No.	Serial No.
CA3B 2.5 Boiler	7745189□□□□□□□□
CA3B 3.0 Boiler	7745190□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

Parts for Burner Control Unit 1.25 and 1.5 MMBH, compact

- 0001 Burner control, VUC310-C10.004
- 0002 Programming unit, HI201-C01.001 with LED
- 0003 Harness "11", ionization/ground
- 0004 Cable, gas pressure switch "2"
- 0005 Harness "54", ignition transformer
- 0006 Harness, step motor
- 0007 Harness "111", gas pressure
- 0008 Harness "35/36", gas valve
- 0009 Harness "100A", motor
- 0010 Harness "100", fan
- 0011 Cable, "131A", sensors and air pressure switch
- 0012 Air pressure switch 1 with cable
- 0013 Air pressure switch with 131A cable
- 0014 Cable, fuel conversion
- 0015 Harness, burner shut-off
- 0016 Accessory pack, plugs #41,90,151,191
- 0017 Suppression filter device AC EMI
- 0018 Plug, 3-pole, RST25I3 (each)
- 0019 Harness "38", bypass



Parts Lists *(continued)*

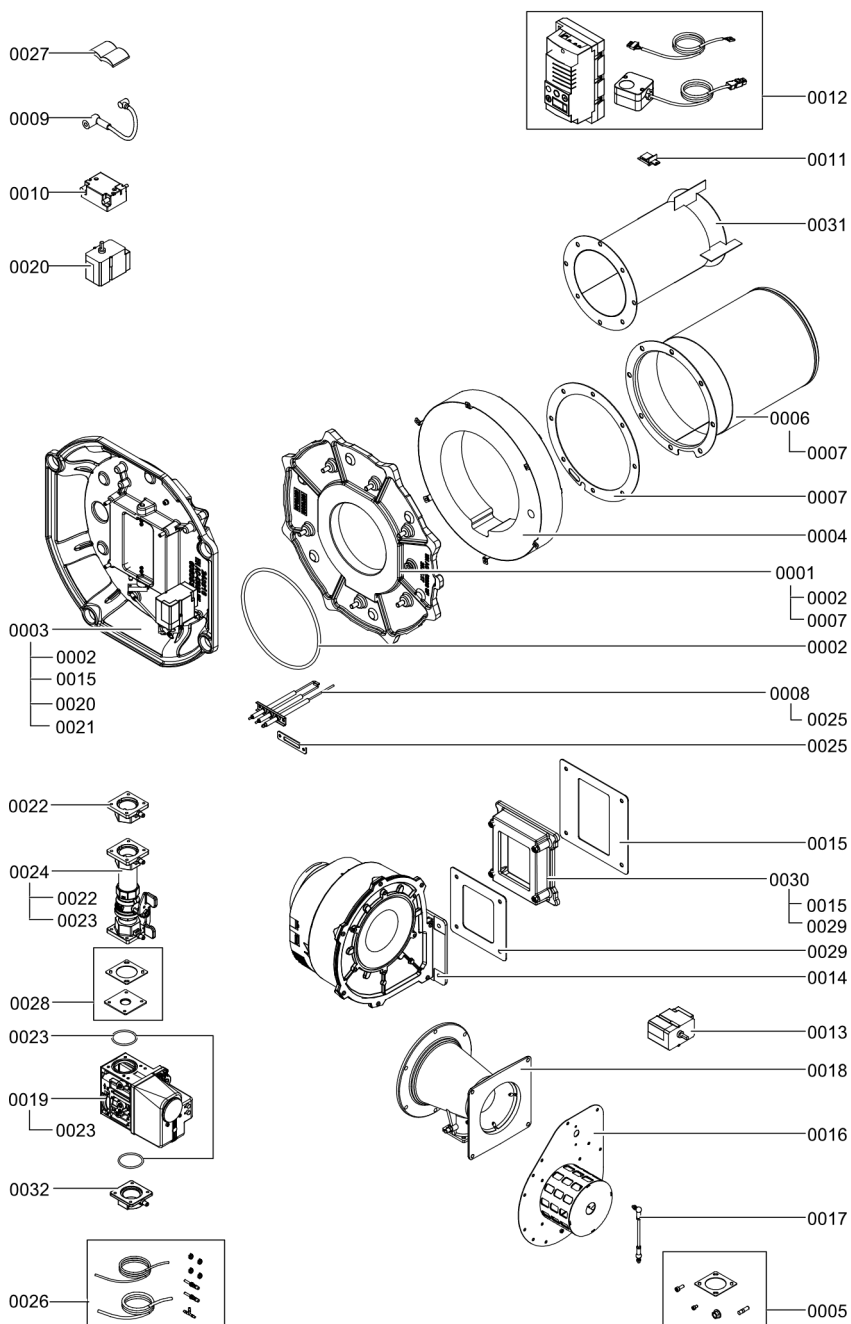
Model No.	Serial No.
CA3B 3.5 Boiler	7745191□□□□□□□□
CA3B 5.0 Boiler	7745193□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

Parts for Burner Assembly, 1.5 MMBTU

0001	Burner plate
0002	Burner gasket
0003	Burner chassis
0004	Combustion chamber door refractory
0005	Accessory pack, small burner parts
0006	Burner tube
0007	Gasket, burner tube
0008	Electrodes
0009	Ignition cable
0010	Ignition transformer
0011	Coding plug, burner
0012	CA3B Burner Control
0013	Servomotor, inlet damper STA
0014	Fan, G3G200 120/1/60
0015	Gasket, fan
0016	Inlet damper
0017	Linkage M5, inlet damper
0018	Venturi mixing pipe
0019	Gas valve, V4734C1010-1100
0020	Servomotor, burner damper STA
0021	Linkage M5, burner damper
0022	Flange, 1¼ in., gas valve
0023	O-ring, gas valve, 52x3.5
0024	Connection pipe 2, with shut-off
0025	Gasket, triple-electrode
0026	Compensation hose set, air pressure
0027	Installation instruction compact burner
0028	Orifice with gasket, NG
0029	Gasket, fan
0030	Fan adaptor
0031	Burner tube kit, D245
0032	Flange, 1¼ in., gas valve



