Service Instructions

for use by heating contractor

Vitocrossal 200 CI2 series
Gas condensing boilers with MatriX cylinder burners
Heating input: 399 to 2000 MBH
(117 to 586 kW)

VITOCROSSAL 200

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.*

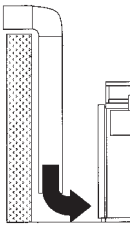
- **Advice to owner**
  Once the installation work is complete, the heating contractor must familiarize the system operator/ ultimate owner with all equipment, as well as safety precautions/requirements, shutdown procedure, and the need for professional service annually before the heating season begins.

- **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 200 CI2 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 200 CI2 boiler is suitable for a maximum operating pressure of 80 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.

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Service Equipment

Tools

- Assortment of flat head 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 % CO_2 or O_2 (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 0ºF to 250ºF (0ºC to 121ºC).
- ⅛ in. NPT male to ¼ in. barb adaptor fitting, as well as tubing for pressure measurement.

Technical information

The following is a list of literature applicable to the Vitocrossal 200 CI2 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 94 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.

▶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.

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.

▶The Maintenance Record is located on page 83 of this manual.

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.

▶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.

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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)*

CSD-1 Field Testing of High Limit Switches for Vitocrossal 200 CI2 boilers – where required by law.

As per ASME Boiler and Pressure Vessel Code, section IV, subsection HG-613 TEMPERATURE CONTROL requirements, Vitocrossal 200 CI2 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.

VIESSMANN IS NOT RESPONSIBLE FOR ANY DAMAGES THAT THE FOLLOWING TEST PROCEDURE MAY RESULT IN BY OVERHEATING THE SYSTEM.
The Vitocrossal 200 CI2 boilers are equipped with a temperature sensor 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.

High Limit Safety Cut-Out Test

Tap the following buttons:

1. " ☰ "
2. "Service"
3. Enter password "viservice".
4. Confirm with ✔.
5. "Test mode"
6. "Test mode"
   Note: For lag boilers, test mode is accessible via the software tool.
7. Confirm with ✔.
   Note: Ensure adequate heat transfer.
8. Use ⮌ to end the Test.

Filling the Heating System with Water and Ventilating

1. Fill the boiler with water in accordance with "Water quality requirements" on page 80.
2. Record the fill volume, water hardness and pH value in the table on page 82.

Commissioning the System

⚠ WARNING

**CO formation can cause serious damage to health.
Always carry out a CO test before and after work on gas appliances.**

⚠ WARNING

**Touching hot parts can result in burns.
Only work on the burner when it has cooled down.**

Seal test

Gaskets on the burner door and components that carry flue gas can be checked during operation with an inspection mirror.
If necessary, remove the thermal insulation components.
Traces of condensate on the outside of the flue gas collector or on sections of thermal insulation also indicate leaks.
Note: The burner settings must be checked with the boiler heated to operating temperature (min. 40°C/104°F). Also check the burner at partial load.

1. Check the heating system pressure.
   Maximum operating pressure: 80 psi (5.5 bar)
   Minimum operating pressure: 15 psi (1.0 bar)
2. For room air dependent operation: Check that the combustion air openings in the mechanical room are open. For room air independent operation direct vent: Check that the air pipes are unobstructed.
3. Check the gas supply pressure (for target value, see table on page 24).
4. Open the gas line shut-off valves.
5. Check the function of the neutralizing system (if installed), including the hydraulic seal in the condensate trap.

   Refer to 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 after approx. 500 hours run.
7. Switch on the boiler power supply at the breaker.
8. Power on the control unit.

Commissioning the System with the Commissioning Assistant

⚠ WARNING

Escaping flue gas can cause life threatening poisoning from carbon monoxide.
☐ To prevent flue gas escaping, only use the condensate drain with a trap.
☐ Ensure there are no leaks from the flue system.

Single boiler system

1. Open the gas shut-off valve.
2. ■ If the boiler has not been switched on yet:
   Turn on the ON/OFF switch.
   The commissioning assistant starts automatically.
   ■ If the boiler has already been switched on:
   See chapter “Calling up the commissioning assistant at a later point”, page 15.
3. Commission the boiler and follow the commissioning assistant. See the overview below.
   Note: All PlusBus subscribers must be connected and switched on.
   Note: Depending on the type of boiler, the accessories connected and other settings, not all menu points will be displayed.
   Note: After the commissioning assistant has finished, check that the actuators are connected and operating correctly. Start the actuator test, refer to page 53.

Commissioning assistant sequence	Explanations and references
Commissioning	
Language	Factory setting: English
With programming unit	If commissioning is to be carried out at the programming unit of the boiler.
With software tool	The boiler automatically switches on the WiFi access point. Further commissioning steps according to the instructions of the software tool used (e.g. “Viguide”) **Note:** Apps for commissioning and service are available for iOS and Android devices. Download on the App Store GET IT ON Google Play Cascade systems can only be commissioned using the software tool.
Units of measurement	
Date and time	Set the current time.
Operating mode	■ Weather-compensated operation The outside temperature sensor must be connected. ■ Constant operation Operation with constant supply temperature
Gas type	If operating with LPG, switch to “LPG” (the delivered condition is Natural Gas)
Flue system type	■ Single connection Only one boiler is connected to the flue system (factory setting). ■ Multiple connections Several boilers are connected to the flue system (common venting).
Flue length adjustment	Specification of the effective flue and ventilation air length. To determine the effective flue and ventilation air length, see page 19, chapter “Matching the burner output to the flue system”.
If no further settings are to be performed, the commissioning assistant can now be closed.	

Commissioning the System with the Commissioning Assistant *(continued)*

Commissioning assistant sequence	Explanations and references
System scheme	
Heating circuit 1	Heating circuit without mixing valve
Heating circuit 2, 3 ...	Heating circuits with mixing valve
DHW ■ Not available ■ Tank with one sensor ■ Tank with one sensor and DHW recirculation pump ■ Tank with temperature switch ■ Tank with temperature switch and DHW recirculation pump	Settings for DHW heating according to the system components System without DHW heating System with DHW tank with 1 tank temperature sensor System with DHW tank with 1 DHW tank temperature sensor and DHW recirculation pump System with DHW tank with temperature switch (such as an aquastat) System with DHW tank with temperature switch, (such as an aquastat) and DHW recirculation pump
Low loss header/buffer tank ■ Not available ■ Low loss header, heating only ■ DHW heating upstream of low loss header ■ DHW heating downstream of low loss header ■ Buffer tank, heating only ■ DHW heating upstream of buffer tank ■ DHW heating downstream of buffer tank	Settings for the consumer circuits according to the system components There is no low loss header or heating water buffer tank in the system. System with low loss header, without DHW heating DHW heating with e.g. separate DHW tank connected upstream of the low loss header DHW heating with e.g. separate DHW tank connected downstream of the low loss header System with heating water buffer tank, without DHW heating DHW heating with e.g. separate DHW tank connected upstream of the heating water buffer tank DHW heating with e.g. separate DHW tank connected downstream of the heating water buffer tank
Heating zone/safety input ■ Heating zone 1 ■ Heating zone 2 ■ Heating zone 3 (based on boiler application type)	 Not available or temperature controller or safety device 1 Not available or temperature controller or safety device 2 Not available or temperature controller or safety device 3

Commissioning the System with the Commissioning Assistant *(continued)*

Commissioning assistant sequence	Explanations and references
Floating contact: Function selection plug 96	If a contact has been connected to plug 96.
■ No function	
■ External demand, DHW circulation pump	Push button function, DHW recirculation pump runs for 5 min.
■ External demand (based on boiler application type)	Boiler demand with adjustable target supply temperature (parameter 528.0) and target primary pump speed (parameter 1100.2)
■ External blocking	
■ Heat demand (based on boiler application type)	Call for heat is shown in the display/menu as “Heating zone 4”.
EM-EA1 (DIO): Function selection (based on boiler application type)	If an EM-EA1 extension (DIO electronics module) is connected as a function extension.
Functions	Selection of the connected function according to the table in the EM-EA1 extension installation instructions.
Remote control units	
	Set the type of remote control and subscriber no. as assignment to the respective heating circuit. Up to 4 heating circuits can be assigned to one remote control unit. It is not possible for several remote controls to act on one heating circuit.
“Primary pump”	
■ **No pump**	
■ **Boiler circuit pump**	On/off control
■ **Boiler circuit pump**	0 - 10V modulation control
Maintenance	
Interval in burner hours run until next maintenance	Interval adjustable in steps of 100 h.
Interval until next maintenance	Interval adjustable to 3, 6, 12, 18 or 24 months.

Multi boiler system
The lead boiler must be commissioned using the Viguide app (service layer).
Note: Commission the lead boiler first, then the lag boilers.
- The lag boiler is numbered by manually setting the subscriber number (ID).
- Always enter the ID number consecutively and without gaps!

After this, the respective boiler has to be commissioned using the Viguide app.
Follow the instructions in the app and establish a connection between the lead boiler and the Viguide app.

Commissioning the System with the Commissioning Assistant *(continued)*

Commissioning assistant sequence	Explanations and references
Commissioning	
Viguide function type:	Lead 1 (1) Cascade lead without heat provides cascade functionalities to connected lag devices. Does not support DHW or heat supply by itself. Lead 1 (1) Cascade heat lead provides cascade functionalities to its own and connected lag devices. Does not support DHW supply or global DHW supply. Lead 1 (1) Cascade heat DHW lead provides cascade functionalities to its own and connected lag devices and provides local DHW production. Lag 1-15 (2-16) Heat lag is a device controller that provides lag heating device functionalities Lag 1-15 (2-16) Buffer lag to be applied for multivalent systems, e.g. CHP Lag 1-15 (2-16) DHW lag is a lag device that provides only support in DHW production – hydraulically separated Lag 1-15 (2-16) Backup heater is a lag device that is taken out of the cascade sequence as a fall-back solution, central heating only..
Viguide cascade member sequencing strategy:	1.1 Dynamic strategy – fixed first dynamic sequence of the cascade members with manually configured fixed first device in sequence 1.2 Dynamic strategy – fixed last dynamic sequence of the cascade members with manually configured fixed last device in sequence 1.3 Dynamic strategy – runtime optimization dynamic sequence of the cascade members with runtime optimization of the cascade members 2 Manual mode – manual mode of the cascade members with fixed configured sequence. In general the whole cascade is supply temperature-controlled: A particular supply temperature is requested from all cascade members.

Commissioning assistant sequence	Explanations and references
Viguide lead boiler commissioning:	Units: ■ Gas type ■ Altitude ■ Filling ■ Venting Safety functions on MZIO; low gas pressure via ZI2; high gas pressure via ZI3). Central heating pump mode (auto or modulation controlled pump). Set up the combustion air interface. Flue gas sensor test. Time and auto summer/wintertime. DHW function: one-time load, hygiene function and scald protection. Supported number and type (direct/mixed/none) of heating circuits. Number of TT circuits. Function of TT circuits. Control type (weather-compensated/constant control) – if weather-compensated, then the setting “heating and TT circuit” or only “heating” without TT circuit is selectable. Setup of internet connection If weather-compensated, then source of valid outside air temperature is selectable. If constant mode control type: a) Constant flow control for heating circuits. b) Constant flow control with data interface for gateway/building automation system for heating circuits. c) Fixed temperature supply to TT zones with TT circuits is selectable.

Commissioning the System with the Commissioning Assistant *(continued)*

Commissioning assistant sequence	Explanations and references
Viguide lag boiler commissioning:	Units: ■ Gas type ■ Altitude ■ Filling ■ Purging Safety functions on MZIO; low gas pressure via ZI2; high gas pressure via ZI3). Central heating pump mode (auto or modulation controlled pump). Set up the combustion air interface. Flue gas sensor test.
Viguide service layer lead device:	Emissions test mode Actuator test mode Min. partial load Max. partial load System configuration: ■ General – device/boiler – DHW – heating circuit 1/2/3/4 - TT circuits Diagnosis: ■ General – device/burner – DHW – heating circuit - TT circuits
Viguide service layer lag device:	Emissions test mode Actuator test mode Min. partial load Max. partial load System configuration: ■ General – device/boiler Diagnosis: ■ General – device/burner

Switching internet connectivity on/off
The boiler equipped with an integrated communication module, the communication module supports internet connectivity via WiFi and LAN.
The internal communication module supports commissioning of the boiler with the “Viguide app”,.

The access information required to establish the connection is stored in the form of an access code with “WiFi symbol”. The access information is located in triplicate on the back of the programming unit.

Remove the WiFi access labels from the clear plastic pocket located on the front of the boiler near the main power switch. For commissioning, affix one of the WiFi access labels to each of the following locations:
- Free space on the boiler jacketing
- Designated space in the Service Instructions
- Designated Space in the Operating Instructions

Operating instructions

Switch on the WiFi connection or LAN and establish a connection to the router.
Activating the internet connection:

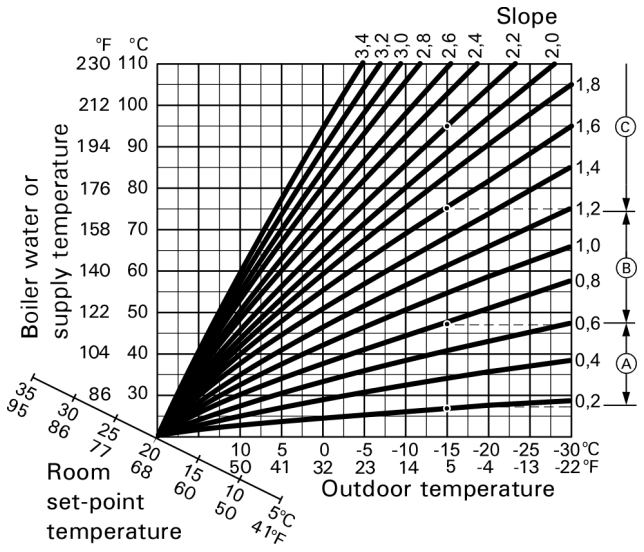
Apply WiFi access label here

Calling up the commissioning assistant at a later point
If you need to continue commissioning later, the commissioning assistant can be reactivated at any time.
Tap the following buttons:
1. ☰
2. “Service”
3. Enter password “viservice”.
4. Confirm with ✔.
5. “Commissioning”

Fuel Conversion Labelling NG to LPG

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

Adjusting the Heating Curves



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

Tap the following buttons:

1. ☰
2. "Heating"
3. Select "Heating circuit 1" or "Heating circuit ..." for the required heating circuit.
4. "Heating curve"
5. Set the heating curve according to the requirements of the system using "Slope" +/– or "Shift" +/–.
6. ✔ to confirm

Heating curve

The heating curves represent the relationship between the outside temperature and the supply temperature. Simplified: The lower the outside temperature, the higher the supply temperature must be in order to reach the target room temperature.

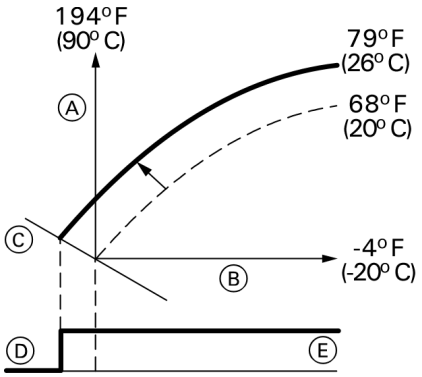
Factory settings:
- Slope = 1.4
- Shift = 0

Note: If heating circuits with mixing valve are present in the heating system: The supply temperature of the boiler is one differential temperature higher than the supply temperature for the heating circuits with mixing valve. Differential temperature in factory setting 14°F (8 K).

The differential temperature is adjustable using the following parameters:
- Heating circuit 2: Parameter 934.5
- Heating circuit 3: Parameter 935.5
- Heating circuit 4: Parameter 936.5

Adjusting the Heating Curves *(continued)*

Standard room temperature or comfort room temperature



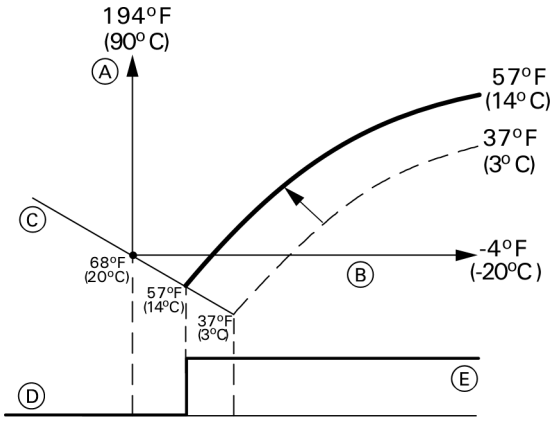
Example 1: Adjusting the room temperature setpoint from 68°F to 79°F (20°C to 26°C)

Legend
Ⓐ Supply temperature
Ⓑ Outside temperature
Ⓒ Target room temperature
Ⓓ Heating circuit pump “OFF”
Ⓔ Heating circuit pump “ON”

Changing the target room temperature

Operating instructions

Reduced room temperature



Example 2: Adjusting the room temperature setback from 41°F to 57°F (5°C to 14°C)

Legend
Ⓐ Supply temperature
Ⓑ Outside temperature
Ⓒ Target room temperature
Ⓓ Heating circuit pump “OFF”
Ⓔ Heating circuit pump “ON”

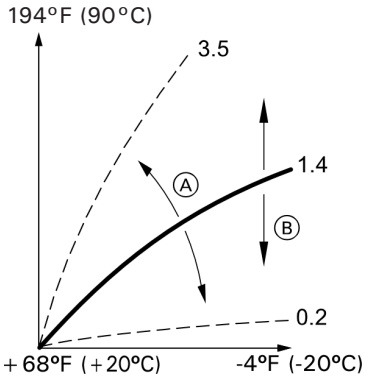
Changing the reduced target room temperature

Operating instructions

Selecting the set room temperature

Individually adjustable for each heating circuit. The heating curve is offset along the target room temperature axis. The start and stop points of the heating circuit pumps depend on the Heating limit, outside temperature, heating circuit... setting.

Adjusting the Heating Curves *(continued)*



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

Changing the slope and shift
Individually adjustable for each heating circuit.

Raising the supply temperature of the heating circuits during operation with room temperature hook-up
The higher the value, the greater the influence of the room temperature on the supply temperature of the heating circuit.

Room influence factor parameter

Heating circuit	Parameter
1 (without mixing valve)	933.7 (only set if just one heating circuit is installed)
2 (with mixing valve)	934.7
3 (with mixing valve)	935.7
4 (with mixing valve)	936.7

Example for determining the increase in the supply temperature using the value of the heating curve when the actual room temperature deviates from the target room temperature:
- Target room temperature = 68°F (20.0°C) (RT target)
- Actual room temperature = 64°F (18.0°C) (RT actual)
- Heating curve slope = 1.4
- Room influence factor = 8 (factory setting)

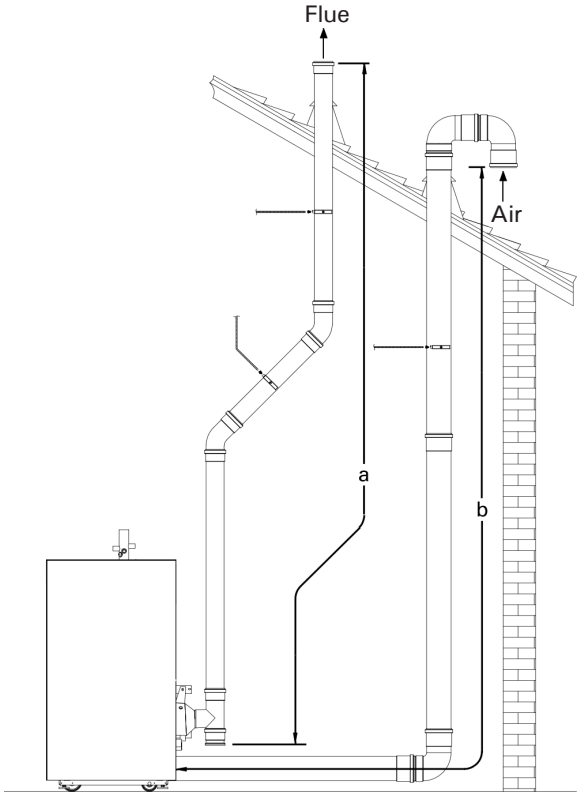
Determining the increase in supply temperature
(RT target - RT actual) x (1 + slope) x room influence factor/4 = raising the supply temperature via heating curve value
(20 - 18) x (1 + 1.4) x 8/4 = 9.6
Increase in supply temperature via heating curve value = 9.6 K

Setting the Max. Heating Output

A limit can be set on the maximum heating output for heating operation. The limit is set via the modulation range.
Note: Ensure sufficient heat transfer before setting the max. heating output.

1. Tap ☰.
2. Select “Service”.
3. Enter password “viservice”.
4. Confirm with ✓.
5. Select “System configuration”.
6. Select “Boiler”.
7. Parameter 596.0 “Maximum heating output”
8. Check that a sufficient flow rate is ensured. If necessary, increase the heat transfer.
   Confirm the prompt with “✓”.
9. ✎
10. Set the required value in % of rated heating output.
    Confirm with ✓. Factory setting 100%.
11. End service functions.

Setting the Boiler Flue System Length



Example based on CI2 399 equipped with Burner Filter Kit
'a' equivalent length – 75 ft. (23 m)
'b' equivalent length – 0 ft. (0 m)
Value for installed Burner Filter Kit – 66 ft. (20 m)
75+0+66=141 ft.
(23+0+20=43 m)
Flue System Length setting in HMI/ViGuide mobile app 141 ft. (43 m).

Example based on CI2 750 with no combustion air intake accessory
'a' equivalent length – 150 ft. (46 m)
'b' equivalent length – 0 ft. (0 m)
Flue System Length setting in HMI/ViGuide mobile app 150 ft. (46m).

Example based on CI2 1500 equipped with Direct Vent with Inline Filter Kit
'a' equivalent length – 75 ft. (23 m)
'b' equivalent length – 60 ft. (18 m)
Value for installed Direct Vent with Inline Filter Kit – 157 ft. (48 m)
75+60+157=292 ft.
(23+18+48=89 m)
Flue System Length setting in HMI/ViGuide mobile app 292 ft. (89 m).

The value for boiler Flue System Length must be set in the commissioning sequence (either through the HMI or Viguide mobile app). The value entered for Flue System Length setting of the commissioning sequence is the calculated equivalent length of the venting system [flue+combustion air piping maximum equivalent length 198 ft. (60 m)] plus the value for any installed combustion air intake accessories listed below. Example calculations are provided on the left.

The setting range for the Flue System Length is adjustable between 0 to 400 ft. (0 to 122 m).

IMPORTANT

Excessive flue gas back pressure will cause the boiler to malfunction. The maximum equivalent length of the flue system (flue and combustion air piping) must not exceed 198 ft. (60 m).

4 in. elbow equivalent length

- 45° elbow: 3 ft. (0.9 m)
- 90° elbow: 8 ft. (2.4 m)

6 in. and 8 in. elbow equivalent length

- 45° elbow: 5 ft. (1.5 m)
- 90° elbow: 10 ft. (3 m)

If the maximum equivalent vent length (flue+combustion air piping without combustion air intake accessories listed below) exceeds 198 ft. (60 m), a vent manufacturer may calculate a revised venting system if required. Available flue pressure at the boiler flue outlet (at rated input is 2.4 "w.c. (600 pa).

The boiler Flue System Length can only be set during the commissioning sequence, if the value needs to be adjusted restart the commissioning process:

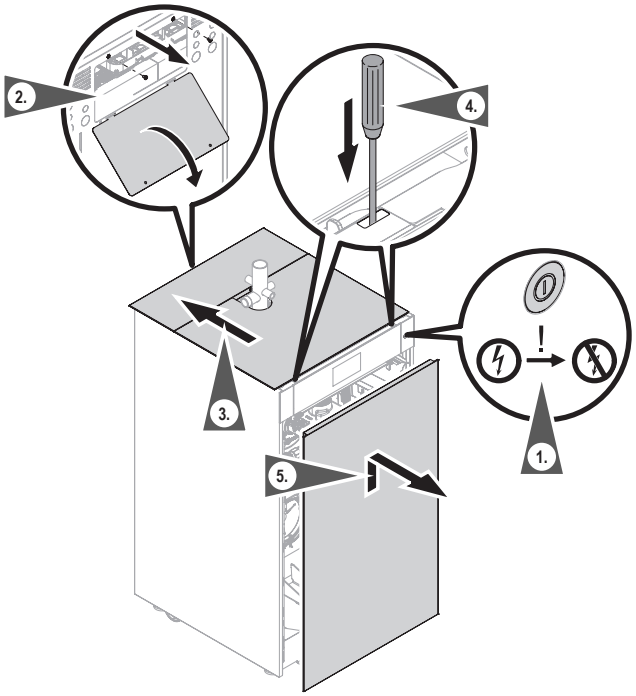
1. Tap ☰.
2. Select "Service".
3. Enter password "viservice".
4. Confirm with ✔.
5. Select "Commissioning".

Setting the boiler Flue System Length when using common vent system
When connecting several boilers to a common vent system: Adjust the Flue System Length setting for each connected boiler to the common venting system, using the instructions above.

Value for installed combustion air intake accessories				
CI2 Boiler model		**Burner filter**	**Direct vent kit**	**Direct vent with inline filter**
399/500	**ft. (m)**	66 (20)	90 (28)	144 (44)
750/1000	**ft. (m)**	39 (12)	66 (20)	131 (40)
1500	**ft. (m)**	66 (20)	131 (40)	157 (48)
2000	**ft. (m)**	39 (12)	157 (48)	198 (60)

Preparing for Servicing of the Burner/Combustion Chamber

Opening the CI2 399 to 1000



Note: Whenever working on the burner, close the gas shutoff valve. Shut down the system.

WARNING

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

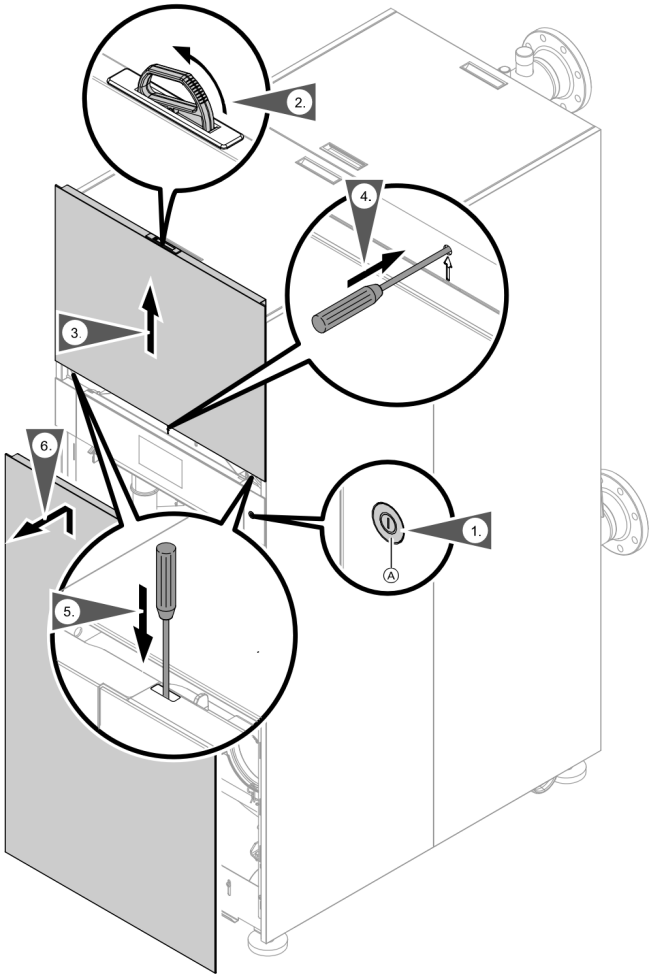
WARNING

Touching hot parts can result in burns.
Only work on the burner when it has cooled down.

1. Turn the power switch off and disconnect the power supply to the boiler, close gas shutoff valve.
2. Remove junction box retaining screws and set aside, swing the junction box access door to open.
3. Push back top panels to access the front panel release (top panel removal is not required).
4. Using a screwdriver push down on the front panel releases.
5. Pull forward at the top of the front panel and lift up to remove.

Preparing for Servicing of the Burner/Combustion Chamber *(continued)*

Opening the CI2 1500 and 2000



Legend
Ⓐ ON/OFF switch

Note: Whenever working on the burner, close the gas shutoff valve. Shut down the system.

WARNING

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

WARNING

Touching hot parts can result in burns.
Only work on the burner when it has cooled down.

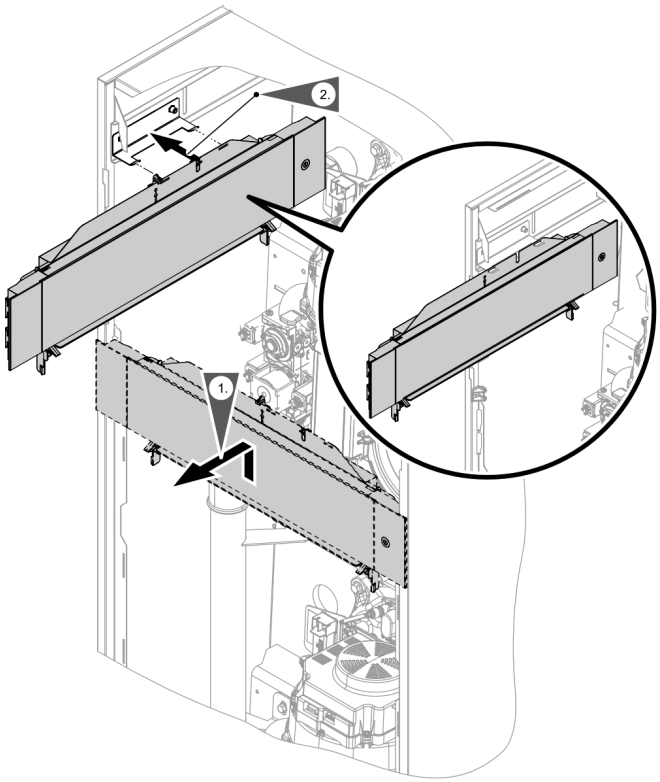
1. Turn the power switch off and disconnect the power supply to the boiler close gas shutoff valve.
2. Flip open the panel handle located at the top of the upper front panel.
3. Pull up the upper front panel using the panel handle.
4. While holding the panel handle, use a screw driver to release the panel retaining clip, pull up to finish removing the panel.