Parts Lists *(continued)*

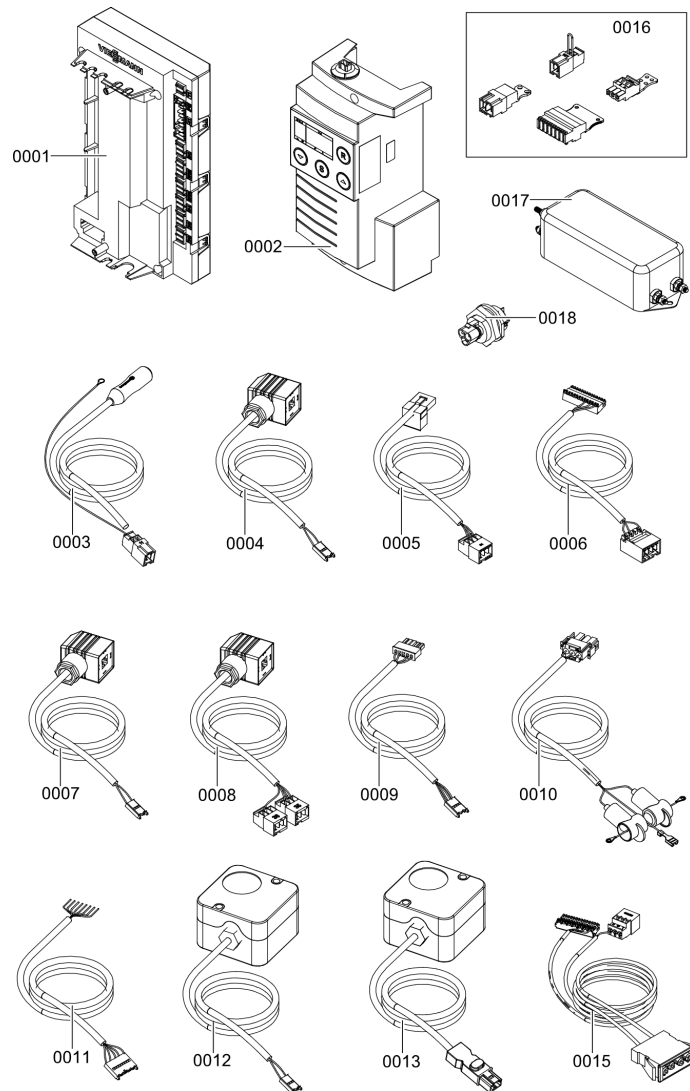
Model No.	Serial No.
CA3B 3.5 Boiler	7745191□□□□□□□□
CA3B 5.0 Boiler	7745193□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

Parts for Burner Control Unit, 1.5 MMBTU

- 0001 Burner control, VUC310-C10.004
- 0002 Programming unit with LED
- 0003 Harness "11", ionization/ground
- 0004 Harness "VPS87", gas pressure
- 0005 Harness "54", ignition transformer
- 0006 Harness, step motor/inlet damper
- 0007 Harness "111", gas pressure
- 0008 Harness "35/36", gas valve
- 0009 Harness "100A", motor
- 0010 Harness "100", fan
- 0011 Harness sensors
- 0012 Air pressure switch 1 with cable
- 0013 Air pressure switch 2 with cable
- 0014 Air pressure switch with cable
- 0015 Harness, step motor/burner damper
- 0016 Accessory pack, plugs #41,90,151,191
- 0017 Suppression filter device AC EMI
- 0018 Plug, 3-pole, RST25I3 (each)



Parts Lists *(continued)*

Model No.	Serial No.
CA3B 3.5 Boiler	7745191□□□□□□□□
CA3B 4.0 Boiler	7745192□□□□□□□□
CA3B 5.0 Boiler	7745193□□□□□□□□
CA3B 6.0 Boiler	7745194□□□□□□□□

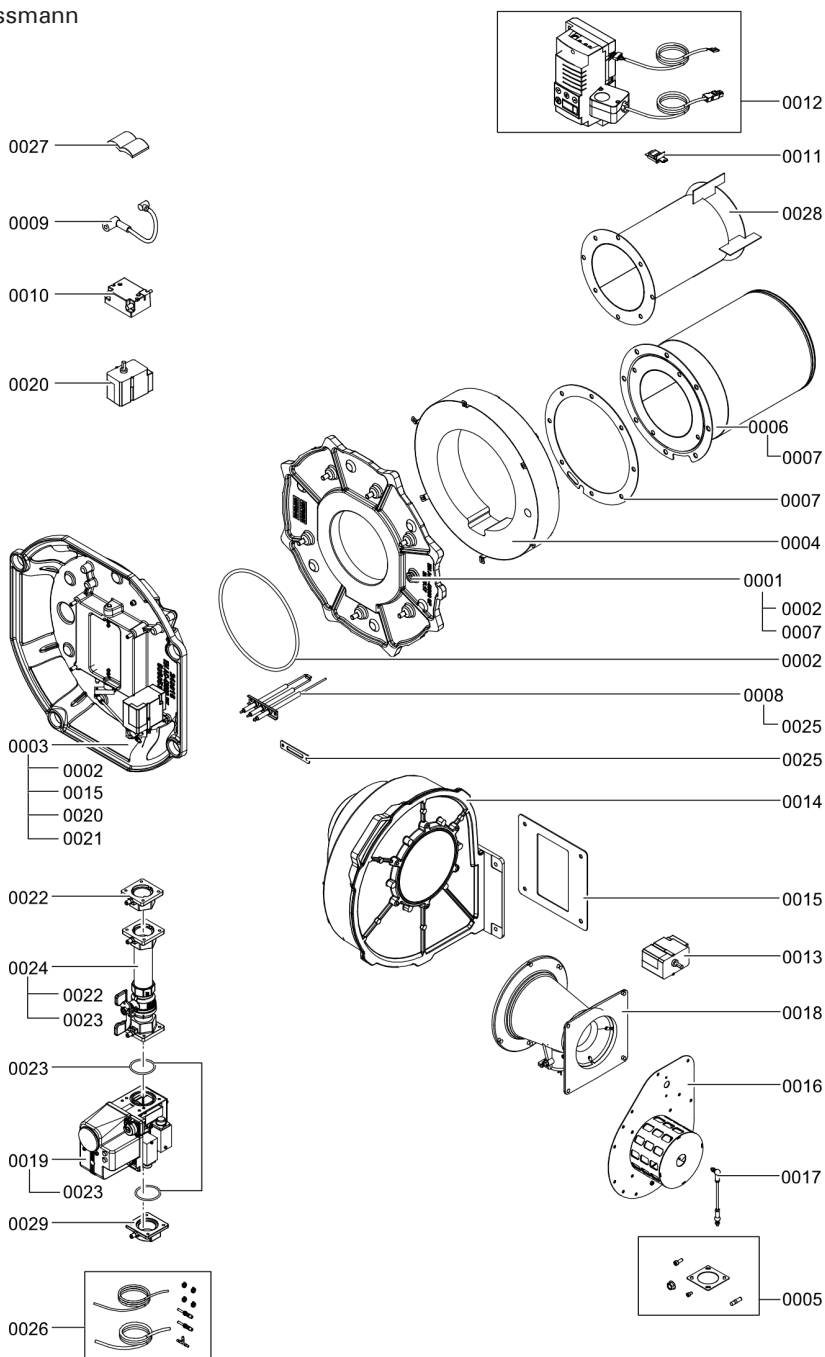
Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.

Order replacement components from your Viessmann distributor.

Parts for Burner Assembly, 2.0 MMBH

0001	Burner plate
0002	Burner gasket
0003	Burner chassis
0004	Combustion chamber door refractory
0005	Accessory pack, small burner parts
0006	Burner tube
0007	Gasket, burner tube
0008	Electrodes
0009	Ignition cable
0010	Ignition transformer
0011	Coding plug, burner
0012	CA3B Burner Control
0013	Servomotor, inlet damper STA
0014	Fan, 120/1/60
0015	Gasket, fan
0016	Inlet damper
0017	Linkage M5, inlet damper)
0018	Venturi mixing pipe
0019	Gas valve, V4734C1010-1100
0020	Servomotor, burner damper STA
0021	Linkage M5, burner damper
0022	Flange, 1¼ in., gas valve
0023	O-ring, gas valve, 52x3.5
0024	Connection pipe 1 with shut-off
0025	Gasket triple-electrode
0026	Compensation hose set, air pressure
0027	Installation instructions compact burner
0028	Burner tube kit, D245
0029	Flange, 1¼ in., gas valve



Parts Lists *(continued)*

Model No.	Serial No.
CA3B 3.5 Boiler	7745191□□□□□□□□
CA3B 4.0 Boiler	7745192□□□□□□□□
CA3B 5.0 Boiler	7745193□□□□□□□□
CA3B 6.0 Boiler	7745194□□□□□□□□

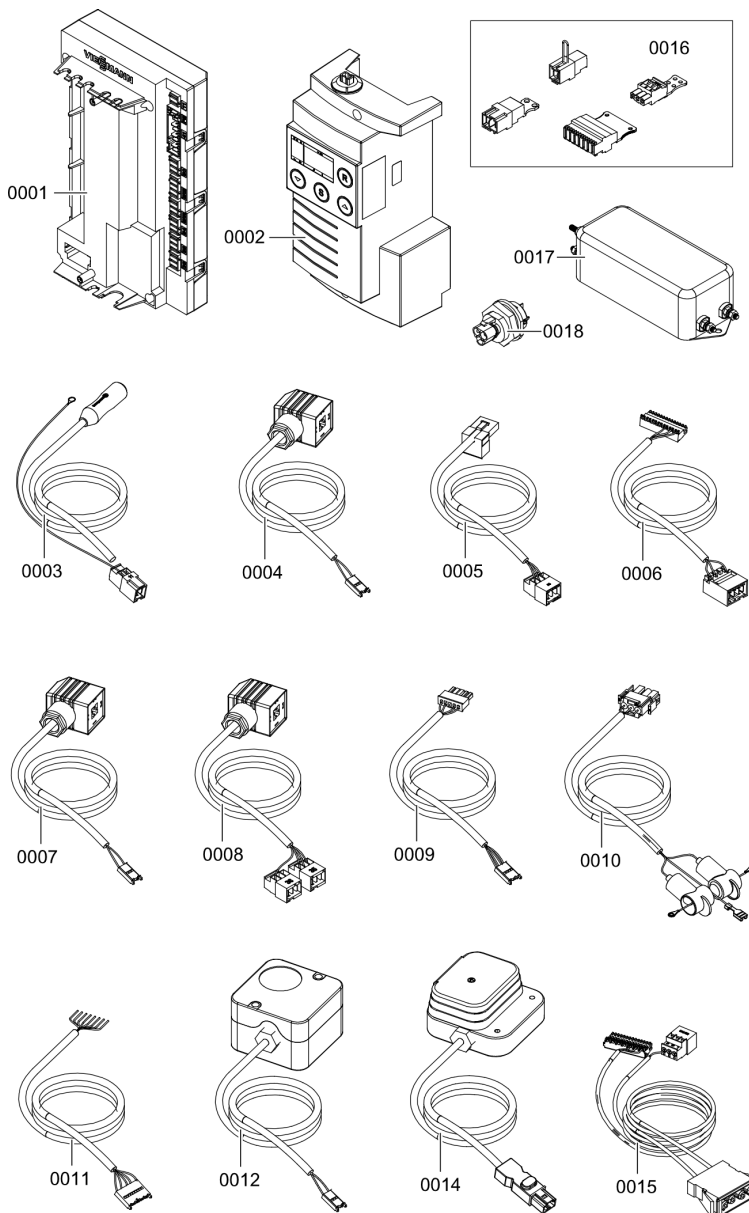
Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.

Order replacement components from your Viessmann distributor.

Parts for Burner Control Unit, 2.0 MMBTU

- 0001 Burner control, VUC310-C10.004
- 0002 Programming unit with LED
- 0003 Harness "11", ionization/ground
- 0004 Harness "VPS87", gas pressure
- 0005 Harness "54", ignition transformer
- 0006 Harness, step motor/inlet damper
- 0007 Harness "111", gas pressure
- 0008 Harness "35/36", gas valve
- 0009 Harness "100A", motor
- 0010 Harness "100", fan
- 0011 Harness sensors
- 0012 Air pressure switch 1 with cable
- 0013 Air pressure switch 2 with cable
- 0014 Air pressure switch with cable
- 0015 Harness, step motor/burner damper
- 0016 Accessory pack, plugs #41, 90, 151, 191
- 0017 Suppression filter device AC EMI
- 0018 Plug, 3-pole, RST25I3 (each)