CAUTION

Failure to keep a firm grip on the panel handle may cause the upper front panel to fall causing injury.

5. Using a screw driver, press down on the lower front panel release.
6. Pull the top of the lower front panel away from the boiler, lift up to remove.

Preparing for Servicing of the Burner/Combustion Chamber *(continued)*

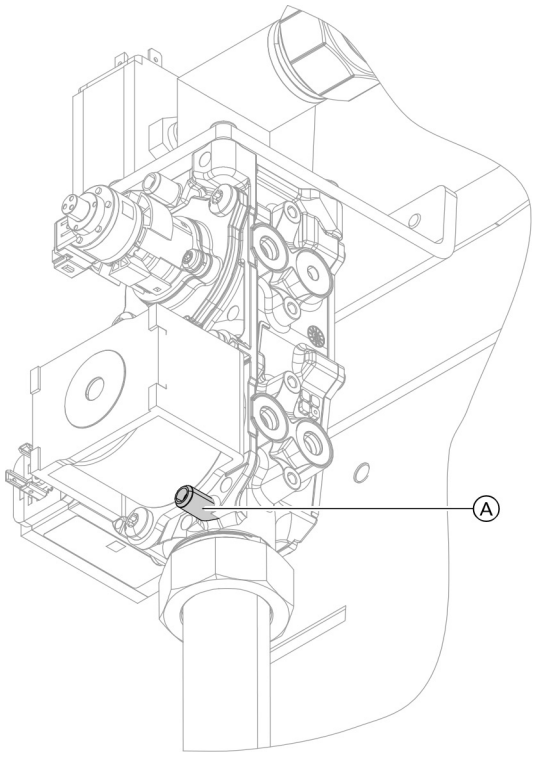


Hooking the programming unit in the service position

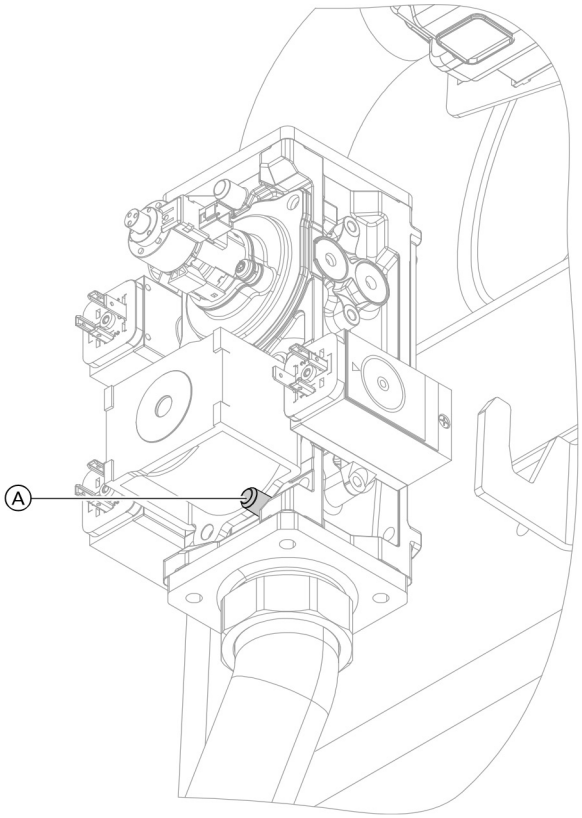
Note: for CI2 1500 and 2000 only

1. Gently pull straight up on the boiler interface and then forward slightly to remove the interface.
2. Place the interface into the hook located at the top left of the boiler jacketing.

Checking the Static Pressure and Supply Pressure



399/500 MBH burner



750/1000 MBH burner

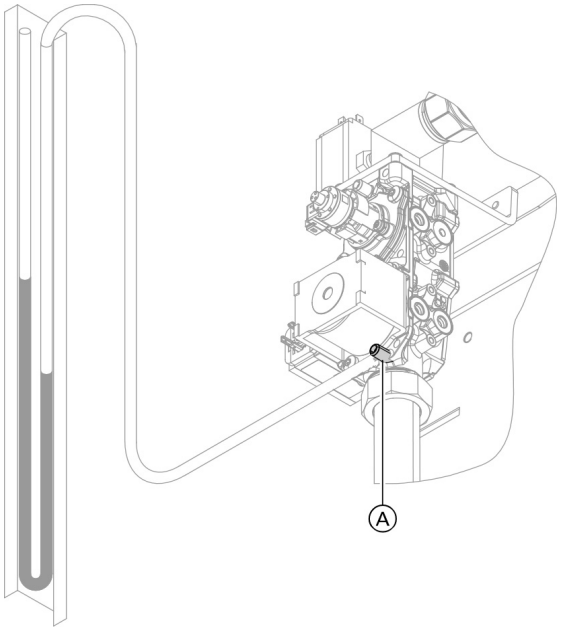
Checking the static pressure

1. Close the gas shut-off valve.
2. Undo screw in test connector Ⓐ, but do not remove.
3. Connect the pressure measuring device at test connector Ⓐ.
4. Open the gas shut-off valve.
5. Check the static pressure max. 14" w.c.
6. Record the measured values in the report on page 83.

WARNING

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

Checking the Static Pressure and Supply Pressure *(continued)*



⚠ 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.

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.
Reset the burner.
The ignition procedure is repeated.
This boiler employs a direct spark ignition system.

IMPORTANT

A CO_2 measurement (see page 25) 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.

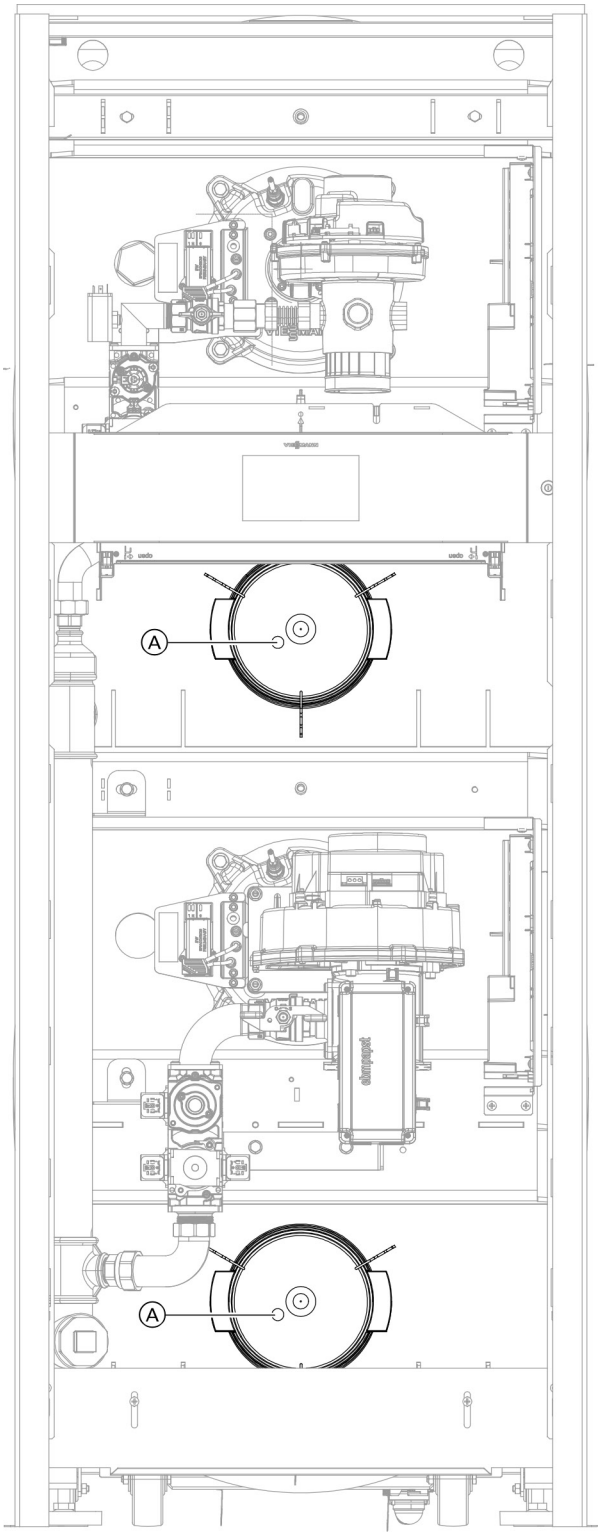
2. Measure the supply pressure (running pressure). Use suitable measuring instruments calibrated with a minimum resolution of 0.04 "w.c. Value must be as per the chart below:

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 83).
4. Close the gas shut-off valve.
5. Remove the pressure tester and close test nipple Ⓐ.

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 the CO_2 Content



Inspection ports Ⓐ using the Vitocrossal CI2 1500 as an example, the lower 1000 MBH burners is shown with venturi tube removed for clarity.

Preparing the test

For boilers with 2 burners, each burner must be measured at the respective inspection port

1. Plug the flue gas analyzer into flue gas test port Ⓐ of the respective burner on the inspection cover.
2. Open the gas shut-off valve.
3. Start the burner using the emissions test switch on the control unit.
   Note: During commissioning, the combustion controller carries out an automatic calibration. Allow approx. 50 sec after the burner has started before testing the emissions.

CO_2 test at the upper heating output

Selecting the upper/lower heating output

Note: Ensure adequate heat transfer.

Note: The actuator test for lag appliances is available via the software tool, not on the display.

Tap the following buttons:

1. ☰
2. "Service"
3. Enter password "viservice".
4. Confirm with ✔.
5. "Actuator test"
6. Confirm with ✔.
7. Select "Primary pump, set speed". Set the target value to the maximum value.
8. Select "Burner modulation, set value".
9. Set the lower heating output:
   Select "Minimum heating output, burner 1" or "Minimum heating output, burner 2".
   The burner now operates at the lower heating output.
10. Set the upper heating output:
    Select "Maximum heating output, burner 1" or "Maximum heating output, burner 2".
    The burner now operates at the upper heating output.
11. End output selection:
    ↩ or 🏠
12. Close test port A on the inspection cover with a plug. Check for leaks.
13. For boilers with 2 burners, take measurements on the 2nd burner. To do this, switch off the boiler and connect the flue gas analyser to test port A of the 2nd burner.

Note: The actuator test for lag boiler is available via the software tool, not on the display i.e. viguide app.

Checking the Combustion Quality

The electronic combustion controller automatically ensures optimum combustion quality. During commissioning/ maintenance, only the combustion values need to be checked. For this, measure the CO content and the CO_2 or O_2 content. Record the results in the report on page 83.

Note: To prevent operating faults and damage, operate the boiler with uncontaminated combustion air.

Permissible CO_2 or O_2 content

Operation with natural gas

- CO_2 content: 6.9 - 11%
- O_2 content: 2.1 - 8.4%

Operation with LPG

- CO_2 content: 8.3 - 12.4%
- O_2 content: 2.1 - 8.4%

If the measured CO, CO_2 or O_2 content is outside the respective range, proceed as follows:

- Check the venting system for leaks.

Note: During commissioning, the combustion controller carries out an automatic calibration. Allow approx. 50 sec after the burner has started before testing the emissions.

Shutting Down the System

1. Switch off the breaker or the power supply. Safeguard against unauthorized reconnection.

2. Close the central 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.

WARNING

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

IMPORTANT

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

Removing the Burner

IMPORTANT

Damage to the burner gauze assembly will impair the burner function. Do not damage the mesh.

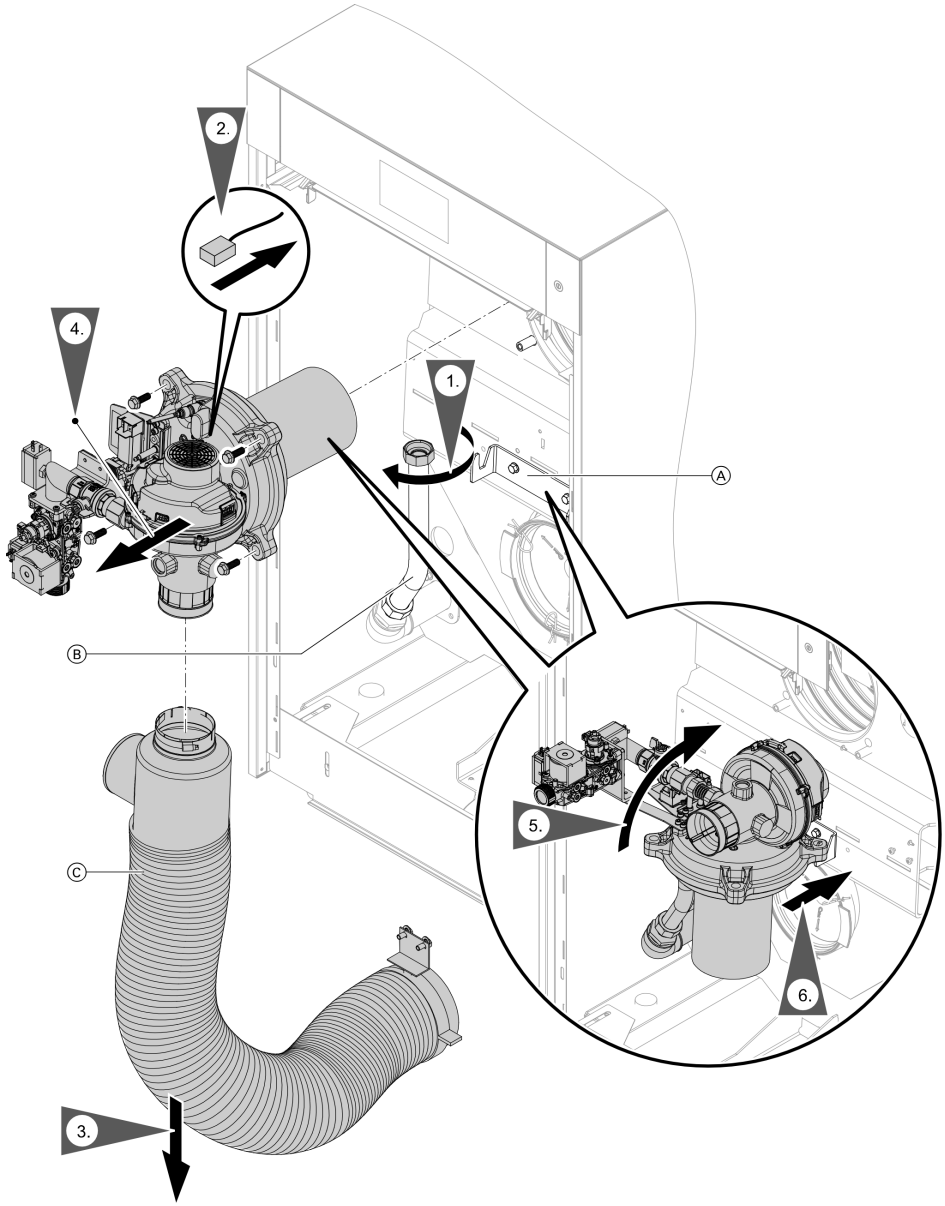
Note: Observe chapter “Preparing for servicing the burner/combustion chamber”; see page 19.

Note: Burner weight 399/500 MBH: 25 lb. (11.3 kg)
Burner weight 750/1000 MBH: 35.5 lb. (16.1 kg)

Note: When removing, check the burner gasket for damage; replace if necessary.

1. Disconnect the burner gas line.
2. Disconnect the cable to the burner control unit (BCU).
3. If present, remove the combustion air intake hose (accessories).
4. Remove the burner mounting bolts (x4 per burner) and remove the burner.
5. Rotate the burner to place in the burner maintenance bracket.
6. Hook the burner into burner maintenance bracket Ⓐ.
   Note: The burner maintenance bracket can also be fixed to the wall, that is capable of supporting the weight of the burner.

CI2 399 to 1000



Legend

Ⓐ Burner maintenance bracket
Ⓑ Burner gas line
Ⓒ Hose for combustion air intake (accessories)

Removing the Burner *(continued)*

IMPORTANT

Damage to the burner gauze assembly will impair the burner function. Do not damage the mesh.

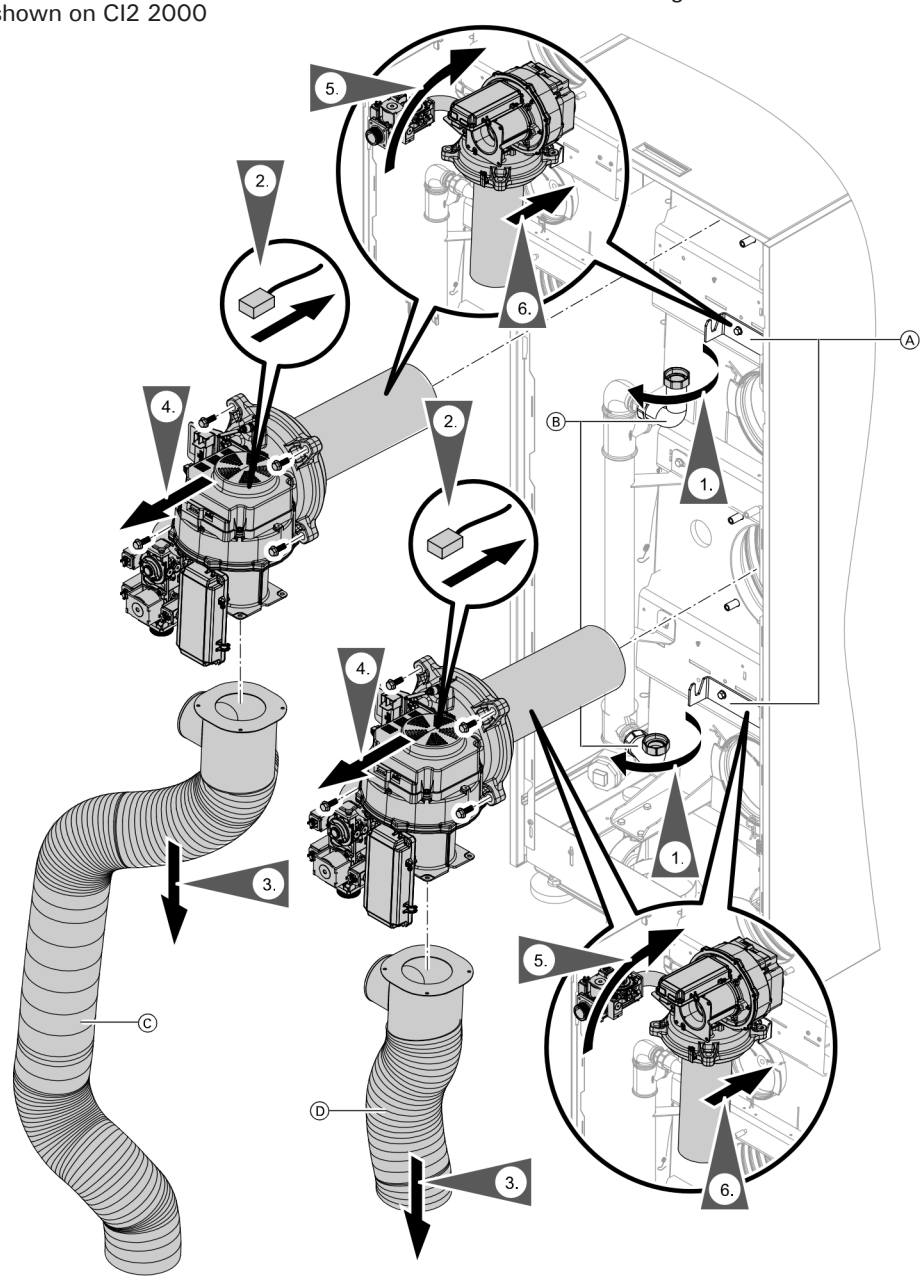
Note: Observe chapter “Preparing for servicing the burner/combustion chamber”; see page 19.

Note: Burner weight 399/500 MBH: 25 lb. (11.3 kg)
Burner weight 750/1000 MBH: 35.5 lb. (16.1 kg)

Note: When removing, check the burner gasket for damage; replace if necessary.

1. Disconnect the burner gas line.
2. Disconnect the cable to the burner control unit (BCU).
3. If present, remove the combustion air intake hose (accessories) if a burner venturi is present remove it and set aside.
4. Remove the burner mounting bolts (x4 per burner) and remove the burner.
5. Rotate the burner to place in the burner maintenance bracket.
6. Hook the burner into burner maintenance bracket Ⓐ.
   Note: The burner maintenance bracket can also be fixed to the wall, that is capable of supporting the weight of the burner.

CI2 1500 to 2000, shown on CI2 2000

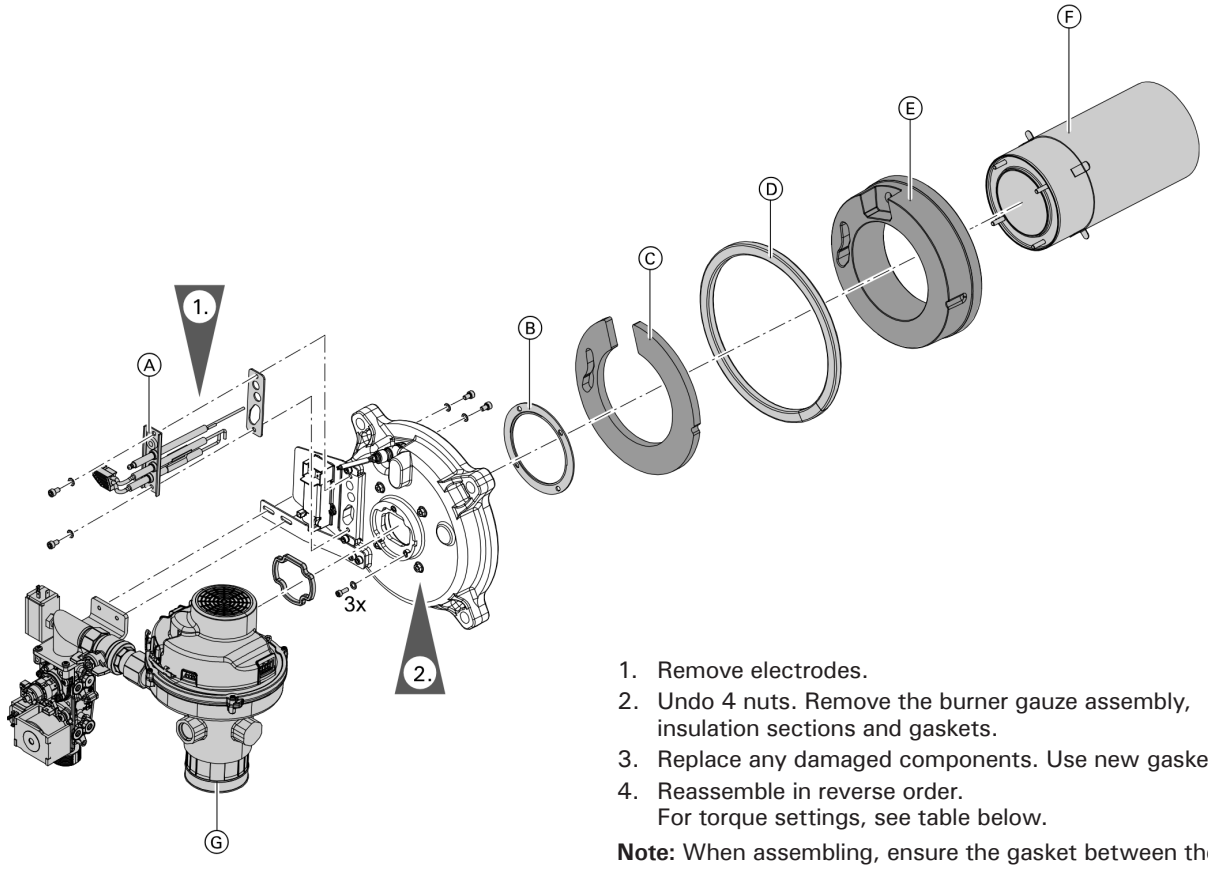


Legend

Ⓐ Burner maintenance bracket
Ⓑ Burner gas line
Ⓒ Hose for combustion air intake (accessories)

Cleaning the Burner

399/500 MBH burner



Legend

Ⓐ Electrode block
Ⓑ Burner gauze assembly gasket
Ⓒ Insulation mat
Ⓓ Burner door gasket
Ⓔ Thermal insulation block
Ⓕ Flame tube
Ⓖ Fan with gas solenoid valve and gas line

1. Remove electrodes.
2. Undo 4 nuts. Remove the burner gauze assembly, insulation sections and gaskets.
3. Replace any damaged components. Use new gaskets.
4. Reassemble in reverse order.
   For torque settings, see table below.

Note: When assembling, ensure the gasket between the fan housing and the burner plate is correctly seated. Replace the gasket if damaged.

Note: If no components of the burner are damaged, an external visual inspection is sufficient.
We recommend blowing compressed air through the burner gauze assembly. Detach the fan for this. Clean the burner door with the burner gauze assembly facing upwards from the outside with compressed air.

Torque settings

Burner	**399/500 MBH**
Electrodes	35 in.lb (4 Nm)
Ignition transformer	13 in.lb (1.5 Nm)

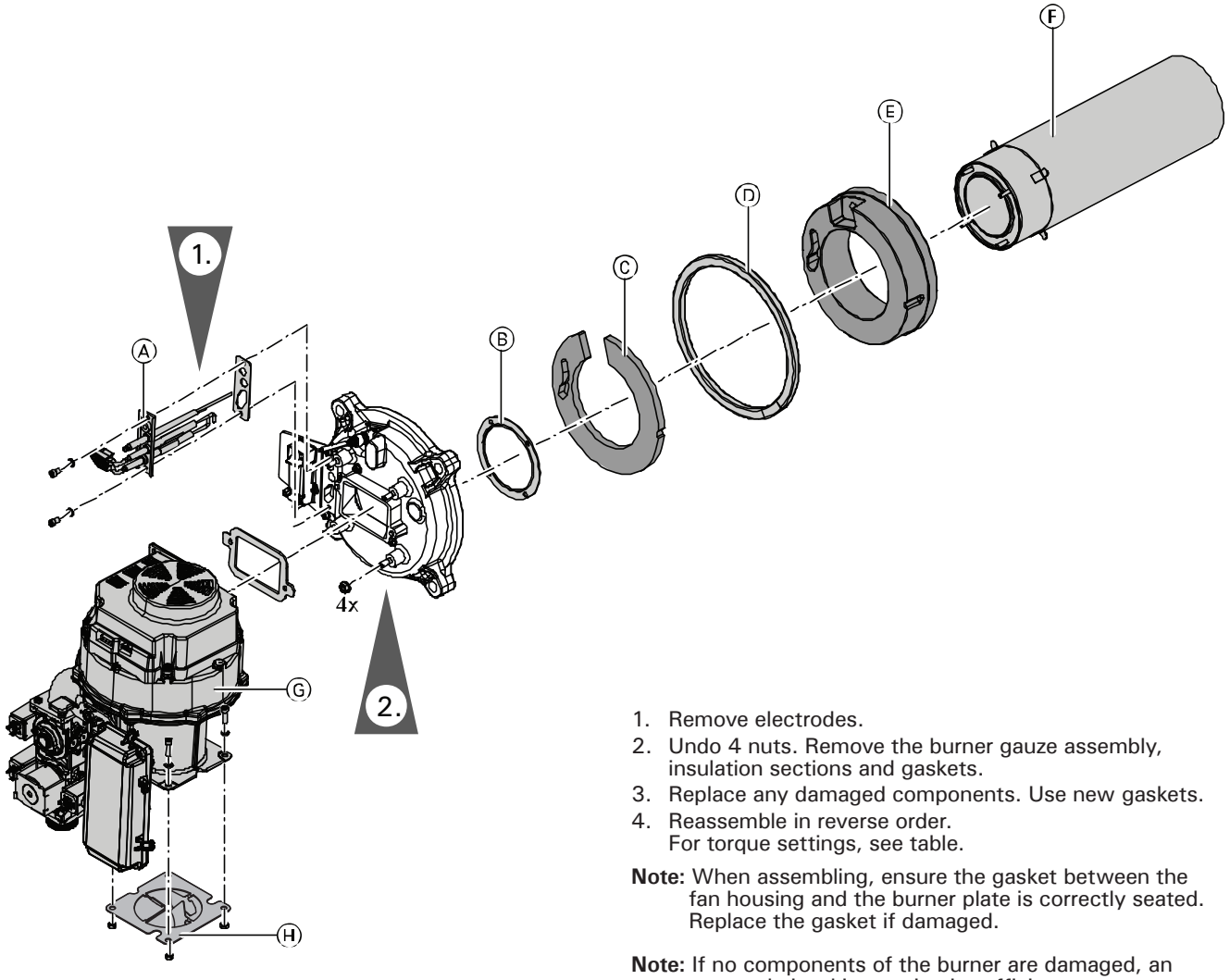
Burner	**399/500 MBH**
Fan	26 in.lb (3 Nm)
Gas solenoid valve	26 in.lb (3 Nm)
Burner gauze assembly	44 in.lb (5 Nm)

⚠ WARNING

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

Cleaning the Burner *(continued)*

750/1000 MBH burner



Legend

Ⓐ Electrode block
Ⓑ Burner gauze assembly gasket
Ⓒ Insulation mat
Ⓓ Burner door gasket
Ⓔ Thermal insulation block
Ⓕ Flame tube
Ⓖ Fan with gas solenoid valve and gas line
Ⓗ Burner Baffle Plate

1. Remove electrodes.
2. Undo 4 nuts. Remove the burner gauze assembly, insulation sections and gaskets.
3. Replace any damaged components. Use new gaskets.
4. Reassemble in reverse order.
   For torque settings, see table.