Parts Lists *(continued)*

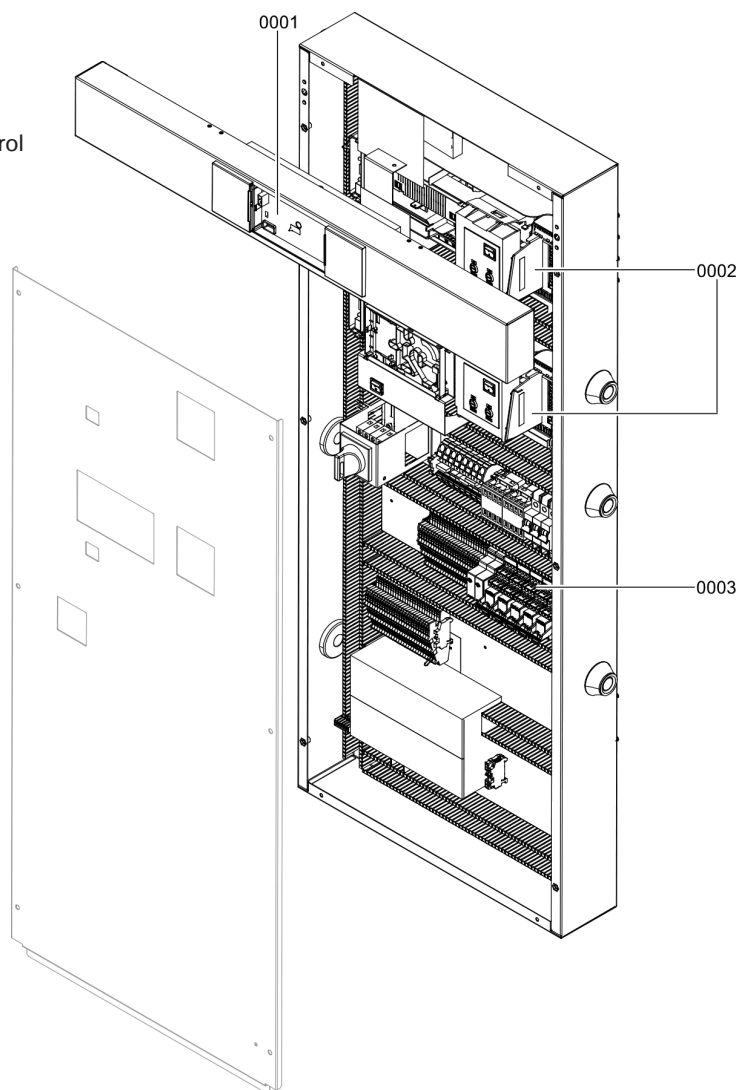
Model No.		Serial No.
CA3B 2.5	Boiler	7745189□□□□□□□□
CA3B 3.0	Boiler	7745190□□□□□□□□
CA3B 3.5	Boiler	7745191□□□□□□□□
CA3B 4.0	Boiler	7745192□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

Parts for Control Panel, Vitotronic 300, GW6C

0001	Master-Display
0002	Vitotronic 300, GW6C boiler and system control
0003	Junction Box



Parts Lists *(continued)*

Model No.	Serial No.
CA3B 5.0 Boiler	7745193□□□□□□□□
CA3B 6.0 Boiler	7745194□□□□□□□□

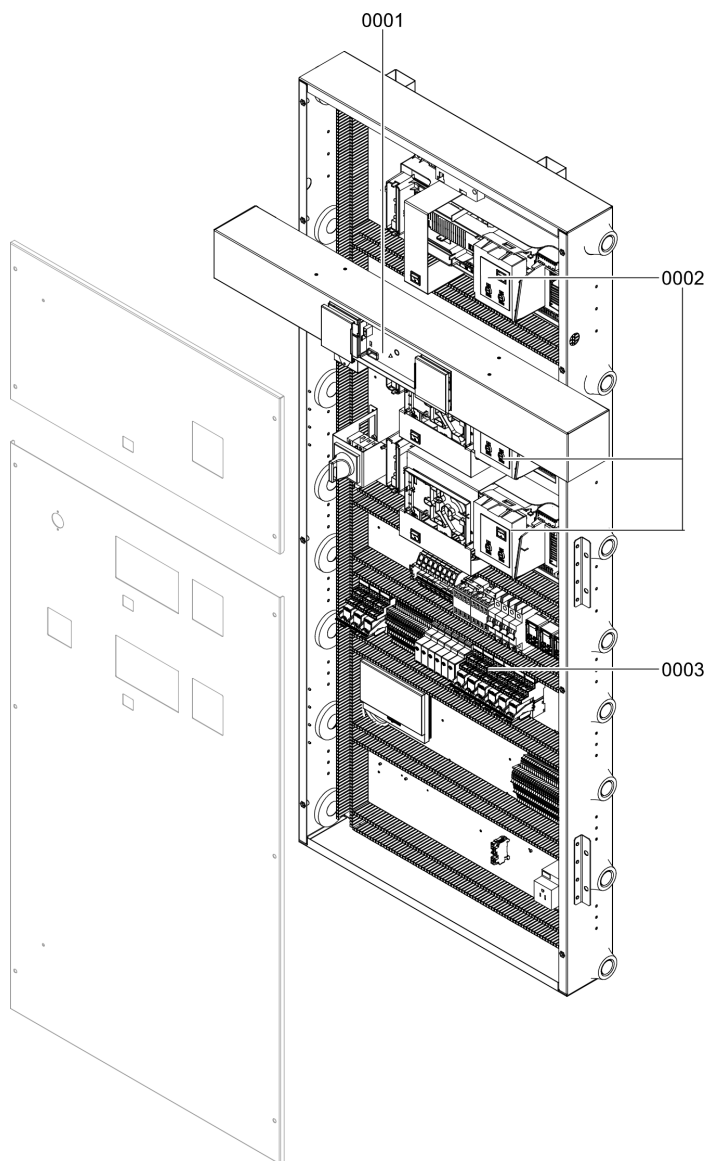
Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.

Order replacement components from your Viessmann distributor.

Parts for Control Panel, Vitotronic 300, GW6C

0001	Master-Display
0002	Vitotronic 300, GW6C boiler and system control
0003	Junction Box



Parts Lists *(continued)*

Model No.	Serial No.
CA3B 5.0 Boiler	7745193□□□□□□□□
CA3B 6.0 Boiler	7745194□□□□□□□□