Note: When assembling, ensure the gasket between the fan housing and the burner plate is correctly seated. Replace the gasket if damaged.

Note: If no components of the burner are damaged, an external visual inspection is sufficient.
We recommend blowing compressed air through the burner gauze assembly. Detach the fan for this.
Clean the burner door with the burner gauze assembly facing upwards from the outside with compressed air.

Torque settings

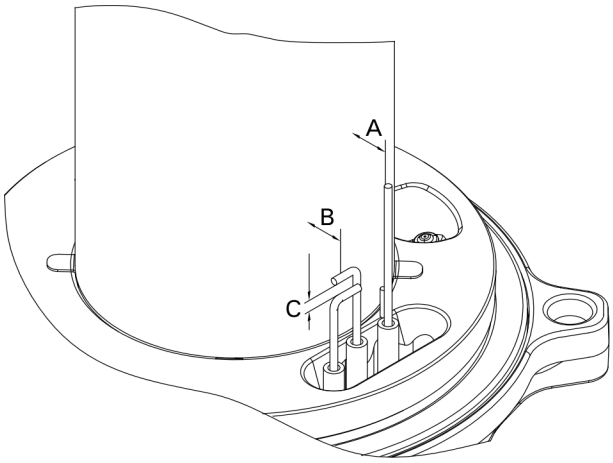
Burner	**750/1000 MBH**
Electrodes	35 in.lb (4 Nm)
Ignition transformer	13 in.lb (1.5 Nm)

Burner	**750/1000 MBH**
Fan	53 in.lb (6 Nm)
Gas solenoid valve	26 in.lb (3 Nm)
Burner gauze assembly	44 in.lb (5 Nm)

⚠ WARNING

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

Checking the Ignition Electrodes and Ionization Electrode



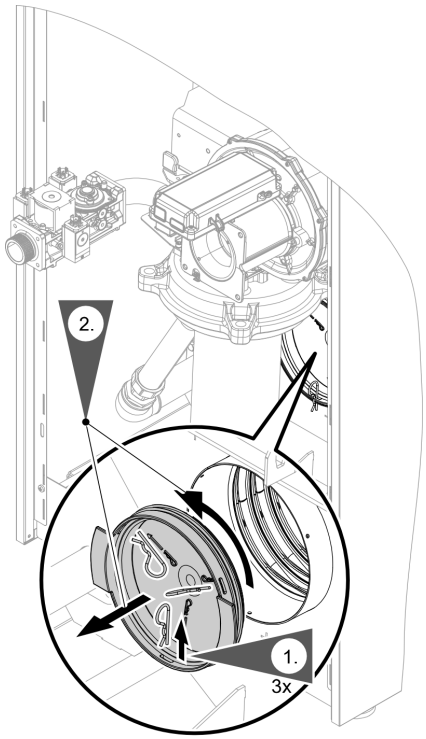
Check the ignition electrodes and ionization electrode for the correct gap and for possible damage. Replace the electrodes if necessary.

A	0.51 in. ±0.04 in.	13 mm ±1 mm
B	0.51 in. - 0.08 in.	13 mm -2 mm
C	0.18 in. ±0.02 in.	4.6 mm ±0.5 mm

Cleaning the Combustion Chamber and Heating Surfaces

WARNING

Loose residues and residual cleaning agents can lead to injury.
Wear the appropriate personal protective equipment.



Note: For CI2 1500 and 2000 boilers, clean both combustion chambers.

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.

1. Remove 3 cotter pins.
2. Open inspection cover and remove.
3. Clean the combustion chamber and heating surfaces.

For normal cleaning, flush the heating surfaces thoroughly with water. Use the angled nozzle of a pressure washer or combustion chamber cleaning set, consult cleaning agent manufacturer for a suitable product.
For stubborn residues, surface stains or soot deposits, cleaning agents can be used.

Note on cleaning agents

- Only use solvent-free cleaning agents. Ensure that no cleaning agent gets between the boiler body and the thermal insulation.
- Remove soot deposits with alkaline cleaning agents with surfactant additive.
- Remove coatings and surface discolouration (yellow-brown) with slightly acidic, chloride-free cleaning agents based on phosphoric acid.

4. Remove loosened deposits from the boiler. Flush the heating surfaces thoroughly with a pressuure washer. Cleaning agent manufacturer's instructions
5. Assemble in reverse order:
   Check gasket for damage and replace if necessary.
   Apply a suitable lubricating paste to the gasket before installing.
   Position the inspection cover. Insert the cotter pins.

WARNING

Leaks can result in poisoning through escaping flue gas.
Check correct seating of O ring and inspection cover.
Carry out a seal test, e.g. with a mirror or electrical sensor.

CAUTION

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

Checking all Connections on the Heating Water Side for Leaks

⚠ WARNING

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

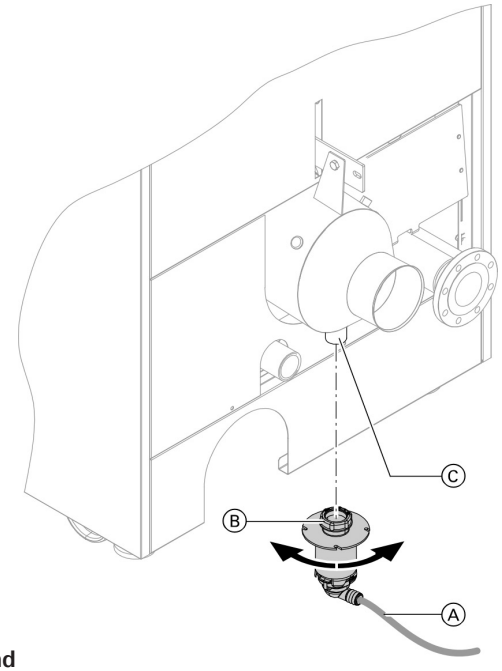
⚠ CAUTION

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 cutoff) are also leakage-free.

Cleaning the Condensate Drain Pipe and Condensate Trap



Legend
Ⓐ Condensate drain pipe to the neutralizing system
Ⓑ Condensate trap
Ⓒ Condensate trap connection at the boiler flue connection

Note: Clean the inside of the condensate drain pipe and condensate trap at least once a year.

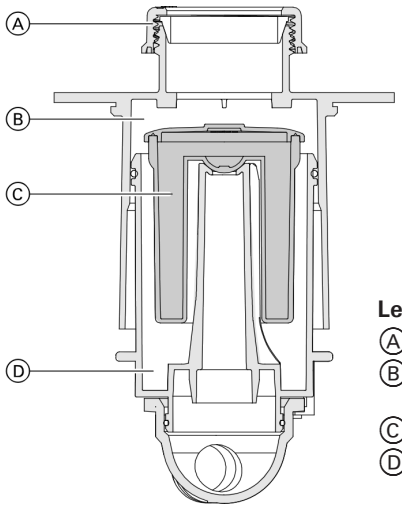
1. Disconnect the condensate drain pipe to the neutralizing system from the condensate trap.
2. Unscrew the lower part of the condensate trap. Remove the float. Remove deposits.
   Clean the components.
3. Re-assemble the condensate trap.
4. Refit the condensate drain pipe.
5. If necessary, clean the neutralizing system in accordance with the manufacturer's instructions.

Neutralizing system operating instructions

Note: The neutralizing medium can be obtained from Viessmann.
Note: Do not allow the hose connection to the on-site condensate drain or neutralizing system to sag. Stabilize the hose connection if necessary.

⚠ WARNING

Escaping flue gas can cause life threatening poisoning from carbon monoxide.
To prevent flue gas escaping, only ever operate the boiler with the condensate trap.
Check that the condensate can drain freely.



Legend
Ⓐ Union nut
Ⓑ Upper part of condensate trap
Ⓒ Float
Ⓓ Lower part of condensate trap

Checking/Cleaning the Neutralizing System (accessories)

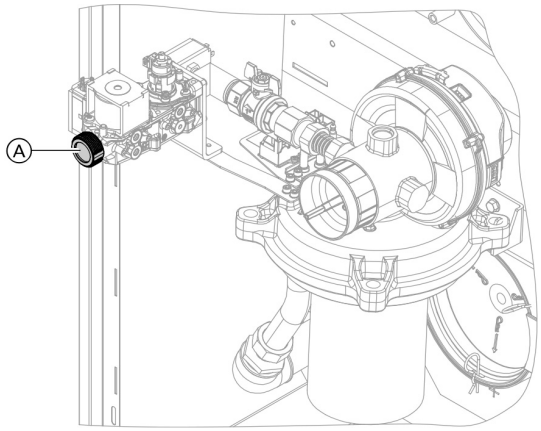
Neutralizing system service instructions

With the burner removed, pour water into the combustion chamber.

Note: The water must flow freely from the condensate drain pipe without backing up.
If necessary, clean the condensate drain pipe again.

Cleaning Internal Gas Filters

399/500 MBH burner in maintenance position



Legend
Ⓐ Gas connector with tapered mesh filter

Visually check the gas inlet filter. Carefully blow air through the filter.

Burner Installation

Installing the burner after inspection and maintenance work

Refit the burner in reverse order to the removal sequence; see page 27 and page 28.

WARNING

Escaping gas or flue gas can cause life threatening poisoning.
Check the burner door gasket for correct seating.

Torque settings
- Union nuts for gas connection:
  G 1 ¼ : 22 lb.ft (30 Nm)
  G 1 ½ : 37 lb.ft (50 Nm)
- Screws to secure the burner to the boiler: 11 lb.ft (15 Nm)

Checking for Leaks on the Flue Side

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 glue gas collector or on the thermal insulation parts also indicate leakages.

Testing the Valves of the Gas Solenoid Valve for Leaks; Replacing if Necessary

Automatic seal test of the coaxial safety valves on the gas solenoid valve with 750/1000 MBH burners. The burner control unit automatically checks both the valves for leaks when the burner is started. If there are no leaks from the valves, the burner starts up and begins normal operation.

Checking the Filter Element in the Gas Line (if installed); Replacing if Necessary

Checking the Connections on the Gas Side for Leaks

⚠ WARNING

Escaping gas leads to a risk of explosion.
Always carry out the following steps.

IMPORTANT

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

1. Insert new gaskets in all gas fittings that have been separated on site.
2. Open the gas shut-off valve.
3. Check the sealing points of the gas solenoid valve for leaks.
4. Start the burner (see page 25).
5. Check the sealing points:
   - Outlet sealing points of the gas solenoid valve
   - Sealing point between the fan and the burner plate
   - Sealing point between the fan and the Venturi pipe

Performing Final Checks

1. After the burner has been removed, always conclude with a CO2 test in accordance with the points on page 26.
2. Record the measured values in the report on page 83.

Checking the Water Quality

Enter the amount of top-up water, the total hardness and the pH value in the table in the appendix on page 82.
For water quality requirements, see page 80.
The pH value should be between 8.2 and 9.5.

Checking the Safety Valve Function

Test the pressure relief valve for proper operation.

Checking the Expansion Vessel and System Pressure

Note: Observe the expansion vessel manufacturer's instructions.

Carry out this test on a cold system.

1. Drain the system until the manometer indicates "0" or close the cap valve on the expansion vessel and reduce the pressure in the expansion vessel.
2. If the pre-charge pressure of the expansion vessel is lower than the static system pressure, top up with nitrogen until the pre-charge pressure is 1 to 2 psi (0.1 to 0.2 bar) higher.
3. Top up with water until the charge pressure of the cooled system is 1 to 2 psi (0.1 to 0.2 bar higher than the pre-charge pressure of the expansion vessel. Permissible operating pressure: 80 psi (5.5 bar)

Checking the Mixing Valve for Ease of Operation and Leaks

1. Remove the motorized lever from the mixing valve handle.
2. Check the mixing valve for ease of operation.
3. Check the mixing valve for leaks. Replace the O-ring seals if the mixer is leaking.
4. Click the motorized lever into place.

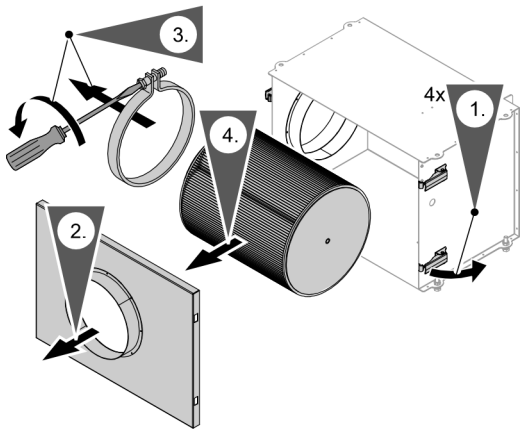
Checking the Thermal Insulation for Firm Seating

Checking the Combustion Air Opening of the Installation Room (visual inspection)

For room air operation, check the filter and combustion air openings.

In the case of room air independent direct vent operation, also check the combustion air intake for blockages.

Replacing the Air Filter (accessories) if used



Filter change in the filter box for room air independent operation

Visual inspection of the air filters. If necessary, clean with compressed air or wash from the outside with soapy water and rinse with clean water. Allow sufficient time to dry.

The maintenance interval depends on the dust level on site. A maintenance message is issued, if the air filter status accessory is installed.

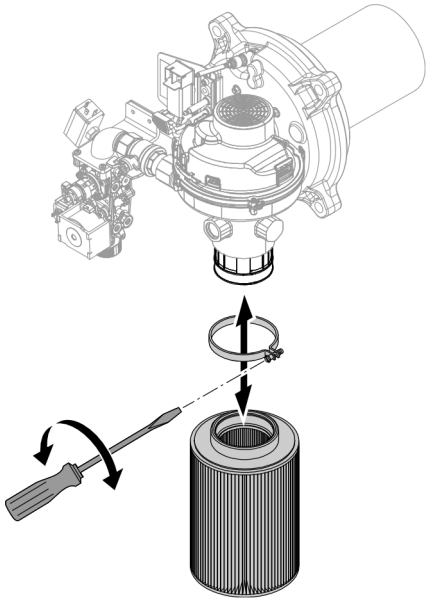
Note: Before cleaning with compressed air, disconnect the hose to the air filter status switch.

To remove filter

1. Release latches on the end of the combustion air filter box.
2. Remove filter box cover.
3. Release the filter clamp on the base of the filter.
4. Remove filter.

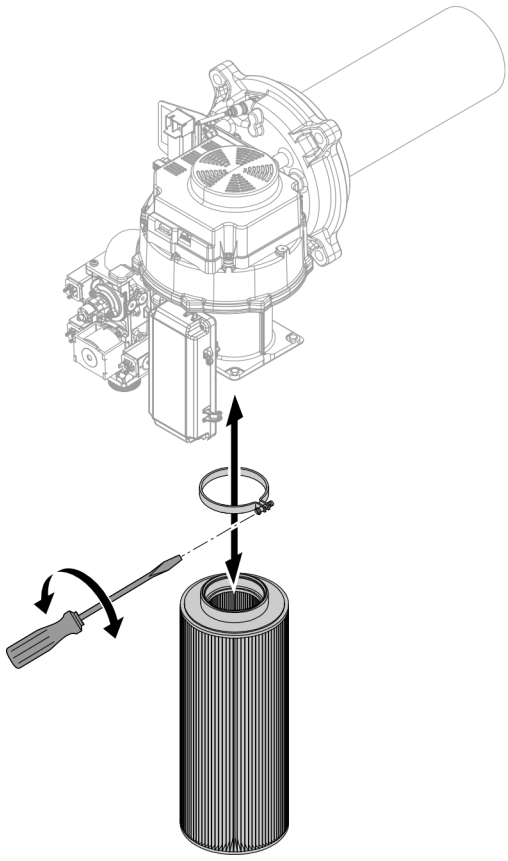
   Re-install filter in reverse order.

Replacing the Air Filter (accessories) if used *(continued)*



399/500 MBH burner

Filter change for burner
Filters room air dependent operation



750/1000 MBH burner

Instructing the System User

The system manufacturer must provide the operator of the system with the operating instructions and instruct the operator in the system operation.
This also includes all components added as accessories, e.g. remote controls. The system installer should also provide information on the required maintenance.

Operating and Service Documents

1. Complete the customer information, file and separate:
   - Hand over the section for operators for safekeeping.
   - Retain the heating contractor's section.
2. File all parts lists, operating and service instructions in folders and hand over to the operator.
   The installation instructions are not required after the installation is complete and may therefore be disposed of.

Calling Up Parameters (for multi boiler systems via software tool)

- Parameters are split into the following groups:
  – "General"
  – "Boiler"
  – "DHW"
  – "Heating circuit ..."
  – "Heating zones"
- Heating systems with one heating circuit without mixing valve and one or 2 heating circuits with mixing valve:
  In the following, the heating circuit without mixing valve is referred to as "Heating circuit 1" and the heating circuits with mixing valve as "Heating circuit 2" ... (if installed).
  If the heating circuits have been given individual names, the chosen name appears.

Note: The display and setting of some parameters is dependent on:
- Boiler
- Connected accessories and the functions associated with them

Tap the following buttons:
1. "☰"
2. "Service"
3. Enter password "viservice".
4. Confirm with ✔.
5. "System configuration"
6. Select group.
7. ∧/∨, to select parameters.
8. ✎
9. ∧/∨ for the required value in line with the following tables.
10. ✔ to accept the set value.

General

Note: Parameter values in bold are factory settings.

508.0 "UTC time zone"

Setting		Explanations
	2 –24 to +24	Setting of the UTC time zone in which the boiler is located. Note: Only active if 1508.0 is set to 1. The factory setting is UTC +1 h Time difference adjustable from –12 h to +12 h in increments of 0.5 h

528.0 "Set flow temperature for external demand"

Setting		Explanations
	70 20 to 90	Target supply temperature for external demand Target supply temperature in the factory setting 70°C (158°F) Target supply temperature adjustable from 20 to 90°C (68 to 194°F) in 1°C (1.8°F) increments

896.0 "Display correction for outside temperature"

Setting		Explanations
	0 -10 to +10	Correction of measured outside temperature Correction in the factory setting 0 K (0°f) Correction adjustable from -10 to +10 K (-18 to 18°f) in 1 K (1.8°f) increments

912.0 "Automatic summer/wintertime changeover"

Setting		Explanations
No	0	Automatic changeover switched off
Yes	**1**	Automatic changeover switched on

912.1 "Earliest day of changeover from winter to summertime"

Setting		Explanations
	25 1 to 31	Changeover from 02:00 h to 03:00 h occurs on the Sunday after or on this set date. Day of changeover adjustable from 1st to 31st of the month

General *(continued)*

Note: Parameter values in bold are factory settings.

912.2 "Month of changeover from winter to summertime"

Setting		Explanations
	3 1 to 12	Month of changeover: March Month of changeover adjustable from January to December

912.3 "Earliest day of changeover from summer to wintertime"

Setting		Explanations
	25 1 to 31	Changeover from 03:00 h to 02:00 h occurs on the Sunday after or on this set date. Day of changeover adjustable from 1st to 31st of the month

912.4 "Month of changeover from summer to wintertime"

Setting		Explanations
	10 1 to 12	Month of changeover: October Month of changeover adjustable from January to December

1098.4 "Gas volume correction factor"

Setting		Explanations
	1.0000 0.7000 to 1.0000	Value is provided on the gas supplier's bill. Used for gas consumption data. Gas volume correction factor adjustable from 0.7000 to 1.0000 in increments of 0.0001.

1098.5 "Calorific value"

Setting		Explanations
	10.0000 5.0000 to 40.0000	Value is provided on the gas supplier's bill. Used for gas consumption data. Calorific value adjustable from 5.0000 to 40.0000 kWh/m3 in increments of 0.0001

1139.0 "Outside temperature limit for cancelling reduced set room temperature"

Setting		Explanations
	-**5** -61 to +10	Temperature limit for cancelling reduced target room temperature Temperature limit in the factory setting -5°C (23°F) Temperature limit adjustable from -61 to +10°C(-78 to 50°F) in 1°C (1.8°F) increments

1139.1 "Outside temperature limit for raising the reduced set room temperature to the standard set room temperature"

Setting		Explanations
	-**14** -60 to +10	Temperature limit for raising the reduced target room temperature (see function description) Temperature limit in the factory setting -14°C (7°F) Temperature limit adjustable from -60 to +10°C (-76 to 50°F) in 1°C (1.8°F) increments

1504.0 "Source for date and time"

Setting		Explanations
Local	**0** 1	Selection of source for date and time The setting depends on the boiler and accessories. Factory setting: The date and time are adopted from the control unit. Internet protocol (see parameter "508.0")

General *(continued)*

Note: Parameter values in bold are factory settings.

2241.0 "Source outside temperature sensor "

Setting		Explanations
	0 1 2 3	Not available Hardwired Home automation Internet service provider: Outside temperature values via internet

Energy saving functions (setting only via software tool)

2426.1 Weather-compensated heating circuit pump logic function (only for weather-compensated control units).

Setting		Explanations
		If the outside temperature is above the threshold value (selected target room temperature plus hysteresis in K), the heating circuit pump is switched off. If the outside temperature is below the threshold value (selected target room temperature plus hysteresis in K), the heating circuit pump is switched on.

2427.1 Weather-compensated heating circuit pump logic for heating circuit 2 (only for weather-compensated control units).

Setting		Explanations
Only activate this function for the heating circuit with mixing valve or if there is only one direct heating circuit in the system.		If the outside temperature is above the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched off. If the outside temperature is below the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched on.

2428.1 Weather-compensated heating circuit pump logic for heating circuit 3 (only for weather-compensated control units).

Setting		Explanations
		If the outside temperature is above the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched off. If the outside temperature is below the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched on.

2429.1 Weather-compensated heating circuit pump logic for heating circuit 4 (only for weather-compensated control units).

Setting		Explanations
		If the outside temperature is above the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched off. If the outside temperature is below the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched on.

2426.3 Room temperature-dependent heating circuit pump logic for heating circuit 1 (only for weather compensated control units).

Setting		Explanations
		If the actual room temperature is above the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched off. If the actual room temperature is below the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched on.

General *(continued)*

Note: Parameter values in bold are factory settings.

2427.3 Room temperature-dependent heating circuit pump logic for heating circuit 2 (only for weather compensated control units).

Setting		Explanations
		If the actual room temperature is above the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched off. If the actual room temperature is below the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched on.

2428.3 Room temperature-dependent heating circuit pump logic for heating circuit 3 (only for weather compensated control units).

Setting		Explanations
		If the actual room temperature is above the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched off. If the actual room temperature is below the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched on.

2429.3 Room temperature-dependent heating circuit pump logic for heating circuit 4 (only for weather compensated **control units).**

Setting		Explanations
		If the actual room temperature is above the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched off. If the actual room temperature is below the threshold value (selected target room temperature plus offset in K), the heating circuit pump is switched on.

Boiler

521.0 "Interval in burner hours run until next maintenance"

Setting		Explanations
	0 0 to 25500	Number of burner hours to run until next service Burner hours until next service adjustable from 0 to 25500

522.3 "Interval until next maintenance"

Setting		Explanations
	0 1 2 3 4 5	Interval until next maintenance No interval selected 3 months 6 months 12 months 18 months 24 months

596.0 "Maximum heating output"

Setting		Explanations
	100 0 to 100	A limit can be set on the maximum heating output for heating operation. Heating output in the factory setting 100% Adjustable from 0 to 100% (0% being minimum firing rate)

Boiler *(continued)*

Note: Parameter values in bold are factory settings.

597.0 "Limit, max. heating output for DHW heating"

Setting		Explanations
	100 0 to 100	A limit can be set on the maximum heating output for DHW heating. Heating output in the factory setting 100% Adjustable from 0 to 100% (0% being minimum firing rate)

1100.1 "Maximum speed, primary circuit pump"

Setting		Explanations
	100 0 ... 100	Maximum speed of the primary circuit pump Setting range Shown in %

1100.2 "Set speed of the primary circuit pump"

Setting		Explanations
	...	Target speed of primary circuit pump ■ In heating operation ■ With external demand ■ With demand in conjunction with a low loss header Factory settings defined by settings specific to the boiler Shown in % The setting range depends on the boiler.

1240.0 "Operating mode of primary circuit pump" (not for weather-compensated operation)

Setting		Explanations
	1 2 7	"Automatic" Switched on regardless of current temperature level Modulating in line with the modulation level of the boiler. Boiler-specific min. and max. pump speeds are observed. Shutdown in reduced mode (in conjunction with constant operation or when no demand via room thermostat)

1411.0 "Clear maintenance messages"

Setting		Explanations
		Clear maintenance messages once maintenance has been performed.
No	0	Maintenance messages are active (if present).
Yes	1	Clear maintenance messages once.

1503.0 "Minimum heating output"

Setting		Explanations
	... 5 to 100	A limit can be set on the minimum heating output for heating operation. Factory settings defined by settings specific to the boiler Adjustable from 5 to 100%

1606.0 "Minimum burner pause time"

Setting		Explanations
	0 **1**	The minimum burner pause time can be set subject to boiler load. Fixed setting for minimum burner pause time Factory setting, integral method (see parameter 1606.4)

1606.4 "Integral threshold for burner switch-off"

Setting		Explanations
	50 5 to 255	Only effective if parameter 1606.0 has been set to 1. Factory setting 50 K (90°F) x min Adjustable from 5 to 255 K (9 to 459°F) x min The integral control mode allows for the adjustment of the supply water temperature dead band (supply temperature overshoot and undershoot) to extend burner cycle times and help minimize burner short cycling in low heat demand applications. The greater the setting the wider the dead band, the smaller the setting the tighter the dead band.

Boiler *(continued)*

Note: Parameter values in bold are factory settings.

1706.0 "Function selection MZIO"

Setting		Explanations
	0	Cannot be selected
	1	Individual (plug 66 and 0-10V input have no function)
	2	Cannot be selected
	3	Ext. temperature demand via 0-10V input
	4	Ext. modulation demand via 0-10V input
	5	Fault message output
	6	Fault message output and ext. temperature demand
	7	Fault message output and ext. modulation demand
	8	Additional call for heat via plug 66 (see parameter 2445 in the software tool)
	9	Additional call for heat via plug 66 and ext. temperature demand via 0-10V input
	10	Additional call for heat via plug 66 and ext. modulation demand via 0-10V input

2344.0 "Feedback combustion air supply"

Setting		Explanations
		Setting for feedback from the ventilation air supply in minutes (if feedback does not occur within this time, fault message F.691 appears).
	2 1 to 10	Delivered condition Range adjustable from 1 to 10 minutes

DHW

Note: Parameter values in bold are factory settings.

396.0 "DHW set temperature"

Setting		Explanations
	50	Factory setting adjustable between 10-65°C (50-149°F)

497.0 "Operating mode of DHW recirculation pump"

Setting		Explanations
		DHW recirculation pump:
	0	Time program
	4	Selected cycle (see parameter 497.3)

497.1 "DHW recirculation pump for auxiliary function DHW heating"

Setting		Explanations
Off	**0**	DHW recirculation pump: In accordance with the selected time program
On	1	Switched on during hygiene function and after time program

⚠ WARNING

Risk of injury due to increased DHW temperature.
Inform the system user of the risk from the raised outlet temperature at the draw-off points.

497.2 "DHW recirculation pump for DHW heating"

Setting		Explanations
		DHW recirculation pump:
Off	**0**	In accordance with the selected time program
On	1	Switched on during DHW heating

DHW *(continued)*

Note: Parameter values in bold are factory settings.

497.3 "Number of cycles DHW circulation pump"

Setting		Explanations
	0 1 2 3 4 **5**	Number of DHW recirculation pump cycles per hour for 5 minutes each during the selected time phase: 1 cycle 2 cycles 3 cycles 4 cycles 5 cycles 6 cycles

503.0 "Scald protection"

Setting		Explanations
Off	**0**	The adjustable water temperature is limited to a maximum value. Scald protection switched off
On	1	**⚠ WARNING** **Risk of injury due to increased DHW temperature.** **Inform the system user of the risk from the raised outlet temperature at the draw-off points.** Scald protection switched on (maximum DHW temperature 60°C (140°F) **Note:** Even with the scald protection switched on, higher outlet temperatures may occur at the draw-off points in the following cases: ■ With active hygiene function ■ While the boiler is being calibrated

534.0 "Circulation pump run-on"

Setting		Explanations
120 s	**120** 0 to 900	DHW pump run-on after storage tank heating Factory setting 120 sec run-on Run-on time adjustable from 0 to 900 sec in 60 sec increments (the run-on time is rounded down to full minutes) **Note:** To avoid damaging the boiler, do not set the runon time to < 120 sec.

1085.0 "Cylinder heating: Set start point"

Setting		Explanations
	25 10 to 100	Start point for DHW heating below target DHW temperature Factory-set start point 2.5 K (5°F) below target DHW temperature Adjustable start points: 10: 1.0 K (1.8°F)... 100: 10.0 K (18°F) Irrespective of this, the stop point is 2.5 K (5°F) above the target DHW temperature.

1087.0 "Max. duration, DHW heating"

Setting		Explanations
	240 0 1 to 240	After a set period of time has elapsed, DHW heating ends even though the target DHW temperature has not yet been reached. Factory setting 240 min No time limit for DHW heating Duration of DHW heating adjustable from 1 to 240 min in 1 min increments

DHW *(continued)*

Note: Parameter values in bold are factory settings.

1087.1 "Min. delay until next time DHW is heated"

Setting		Explanations
	60 60 to 240	Minimum delay before DHW heating starts again, even though there is a demand. **Note:** Function becomes effective when the set "Max. duration, DHW heating" (1087.0) is exceeded. Factory setting, delay of 60 min Delay adjustable from 60 to 240 min in 1 min increments

Heating circuit 1, Heating circuit 2, Heating circuit 3, Heating circuit 4

Note: Parameter values in bold are factory settings.

424.3 "Set flow temperature increase when switching from operation with reduced room temperature to operation with standard/comfort room temperature, heating circuit 1"

Setting		Explanations
O K	**0** 0 to 20	Increase in target supply temperature when changing from operation at reduced room temperature to operation at standard room temperature or comfort room temperature. See also chapter "Function description" Factory setting increase 0 K (0°F) Temperature rise adjustable from 0 to 20 K (0 to 36°F)

424.4 "Duration for set flow temperature increase, heating circuit 1"

Setting		Explanations
60 min	**60** 0 to 120	Duration for target supply temperature increase See also chapter "Function description" Factory setting 60 min Temperature rise adjustable from 0 to 120 min

426.3 "Set flow temperature increase when switching from operation with reduced room temperature to operation with standard/comfort room temperature, heating circuit 2"

Setting		Explanations
OK	**0** 0 to 20	Increase in target supply temperature when changing from operation at reduced room temperature to operation at standard room temperature or comfort room temperature. See also chapter "Function description" Factory setting increase 0 K (0°F) Temperature rise adjustable from 0 to 20 K (0 to 36°F)

426.4 "Duration for set flow temperature increase, heating circuit 2"

Setting		Explanations
60 min	**60** 0 to 120	Duration for target supply temperature increase See also chapter "Function description" Factory setting 60 min Temperature rise adjustable from 0 to 120 min

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Heating circuit 1, Heating circuit 2, Heating circuit 3, Heating circuit 4 *(continued)*

Note: Parameter values in bold are factory settings.

428.3 "Set flow temperature increase when switching from operation with reduced room temperature to operation with standard/comfort room temperature, heating circuit 3"

Setting		Explanations
O K	**0** 0 to 20	Increase in target supply temperature when changing from operation at reduced room temperature to operation at standard room temperature or comfort room temperature. See also chapter "Function description" Factory setting increase 0 K (0°F) Temperature rise adjustable from 0 to 20 K (0 to 36°F)

428.4 "Duration for set flow temperature increase, heating circuit 3"

Setting		Explanations
60 min	**60** 0 to 120	Duration for target supply temperature increase See also chapter "Function description" Factory setting 60 min Temperature rise adjustable from 0 to 120 min

430.3 "Set flow temperature increase when switching from operation with reduced room temperature to operation with standard/comfort room temperature, heating circuit 4"

Setting		Explanations
0 K	**0** 0 to 20	Increase in target supply temperature when changing from operation at reduced room temperature to operation at standard room temperature or comfort room temperature. See also chapter "Function description" Factory setting increase 0 K (0°F) Temperature rise adjustable from 0 to 20 K (0 to 36°F)

430.4 "Duration for set flow temperature increase, heating circuit 4"

Setting		Explanations
60 min	**60** 0 to 120	Duration for target supply temperature increase See also chapter "Function description" Factory setting 60 min Temperature rise adjustable from 0 to 120 min

933.3 "DHW heating priority, heating circuit 1"

Setting		Explanations
Off	0	Priority of DHW heating over the heating circuit No priority for DHW heating (only if the DHW tank is installed downstream of the low loss header)
DHW	**1**	With DHW heating priority

933.6 "Operating mode of heating circuit 1"

Setting		Explanations
Weather-compensated without room temperature hook-up	**4**	Only adjust for systems with one heating circuit. Heating operation: Weather-compensated without room temperature influence
Weather-compensated with room temperature hook-up	7	Weather-compensated with room temperature influence (see also parameter 933.7)

Heating circuit 1, Heating circuit 2, Heating circuit 3, Heating circuit 4 *(continued)*

Note: Parameter values in bold are factory settings.

933.7 "Room influence factor, heating circuit 1"

Setting		Explanations
		The higher the value, the greater the influence of the room temperature on the set supply temperature of the heating circuit (heating curve). Operation with room temperature hook-up must be set for the heating circuit (parameter 933.6). Only change the value for systems with one heating circuit. For a sample calculation, see chapter "Heating curve" in the "Function description"
	8	Room influence factor
	0 to 64	Room influence adjustable from 0 to 64

934.3 "DHW heating priority, heating circuit 2"

Setting		Explanations
		Priority of DHW heating over heating circuit pump and mixing valve
Off	0	No priority for DHW heating (only if the DHW tank is installed downstream of the low loss header)
DHW	**1**	With DHW heating priority

934.5 "Differential temperature, heating circuit 2"

Setting		Explanations
		The supply temperature of the boiler is higher than the supply temperature of the heating circuit with mixing valve by an adjustable differential temperature. See also chapter Function description.
8 K	**8**	Differential temperature in factory setting 8 K (14°F)
	0 to 20	Differential temperature adjustable from 0 to 20 K (0 to 36°F)

934.6 "Operating mode of heating circuit 2"

Setting		Explanations
		Heating operation:
Weather-compensated without room temperature hook-up	**4**	Weather-compensated without room temperature influence
Weather-compensated with room temperature hook-up	7	Weather-compensated with room temperature influence See also parameter 934.7

934.7 "Room influence factor, heating circuit 2"

Setting		Explanations
		The higher the value, the greater the influence of the room temperature on the set supply temperature of the heating circuit (heating curve). Operation with room temperature hook-up must be set for the heating circuit (parameter 934.6). Change value for heating circuit with mixing valve only. For a sample calculation, see chapter "Heating curve" in the "Function description"
	8	Room influence factor
	0 to 64	Room influence adjustable from 0 to 64

Heading circuit 1, Heating circuit 2, Heating circuit 3, Heating circuit 4 *(continued)*

Note: Parameter values in bold are factory settings.

935.3 "DHW heating priority, heating circuit 3"

Setting		Explanations
		Priority of DHW heating over heating circuit pump and mixing valve
Off	0	No priority for DHW heating (only if the DHW tank is installed downstream of the low loss header)
DHW	**1**	With DHW heating priority

935.5 "Differential temperature, heating circuit 3"

Setting		Explanations
		The supply temperature of the boiler is higher than the supply temperature of the heating circuit with mixing valve by an adjustable differential temperature. See also chapter Function description.
8 K	**8**	Differential temperature in factory setting 8 K (14°F)
	0 to 20	Differential temperature adjustable from 0 to 20 K (0 to 36°F)

935.6 "Operating mode of heating circuit 3"

Setting		Explanations
		Heating operation:
Weather-compensated without room temperature hook-up	**4**	Weather-compensated without room temperature influence
Weather-compensated with room temperature hook-up	7	Weather-compensated with room temperature influence See also parameter 935.7

935.7 "Room influence factor, heating circuit 3"

Setting		Explanations
		The higher the value, the greater the influence of the room temperature on the set supply temperature of the heating circuit (heating curve). Operation with room temperature hook-up must be set for the heating circuit (parameter 935.6). Change value for heating circuit with mixing valve only. For a sample calculation, see chapter "Heating curve" in the "Function description"
	8	Room influence factor
	0 to 64	Room influence adjustable from 0 to 64

936.3 "DHW heating priority, heating circuit 4"

Setting		Explanations
		Priority of DHW heating over heating circuit pump and mixing valve
Off	0	No priority for DHW heating (only if the DHW tank is installed downstream of the low loss header)
DHW	**1**	With DHW heating priority

936.5 "Differential temperature, heating circuit 4"

Setting		Explanations
		The supply temperature of the boiler is higher than the supply temperature of the heating circuit with mixing valve by an adjustable differential temperature. See also chapter Function description.
8 K	**8**	Differential temperature in factory setting 8 K (14°F)
	0 to 20	Differential temperature adjustable from 0 to 20 K (0 to 36°F)

Heating circuit 1, Heating circuit 2, Heating circuit 3, Heating circuit 4 *(continued)*

Note: Parameter values in bold are factory settings.

936.6 "Operating mode of heating circuit 4"

Setting		Explanations
		Heating operation:
Weather-compensated without room temperature hook-up	**4**	Weather-compensated without room temperature influence
Weather-compensated with room temperature hook-up	7	Weather-compensated with room temperature influence See also parameter 936.7

936.7 "Room influence factor, heating circuit 4"

Setting		Explanations
		The higher the value, the greater the influence of the room temperature on the set supply temperature of the heating circuit (heating curve). Operation with room temperature hook-up must be set for the heating circuit (parameter 936.6). Change value for heating circuit with mixing valve only. For a sample calculation, see chapter "Heating curve" in the "Function description"
	8	Room influence factor
	0 to 64	Room influence adjustable from 0 to 64

937.6 "Heating zone1"

Setting		Explanations
	4	Weather-compensated without room temperature influence
	7	Weather-compensated with room temperature influence

938.6 "Heating zone 2"

Setting		Explanations
	4	Weather-compensated without room temperature influence
	7	Weather-compensated with room temperature influence

939.6 "Heating zone 3"

Setting		Explanations
	4	Weather-compensated without room temperature influence
	7	Weather-compensated with room temperature influence

940.6 "Heating zone 4"

Setting		Explanations
	4	Weather-compensated without room temperature influence
	7	Weather-compensated with room temperature influence

1102.0 "Min. speed of the variable speed primary circuit/heating circuit pump in standard mode, heating circuit 1"

Setting		Explanations
		Minimum speed of the internal circulation pump in heating operation with standard room temperature
	...	Factory settings defined by settings specific to the boiler The setting range depends on the boiler.

Heating circuit 1, Heating circuit 2, Heating circuit 3, Heating circuit 4 *(continued)*

Note: Parameter values in bold are factory settings.

1102.1 "Max. speed of the variable speed primary circuit/heating circuit pump in standard mode, heating circuit 1"

Setting		Explanations
	…	Maximum speed in heating operation with standard room temperature Factory settings defined by settings specific to the boiler The setting range depends on the boiler.

1192.0 "Minimum flow temperature limit, heating circuit 1"

Setting		Explanations
20°C	**20** 1 to 90	Minimum supply temperature limit for the heating circuit Minimum limit in the factory setting 20°C (68°F) Setting range limited by boiler-specific parameters

1192.1 "Maximum flow temperature limit, heating circuit 1"

Setting		Explanations
74°C	74 10 to 100	Maximum supply temperature limit for the heating circuit Maximum limit in the factory setting 74°C (165°F) Setting range limited by boiler-specific parameters

1193.0 "Minimum flow temperature limit, heating circuit 2"

Setting		Explanations
20°C	**20** 1 to 90	Minimum supply temperature limit for the heating circuit Minimum limit in the factory setting 20°C (68°F) Setting range limited by boiler-specific parameters

1193.1 "Maximum flow temperature limit, heating circuit 2"

Setting		Explanations
74°C	**74** 10 to 100	Maximum supply temperature limit for the heating circuit Maximum limit in the factory setting 74°C (165°F) Setting range limited by boiler-specific parameters

1194.0 "Minimum flow temperature limit, heating circuit 3"

Setting		Explanations
20°C	**20** 1 to 90	Minimum supply temperature limit for the heating circuit Minimum limit in the factory setting 20°C (68°F) Setting range limited by boiler-specific parameters

1194.1 "Maximum flow temperature limit, heating circuit 3"

Setting		Explanations
74°C	**74** 10 to 100	Maximum supply temperature limit for the heating circuit Maximum limit in the factory setting 74°C (165°F) Setting range limited by boiler-specific parameters

1195.0 "Minimum flow temperature limit, heating circuit 4"

Setting		Explanations
20°C	**20** 1 to 90	Minimum supply temperature limit for the heating circuit Minimum limit in the factory setting 20°C (68°F) Setting range limited by boiler-specific parameters

Heating circuit 1, Heating circuit 2, Heating circuit 3, Heating circuit 4 *(continued)*

Note: Parameter values in bold are factory settings.

1195.1 "Maximum flow temperature limit, heating circuit 4"

Setting		Explanations
74°C	**74** 10 to 100	Maximum supply temperature limit for the heating circuit Maximum limit in the factory setting 74°C (165°F) Setting range limited by boiler-specific parameters

1395.1 "Heating limit: Economy function, outside temperature, heating circuit 1"

Setting		Explanations
25°C	**25** 10 to 35	Heating circuit pump logic function (summer economy control): Heating circuit pump switches off when outside temperature 1 K (1.8°F) above selected value. Heating circuit pump switches back on when outside temperature 1 K below selected value. Factory setting: Heating limit at outside temperature 25°C (77°F) Heating limit adjustable from 10 to 35°C (50 to 95°F) in 1°C (1.8°F) increments

1396.1 "Heating limit: Economy function, outside temperature, heating circuit 2"

Setting		Explanations
25°C	**25** 10 to 35	Heating circuit pump logic function (summer economy control): Heating circuit pump switches off when outside temperature 1 K above selected value. Heating circuit pump switches back on when outside temperature 1 K below selected value. Factory setting: Heating limit at outside temperature 25°C (77°F) Heating limit adjustable from 10 to 35°C (50 to 95°F) in 1°C (1.8°F) increments

1397.1 "Heating limit: Economy function, outside temperature, heating circuit 3"

Setting		Explanations
25°C	**25** 10 to 35	Heating circuit pump logic function (summer economy control): Heating circuit pump switches off when outside temperature 1 K above selected value. Heating circuit pump switches back on when outside temperature 1 K below selected value. Factory setting: Heating limit at outside temperature 25°C (77°F) Heating limit adjustable from 10 to 35°C (50 to 95°F) in 1°C (1.8°F) increments

1398.1 "Heating limit: Economy function, outside temperature, heating circuit 4"

Setting		Explanations
25°C	**25** 10 to 35	Heating circuit pump logic function (summer economy control): Heating circuit pump switches off when outside temperature 1 K above selected value. Heating circuit pump switches back on when outside temperature 1 K below selected value. Factory setting: Heating limit at outside temperature 25°C (77°F) Heating limit adjustable from 10 to 35°C (50 to 95°F) in 1°C (1.8°F) increments

Service Menu

Overview of service menu (for single boiler systems)

Service	
Diagnosis	
	General
	Burner
	Heating circuit 1
	Heating circuit 2
	Heating circuit 3
	Heating circuit 4
	DHW
	Communication module
	Heating zone 1
	Heating zone 2
	Heating zone 3
	Heating zone 4
Actuator test	
System configuration	
Message history	
Service functions	
	Reset service
	Filling
	Air vent valve
	System information
	Connectivity information
Test mode	
	Emissions test mode
	High limit safety cut-out test
Change passwords	
Commissioning	
Appliances detected	
Exit demo mode	
Exit service	
Access point on/off	

Calling up the service menu

Tap the following buttons:

1. "☰"
2. "Service"
3. Enter password "viservice".
4. Confirm with ✔.
5. Select the required menu section.

Note: Not all menu areas will be available, depending on the system equipment level.
Additional functions for multi boiler systems.

Overview of service menu, lead boiler (for multi boiler systems via software tool)

Service	
Message history	
	Reset service
	Filling
	Air vent valve
	System information
	Connectivity information
Change passwords	
Commissioning	
Test mode	
	Emissions test mode
	High limit safety cut-out test
Exit service	
Access point on/off	

Note: No service menu in the lag boiler

Note: Tap 🏠 to return to the "Service main menu"

Leaving the service menu

Tap the following buttons:

"Exit service" or ↩.

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

Service Menu *(continued)*

Changing the service password

In the factory setting, “viservice” is preset as the password for accessing the “Service menu”.

Tap the following buttons:

1. “ ☰ “
2. “Service”
3. Enter password “viservice”.
4. Confirm with ✔.
5. “Change passwords”.
6. “Service menu”
7. Enter current password.
8. Confirm with ✔.
9. Enter new password.
10. Confirm twice with ✔.

Resetting all passwords to the factory settings

Tap the following buttons:

1. Request the master password from the Technical Service at the Viessmann Group.
2. “ ☰ “
3. “Service”
4. Enter password “viservice”.
5. Confirm with ✔.
6. “Change passwords”
7. “Reset all passwords”
8. Enter master password.
9. Confirm twice with ✔.

Checking operating data

Operating data can be checked in various areas.

See “Diagnosis” in the service menu overview.

Operating data on heating circuits with mixing valve can only be called up if such components are installed in the system.

Note: If a called up sensor is faulty, “- - -” appears on the display.

Calling up operating data

Tap the following buttons:

1. “ ☰ “
2. “Service”
3. Enter password “viservice”.
4. Confirm with ✔.
5. “Diagnosis”
6. Select required group, e.g. “General”.

Checking Outputs (actuator test)

Note: For multi boiler systems via software tool!

Note: When the actuator test is started, all actuators are initially disabled and valves moved to their central position.

Tap the following buttons:

1. "☰"
2. "Service"
3. Enter password "viservice".
4. Confirm with ✔.
5. "Actuator test"
6. ✔ to confirm the security prompt.

Note: If an actuator function is not possible due to the running process, the function is interrupted. A prompt appears.

7. Use ◀/▶ to select the required group. See the table.
8. Tap the required actuator function. Several functions can be activated simultaneously.
9. If necessary, tap ✔ to confirm. The functions are active for 30 sec.
10. Use ↩ to end the Actuator test.

Checking Outputs (actuator test) *(continued)*

The following actuator functions can be controlled subject to the system equipment level:

Display		Explanation
Gas condensing boiler group		
Burner modulation, set value ■ Off ■ Min. heating output ■ Max. heating output		Modulation level (in accordance with specific boiler settings)
With 2 burners ■ Off ■ Minimum heating output, burner 1 ■ Minimum heating output, burner 2 ■ Maximum heating output, burner 1 ■ Maximum heating output, burner 2		
Ventilation air supply		Open or closed
Hydraulic shut-off valve		Open or closed
0-10V output/input		
Heating group		
Primary circuit pump speed	Target value	Circulation pump speed in %
Primary circuit 1 pump speed	Target value	Speed, heating circuit pump, heating circuit 1 without mixing valve in %
Primary circuit 2 pump speed	Target value	Speed, heating circuit pump, heating circuit 2 with mixing valve in %
Primary circuit 3 pump speed	Target value	Speed, heating circuit pump, heating circuit 3 with mixing valve in %
Primary circuit 4 pump speed	Target value	Speed, heating circuit pump, heating circuit 4 with mixing valve in %
Mixer HC2	Open	Output for “Mixer open” active (mixing valve extension kit)
	Stop	Current position is maintained
	Close	Output for “Mixer close” active
Mixer HC3	Open	Output for “Mixer open” active (mixing valve extension kit)
	Stop	Current position is maintained
	Close	Output for “Mixer close” active
Mixer HC3	Open	Output for “Mixer open” active (mixing valve extension kit)
	Stop	Current position is maintained
	Close	Output for “Mixer close” active
Heating zone pump 1	On	
	Off	
Heating zone pump 2	On	
	Off	
Heating zone pump 3	On	
	Off	
DHW group		
Primary circuit pump, target speed	Target value	Circulation pump in %
Circulation pump for DHW tank heating	On	
	Off	
DHW recirculation pump	On	
	Off	

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Maintenance Display

In the following cases, ⚠ will be displayed (red indicator flashes):
- The specified limits have been reached.
- A test mode is active.

Checking maintenance messages
1. "☰"
2. For "Message lists"
3. For "Service"

Acknowledging service
1. ✓ to acknowledge the maintenance messages
2. ✓ to confirm

Note: An acknowledged maintenance message that was not reset reappears the following Monday.

Reset service (for multi boiler systems via software tool)
1. "☰"
2. "Service"
3. Enter password "viservice".
4. Confirm with ✓.
5. "System configuration"
6. "Boiler"
7. Select parameter 1411.0 "Clear maintenance messages" and "ON".
   Note: The selected maintenance parameters for hours run and time intervals restart at 0.

Emissions Test Mode

Tap the following buttons:
1. "☰"
2. "Service"
3. Enter password "viservice".
4. Confirm with ✓.
5. "Test mode"
6. "Emissions test mode"
7. Confirm with ✓.
   Note: Ensure adequate heat transfer.
8. Use ↩ to end Test mode.
   Note: On lag boiler, exit using the chimney sweep button on the "home screen".

For more information, refer to the Operating Instructions.

High Limit Safety Cut-Out Test

Tap the following buttons:
1. "☰"
2. "Service"
3. Enter password "viservice".
4. Confirm with ✓.
5. "Test mode"
6. "Test mode"
   Note: For lag boilers, test mode is accessible via the software tool.
7. Confirm with ✓.
   Note: Ensure adequate heat transfer.
8. Use ↩ to end the Test.

Fault Display on the Programming Unit

If there is a fault, the display shows the fault message plus ⚠.

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

1. Tap ⚠ in the footer to call up the fault messages.
   For an explanation of the fault codes, see the following table.
2. Tap ✔ to hide the fault messages.
   For an explanation of the fault codes, see the following table.

If "Connection error" ⚠ and appear on the display:
Check connecting cable and plug between HMU heat management unit and HMI programming unit.

Acknowledge fault display

Tap ✔.

Note: Any connected central fault message facility stops. If an acknowledged fault is not remedied, the fault message will be redisplayed the following day at 07:00, and the fault message facility restarts.

Calling up acknowledged fault messages

Tap the following buttons:
1. " ☰ "
2. Tap "Message lists".

The fault messages appear in chronological order.

Note: When troubleshooting, note the subscriber number of the component.
Check the component displayed and rectify the fault if necessary. The subscriber number of the component depends on the position of rotary switch S1 on the corresponding extension module.
The rotary switch position was set during installation. To identify the affected module, check the position of rotary switch S1 on the module if necessary.

The following is displayed:
- Date and time of the occurrence of the fault
- Fault code
- Description of the fault
- Subscriber number of the component on which the fault has occurred:

PlusBus subscriber components
1 - 15 EM-M1 and EM-P1 extensions (ADIO electronics module)
17 - 31 EM-EA1 extension (DIO electronics module)
48 - 63 Vitotrol 200-E
81 MZIO electronics module
CAN BUS subscriber components
1 HMU heat management unit
50 BCU burner control unit
51 BCU burner control unit 2 (CI2 1500 and 2000 only)
58 Communication module (TCU 200)
59 HMI programming unit
60 Fan unit
70 - 85 Cascade subscribers
90 Gateway
Low power radio subscriber components

Calling up Fault Messages from the Fault Memory (message history)

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

Tap the following buttons:

1. " ☰ "
2. "Service"
3. Enter password "viservice".
4.
5. "Message history"
6. "Faults" to call up saved fault messages.
7. If you wish to delete the list, tap 🗑.
8. Confirm with ✔.

Fault Messages

Note: Fault messages dependent on boiler equipment level, and connected accessories.

Displayed fault code	System characteristics	Cause	Measures
F.7	No DHW heating	Lead break, tank temperature sensor	■ Check DHW setting in the commissioning assistant and correct if necessary. ■ Check tank temperature sensor. ■ Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected Replace faulty component if necessary.
F.8	No DHW heating	Short circuit, tank temperature sensor	Check tank temperature sensor. Replace faulty component if necessary.
F.13	Regulates as if the outside temperature were 32°F (0°C).	Lead break, outside temperature sensor	■ Check the operating mode setting in the commissioning assistant and correct if necessary. ■ Check outside temperature sensor and connection to sensor. ■ Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected Replace faulty component if necessary.
F.14	Regulates as if the outside temperature were 32°F (0°C).	Short circuit, outside temperature sensor	Check outside temperature sensor and connection to sensor. Replace faulty components if necessary.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.29	Regulates without supply temperature sensor for low loss header.	Lead break, low loss header sensor	■ Check low loss header setting in the commissioning assistant and correct if necessary. ■ Check supply temperature sensor, low loss header. ■ Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected
F.30	Regulates without supply temperature sensor for low loss header.	Short circuit, low loss header sensor	Check supply temperature sensor, low loss header. Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected
F.49	Burner in a fault state	Lead break, flue gas temperature sensor	Check flue gas temperature sensor. Reset the boiler.
F.50	Burner in a fault state	Short circuit, flue gas temperature sensor	Check flue gas temperature sensor. Reset the boiler.
F.57	Normal operation without room influence	Lead break, room temperature sensor	■ Check remote control setting in the commissioning assistant and correct if necessary. ■ Check plug and cable of external room temperature sensor, heating circuit. ■ If no external room temperature sensor installed, replace Vitotrol programming unit.
F.58	Normal operation without room influence	Short circuit, room temperature sensor	Check plug and cable of external room temperature sensor, heating circuit. If no external room temperature sensor installed, replace Vitotrol programming unit.
F.59	Burner locked out	Power supply, low voltage	Check mains voltage. If voltage is correct and the fault occurs repeatedly, replace the fan unit.
F.62	Burner in a fault state	High limit safety cut-out has responded.	■ Check heating system fill level. ■ Check pre-charge pressure in diaphragm expansion tank. Adjust to required system pressure. ■ Check whether flow rate is sufficient (flow sensor and circulation pump). Reset the boiler.
F.63	Burner in a fault state	Flue gas temperature limiter has responded.	■ Check heating system fill level. ■ Check pre-charge pressure in diaphragm expansion tank. Adjust to required system pressure. ■ Check whether flow rate is sufficient (flow sensor and circulation pump). Vent the system. Reset the boiler once the flue system has cooled down.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.64	Normal operation; burner restarts	Flame loss during stabilization or operating phase.	■ Check ionization electrode (replace if necessary): Check the electrode for contamination and clearance to the burner gauze assembly.
F.65	Burner in a fault state	Flame signal is not present or insufficient at burner start.	■ Check ventilation air/flue system and condensate drain; clean if necessary. Check ionization electrode and connecting cable. Check the ignition. Check the connecting cables between the ignition module and ignition electrode; check the ignition electrode for clearance, contamination and broken insulation.
F.67	Burner in a fault state	Ionization current lies outside the permissible range	Check gas supply (gas pressure), check gas solenoid valve and inlet strainer. Check ionization electrode: ■ Clearance to burner gauze assembly ■ Check electrode/burner gauze assembly for contamination. If specified measures don't help, replace fan unit. Reset the boiler.
F.69	Burner in a fault state	Ionization current lies outside the permissible range	Check ionization electrode: ■ Check whether insulation block is touching electrode ceramic. ■ Check gas solenoid valve: Activate "Minimum heating output" for approx. 4 min in actuator test. If this causes a fault to occur, replace BCU burner control unit. ■ In the actuator test, switch from "Minimum heating output" to "Maximum heating output". If this fault occurs during modulation, check the intake screen for contamination. Replace the fan unit if necessary.
F.71	Burner in a fault state	Fan speed too low	■ Check fan for blockage. ■ Check the gas type and flue system setting in the commissioning assistant and correct if necessary. Reset the boiler.
F.72	Burner in a fault state	Fan idle state not reached	Reset the boiler. If fault occurs repeatedly, replace fan unit.
F.74	Burner locked out. Internal circulation pump off. No central heating and no DHW heating.	System pressure too low	Top up with water. Vent the system. If the fault occurs repeatedly: ■ Check system pressure sensor with external pressure gauge. ■ Check diaphragm expansion tank pre-charge pressure. ■ Check settings for target system pressure and range.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.77	Burner in a fault state	Data memory burner control unit	Reset the boiler. If the fault recurs, replace the BCU burner control unit.
F.87	Burner in a fault state	Water pressure too high	■ Replace the water pressure sensor. ■ Replace the safety assembly. ■ Open BDF valves. ■ Check expansion vessel function. ■ Correct the amount of water in the system.
F.89	No central heating and no DHW heating	Circulation pump blocked	Check circulation pump. Replace if necessary.
F.91	Function of affected extension in emergency mode	DIO electronics module communication error	Check connections to DIO electronics module and connection to heat management unit.
F.92	Function of the relevant electronics module in emergency mode	ADIO electronics module communication error	■ Check setting in the commissioning assistant and correct if necessary. ■ Check connections and leads to the ADIO electronics module. ■ Check PlusBus voltage level (24 to 28V). ■ Check subscriber number on rotary switch S1 and correct if necessary.
F.94	Function of the relevant electronics module in emergency mode	Function of the relevant electronics module in emergency mode	■ Check setting in the commissioning assistant and correct if necessary. ■ Check connections and leads to the SDIO electronics module. ■ Check PlusBus voltage level (24-28V).
F.99	Electronics modules connected to PlusBus not functioning	Communication error PlusBus	■ Check setting in the commissioning assistant and correct if necessary. ■ Check the connecting elements (plugs) for firm seating and corrosion. ■ Check for connection of an incorrect device; refer to the connection diagram/installation instructions. ■ After checking, reset the power supply to the system and check whether the fault recurs. If the fault recurs after the burner control unit has been restarted, replace the burner control unit concerned.
F.100	Electronics modules connected to PlusBus not functioning	Voltage error PlusBus	Check whether the PlusBus power supply on the HMU heat management unit is OK: Remove all connected PlusBus components and reconnect one by one. Check that there aren't more than 2 Vitotrol 200-E connected to the HMU. Check whether there is a short circuit at the PlusBus cable. Check the PlusBus voltage.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.104	Depending on configuration of EM-EA1 extension (DIO electronics module)	External fault message input active	Check connected external device.
F.142	Burner in a fault state	Communication error CAN bus	■ Check the fan unit for correct function. For this, check the stepper motor of the fan unit (reference run with mains ON). ■ If the fault still persists, visually check the plug-in connections and cables of the CAN bus. ■ Check further CAN bus subscribers. If fault still persists, replace the fan unit.
F.160	Burner in a fault state	Communication error CAN bus	■ If "Connection error" is displayed, check the internal CAN bus subscriber connections. ■ If only F.160 is displayed, check the connections of the external CAN bus subscribers. ■ Check the connecting cables for firm seating and corrosion. Reset the boiler.
F.180	Burner in a fault state	Gas pressure too low	■ Check gas pressure. Notify the gas supply utility if necessary. ■ Check whether the gas pressure switch is working properly. Replace the gas fitting if necessary Direct replacement of the gas pressure switch is not permissible.
F.182	No DHW heating	Short circuit, outlet temperature sensor (if installed)	Check outlet temperature sensor (plug X1, cores 13 and 14). Measure sensor input on electronics module. Target value: 3.3V– with sensor disconnected
F.183	No DHW heating	Lead break, outlet temperature sensor (if installed)	Check the outlet temperature sensor.
F.185	Burner in a fault state	Lead break, supply temperature sensor/high limit safety cut-out	Check the supply temperature sensor/ high limit safety cut-out. Check sensor lead. Replace faulty component if necessary. Reset the boiler.
F.299	Time/date incorrect	Real time clock setting incorrect	Set the time and date.
F.342	No central heating, no DHW heating	Communication error, BCU burner control unit	■ Check connecting cable to the burner control unit plug X4 on BCU. ■ Check all plug-in connections and cables of the internal CAN. ■ Remove all plugs except X4, X2, X16 and X18 from the BCU burner control unit. Check whether fault persists. **Note:** Several other fault messages will be added due to the removed plugs. Ignore these. If fault message F.342 is no longer shown, reinsert the plugs one by one and establish which component is faulty. Reset the boiler.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.343	Regulates without return temperature sensor for low loss header	Short circuit of the common return sensor	■ Check the low loss header setting in the commissioning assistant and correct if necessary. ■ Check return temperature sensor for low loss header. Measure sensor input on electronics module. (3.3V– with sensor disconnected)
F.344	Regulates without return temperature sensor for low loss header	Lead break of the common return sensor	■ Check return temperature sensor for low loss header. Measure sensor input on electronics module. (3.3V– with sensor disconnected)
F.348	Burner in a fault state	Gas modulation valve	If several boilers are connected to a common flue system: Check whether “Multiple connections” is set in the commissioning assistant. Check the flue system for unrestricted flow. If the fault persists, replace the gas fan unit.
F.353	Burner shutdown with restart if demand exists	Insufficient gas supply, burner output reduced	Check the gas supply. Optically check input-side screen in the gas solenoid valve for contamination. Reset the boiler.
F.354	Burner in a fault state	Gas modulation valve tolerance outside permissible range	Replace gas fan unit.
F.365	Burner in a fault state	Gas fitting relay monitoring has responded	Start the burner several times; replace the burner control unit if necessary.
F.370	Burner in a fault state	Fuel valve or modulation valve will not close.	Reset the boiler. If fault occurs repeatedly, replace fan unit.
F.379	Burner in a fault state	Flame signal not present or insufficient	■ Check ionization electrode connecting cable for damage and firm seating. ■ Check ionization electrode; replace if necessary. Reset the boiler.
F.380	Burner in a fault state	Flame loss immediately after flame formation (during safety time)	Check gas supply (gas pressure). Check balanced flue system for flue gas recirculation. Check ionization electrode and burner gauze assembly: ■ Clearance to burner gauze assembly ■ Contamination on electrode Reset the boiler.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.415	System in a fault state	Communication error of M bus gateway	Check the control cable and power supply.
F.416	Burner locked out	Flue gas temperature sensor incorrectly positioned	Fit flue gas temperature sensor correctly. See “Repairs”. Carry out mains reset after fault has been remedied.
F.425	System operating normally; calculation not working	Time synchronization failed	Set the time. If external time is used, check parameters 1504 and 508.
F.430	Normal operation in line with target values of boiler	Communication error gateway	Check gateway module connecting cable and power supply.
F.517	Normal operation, remote control unit not functioning	Lead break, PlusBus cable, incorrect boiler address set, remote control faulty	■ Check setting in commissioning assistant. ■ Check remote control cable. ■ Check remote control subscriber number. Replace faulty remote control if applicable.
F.519	Communication with the building management system is not possible. External control is not possible. The boiler returns to the internal control target values.	Communication error BACnet. Same device ID twice in the same network.	Check the connecting cable and power supply to the WAGO gateway. Check the BACnet participants.
F.520	Communication with the building management system is not possible. External control is not possible. The boiler returns to the internal control target values.	Communication error Modbus. 2 identical device IDs in the same network	Check the connecting cable and power supply to the WAGO gateway. Check the Modbus participants.
F.527	Burner in a fault state	Incorrect parameter set, HMU heat management unit	Overwrite (flash) the HMU heat management unit with the correct parameter set.
F.528	Burner in a fault state	Incorrect parameter set, BCU burner control unit	Overwrite (flash) the BCU burner control unit with the correct parameter set.
F.542	Emergency function operating mode is activated for heating circuit 1: Heating circuit pump is switched on Heating circuit mixing valve is moved to the CLOSED position	Lead break, supply temperature sensor, heating circuit 1, incorrect setting during commissioning	Check supply temperature sensor, mixing valve 1. Measure sensor input on electronics module. (3.3V– with sensor disconnected) Check commissioning assistant setting. Check setting of ADIO rotary switch
F.543	Emergency function operating mode is activated for heating circuit 1: Heating circuit pump is switched on. Heating circuit mixing valve is moved to the CLOSED position.	Short circuit, supply temperature sensor, heating circuit 1	Check supply temperature sensor, mixing valve 1. Measure sensor input on electronics module. (3.3V– with sensor disconnected)