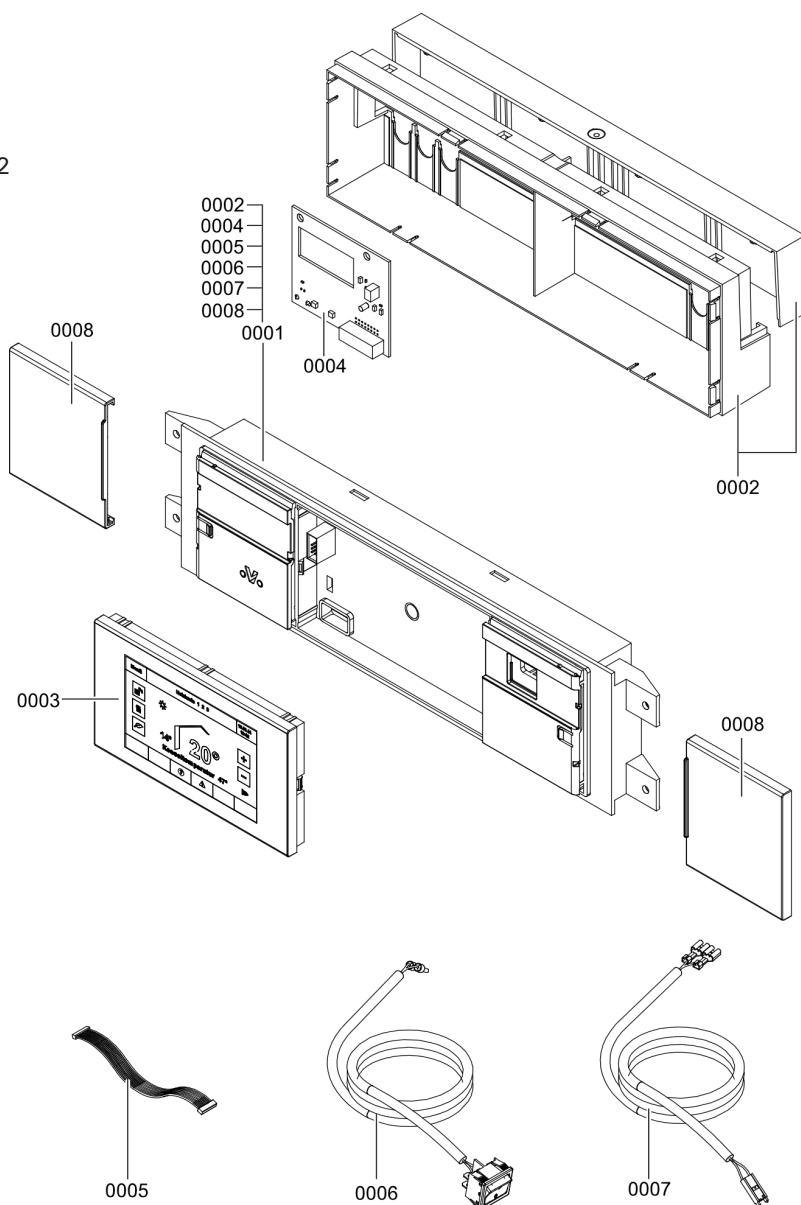
Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.

Order replacement components from your Viessmann distributor.

Parts for Master-Display Assembly

- 0001 Control console, GW6C
- 0002 Rear housing, master display
- 0003 Programming unit, Vitotronic 200 HI932
- 0004 Circuit board, SA168 A10
- 0005 Flat cable, 16-pole
- 0006 Harness, master power
- 0007 Harness, relay
- 0008 Covers, sliding, left/right



Parts Lists *(continued)*

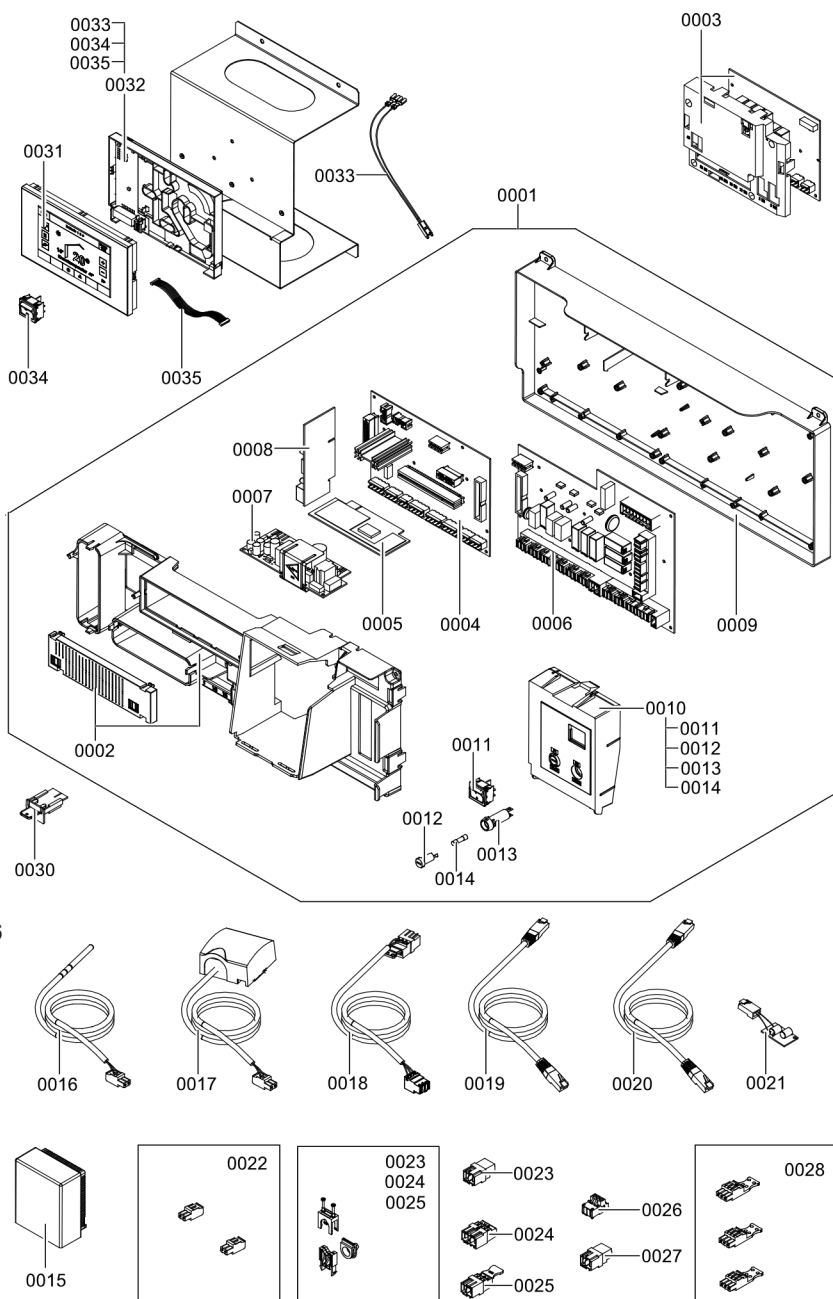
Model No.	Serial No.
CA3B 5.0 Boiler	7745193□□□□□□□□
CA3B 6.0 Boiler	7745194□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