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.544	Mixing valve closes. Heating circuit pump is operational.	Lead break, supply temperature sensor, heating circuit 2 with mixing valve Incorrect setting during commissioning	Check supply temperature sensor, mixing valve 2. Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected. Check commissioning assistant setting. Checking setting of ADIO rotary switch.
F.545	Mixing valve closes. Heating circuit pump is operational.	Short circuit, supply temperature sensor for heating circuit 2 with mixing valve	Check supply temperature sensor, mixing valve 2. Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected
F.546	Mixing valve closes. Heating circuit pump is operational.	Lead break, supply temperature sensor, heating circuit 3 with mixing valve	Check supply temperature sensor, mixing valve 3. Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected. Check commissioning assistant setting. Checking setting of ADIO rotary switch.
F.547	Mixing valve closes. Heating circuit pump is operational.	Short circuit, supply temperature sensor for heating circuit 3 with mixing valve	Check supply temperature sensor, mixing valve 3. Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected
F.548	Mixing valve closes. Heating circuit pump is operational.	Short circuit, supply temperature sensor for heating circuit 4 with mixing valve	■ Check supply temperature sensor, mixing valve 4. ■ Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected ■ Check commissioning assistant setting. ■ Checking setting of ADIO rotary switch.
F.549	Mixing valve closes. Heating circuit pump is operational.	Short circuit, supply temperature sensor for heating circuit 4 with mixing valve	Check supply temperature sensor, mixing valve 4. Measure voltage at sensor input on electronics module. Target value: 3.3V– with sensor disconnected
F.574	Room temperature sensor for heating circuit 1 not available.	Normal operation without room influence	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit.
F.575	Normal operation without room influence	Lead break, room temperature sensor, heating circuit 1	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit
F.576	Normal operation without room influence	Short circuit, room temperature sensor, heating circuit 1	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.577	Normal operation without room influence	Room temperature sensor for heating circuit 2 not available	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit Check setting of parameter 934.6.
F.578	Normal operation without room influence	Lead break, room temperature sensor, heating circuit 2	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit.
F.579	Normal operation without room influence	Short circuit, room temperature sensor, heating circuit 2	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit.
F.580	Normal operation without room influence	Room temperature sensor for heating circuit 3 not available	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit. Check setting of parameter 935.6.
F.581	Normal operation without room influence	Lead break, room temperature sensor, heating circuit 3	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit.
F.582	Normal operation without room influence	Short circuit, room temperature sensor, heating circuit 3	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit.
F.583	Normal operation without room influence	Room temperature sensor for heating circuit 4 not available	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit.
F.584	Normal operation without room influence	Lead break, room temperature sensor, heating circuit 4	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit.
F.585	Normal operation without room influence	Short circuit, room temperature sensor, heating circuit 4	Check external room temperature sensor for heating circuit or room temperature sensor with remote control unit.
F.623	Emergency function operating mode is activated for heating circuit 1: Heating circuit pump is switched on. Heating circuit mixing valve is moved to CLOSED position	Lead break, return temperature sensor, heating circuit	Check return temperature sensor, mixing valve 1. Measure sensor input on electronics module. (3.3V DC with sensor disconnected)
F.624	Emergency function operating mode is activated for heating circuit 1: Heating circuit pump is switched on. Heating circuit mixing valve is moved to CLOSED position	Short circuit, return temperature sensor, heating circuit 1	Check return temperature sensor, mixing valve 1. Measure sensor input on electronics module. (3.3V DC with sensor disconnected)

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.625	Emergency function operating mode is activated for heating circuit 2: Heating circuit pump is switched on. Heating circuit mixing valve is moved to CLOSED position	Lead break, return temperature sensor, heating circuit 2	Check return temperature sensor, mixing valve 2. Measure sensor input on electronics module. (3.3V DC with sensor disconnected)
F.626	Emergency function operating mode is activated for heating circuit 2: Heating circuit pump is switched on. Heating circuit mixing valve is moved to CLOSED position	Short circuit, return temperature sensor, heating circuit 2	Check return temperature sensor, mixing valve 2. Measure sensor input on electronics module. (3.3V DC with sensor disconnected)
F.627	Emergency function operating mode is activated for heating circuit 3: Heating circuit pump is switched on. Heating circuit mixing valve is moved to CLOSED position	Lead break, return temperature sensor, heating circuit 3	Check return temperature sensor, mixing valve 3. Measure sensor input on electronics module. (3.3V DC with sensor disconnected)
F.628	Emergency function operating mode is activated for heating circuit 3: Heating circuit pump is switched on. Heating circuit mixing valve is moved to CLOSED position	Short circuit, return temperature sensor, heating circuit 3	Check return temperature sensor, mixing valve 3. Measure sensor input on electronics module. (3.3V DC with sensor disconnected)
F.629	Emergency function operating mode is activated for heating circuit 4: Heating circuit pump is switched on. Heating circuit mixing valve is moved to CLOSED position	Lead break, return temperature sensor, heating circuit 4	Check return temperature sensor, mixing valve 4. Measure sensor input on electronics module. (3.3V DC with sensor disconnected)
F.630	Emergency function operating mode is activated for heating circuit 4: Heating circuit pump is switched on. Heating circuit mixing valve is moved to CLOSED position	Short circuit, return temperature sensor, heating circuit 4	Check return temperature sensor, mixing valve 4. Measure sensor input on electronics module. (3.3V DC with sensor disconnected)
F.688	Function of the relevant electronics module in emergency mode	Communication error MZIO	Check setting in the commissioning assistant and correct if necessary. Check connections and leads to the MZIO electronics module. Check PlusBus voltage level (24 to 28V).
F.691	System in a fault state	No feedback, ventilation air supply preventing burner start	Check plug connection, check for blockages of the ventilation air damper, replace if necessary.
F.692	System in a fault state	Burner ventilation air supply interrupted	Check plug connection, check for blockages of the ventilation air damper, replace if necessary.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.762	System in a fault state	System pressure too low	Top up with water. Vent the system. If the fault recurs: Check the minimum pressure switch with an external pressure gauge. Check diaphragm expansion tank pre-charge pressure. Check safety chain plugs on burner control unit.
F.764	System in a fault state	Lag boiler reports a fault	Check the lag boiler fault.
F.765	System in a fault state	Communication error lag boiler	Check communication of lag boiler.
F.875	System in a fault state	Communication error lead boiler	Check communication of lead boiler.
F.882	Burner/system in a fault state	Gas outlet pressure too high (GDW3)	Check gas pressure switch 3 and the gas outlet pressure (GDW3). If necessary, replace the pre-assembled gas line (399/500 MBtu) or gas fitting (750/1000 MBtu).
F.883	Burner/system in a fault state	Gas valve test malfunction: Electronic fault with gas fitting or CAN bus communication error	Restart the burner several times. If necessary, replace the burner control unit or E-Box.
F.884	Burner/system in a fault state	Gas valve test malfunction: VPS pressure (GDW 2) does not increase during filling	Check gas inlet pressure. Restart the burner several times. If necessary, replace the burner control unit or E-Box.
F.885	Burner/system in a fault state	Gas valve test faulty, valve seat V2 faulty	Replace the gas fitting.
F.886	System in a fault state	Gas valve test malfunction: VPS pressure (GDW 2) does not drop during VPS test.	Restart the burner several times. If necessary, replace the burner control unit or E-Box.
F.887	System in a fault state	Gas valve test faulty, valve seat V1 faulty	Replace the gas fitting.
F.888	System in a fault state	Communication error with Lambda probe controller (burner control unit internal error)	Replace burner control unit.
F.889	System in a fault state	Lambda probe malfunction: Cyclic probe check failed	Check Lambda probe plug and replace if necessary.
F.890	System in a fault state	Lambda probe malfunction: Cyclic probe check failed	Check Lambda probe plug and replace if necessary.
F.891	System in a fault state	Lambda probe malfunction: Probe not ready for operation in pre/postpurge	Check ventilation air/flue system and condensate drain; clean if necessary. Check Lambda probe plug and replace if necessary.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.892	Burner in a fault state	Lambda probe malfunction: Calibration failed	Check ventilation air/flue system and condensate drain; clean if necessary. Check flue gas recirculation. Check Lambda probe plug and replace if necessary.
F.893	Burner in a fault state	Lambda probe malfunction: Calibration failed	Check ventilation air/flue system and condensate drain; clean if necessary. Check flue gas recirculation. Check Lambda probe plug and replace if necessary.
F.894	Burner in a fault state	Lambda probe malfunction: Probe heating	Check Lambda probe plug and replace if necessary. Replace burner control unit.
F.895	Burner in a fault state	Lambda probe malfunction: Wear	Check Lambda probe plug and replace if necessary.
F.896	System in a fault state	Safety chain 1 has responded	Check the hydraulic minimum pressure switch.
F.897	System in a fault state	Safety chain 2 has responded	Check low water indicator.
F.920	System in a fault state	MZIO function fault, digital input 1	Check external setup.
F.921	System in a fault state	MZIO function fault, digital input 2	Check external setup.
F.922	System in a fault state	MZIO function fault, digital input 3	Check external setup.
F.971	Burner in a fault state	When the gas fitting was replaced, the calibration value was not entered.	Replace the CV2 calibration value (see label on gas fitting) in ViGuide/ Spare parts replacement/Gas fitting.
F.982	No heating, no DHW heating	Circulation pump heating circuit 1 running dry	Check diaphragm expansion tank, check pump.
F.986	System in a fault state	Parameter plausibility check between burner 1 and burner 2 failed	Restart the boiler.
F.1001	Burner in a fault state	Burner control unit not calibrated	Replace burner control unit
F.1002	Burner in a fault state	Burner control unit not calibrated	Replace burner control unit
F.1004	System in a fault state	Reverse flow of flue gas in “dry mode” (partial load range with CI2 1500/2000 MBtu/h)	Check flue system CI2 1500/2000 / burner fan in “dry mode”; replace if necessary. Check flue gas damper and connection.

Burner Faults Without a Specific Message

Fault	Cause of Fault	Measures
Combustion faults due to pulsation	Excessive gas throughput	Adjust gas throughput in accordance with the rated boiler heating output.
	Insufficient or excessive air	
	Condensate drain in the flue system blocked	Check condensate drain.
	Flue outlet not installed correctly	Check flue outlet and flue system.
Burner output fluctuating	Insufficient or excessive air	Correct the settings. Check combustion in installation room.
	Insufficient draught in flue system	Check flue system.
Flame tears off during operation	Inlet strainer of gas solenoid valve contaminated	Remove flange and clean strainer.

Warning Messages

Display	Warning	Cause	Measure
A.48	Reduced system output	Condensate backup Wind influence due to non-approved flue systems and wall terminals	Check system for condensate backup. Assemble the flue system and wall outlet according to the versions in the service instructions

Service Messages

Display	Message	Measure
P.1	Maintenance due according to interval	Carry out system maintenance
P.36	Air filter contaminated	Clean the air filter

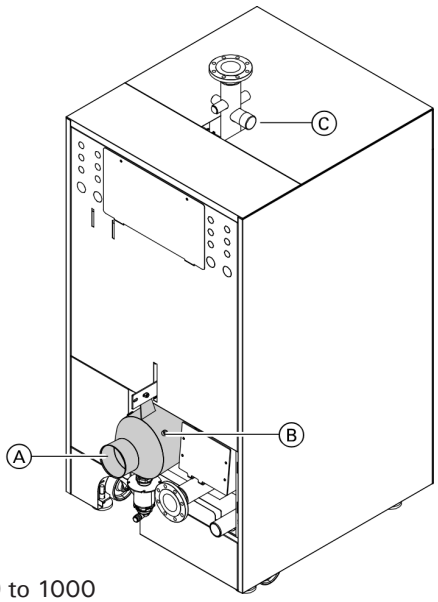
Fault Memory

The 10 most recent faults are saved and can be called up. The most recent fault code is shown first, followed by the preceding codes.

Note: If the burner repeatedly starts up due to a non-lockout fault without displaying a fault code, the fault memory may give an indication of the cause.

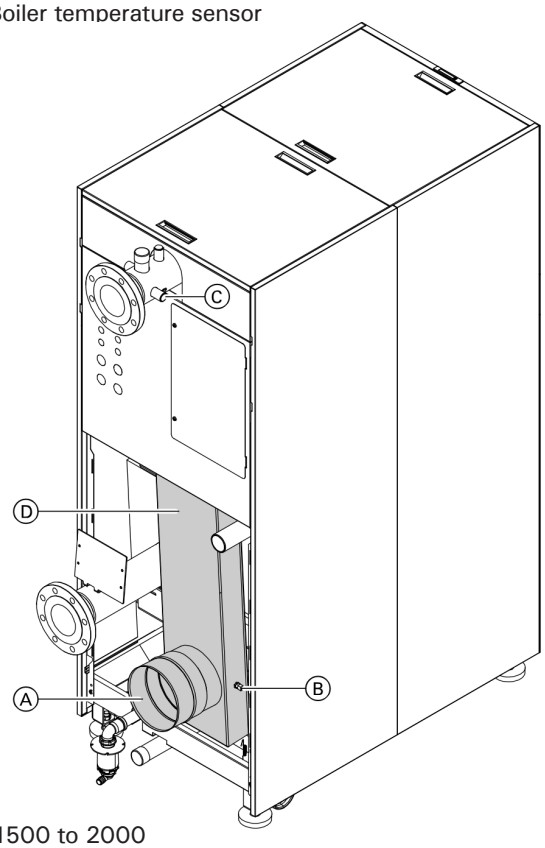
Check Sensors

Flue gas temperature sensor



CI2 399 to 1000

Legend
Ⓐ Flue outlet
Ⓑ Flue gas temperature sensor
Ⓒ Boiler temperature sensor



CI2 1500 to 2000

Legend
Ⓐ Flue outlet
Ⓑ Flue gas temperature sensor
Ⓒ Boiler temperature sensor
Ⓓ Flue gas collector

1. Check the cable and plug of flue gas temperature sensor Ⓑ.
2. Disconnect the cable from the flue gas temperature sensor.
3. Rotate sensor (counter-clockwise) by ¼ turn to remove it (bayonet fitting).
4. Check the sensor resistance. Compare the resistance with the value for the currently recorded temperature from the following diagram.
   In the event of severe deviation (> 10 %), replace the sensor.
5. Rotate sensor (clockwise) by ¼ turn to install it.

WARNING

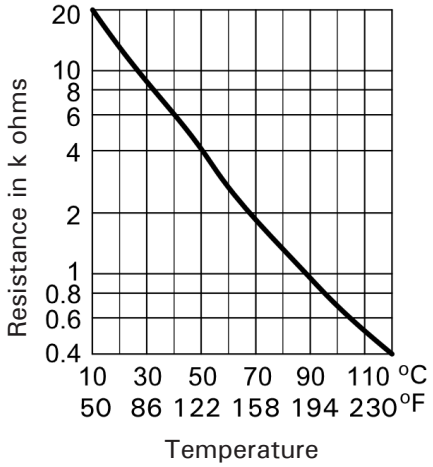
Escaping flue gas can cause poisoning.
When restarting, check for leaks on the flue gas side.

6. Reconnect the cable to the flue gas temperature sensor.
7. If the permissible flue gas temperature has been exceeded, the flue gas temperature sensor locks out the boiler. Reset the burner on the programming unit once the flue system has cooled down.

Check Sensors *(continued)*

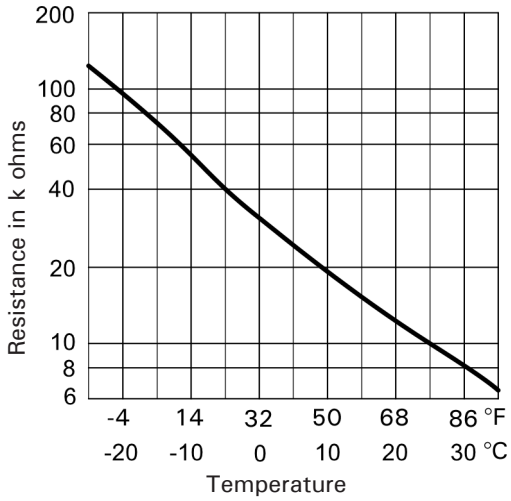
Viessmann NTC 10 kΩ (blue ID label)

- Flue gas temperature sensor
- Supply temperature sensor
- Tank temperature sensor
- Supply temperature sensor
- Temperature sensor, low loss header



Viessmann NTC 10 kΩ

- Outside temperature sensor



Tank, supply and temperature sensor

1. Disconnect plug TS1 or [5] sensor from the electronics module. Measure the resistance.
2. Compare the sensor resistance to the curve.
3. In the event of severe deviation (> 10%), replace the sensor.

Room temperature sensor

Note: ■ The room temperature sensor is connected at terminals 3 and 4 in the Vitotrol 200-E.

Vitotrol 200-E installation and service instructions

Outside temperature sensor

1. Check the lead and plug of the outside temperature sensor.
2. Disconnect wires 1 and 2 from terminal [1] on the wiring panel.
3. Check the sensor resistance. Compare the resistance with the value for the current temperature from the following diagram.
   If the results are very different from the curve (> 10 %), disconnect the wires from the sensor.
   Repeat the test directly on the sensor.
   Check the on-site cable. 2-wire cable, length up to 115 ft (35 m) with a cross-section of 16 AWG (1.5 mm^2)
   Depending on the result, replace the lead or the outside temperature sensor.

Replacing Components

IMPORTANT

Repairing components that fulfil a safety function can compromise the safe operation of the system.
Always replace faulty components with genuine Viessmann spare parts.

Replacing gas valves and gaskets
Gas valves must be replaced when they reach the end of their service life. A warning is issued when this occurs.

Replacing gaskets
The elastomer gaskets of the fan, gas line and boiler flue connection/flue gas collector must be replaced after 12 years

⚠ WARNING

Leaking gaskets on the burner and flue gas connections can allow gas and flue gas to escape.
Gas can cause serious explosions.
Flue gas causes life threatening poisoning.
- ☐ **Replace gaskets after 12 years at the latest.**
- ☐ **Check the gaskets on the burner and flue gas connections for leaks.**

Replacing electronic components
Note on the HMU heat management unit and BCU burner control unit.
If the BCU burner control unit and/or HMU heat management unit are replaced, the replacement must be carried out with the help of the "Viguide" software tool.


See the installation instructions for the spare part and "www.viguide.info"
Replacing the connecting cable

Replacing the connecting cable

IMPORTANT

Incorrect routing of the cable can lead to heat damage and impairment of the EMC properties.
For positioning and securing of the cable (fixing point of the cable tie) see connecting cable installation instructions.

Boiler Water Temperature Control

Brief description
■ The boiler water temperature is regulated by modulating the burner.
■ The target boiler water temperature is determined from the following parameters:
– Target supply temperature of the heating circuits connected to the control unit.
– External demand
– Target DHW temperature
■ When the DHW tank is heated, a target boiler water temperature is specified that is 36°F (20 K) above the target DHW temperature (can be adjusted with the software tool via parameter "2257" in the "DHW" group).
Note: For the CI2 1500 and 2000, the upper burner is always switched on first.

Emissions test function
In multi boiler systems, enable the emissions test function on all control units.
The following functions are triggered:
■ Burner start
■ Starting all pumps
■ 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. target value [e.g. 185°F (85°C)]. The burner is operated in modulating mode.
This prevents excessive cycling if emissions testing is carried out over an extended period.

Control of Boiler Circuit Pump

The method of speed control can be set via parameter 1240.0.

ON/OFF control

When there is a call for heat, the 120V output of the boiler circuit pump is activated. When the call for heat expires, the 120V output of the boiler circuit pump is deactivated after a delay-off time of 60 sec.

Variable speed control

The 120V output of the boiler circuit pump is permanently active. The 0 - 10V output of the boiler circuit pump is set according to the pump speed setting at the control unit (0V: Standby, 1V: 10% modulation, 10V: 100% modulation). Minimum and maximum pump speeds are configured via parameters 1100.0 and 1100.1.

■ Analogue burner modulation control

The speed setting of the boiler circuit pump is controlled by the modulation value of the boiler (0 to 100 %), which is assigned 1:1 to the pump control by a linear function.

■ Δt control

Δt control increases the condensing effect.
At low load, the speed is usually too high. This causes too high a flow rate in the primary circuit and the return temperature is too high. The condensing effect is reduced. The aim is to maintain a fixed spread between the supply and return temperatures. In the delivered condition, the target value is 18°F (10 K). If the differential is less than 18°F (10 K), the speed setting for the boiler circuit pump is reduced.
If the differential is greater, the speed is increased.

Cascade Control Unit

Condensing strategy

Benefit	Optimum utilization of the condensing effect and long burner runtimes. It is the aim of the condensing strategy to operate as many boilers as possible at the lowest output level.
Starting criterion	The boilers are switched on via a power balance (only adjustable via software tool parameter 2235.3). An additional boiler starts if the current heat demand can also be covered by the currently active boilers plus the next boiler in the boiler sequence.
Switch-off criterion	The boilers are switched off via a switch-off integral (only adjustable via software tool parameter 2235.3). If the switch-off integral exceeds a set limit, the boiler most recently started is switched off.

Brief description

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

Target supply temperature

The target supply temperature is determined from the following parameters:

- Target supply temperature of the heating circuit without mixing valve A1 (heating circuit 1) and the heating circuits with mixing valve M2 (heating circuit 2), M3 (heating circuit 3) and M4 (heating circuit 4).
- Target supply temperature of further consumers
- Target DHW temperature
- External demands

Cascade strategy

Type of control: Autonomous/parallel with system supply temperature sensor.
All boilers operate to the same transfer point (heating circuit manifold).
The boilers receive a temperature target value from the lead boiler. The boilers work autonomously toward the temperature target value transferred by the cascade (system supply temperature sensor required).
Connect the system supply temperature sensor to the MZIO electronics module of the boiler.

Cascade Strategy

Type of control: Autonomous/parallel with system supply temperature sensor.

All boilers operate to the same transfer point (heating circuit manifold).

The boilers receive a temperature target value from the lead boiler. The boilers work autonomously toward the temperature target value transferred by the cascade (system supply temperature sensor required).

Connect the system supply temperature sensor to the control unit of the boiler.

In the delivered condition, the boilers are started according to their boiler number and stopped again in reverse order (no boiler sequence control active).

There are several ways to influence this order or to choose a different order. The boilers are switched on in an order specified by the user or determined by the energy manager, and switched off in reverse order.

The regular boiler sequence can be influenced by a variety of settings and events, e.g. temporary events.

These events can also occur in parallel. Priorities must be observed here. The boiler sequence can be specified via the software tool. In the delivered condition, the boilers are in ascending order.

The following strategies can be selected:

- Manual specification of a boiler switch-on/switch-off sequence
- Selection of a fixed first boiler
- Selection of a fixed last boiler
- Dynamic determination of the boiler sequence according to burner hours run

1. Regular on/off sequence

In undisturbed operation, the boilers are switched on in ascending order according to their boiler number (ID) and switched off again in reverse order.

Example of a system with 4 boilers:

Switch on 1-2-3-4. Switch off 4-3-2-1

2. Manual specification of the boiler sequence

The preset boiler sequence can be set manually by the user via the software tool. These settings (except in special cases such as boiler faults) have the highest priority. The boiler sequence is manually specified and saved by the user.

Other configurable influences on the boiler sequence are not evaluated (except e.g. fault operation).

The setting is made via the lead boiler.

Cascade Strategy *(continued)*

3. Configurable specification of the boiler sequence
If no manual boiler sequence is defined, the order can be influenced by the following events. The initial boiler sequence (1..2..3 ...) can be influenced statically or dynamically by various configuration settings.
These events can also occur in parallel/simultaneously. The respective priorities must then be observed.
Setting options
- Fix the first boiler
- Fix the last boiler
- Burner runtime optimization

3.1 Fixed first boiler
By specifying an energy generator number, a fixed first energy generator can be defined. One energy generator is permanently configured as the first master boiler. This setting has the highest priority after any manual setting.
It is possible to specify 1 fixed first boiler.
This boiler is always the first to be started.
Example of a system with 4 boilers;
boiler 3 should always switch on first.
Switch on 3-1-2-4; switch off 4-2-1-3

3.2 Fixed last boiler
A fixed last energy generator can be defined by specifying an energy generator number. One energy generator is permanently configured as the last boiler. This setting has the highest priority after any manual setting.
It is possible to specify 1 fixed last boiler.
This is always the last to be used and the first to be stopped.
Example of a system with 4 boilers; boiler 1 should always be switched on last. Switch on 2-3-4-1; switch off 1-4-3-2
The settings for "Fixed last" and "Fixed first" must be plausible. If the setting is not plausible (e.g. Fixed first = Fixed last) and both are activated, "Fixed last" is ignored.

3.3 Boiler sequence – changeover according to burner hrs run
After a configurable number of burner hours run for the first boiler within the boiler sequence has elapsed, the boiler sequence can be re-sorted based on the burner operating times of the individual boilers. Dynamic adjustment of the boiler sequence according to burner runtime. The user can choose a burner runtime of 50 ... 999 hours, after which the boiler sequence is re-sorted based on the burner runtimes at the first master boiler. After the event, the boiler sequence is sorted by the burner runtime – the boiler with the lowest burner runtimes takes first position.
The setting is made via the lead boiler. The prerequisite for the dynamic boiler sequence calculation is the continuous operation of the lead boiler.
Note: Based on the burner runtime of the lead boiler, the boilers are re-sorted according to the burner runtime when the threshold is reached. The burner runtime of the respective lead boiler is used as the reference value. If the lead boiler changes (e.g. local DHW heating, emissions test mode, boiler not available, etc.), the reference value (current burner runtime of the lead boiler) is reinitialized.

4. Influence of special functions
Certain operating situations may result in the boiler no longer being able to participate in heat generation. The individual boiler reports this situation.
The following events can lead to a boiler being excluded from the sequence
- Boiler fault: Air damper (CAI) of the boiler could not be opened.
- Boiler is in emissions test mode.
- Boiler is carrying out local DHW heating.

Emergency mode fault situation
Requirements
- CAN bus cascade with at least 2 boiler participants.
- The individual boilers can control the air damper (CAI) independently.

Operating principle
In the event of a communication failure with the lead boiler (no communication with the higher-level lead boiler in the cascade), the respective boiler automatically go into emergency mode by automatically regulating to a configurable target supply temperature.

Procedure
The boilers regulate "autonomously" to a configurable boiler target temperature. The time between the communication failure and the transition to emergency mode is 60 sec (until then the individual boilers regulate to the last received value). The boiler target temperature for emergency mode can be set/ enabled via a VDD. Boiler frost protection monitoring remains active < 41°F (< 5°C)

Parameter 2451
Boiler target temperature for emergency mode/enabling emergency mode
Enabling emergency mode: By default, the function is disabled (OFF)
Boiler target temperature for emergency mode – setting range: 32°F to 176°F (0°C to 80°C); default for emergency mode: 140°F (60°C)
Note: The system supply temperature (min./max.) is not adjustable. Minimum limit: 32°F (0°C); maximum limit: 176°F 80°C)

Air supply damper CAI
The CAI air damper is not methodologically considered separately from the heat manager (cascade). Each boiler operates the CAI air damper individually and receives the status (OPEN/CLOSED) of the CAI air damper as feedback. Each boiler individually monitors the status of the CAI air damper. In the event of a fault (CAI air damper does not open within the specified time), a corresponding fault message is issued. The heat manager then responds directly to the fault event and stops the boiler from producing heat until the fault event has disappeared.
While the fault event (CAI air damper does not open) is active, the controller has to continuously actuate the air damper. Background: For safety reasons, the air damper must be actuated when a fault event is active, so that it is possible to rectify the fault.
If there is a problem with the air damper, the boiler within a cascade system (boiler not available) is no longer taken into account. The request to the boiler is cleared. In the event of a fault, the CAI must be continuously activated so that it is possible to rectify the fault.

Heating Circuit Control Unit

Brief description

■ The control unit has control circuits for one heating circuit without mixing valve A1 (heating circuit 1) and 2 heating circuits with mixing valve M2 (heating circuit 2), M3 (heating circuit 3) and M4 (heating circuit 4).
■ The target supply temperature of each heating circuit is determined from the following parameters:
– Outside temperature
– Room temperature target
– Operating mode
– Heating curve slope and level
■ 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 in line with the control differential (control deviation).

Functions

The heating circuit without mixing valve is subject to the system 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 recorded by the supply temperature sensor of the respective heating circuit.
■ Upper control limit:
Electronic maximum supply temperature limit
Parameter “1192.1”
■ Lower control range limit:
Electronic minimum supply temperature limit
Parameter “1192.0”

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 target level. 4 time phases per day can be set.

Outside 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 target boiler water temperature subject to the outside temperature.
Control is based on the average outside temperature.
The average outside temperature is composed of the actual and the adjusted outside temperature.
Or set the outside temperature via the internet service provider (depending on availability); see parameter 2241.0

Room temperature

Raising the supply temperature of the heating circuits during operation with room temperature hook-up
The higher the value, the greater the influence of the room temperature on the supply temperature of the heating circuit.

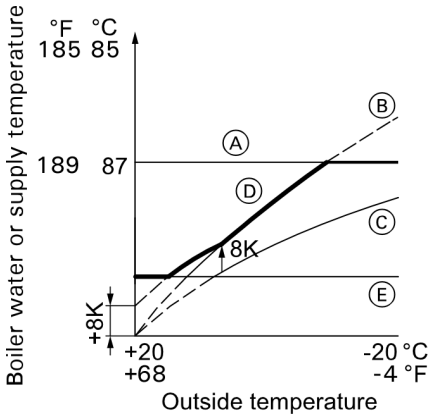
Room influence factor parameter

Heating circuit	Parameter
1 (without mixing valve)	933.7 (only set if just one heating circuit is installed)
2 (with mixing valve)	934.7
3 (with mixing valve)	935.7
4 (with mixing valve)	936.7

Example for determining the increase in the supply temperature using the value of the heating curve when the actual room temperature deviates from the target room temperature:
■ Target room temperature = 20.0°C (RT target)
■ Actual room temperature = 18.0°C (RT actual)
■ Heating curve slope =1.4
■ Room influence factor = 8 (factory setting)
Determining the increase in supply temperature
(RT target - RT actual) x (1 + slope) x room influence factor/4 = raising the supply temperature via heating curve value (20 - 18) x (1 + 1.4) x 8/4 = 9.6
Increase in supply temperature via heating curve value = 9.6 K

Heating Circuit Control Unit *(continued)*

Supply temperature control



Legend

Ⓐ Slope = 1.8 for heating circuit without mixing valve
Ⓑ Slope = 1.2 for heating circuit with mixing valve
Ⓒ Common supply temperature
[at a differential temperature = 8 K (14.4°F)]
Ⓓ Lower common supply temperature

DHW temperature
Priority control

■ With priority control: (parameter "933.4":
The target supply temperature is adjusted to 0°C (32°F) 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 target value.
Heating circuit pump logic – Economy circuits
The heating circuit pump is switched off (target supply temperature set to 0°C (32°F)) if one of the following criteria is met:
■ The adjusted outside temperature exceeds the value set via parameter "1395.1".
■ The actual room temperature exceeds the value set via parameter "2426.2".
■ Parameter 2426.1: Weather-compensated heating circuit pump logic (only for weather-compensated control units):
If the outside temperature is above the threshold value (selected target room temperature plus hysteresis in K), the heating circuit pump is switched off. If the outside temperature is below the threshold value (selected target room temperature plus hysteresis in K), the heating circuit pump is switched on.

Frost protection

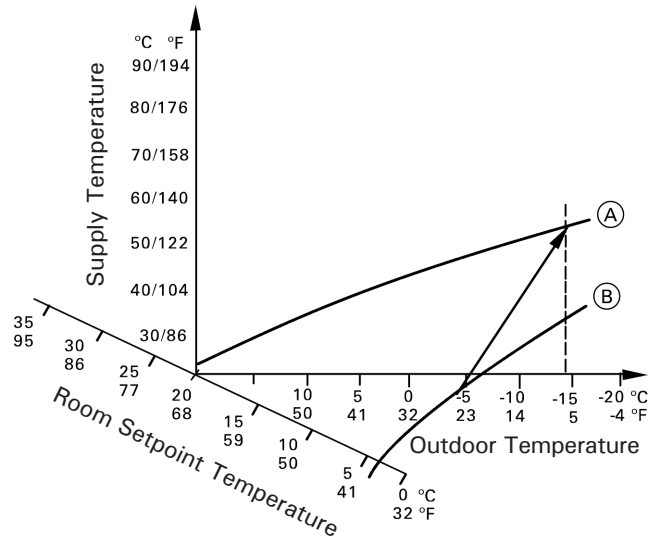
The supply temperature is maintained in accordance with the heating curve for the reduced target room temperature, but at a minimum of 10°C (50°F).

Raising the reduced room temperature

During operation with reduced room temperature, the reduced target room temperature can be automatically raised subject to the outside temperature. The temperature is raised in accordance with the selected heating curve, and no higher than the standard target room temperature or comfort room temperature. Depending on which target room temperature will become active in the next time phase.
The outside temperature limits for the start and end of temperature raising can be set in parameters 1139.0 and 1139.1.

Differential temperature:
The differential temperature can be set via parameter "934.5" in the "Heating circuits" group, delivered condition 8 K (14.4°F).
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 target supply temperature is regulated automatically to 8 K (14.4°F) above the target supply temperature of the heating circuit with mixing valve.
■ System with heating circuit without mixing valve and heating circuits with mixing valve:
The common target supply temperature operates in accordance with its own heating curve. The differential temperature of 8 K (14.4°F) to the target supply temperature of the heating circuits with mixing valve is preset at the factory.

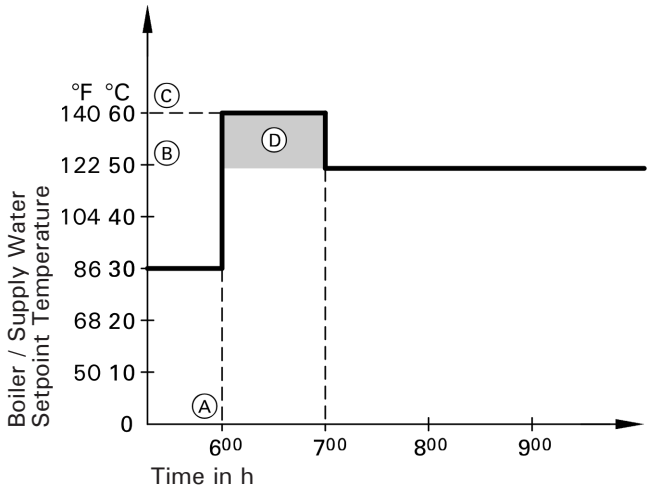
Heating Circuit Control Unit *(continued)*



Legend

Ⓐ Heating curve for operation at standard room temperature or comfort room temperature

Ⓑ Heating curve for operation with reduced room temperature



Legend

Ⓐ Start of operation at standard room temperature or comfort room temperature

Ⓑ Target supply temperature in accordance with the set heating curve

Ⓒ Target supply temperature in accordance with parameter 424.3

Ⓓ Duration of operation with higher target supply temperature in accordance with parameter 424.4: 60 min

Reducing the heat-up time

During the transition from operation at reduced room temperature to operation at standard room temperature or comfort room temperature, the supply temperature will be raised in accordance with the selected heating curve.
The value and duration of the additional increase in the target supply temperature is adjusted in parameters 424.3 and 424.4.

Control sequence

Heating circuit with mixing valve

The mixing valve motor is not activated within the "neutral zone" ±1 K (±1.8°F).

The supply temperature drops.

Target value –1 K (-1.8°F)
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.

Target value +1 K (+1.8°F)
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.

Tank Temperature Control

Brief description

■ Tank temperature control is a constant temperature control. It operates by starting and stopping the DHW pump.
The switching differential is ±2.5 K (±5°F).

■ When the DHW tank is heated, a target supply temperature is specified that is 20 K (36°F) above the target DHW temperature (can be adjusted with the software tool via parameter "2257").

Functions
Time program

An individual time program can be selected for DHW heating and the DHW recirculation pump.
The individual time program allows up to 4 time phases per day to be set for DHW heating and the DHW recirculation pump for every day of the week.
All tank heating sequences are completed irrespective of the time program.

Priority control

■ With priority control: (Parameter "9345.5" in the "Heating circuit..." group):
The target supply temperature is adjusted to 0°C (32°F) 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 target value.

Frost protection

If the DHW temperature falls below 5°C (41°F), the DHW tank is heated to 20°C (68°F).

DHW hygiene

For optimum DHW hygiene, avoid DHW temperatures that are < 50°C (<120°F). For larger systems and systems with low water exchange, the temperature should not drop below < 60°C (<140°F).

Hygiene function

The DHW can be heated to a specified (higher) target DHW temperature for a period of one hour.
To activate the function, see the operating instructions.
Inform the system user what DHW temperatures should be set and the risks associated with having a raised outlet temperature at the draw-off points.

Target DHW temperature

The target DHW temperature can be set to between 10 and 60°C (50 and 140°F).
The target value range can be extended via parameter "503.0" in the "DHW" group.

DHW recirculation pump

This delivers hot water to the draw-off points at adjustable times. 4 time phases can be selected at the control unit for every day.

Control sequence

The following parameters in the "DHW" group influence the controlled sequence.

Tank heating

The DHW tank goes cold [target value –2.5 K (-5°F)], adjustable
via parameter "1085.0"):
■ The common target supply temperature is set 20 K (36°F) higher than the target DHW temperature (adjustable via parameter "2257").
The DHW tank is hot [target value +2.5 K (+5°F)]:
■ The common target supply temperature is returned to the weather-compensated target value.
■ With pump run-on:
The circulation pump runs on after tank heating until one of the following criteria is met:
– The set max. delay-off time is reached (parameter "534.0").
■ Without pump delay-off time (parameter "534:0").

Gas Pressure Switch GDW

For the location of the gas pressure switches, see diagrams on page 79.

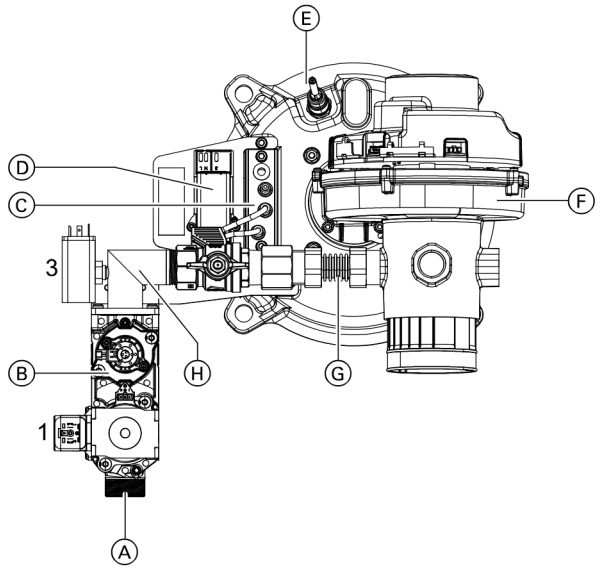
Gas pressure switches 1 and 3

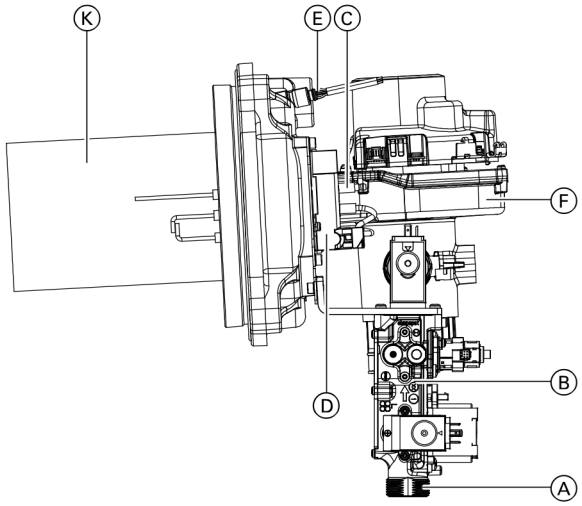
Gas pressure switch 1 monitors the minimum pressure in the gas grid and is set to 4" w.c. (10 mbar).
Gas pressure switch 3 monitors the max. gas pressure downstream of the gas valve and ensures the functionality of the internal inlet pressure regulator in the gas valve.

Gas pressure switch 2

The 750/1000 MBtu burner is equipped with an additional gas pressure switch.
To check the safety valves for leaks, the switching threshold of gas pressure switch 2 (marked red; VPS pressure) is monitored each time the burner starts.
If there is an impermissible leakage from the safety valves, the gas pressure switch triggers a fault shutdown.
In the event of a fault shutdown, reset the burner control unit and restart the burner. In the event of repeated fault shutdowns with fault message "885" or "887", replace the gas solenoid valve.
The fault shutdown can be reset via the control unit.

Overview of Burner Components

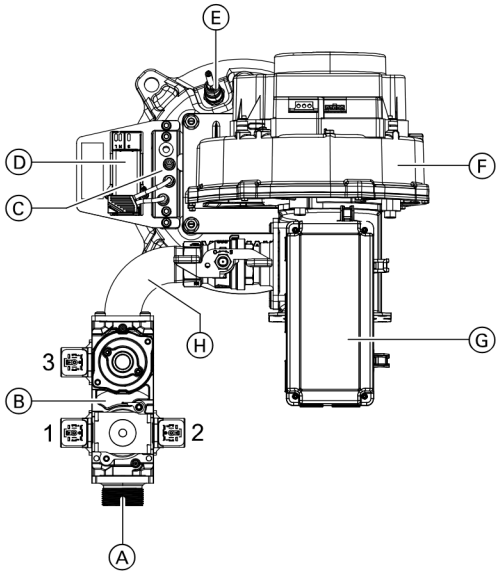


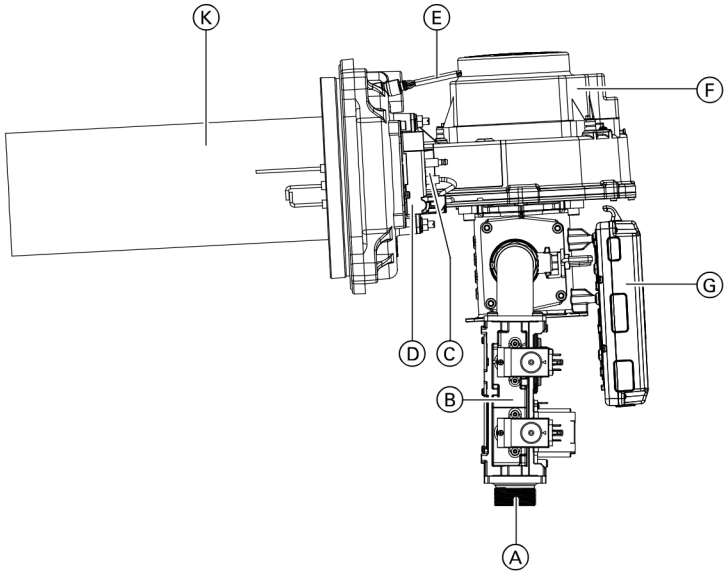


399/500 MBH burner

Legend

Ⓐ Gas supply pipe
Ⓑ Gas solenoid valve with gas pressure switch 1 (GDW1 marked yellow)
Ⓒ Ignition and ionization electrode block with sight glass
Ⓓ Ignition module
Ⓔ Lambda probe (O_2 sensor)
Ⓕ Gas fan
Ⓖ Flexible section of pre-assembled gas line
Ⓗ Pre-assembled gas line (gas ball valve, pipe bend, gas pressure switch 3 (GDW3 marked green))
Ⓚ Burner gauze assembly





MBH 750/1000 burner

Legend

Ⓐ Gas supply pipe
Ⓑ Gas solenoid valve with 3 gas pressure switches (GDW1 marked yellow, GDW marked red, GDW3 marked green)
Ⓒ Ignition and ionization electrode block with sight glass
Ⓓ Ignition module
Ⓔ Lambda probe (O_2 sensor)
Ⓕ Gas fan
Ⓖ E-Box (valve electronics)
Ⓗ Ignition electrode
Ⓗ Pre-assembled gas line (gas ball valve, pipe bend, pressure switch)
Ⓚ Burner gauze assembly

Water Quality Requirements

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 $CaCO_3$)
≤170	300
>170 to ≤680	200
>680 to ≤2000	150
>2000	2

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 IAPMO/ANSI H1001.1.

IMPORTANT

Fill Vitocrossal 200 CI2 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 waterbut 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.

Water Quality Requirements *(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 100°C, IAPMO/ANSI H1001.1 applies together with the following standard values.
See the explanations in the original text of the standard.

Avoiding damage caused by water corrosion

The corrosion-resistance on the heating-water side of ferrous materials used in heating systems and boilers 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.

Water Quality Requirements *(continued)*

Meter reading USG	Fill and make up water USG	Total quantity of water USG	Total hardness		pH value	Date
			Feedwater	Boiler water		

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Maintenance Record

Settings and Test Values		Commissioning		Maintenance/Service	
		Burner 1 (Lead)	Burner 2 (Lag)	Burner 1 (Lead)	Burner 2 (Lag)
Gas Type: ☐ Natural Gas (NG) ☐ Liquid Propane Gas (LPG)					
Static Gas Pressure	Mbar (" w.c.)				
Supply Gas Pressure (Running Pressure)	Mbar (" w.c.)				
Carbon Monoxide Content (CO)					
At the upper rated heating output	PPM				
At the lower rated heating output	PPM				
Carbon Dioxide Content (CO_2)					
At the upper rated heating output	% by Vol.				
At the lower rated heating output	% by Vol.				
Oxygen Content (O_2)					
At the upper rated heating output	% by Vol.				
At the lower rated heating output	% by Vol.				
Flue Gas Temperature (Gross)	^{0}F (^{0}C)				
Draught	Mbar (" w.c.)				

Maintenance Schedule

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.

The following is an overview of scheduled service steps.

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

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.

Technical Data

Boiler Model	CI2	399	500	750	1000	1500	2000
Input	MBH	399	500	750	1000	1500	2000
	kW	117	147	220	293	440	586
Minimum Input NG	MBH	50	50	75	100	50	100
	kW	14.7	14.7	22.0	29.3	14.7	29.3
Minimum Input LPG	MBH	50	50	90	100	50	100
	kW	14.7	14.7	26.2	29.3	14.7	29.3
Output (thermal efficiency)	MBH	391	490	734	977	1460	1940
	kW	114	143	215	286	428	568
Net AHRI Rating	MBH	340	426	638	850	1270	1687
	kW	99	124	187	249	372	494
Combustion efficiency *1	%	97	97	96.9	96.8	96.6	96.5
Thermal efficiency *1	%	98	97.9	97.8	97.7	97.3	97.0
NG Supply Pressure	″w.c. (min.)	4	4	4	4	4	4
	″w.c. (max.)	14	14	14	14	14	14
LPG Supply Pressure	″w.c. (min.)	10	10	10	10	10	10
	″w.c. (max.)	14	14	14	14	14	14
Power Supply	Voltage	120	120	120	120	120	120
	Phase	1	1	1	1	1	1
	Hz	60	60	60	60	60	60
	Amp.	20	20	20	20	20	20
Overall Boiler Length	in.	39	39	47¼	47¼	56¼	56¼
(including insulation and jacketing)	mm	992	992	1200	1200	1428	1428
Overall Boiler Width	in.	29½	29½	29½	29½	29½	29½
(including insulation and jacketing)	mm	750	750	750	750	750	750
Overall Boiler Height	in.	64½	64½	64½	64½	78¾	78¾
(including insulation and jacketing)	mm	1640	1640	1640	1640	1998	1998
Concrete boiler base							
Length	in.	32	32	41	41	47¼	47¼
	mm	812	812	1040	1040	1200	1200
Width	in.	29½	29½	29½	29½	29½	29½
	mm	750	750	750	750	750	750
Thickness	in.	0	0	0	0	0	0
	mm	0	0	0	0	0	0
Weight							
Complete with the burners, control, thermal insulation and jacketing	lb.	789	789	963	963	1812	1969
	Kg	358	358	437	437	822	893
Boiler Water Content	USG	29	29	50	50	113	99
	L	108	108	189	189	426	376
Heat Exchanger Surface	ft.2	65.2	65.2	129.4	129.4	196.2	258.8
	m2	6.1	6.1	12.0	12.0	18.2	24.0
Maximum Operating	°F	210	210	210	210	210	210
Temperature	°C	99	99	99	99	99	99
Maximum Adjustable High	°F	185	185	185	185	185	185
Limit	°C	85	85	85	85	85	85
Maximum Operating Pressure	psig	80	80	80	80	80	80
	bar	5.5	5.5	5.5	5.5	5.5	5.5
Minimum Pressure	lb/hr	375	463	683	904	1345	1786
Relief valve capacity	Kg/hr	170	210	310	410	610	810

***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.

The Vitocrossal 200 CI2 series with Lambda PrO2 combustion technology regulates the oxygen level, automatically adjusting burner operation at the specific input rate. This combined with the electronic elevation setting in the boiler software allows the boiler to operate at altitudes of up to 10,000 ft. (3,000 m) without input derate.

Technical Data *(continued)*

Boiler Model	CI2	399	500	750	1000	1500	2000
Boiler Electric Power Consumption without pumps or accessories (Watts)							
Maximum Input		352	475	492	666	1064	1267
Minimum Input		54	54	74	79	103	134
Standby		17	17	20	20	70	70
Boiler Connections							
Boiler supply and return (BS), (BR) (NPT male thread)	in.	2	2				
	mm	50	50				
Boiler supply and return (BS), (BR) (ANSI flanges)	in.			2½	2½	4	4
	mm			65	65	100	100
Safety supply	in.	1¼	1¼	1¼	1¼	1¼	1¼
Boiler drain	in.	1½	1½	1½	1½	1½	1½
Condensate drain (barbed fitting)	in.	¾	¾	¾	¾	¾	¾
Gas connection	in.	1½	1½	1½	1½	2	2
Boiler flue collar							
Internal diameter	in.	4	4	6	6	6	8
	mm	104.2	104.2	155	155	155	205.2
Combustion Air Internal diameter (with combustion air intake kit	in.	4	4	6	6	6	8
	mm	104.2	104.2	155	155	155	205.2
Flue Gas Values							
Temperature (at a return temperature of 86°F (30°C)							
at rated input	°F	97	104	97	100	108	108
	°C	36	40	36	48	42	42
at partial load	°F	88	88	91	93	93	93
	°C	31	31	33	34	34	34
Temperature (at a return temperature of 140°F (60°C)							
at rated input	°F	145	149	145	149	154	154
	°C	63	65	63	65	68	68
Mass flow rate (of flue gas)							
at rated input	lbs/h	359	452	675	899	1351	1799
	kg/h	163	205	306	408	613	816
at partial load	lbs/h	108	136	202	270	405	540
	kg/h	49	62	92	122	184	245
Max. Condensate Flow Rate for NG and LPG	USG/h	4	5	7	10	15	19
	L/h	14.6	18.4	27.5	36.6	55.0	73.3
Pressure at boiler flue outlet (at rated input	pa (max.)	600	600	600	600	600	600
	"w.c. (max.)	2.4	2.4	2.4	2.4	2.4	2.4
Standby Loss							
At boiler water temperature 158°F (70°C) [room temperature 68°F (20°C)]	BTU/h	2870	2870	2930	2930	4590	4590
	W	841	841	858	858	1345	1345
	%	0.8	0.7	0.4	0.3	0.3	0.3
NOx @3% O_2 (NG) *2		< 20 ppm					

*2 The Vitocrossal 200 CI2 boilers are certified to the requirements of South Coast Air Quality Management District (SCAQMD) Rule 1146.2, Bay Area Air Quality Management District (BAAQMD) Regulation 9 Rule 6.

Lighting and Operating Instructions

FOR YOUR SAFETY READ BEFORE OPERATING

W A R N I N G: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.