Parts for Connection Enclosure Assembly

- 0001 Control unit, module
- 0002 Cover, motherboard
- 0003 Extension module, MV 2+3
- 0004 Motherboard, low voltage, MB200
- 0005 Circuit board, CU102-A60.XXX touch
- 0006 Motherboard, 120/1/60, MB201
- 0007 Circuit board, power supply, SP102
- 0008 Circuit board, LON, IU100-B10
- 0009 Rear housing connection enclosure
- 0010 Control panel, without AHL+FHL, 120/1/60
- 0011 Switch, 2-pole, on/off
- 0012 Fuse holder cover
- 0013 Fuse holder
- 0014 Fuse, T6.3A/250V, (set of 10)
- 0015 Sensor #1, outdoor, NTC
- 0016 Sensor #5, DHW, immersion NTC
- 0017 Sensor #2/#17, supply/return, strap-on NTC
- 0018 Harness heating circuit expansion 156/40A
- 0019 Cable, 1M shielded, 2 x RJ45-steward
- 0020 Connecting cable (7M), LON RJ45
- 0021 LON terminal end resistor (set of 2)
- 0022 Accessory pack, low voltage plugs
- 0023 3-Pole plug, male, #20 (set of 3)
- 0024 4-Pole plug, #52 (set of 3)
- 0025 3-Pole plug, #156 (set of 3)
- 0026 3-Pole plug, #40 (set of 3)
- 0027 3-Pole plug, #50 (set of 3)
- 0028 Accessory pack, plugs #143,145,146
- 0030 Coding plug
- 0031 Programming unit, Vitotronic 200 HI932
- 0032 Control, with sub-base, adaptor and cabling
- 0033 Connecting cable, ETS
- 0034 Switch, 1-pole, ETS
- 0035 Flat cable, 16-pole



Parts Lists *(continued)*

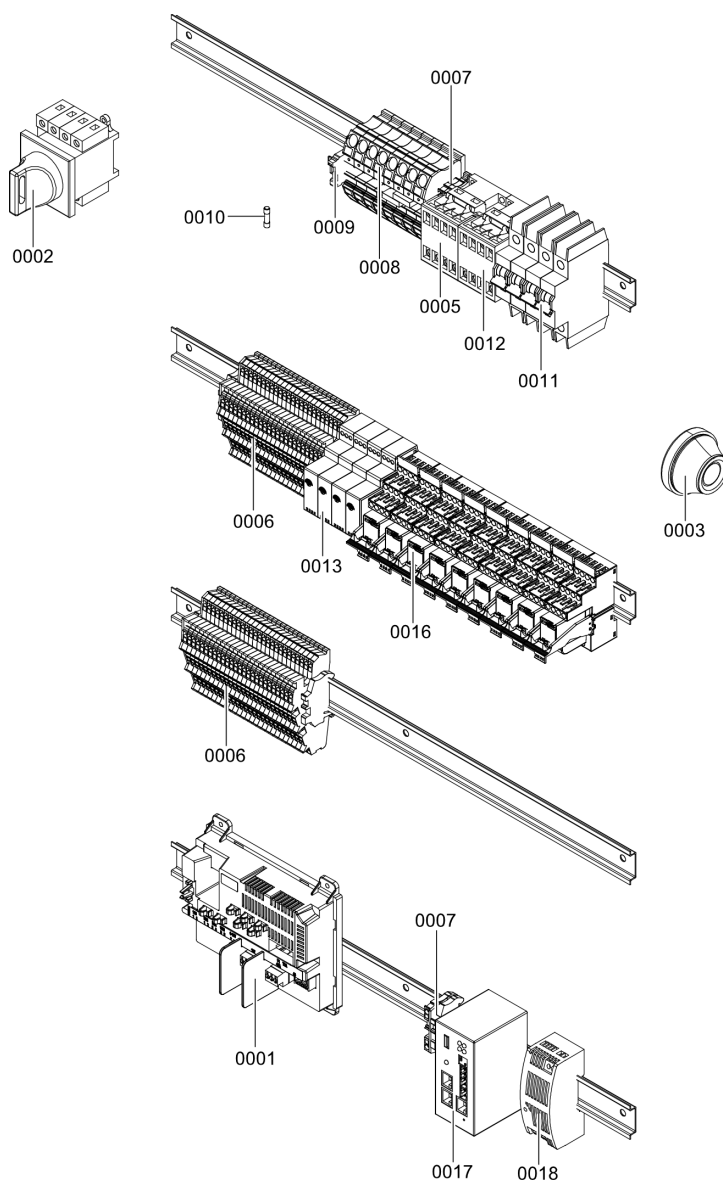
Model No.	Serial No.
CA3B 5.0 Boiler	7745193□□□□□□□□
CA3B 6.0 Boiler	7745194□□□□□□□□

Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

Parts for Junction Box Assembly

0001	EA1 extension 120VAC
0002	Switch-disconnector, 690/3/40
0003	Sealing grommet, M50
0005	Relay, K3-14ND10 120V
0006	Terminal block, 3-pole
0007	Terminal block, PT 2.5
0008	Terminal block, PT 16
0009	Fuse holder
0010	Fuse, 2.0A/250V (set of 10)
0011	Circuit breaker, 16A
0012	Circuit breaker, 10A
0013	Relay, 24-240V 8A SPDT time delay
0014	Power relay, 120V 30A
0015	Power relay, 120V 10A 3PDT
0016	Power relay, 120V 10A DPDT
0017	Vitogate 300 BN (optional accessory)
0018	Power supply, 24VDC 0.75A (optional accessory)