B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
WHAT TO DO IF YOU SMELL GAS
- **Do not try to light any appliance.**
- **Do not touch any electric switch; do not use any phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

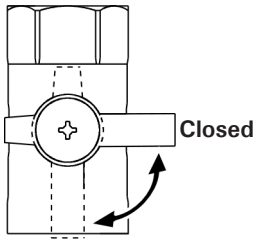
C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

1. **STOP! Read the safety information above on this label.**
2. **Set thermostat or other operating control to lowest setting.**
3. **Turn off all electric power to the applian ce.**
4. **This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.**

Manual gas shutoff



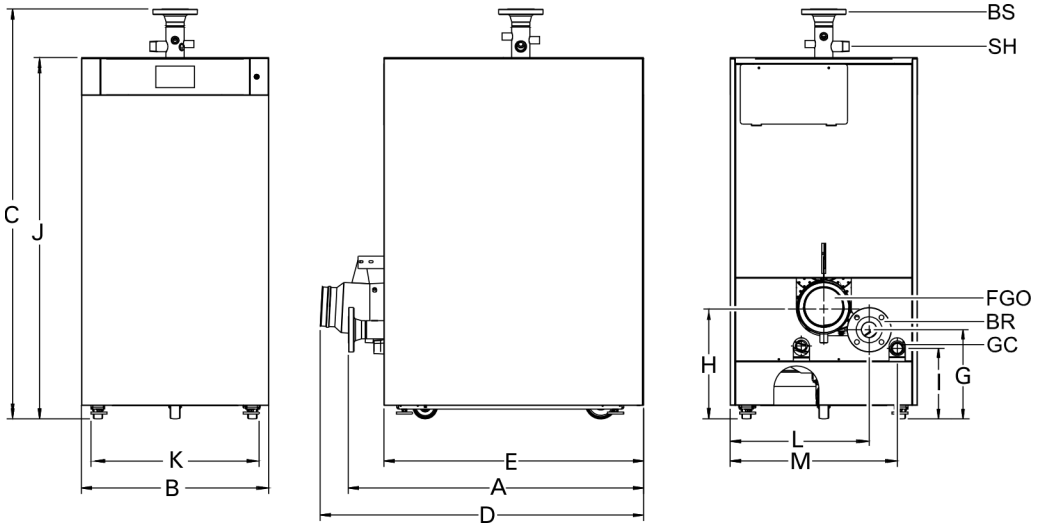
5. **Close main gas shut-off valve.**
6. **Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.**
7. **Open main gas shut-off valve.**
8. **Turn on all electric power to the appliance.**
9. **Set thermostat or other operating control to desired setting.**
10. **If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.**

TO TURN OFF GAS TO APPLIANCE

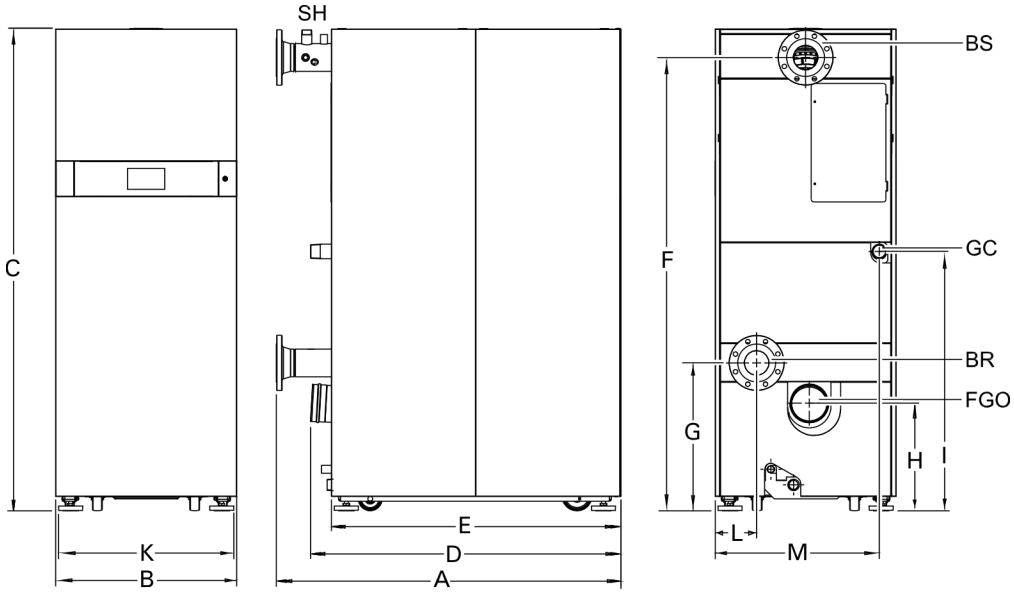
1. **Set thermostat or other operating control to lowest setting.**
2. **Turn off all electric power to the appliance if service is to be performed.**
3. **Close main gas shut-off valve.**

Boiler Dimensions

CI2 399, 500, 750 and 1000



CI2 1500 and 2000



Dimensions

Boiler Model		399/500	750/1000	1500/2000
A	in. (mm)	35¾ (909)	46½ (1183)	56¼ (1428)
B	in. (mm)	29½ (750)	29½ (750)	29½ (750)
C*	in. (mm)	64½ (1640)	64½ (1640)	78¾ (1998)
D	in. (mm)	39 (992)	47¼ (1200)	51 (1297) **1500** 51 (1295) **2000**
E	in. (mm)	32 (812)	41 (1040)	47¼ (1200)
F	in. (mm)	--	--	74 (1875)
G	in. (mm)	14½ (366)	14 (358)	24 (612)
H	in. (mm)	18 (457)	17¼ (444)	15¾ (398) **1500** 15 (383) **2000**
I	in. (mm)	11 (283)	11 (283)	42¼ (1073)
J	in. (mm)	57 (1452)	57 (1452)	--
K	in. (mm)	26½ (674)	26½ (674)	28½ (726)
L	in. (mm)	22 (557)	22 (557)	6¾ (172)
M	n. (mm)	26½ (670)	26½ (670)	26¾ (680)

Note: dimensional tolerance of ± ¼ in. (± 5 mm)

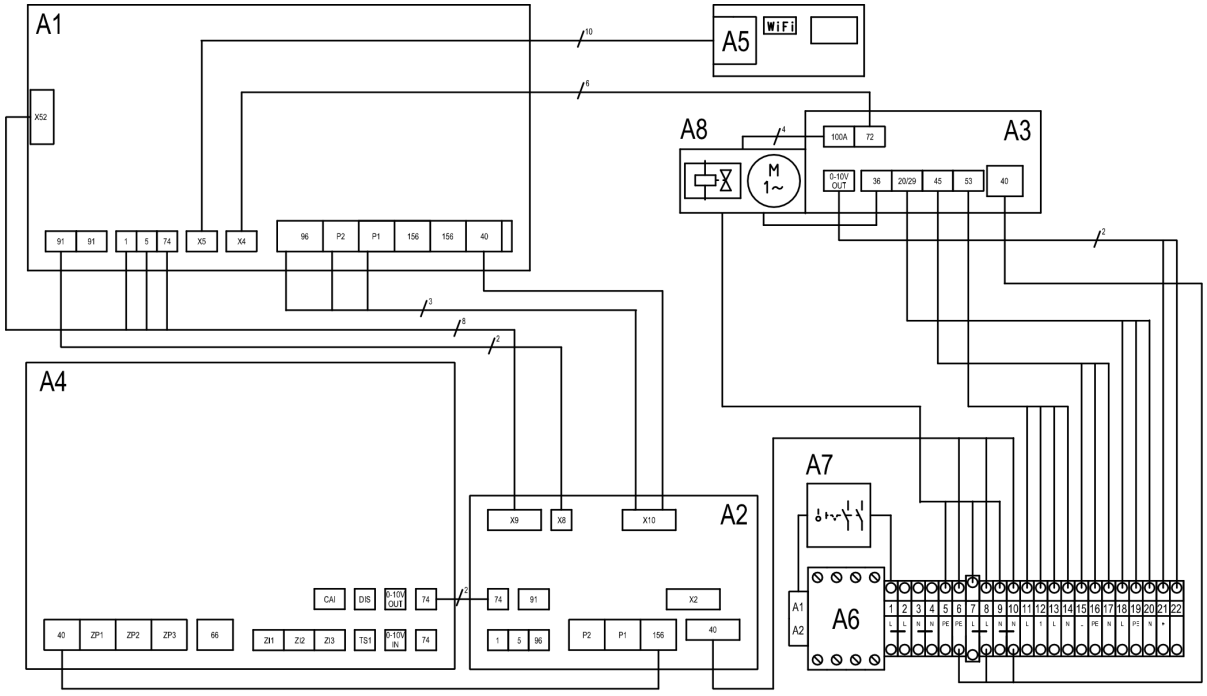
Legend

SH Safety Header
BS Boiler Supply
GC Gas Connection
BR Boiler Return
FGO Flue Gas Outlet (vent pipe connection)

* Height to bottom of the casters

Boiler Connection Diagram

Overview 399 to 1000 MBTU

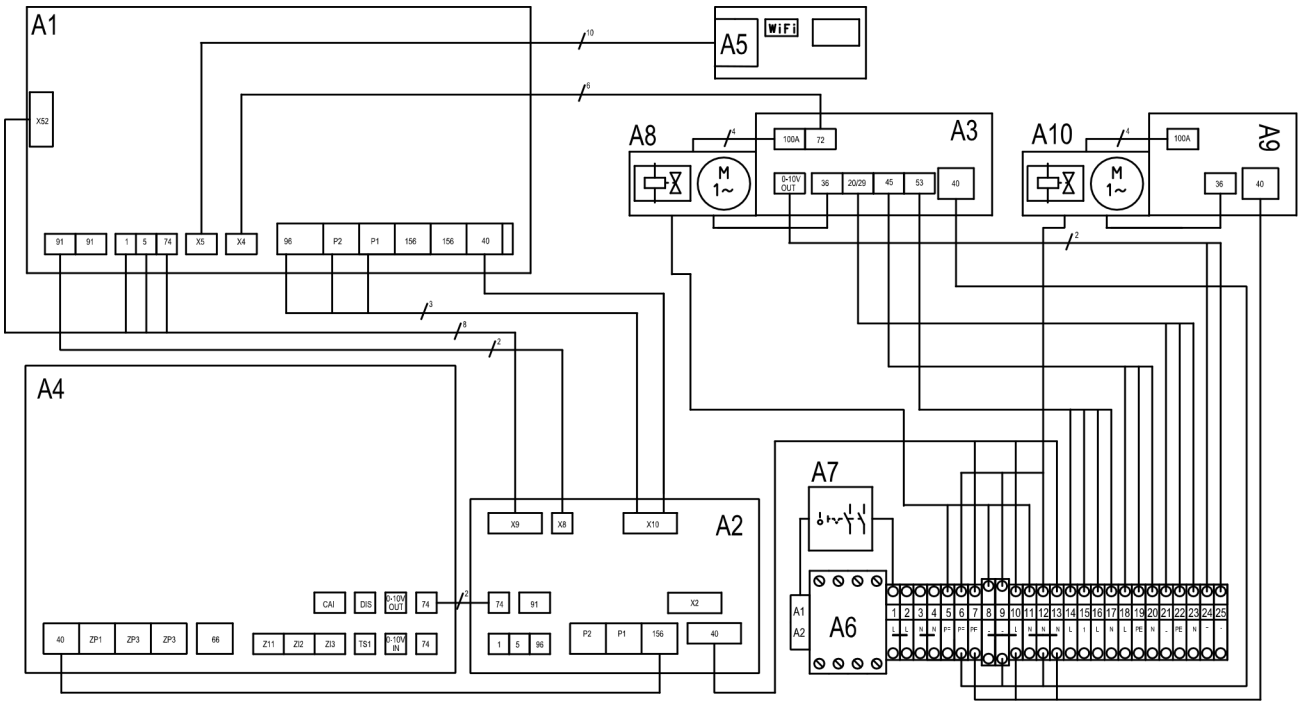


Legend

A1 HMU heat management unit
A2 Wiring panel
A3 BCU burner control
A4 MZIO electronics module
A5 HMI programming unit with communication module (TCU 200)
A6 Terminal block
A7 ON/OFF switch
A8 Fan motor and gas solenoid valve

Boiler Connection Diagram *(continued)*

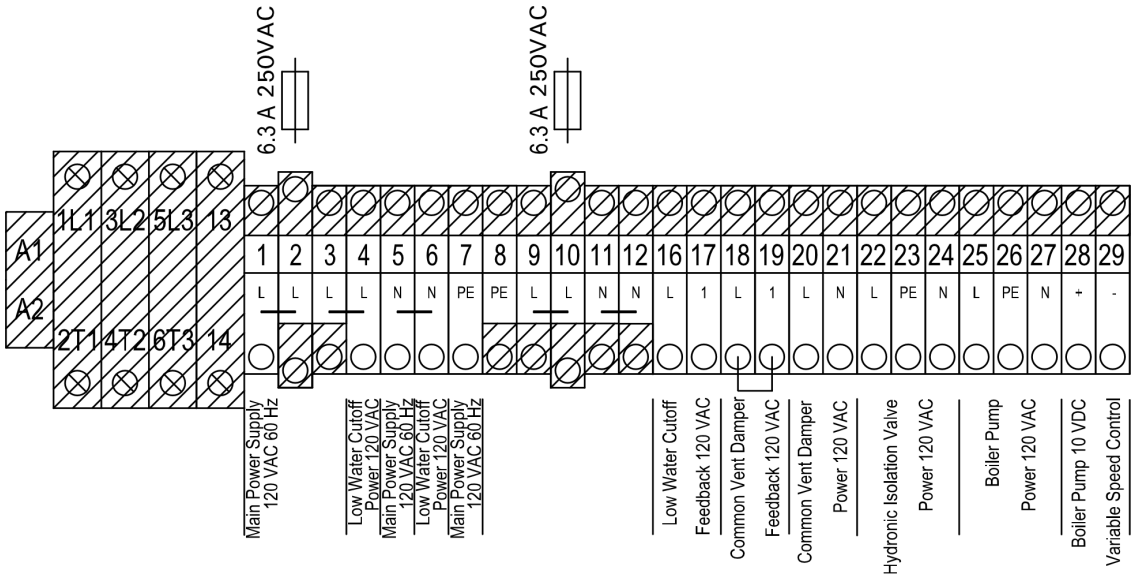
Overview 1500 and 2000 MBTU



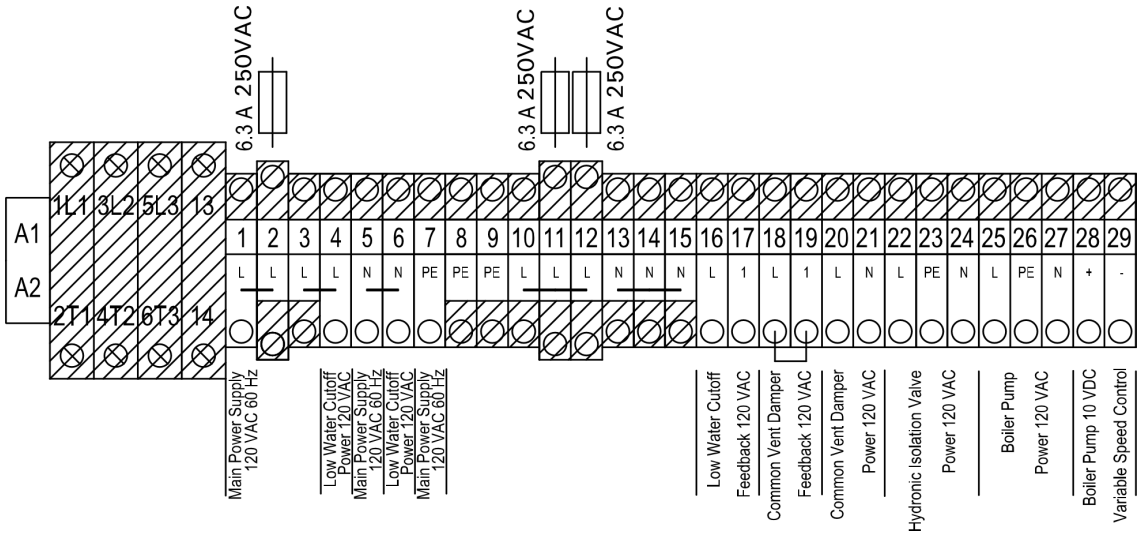
Legend

A1 HMU heat management unit
A2 Wiring panel
A3 BCU burner control
A4 MZIO electronics module
A5 HMI programming unit with communication module (TCU 200)
A6 Terminal block
A7 ON/OFF switch
A8 Fan motor and gas solenoid valve
A9 BCU burner control 2
A10 Fan motor and gas solenoid valve 2

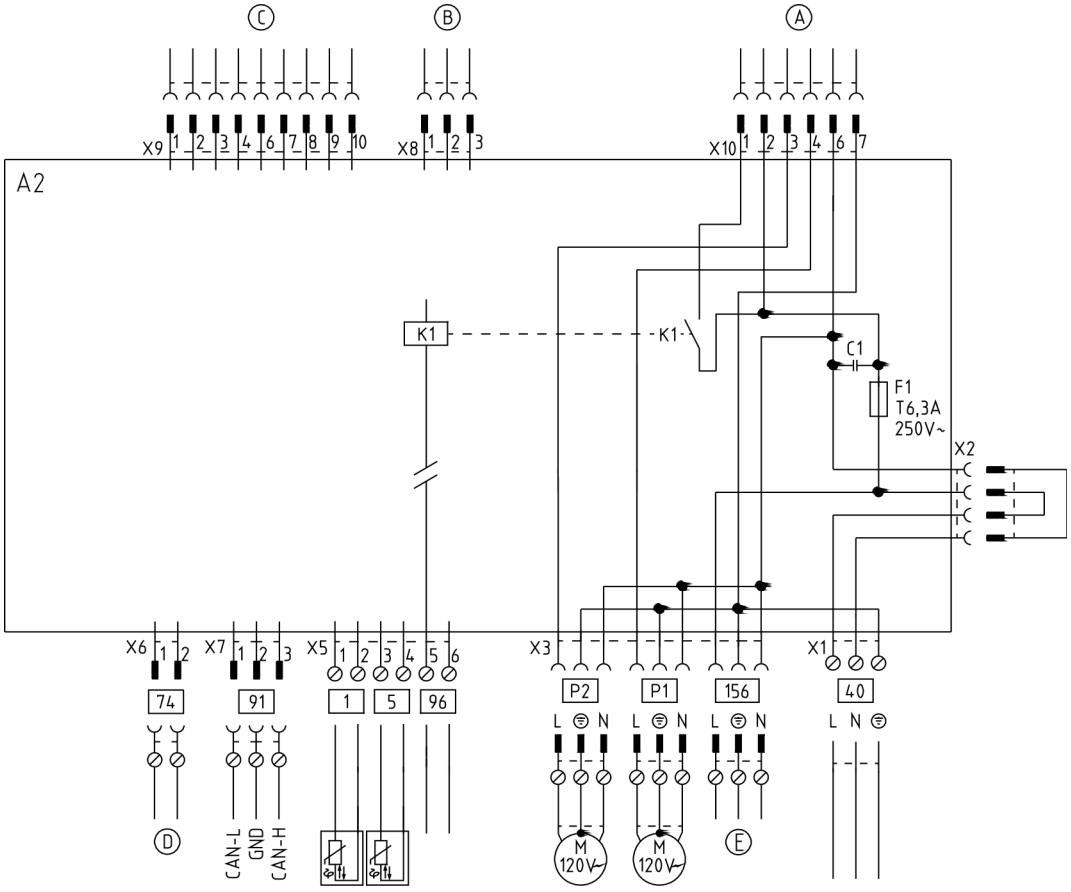
Terminal block Vitocrossal CI2, 399 to 1000



Terminal block Vitocrossal CI2, 1500 and 2000



Wiring Panel



Legend

A2 Wiring panel

40 Power supply 120VAC 60 Hz

156 Output 120VAC for plug 40 MZIO

P1 Output 120 for:
DHW pump downstream of low loss header
If no DHW pump is installed: Heating circuit pump for heating circuit without mixing valve A1 in conjunction with low loss header and heating circuit with mixing valve or DHW recirculation pump

P2 Output 120 for:
Heating circuit pump for heating circuit without mixing valve A1 in conjunction with low loss header and heating circuit with mixing valve or DHW recirculation pump

96 Function of plug 96

5 Tank temperature sensor or DHW temperature switch (such as an Aquastat)

1 Outside temperature sensor

CAN connection

74 PlusBus

F1 Fuse 6.3 A (slow) 250V

Ⓐ 120V connection, HMU heat management unit

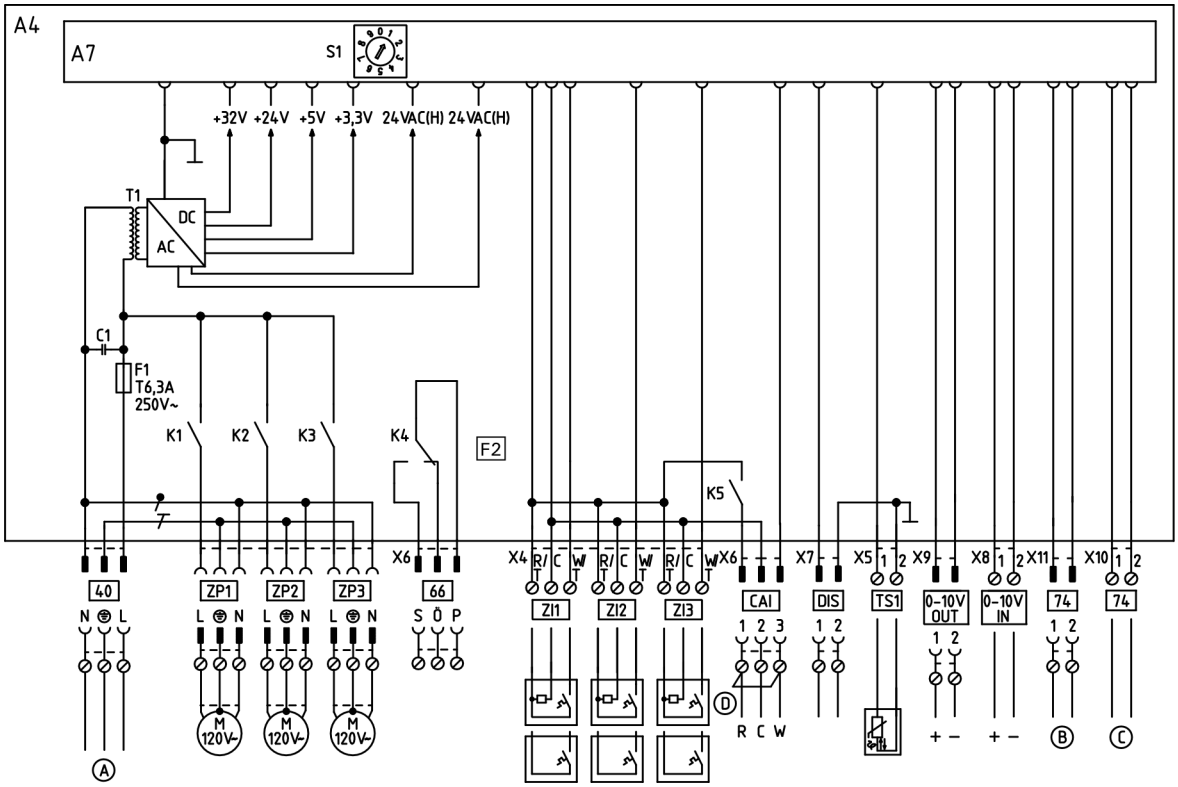
Ⓑ CAN plug 91

Ⓒ HMU heat management unit extra low voltage connection

Ⓓ PlusBus MZIO plug 74

Ⓔ Power supply MZIO plug 40

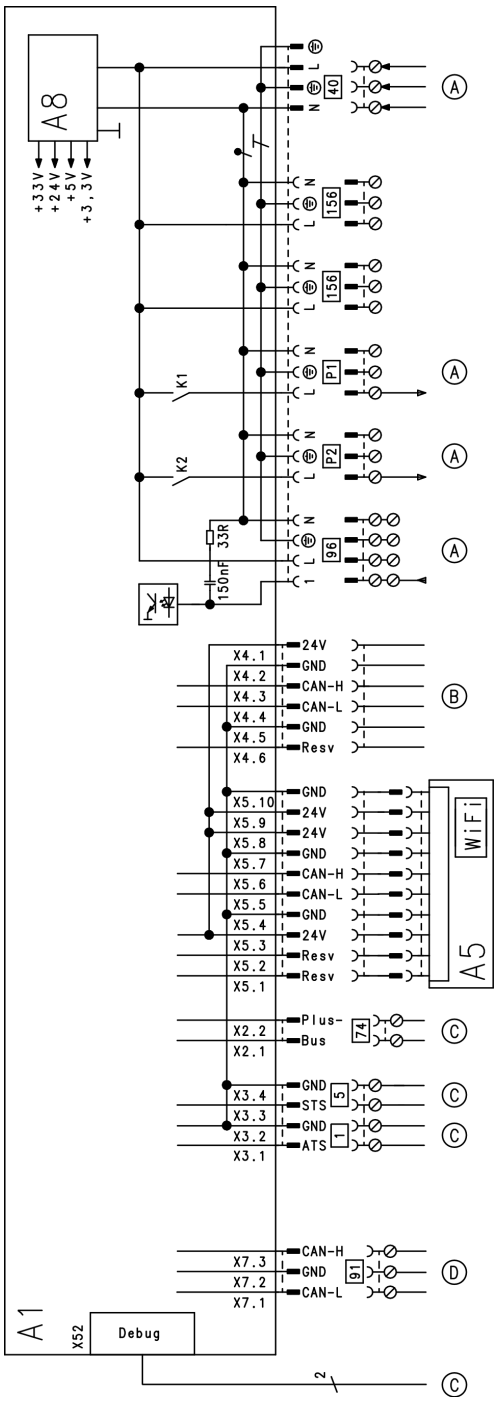
MZIO



Legend

A4	MZIO electronics module
A7	PCB
40	Power supply 120VAC 60 Hz
ZP1	Pump zone 1
ZP2	Pump zone 2
ZP3	Pump zone 3
66	Potential-free changeover contact
Ⓐ	Power supply, electronics module wiring panel plug 156
Ⓑ	PlusBus electronics module, wiring panel plug 74
Ⓒ	PlusBus accessories
Ⓓ	Jumper (remove when making this connection)
ZI1	Zone 1 or external safety device 1
ZI2	Zone 2 or external safety device 2
ZI3	Zone 3 or external safety device 3
CAI	Combustion air supply (combustion air interlock)
DIS	Digital input (no function)
TS1	Low loss header sensor
74	PlusBus
F1	Fuse 6.3 A (slow) 250V
F2	Fuse 1 A (slow) 250V
0 - 10V OUT	Output 0-10V
0 - 10V IN	Input 0-10V
S1	Rotary switch

HMU Heat Management Unit



Legend

A1 HMU heat management unit
A5 HMI programming unit with communication module (wireless module)
A8 Power supply unit
40 Power supply 120VAC 60 Hz
156 No function
P1 Output 120V 60 Hz
P2 Output 120V 60 Hz
Ⓑ Burner control unit 72
Ⓒ Electronics module wiring panel X9
Ⓓ Electronics module wiring panel X8
1 Outdoor temperature sensor
5 Tank temperature sensor
91 CAN connection accessories
74 PlusBus connection for accessories
K1 Relay
Ⓐ Electronics module wiring panel X10

Parts Lists

Model No.	**Serial No.**
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□

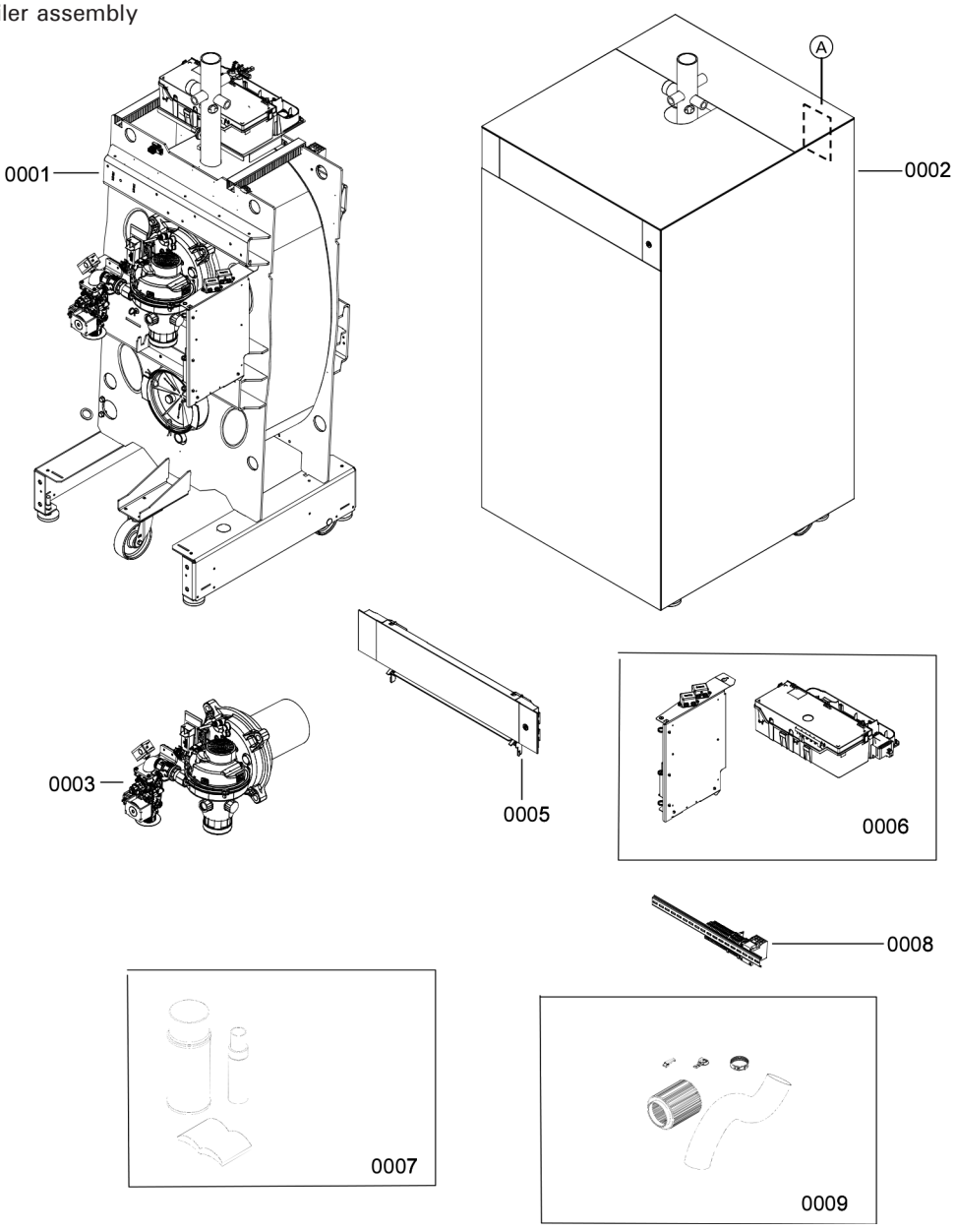
Ordering Replacement Parts:

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

Parts for CI2 399, 500, 750 and 1000

0001 Vitocrossal 200 CI2 boiler assembly
0002 Thermal insulation
0003 Burner assembly
0005 HMI
0006 Control boards
0007 Miscellaneous
0008 DIN rail
0009 Combustion air accessories

Ⓐ Rating Plate



Parts Lists *(continued)*

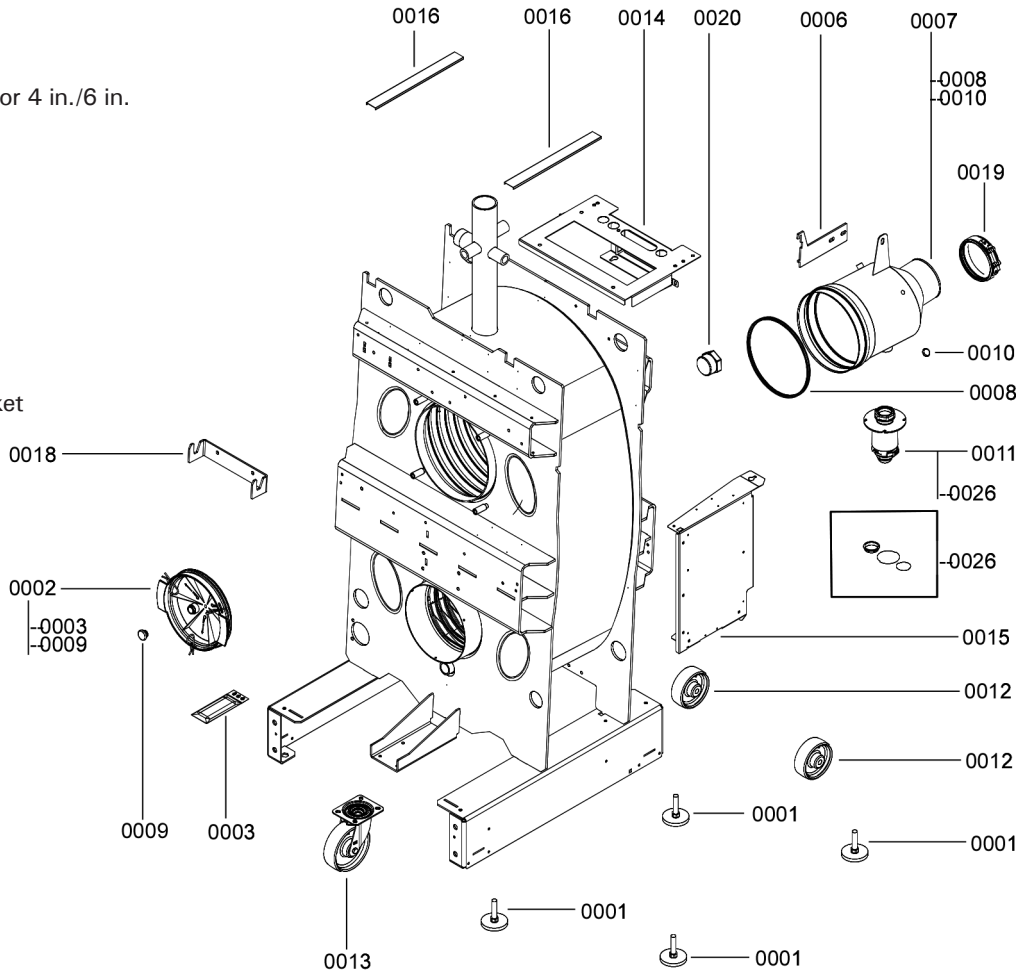
Model No.	Serial No.
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□