Technical Data

Boiler Model	CA3B	2.5	3.0	3.5	4.0	5.0	6.0
Input	MBH	2500	3000	3500	4000	5000	6000
	(kW)	(733)	(879)	(1026)	(1172)	(1465)	(1758)
Minimum Input NG	MBH	250	300	300	400	300	400
	(kW)	(73)	(88)	(88)	(117)	(88)	(117)
Minimum Input LPG	MBH	495	495	495	660	495	660
	(kW)	(145)	(145)	(145)	(193)	(145)	(193)
Output (thermal efficiency)	MBH	2402	2883	3363	3844	4805	5766
	(kW)	(703)	(844)	(985)	(1126)	(1408)	(1689)
Output (combustion efficiency)	MBH	2352	2832	3294	3764	4705	5646
	(kW)	(689)	(830)	(965)	(1103)	(1379)	(1655)
Net AHRI Rating	MBH	2089	2506	2924	3342	4178	5013
	(kW)	(611)	(734)	(856)	(979)	(1224)	(1469)
Combustion efficiency *1	%	94.1	94.1	94.1	94.1	94.1	94.1
Thermal efficiency *1	%	96.1	96.1	96.1	96.1	96.1	96.1
NG Supply Pressure	"w.c. (max.)	14	14	14	14	14	14
	"w.c. (min.)	4	4	4	4	4	4
LPG Supply Pressure	"w.c. (max.)	14	14	14	14	14	14
	"w.c. (min.)	10	10	10	10	10	10
Power Supply	Voltage	120	120	120	120	208*2	208*2
	Phase	1	1	1	1	3	3
	Hz	60	60	60	60	60	60
	Amp.	20	20	20	20	20	20
Overall Boiler Length	in.	88¾	88¾	99½	99½	136	136
(including insulation and jacketing)	(mm)	(2251)	(2251)	(2526)	(2526)	(3449)	(3449)
Overall Boiler Width	in.	34	34	39½	39½	39½	39½
(including insulation and jacketing)	(mm)	(860)	(860)	(1000)	(1000)	(1000)	(1000)
Overall Boiler Height *4	in.	78¾	78¾	84	84	84	84
(including insulation and jacketing)	(mm)	(2000)	(2000)	(2131)	(2131)	(2131)	(2131)
Concrete boiler base *3							
Length	in.	74 ¾	74 ¾	82¾	82¾	114¼	114¼
	(mm)	(1900)	(1900)	(2100)	(2100)	(2900)	(2900)
Width	in.	34	34	39½	39½	39½	39½
	(mm)	(860)	(860)	(1000)	(1000)	(1000)	(1000)
Thickness	in.	4	4	4	4	4	4
	(mm)	(100)	(100)	(100)	(100)	(100)	(100)
Weight							
Complete with the burners, control, thermal insulation and jacketing	lb.	4233	4233	4696	4806	6261	6894
	(Kg)	(1920)	(1920)	(2130)	(2180)	(2840)	(3127)

*1 Tested to ANSI/AHRI standard 1500 Performance Rating of Commercial Space Heating Boilers / DOE Test Procedure 81 FR 89276 / U.S. Standards ANSI Z21.13/CSA 4.9 / AHRI, BTS-2000 Testing Standard Method to determine the efficiency of Commercial Heating Boilers.

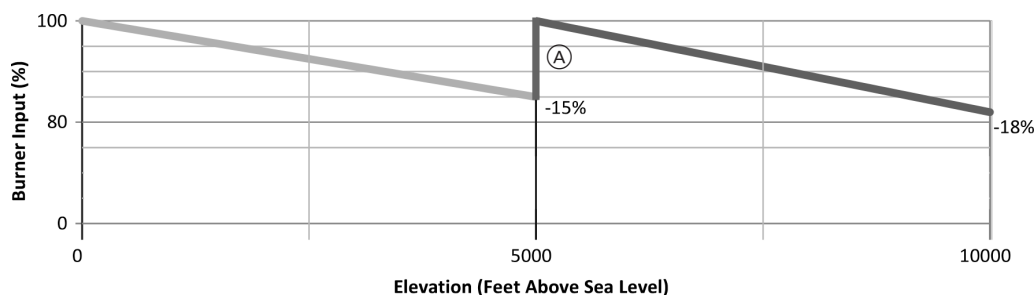
*2 Requires 208Y/120VAC - 3 phase- 60 Hz - 4 wire (L1, L2, L3, N, G) power supply.

*3 Concrete boiler pad is required for all installations (refer to the Installation Instructions).

*4 Does not include the concrete boiler pad or seismic brackets.

Note: For altitude operation up to 4,999 feet, derate the input capacity by 3%/1000 ft.

For operation from 5,000 to 10,000 feet, with the electronic altitude adjustment made, derate the input capacity by an additional 0.6%/1000 ft. for a total derate of 18%.



Ⓐ Input capacity after electronic altitude adjustment is made.

Technical Data *(continued)*

Boiler Model	CA3B	2.5	3.0	3.5	4.0	5.0	6.0
Boiler Water Content	USG (L)	108 (410)	108 (410)	151 (570)	143 (540)	227 (860)	218 (825)
Heat Exchanger Surface	ft. ² (m ²)	142.7 (13.3)	142.7 (13.3)	170.2 (15.8)	192.5 (17.9)	244.1 (22.7)	288.8 (26.8)
Maximum Operating Temperature	°F (°C)	210 (99)	210 (99)	210 (99)	210 (99)	210 (99)	210 (99)
Maximum Adjustable High Limit	°F (°C)	203 (95)	203 (95)	203 (95)	203 (95)	203 (95)	203 (95)
Maximum Operating Pressure	psig (bar)	160 (11)	160 (11)	160 (11)	160 (11)	160 (11)	160 (11)
Min. Pressure Relief Valve Capacity	lbs/h	2205	2646	3086	3527	4409	5280
Boiler Connections							
Boiler supply and return (BS), (BR) (ANSI flanges)	in. (mm)	4 (100)	4 (100)	4 (100)	4 (100)	4 (100)	6 (150)
Safety supply	in.	2	2	2	2	2	2
Boiler drain	in.	2@1½	2@1½	2@1½	2@1½	3@1½	3@1½
Condensate drain (barbed fitting)	in.	¾	¾	¾	¾	¾	¾
Gas connection	in.	2½	2½	2½	2½	3	3
Boiler flue collar							
Internal diameter	in. (mm)	10 (254)	10 (254)	12 (306.8)	12 (306.8)	16 (408.4)	16 (408.4)
Combustion Air							
Internal diameter (for direct vent sealed combustion using the combustion air intake kit optional accessory)	in. (mm)	10 (254)	10 (254)	12 (306.8)	12 (306.8)	16 (408.4)	16 (408.4)
Flue Gas Values							
Temperature (at a return temperature of 86°F (30°C) at rated input	°F (°C)	113 (45)	113 (45)	117 (47)	117 (47)	122 (50)	122 (50)
at partial load	°F (°C)	91 (33)	91 (33)	91 (33)	91 (33)	91 (33)	91 (33)
Temperature (at a return temperature of 140°F (60°C) at rated input	°F (°C)	167 (75)	167 (75)	162 (72)	162 (72)	167 (75)	167 (75)
Mass flow rate (of flue gas) at rated input	lbs/h (kg/h)	2216 (1007)	2656 (1205)	3109 (1410)	3549 (1610)	4442 (2015)	5324 (2415)
at partial load	lbs/h (kg/h)	267 (121)	320 (145)	320 (145)	425.5 (193)	320 (145)	425.5 (193)
Max. Condensate Flow Rate for NG and LPG	USG/h (L/h)	24 (91)	29 (109)	34 (129)	38 (144)	48 (182)	58 (220)
Pressure							
at boiler flue outlet	pa (max.)	100	100	100	100	100	100
at rated input	"w.c. (max.)	0.4	0.4	0.4	0.4	0.4	0.4
Standby Loss							
At boiler water temperature 158°F (70°C) [room temperature 68°F (20°C)]	BTU/h (W) %	6227 (1825) 0.25	7469 (2197) 0.25	8750 (2564) 0.25	10000 (2931) 0.25	12500 (3663) 0.25	15000 (4396) 0.25
NOx @3% O ₂ *5		< 20 ppm					

*5 For operation with natural gas, field setup and adjustment is required to achieve the stated value.
Adjustment may cause a boiler derate of up to 20%.

[illegible]

Maintenance Record

Setting and Test Values			Commissioning			Maintenance/Service		
Static Pressure			mbar ("w.c.)			Section 1	Section 2	Section 3
Supply Pressure (running pressure)								
☐ for natural gas NG			mbar ("w.c.)					
☐ for liquid propane gas LPG			mbar ("w.c.)					
Check gas type								
Carbon Dioxide Content CO ₂								
■ at the upper rated heating output	actual	% by vol.						
	set	% by vol.						
■ at the lower rated heating output	actual	% by vol.						
	set	% by vol.						
Oxygen Content O ₂								
■ at the upper rated heating output	actual	% by vol.						
	set	% by vol.						
■ at the lower rated heating output	actual	% by vol.						
	set	% by vol.						
Carbon Monoxide Content CO	actual	ppm						
	set	ppm						
Flue Gas Temperature (gross)	actual	°F (°C)						
	set	°F (°C)						
Ionization Current								
■ at the upper rated heating output			μA					
■ at the lower rated heating output			μA					
Draught	actual	hPa ("w.c.)						
	set	hPa ("w.c.)						

Maintenance Schedule

The following is an overview of scheduled service steps.

Regular service work ensures reliable, energy-efficient, and environmentally friendly operation.

IMPORTANT

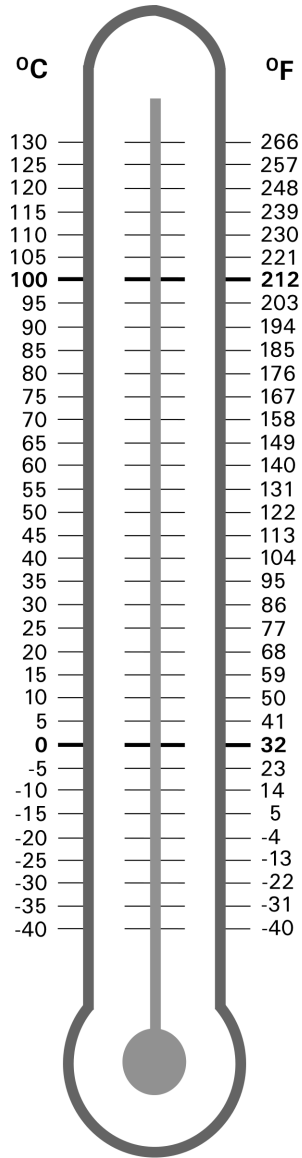
Keep boiler and boiler room clear and free from combustible materials, gasoline and other flammable vapors and liquids. Do not obstruct the flow of combustion and ventilation air. All inspection, maintenance, and service must be performed by a qualified heating technician.

IMPORTANT

The boiler must be cleaned at least once a year by a qualified heating technician or service agency.

Maintenance Schedule *(continued)*

Frequency	Performed by	✓	Service
Monthly	Owner / Operator		Check the system pressure frequently.
			Ensure proper operation of the boiler control. Refer to operating instructions of the control.
			Inspect all seals; retighten or replace as necessary.
			Ensure an adequate supply of combustion air and ventilation air into and out of the mechanical room is being maintained at all times.
			Ensure that nothing is obstructing the flow of combustion ventilation air, and no chemicals, garbage, gasoline, combustible materials, flammable vapors, or liquids are stored, not even temporarily, in the vicinity of the boiler.
			Check for water on the floor from the discharge pipe of pressure relief valve or any other pipe, pipe joint, valve, or air vent.
			Test pressure relief valve and check for proper operation. See instructions attached to pressure relief valve.
			Check all operational high limits for proper operation.
			Check for proper operation of the condensate neutralization system (if used).
			Check the condition and fill status of the neutralization media.
			Check the pH value of the flue gas condensate (min. 6.5).
			Check for moisture water on external vent pipe joints and appearance of ice on the vent pipe or chimney outlet in the winter time.
Annually	Owner / Operator		Ensure service work/test is conducted at least annually by qualified personnel, and that any deficiencies are corrected immediately.
	Heating Technician		Test functionality of safety high limits.
			Test and establish proper chemical makeup of system water.
			Check flue pipe condition, chimney connection and chimney itself.
			Check pressure relief valve and system pressure, and verify proper operation.
			Check heating pipe joints, valves, air vents, etc. System leaks must be corrected immediately to avoid further defects. The cause of defect must also be determined in order to avoid further problems.
			Check for proper combustion air supply and ventilation to boiler / mechanical room.
			Test high limits by dialing lower settings, then switching burners on/off to verify function. Test low water cut-off, check and verify proper function according to manufacturer's instructions.
			Check requirements for maintenance or lubrication of the circulation pumps according to manufacturer's instructions.
			Check for gas-tight connection of gas piping, unions, gas valve and manifold.
			Check proper ignition of the burners.
			Combustion test must be performed by a qualified heating technician.
Periodically	Heating Technician		Ensure functionality of low water cutoffs, including flushing of float types (if used) during operation. Refer to the manufacturer's instructions.
			Inspect low- and/or high pressure gas switch (if used).
			Inspect main burner flame and follow the instruction manual for detailed service and maintenance guidelines.
			All boilers and the boiler room must be kept free of high dust levels, high humidity, aggressive vapors and/or chemicals containing chlorine.
			Ensure proper boiler room ventilation.
			Valves, fittings and pipes not pressure tight must be repaired.
			Combustion chamber door, clean-out opening covers, and flanges may need to be retightened and resealed. Do not over tighten.



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Technical information subject to change without notice.



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