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 Boiler Assembly

0001 Levelling bolt
0002 Inspection cover
0003 Spring clip
0006 Retaining plate
0007 Vent connecting adaptor 4 in./6 in.
0008 Dual lip gasket DN206
0009 Plug
0010 Test port, plug
0011 Condensate siphon
0012 Castor wheel
0013 Swivel castor wheel
0014 Control console
0015 Console burner control
0016 Wiring duct
0018 Burner hanger bracket
0019 Locking band c/w gasket
0020 Plug NPT 1 1/2
0021 Gas line
0022 Gas flex line G1 1/4 in. - G1 1/2 in.
0026 Siphon-gasket



Parts Lists *(continued)*

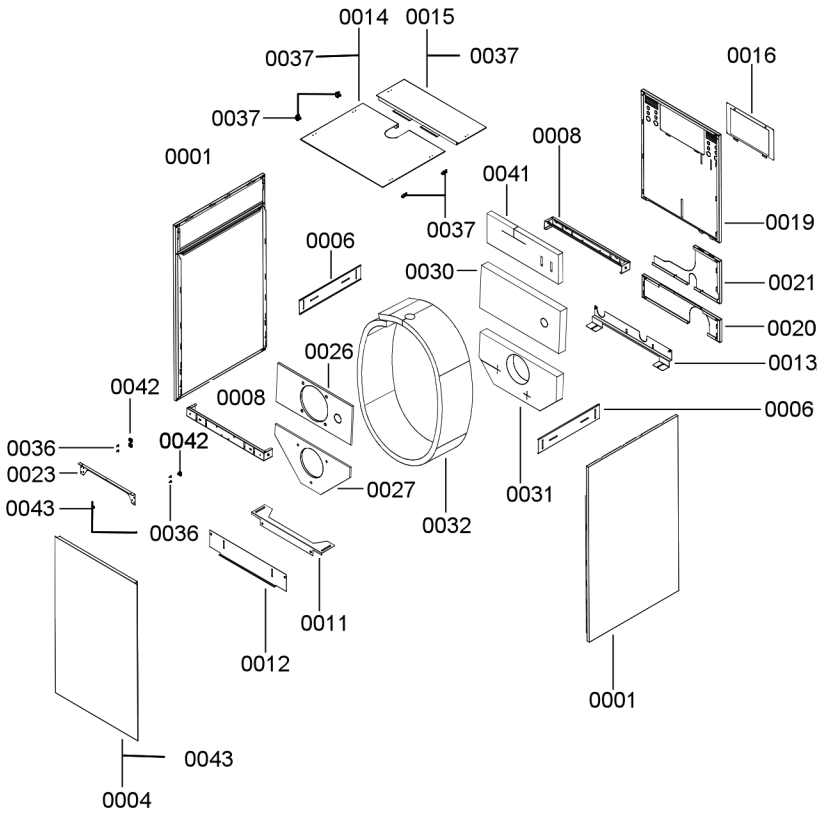
Model No.	Serial No.
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□

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 Thermal insulation

0001 Side panel
0004 Front panel bottom
0006 Cross brace
0007 Cross brace bottom
0008 Front supporting bracket
0011 Connection angle
0012 Bottom mounting bracket
0013 Rear bottom mounting bracket
0014 Upper front panel
0015 Upper rear panel
0016 Cover with connections diagram
0019 Rear upper panel
0020 Rear low panel
0021 Rear panel
0023 HMI Bracket
0026 Insulation, front center
0027 Insulation front lower
0030 Insulation, rear mid
0031 Insulation, rear lower
0032 Insulation, jacket
0035 Accessory parts
0036 Screw EJOT Delta PT 50x14
0037 Top panel sliders
0041 Insulation
0042 Cable adjustable clip
0043 Center clip



Parts Lists *(continued)*

Model No.	**Serial No.**
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

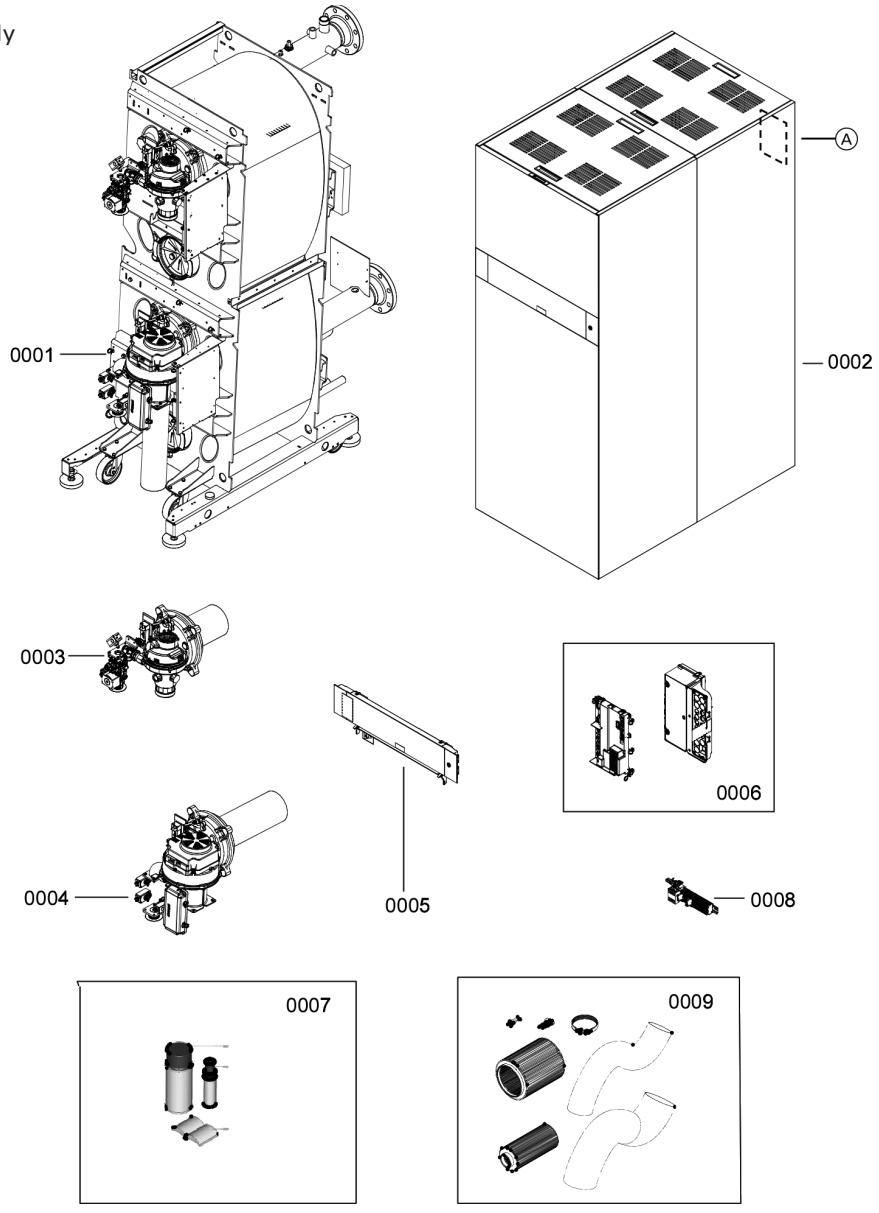
Ordering Replacement Parts:

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

Parts for CI2 1500 and 2000 Boilers

0001 Vitocrossal 200 CI2 boiler assembly
0002 Thermal insulation
0003 Burner 399 and 500 MBH
0004 Burner 750 and 1000 MBH
0005 HMI
0006 Control boards
0007 Miscellaneous
0008 DIN rail
0009 Combustion air accessories

Ⓐ Rating Plate



Parts Lists *(continued)*

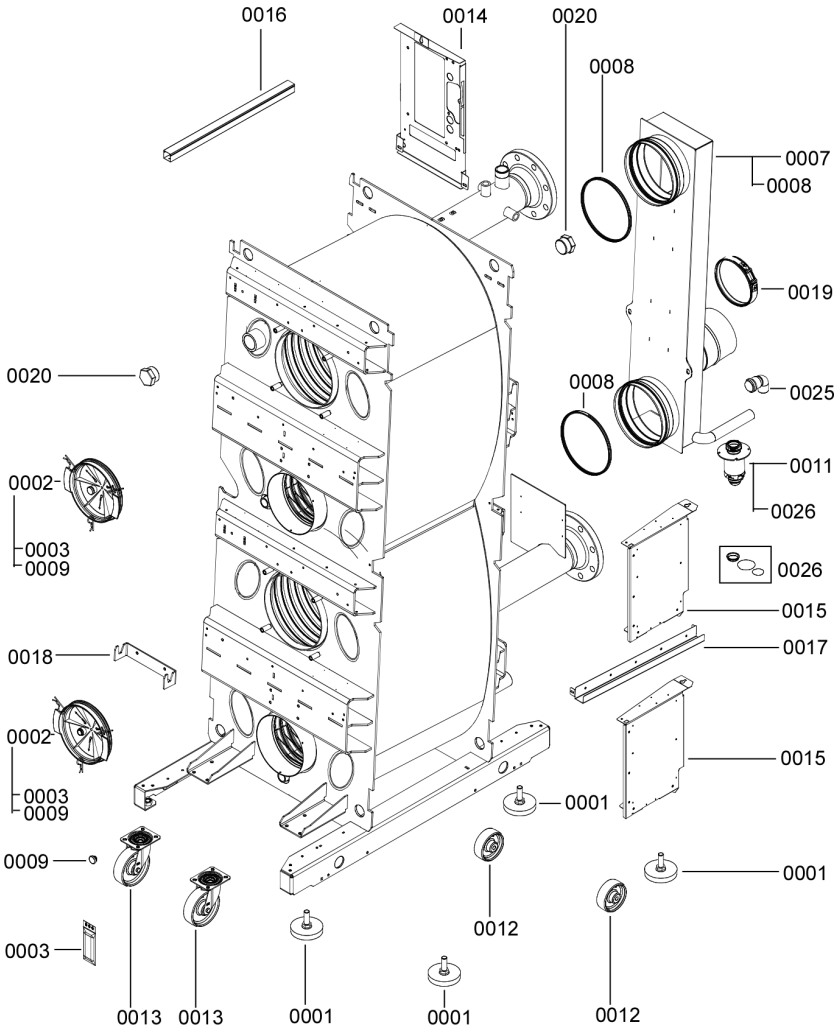
Model No.	**Serial No.**
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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 Boiler Assembly

0001 Levelling bolt
0002 Inspection cover
0003 Spring clip
0007 Vent connecting adaptor 4 in./6 in.
0008 Dual lip gasket DN206
0009 Plug
0010 Test port, plug
0011 Condensate siphon
0012 Castor wheel
0013 Swivel castor wheel
0014 Control console
0015 Console burner control
0016 Wiring duct
0017 Wiring duct
0018 Burner hanger bracket
0019 Locking band c/w gasket
0020 Plug NPT 1 1/2
0021 Gas line
0022 Gas flex line G1 1/4 in.- G1 1/2 in.
0023 Gas flex line G1 1/2 in. 1.5-2.0
0025 Elbow 87° for siphon
0026 Siphon-gasket



Parts Lists *(continued)*

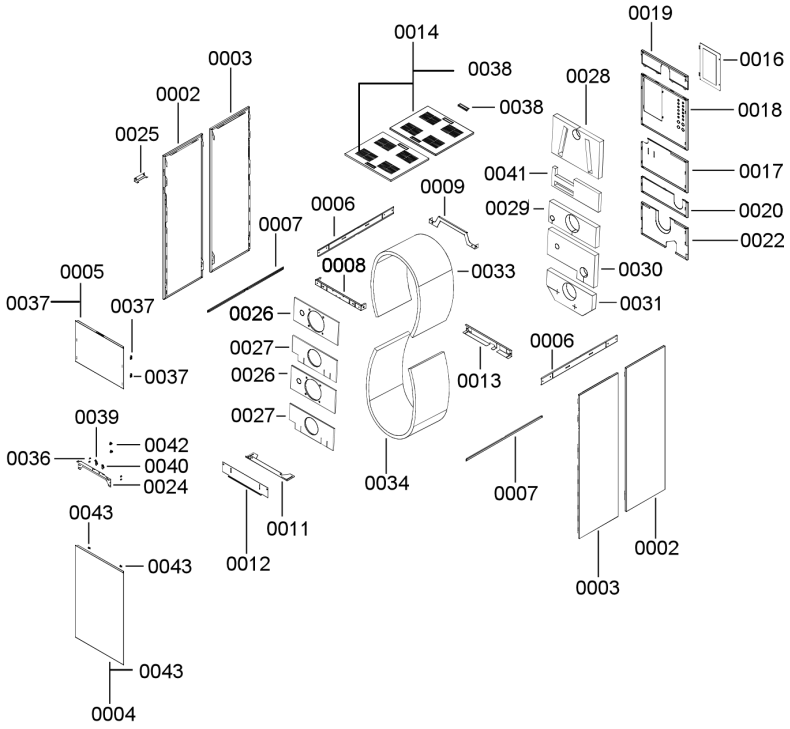
Model No.	**Serial No.**
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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 thermal insulation

0002 Side panel (Right front, left rear)
0003 Side panel (left front, right rear)
0004 Front panel bottom
0005 Front panel top
0006 Cross brace
0007 Cross brace bottom
0008 Front supporting bracket
0009 Rear supporting bracket
0011 Connection angle
0012 Bottom mounting bracket
0013 Rear bottom mounting bracket
0014 Upper front panel
0016 Cover with connections diagram
0017 Rear gas panel
0018 Rear middle panel
0019 Rear upper panel
0020 Rear low panel
0022 Rear low panel
0024 Control back bracket
0025 Control bracket
0026 Insulation, front center
0027 Insulation front lower
0028 Insulation rear upper
0029 Insulation, rear upper
0030 Insulation, rear mid
0031 Insulation, rear lower
0033 Insulation jacket upper
0034 Insulation jacket lower
0035 Accessory parts
0036 Screw EJOT Delta PT 50x14
0038 Recessed handle
0039 Top panel sliders
0040 Stopper
0041 Insulation
0042 Cable adjustable clip
0043 Center clip



Parts Lists *(continued)*

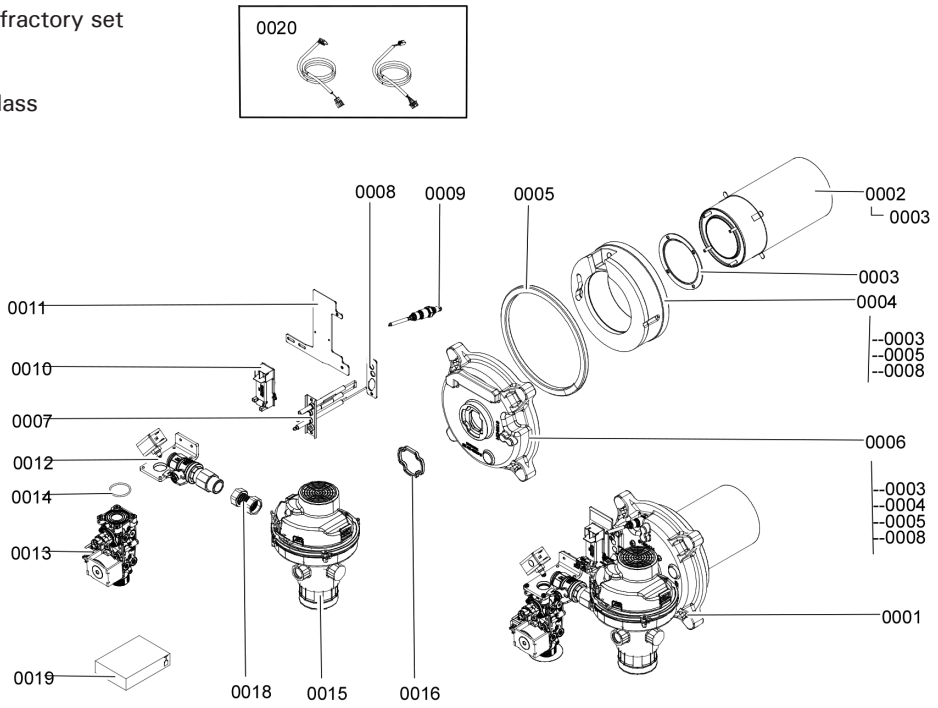
Model No.	Serial No.
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□

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, 399 and 500 MBH

0001 Burner Assembly
0002 Burner tube
0003 Gasket, burner tube
0004 Combustion chamber door refractory set
0005 Fiber glass gasket, rope
0006 Combustion chamber door
0007 Electrodes block with sight glass
0008 Electrodes block gasket
0009 Lambda probe
0010 Ignition transformer
0011 Ignition transformer bracket
0012 Gas manifold with shut off
0013 Gas valve
0014 O-Ring
0015 Radial fan
0016 Burner door-Fan, gasket
0018 Flex gas line
0019 Small hardware
0020 Burner cable set



Parts Lists *(continued)*

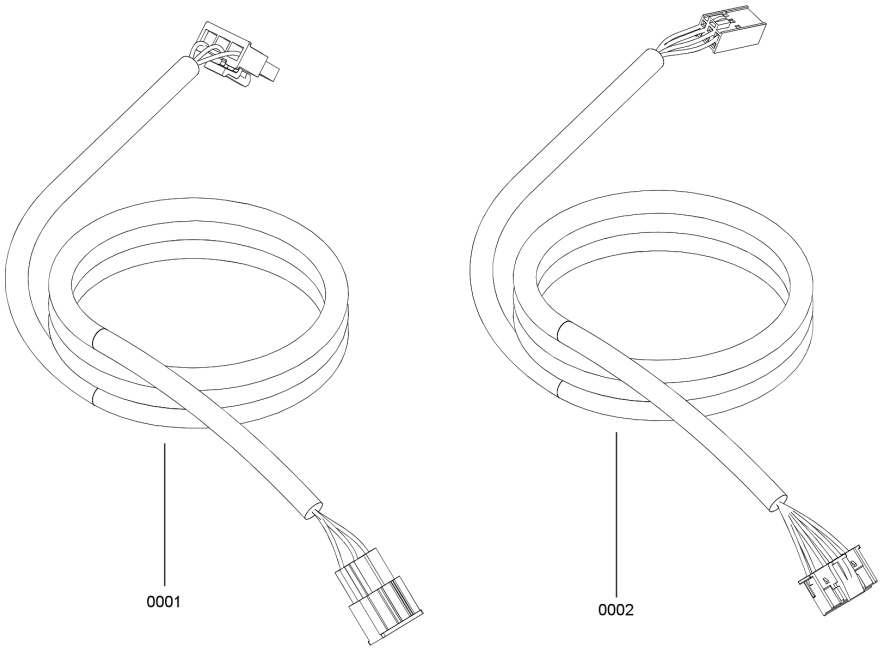
Model No.	Serial No.
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□

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 cable set, 399 and 500 MBH

0001 Radial fan harness
0002 Gas valve harness



Parts Lists *(continued)*

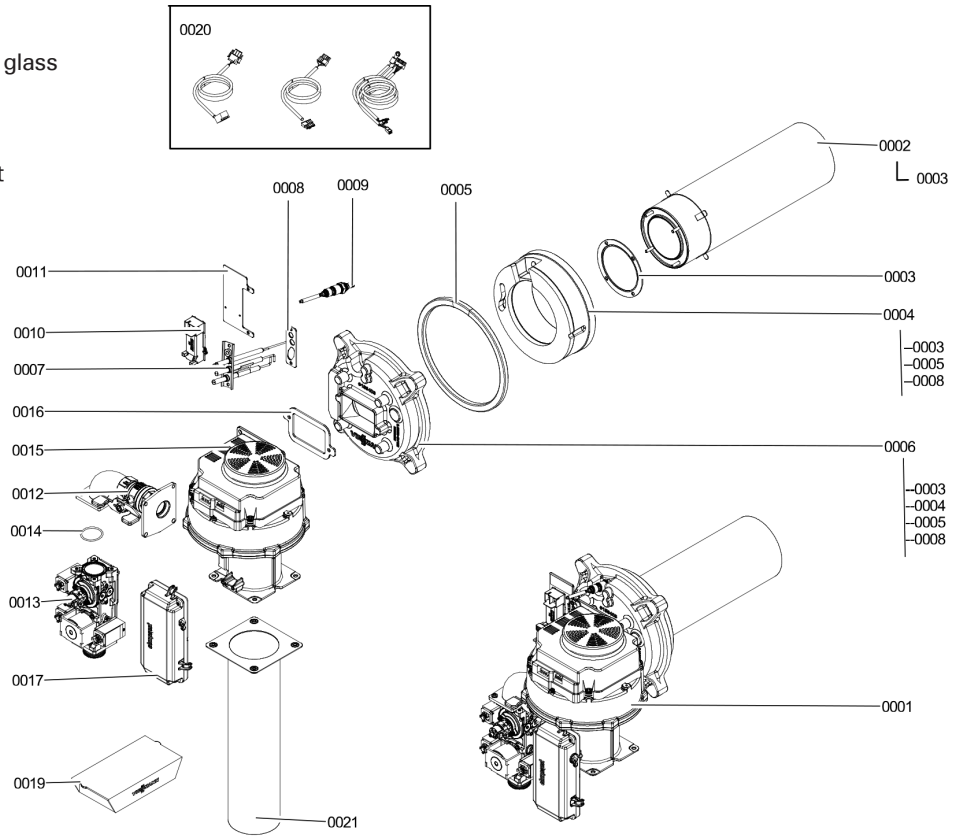
Model No.	**Serial No.**
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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, 750 and 1000 MBH

0001 Burner Assembly
0002 Burner tube
0003 Gasket, burner tube
0004 Combustion chamber door refractory set
0005 Fiber glass gasket, rope
0006 Combustion chamber door
0007 Electrodes block with sight glass
0008 Electrodes block gasket
0009 Lambda probe
0010 Ignition transformer
0011 Ignition transformer bracket
0012 Gas manifold with shut off
0013 Gas valve
0014 O-Ring
0015 Fan
0016 Burner door-Fan, gasket
0017 E-box
0019 Small hardware
0020 Burner cable set
0021 Venturi extension



Parts Lists *(continued)*

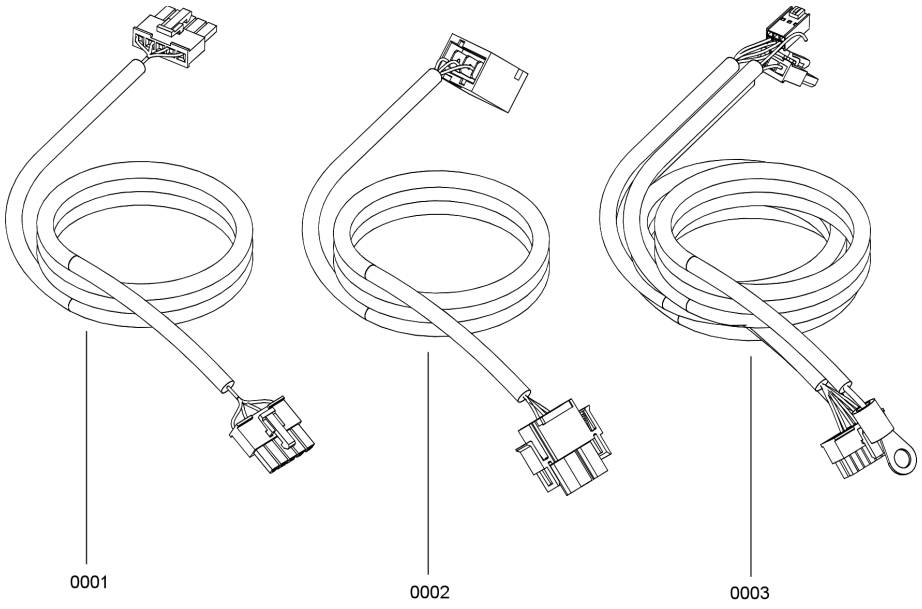
Model No.	**Serial No.**
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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 cable set 750 and 1000 MBH

0001 EBox-Radial fan control cable
0002 EBox-Radial fan power cable
0003 EBox-Gas valve harness



Parts Lists *(continued)*

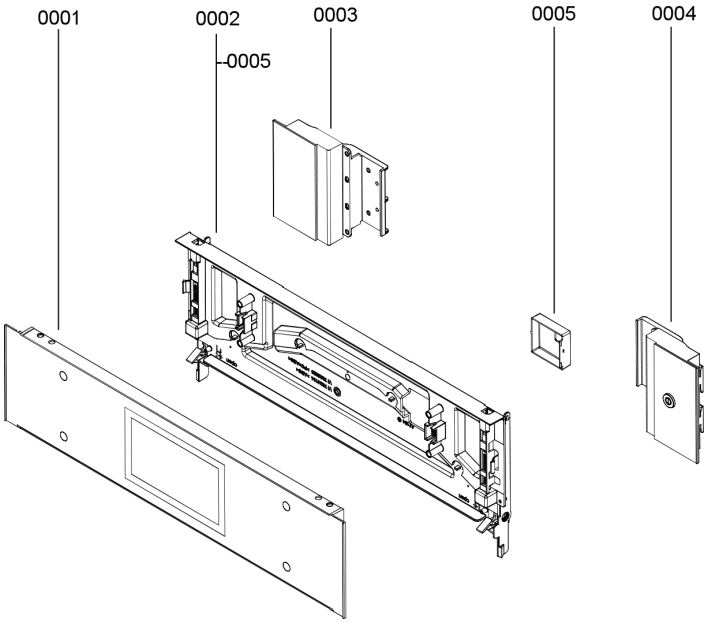
Model No.	**Serial No.**
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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 Programming unit HMI 7 in.

0001 Programming unit, interface HMI-P 7 in. 600
0002 Seal cover
0003 HMI extension 75 on the left
0004 HMI extension 75 on the right with switch
0005 Cover



Parts Lists *(continued)*

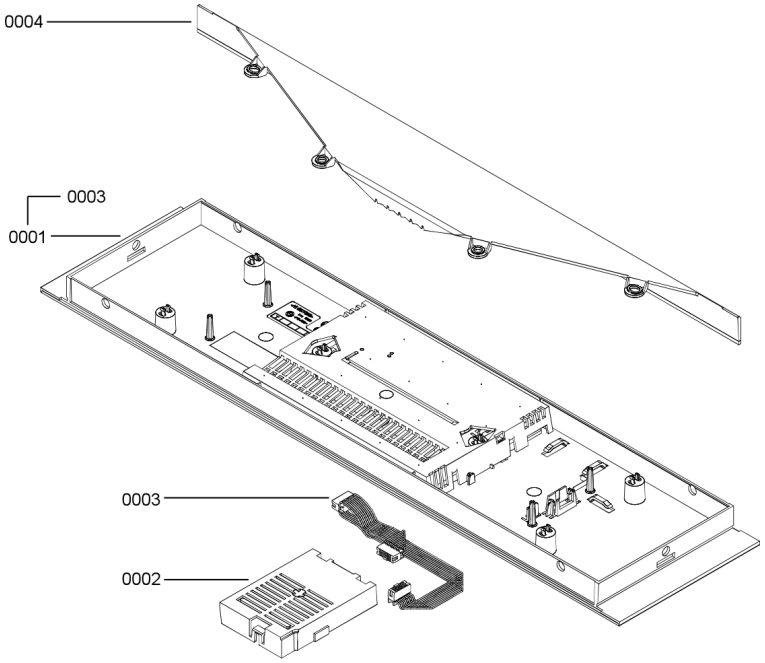
Model No.	**Serial No.**
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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 Programming unit interface HMI 7 in.

0001 Programming unit, interface HMI-P 7 in. 600
0002 Communication module
0003 Flat ribbon cable WiFi
0004 Optical fiber HMI 600



Parts Lists *(continued)*

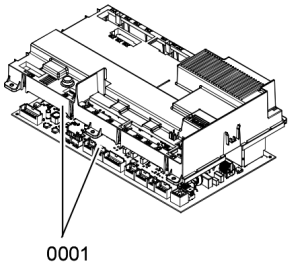
Model No.	**Serial No.**
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

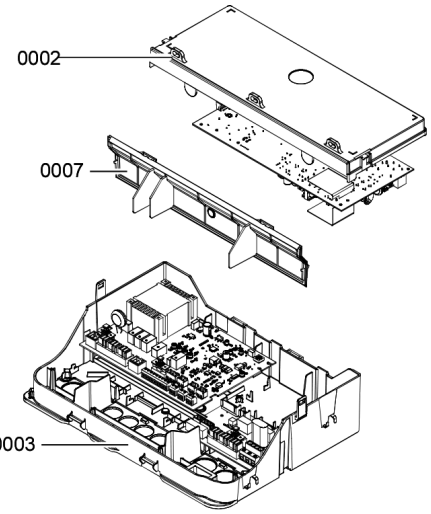
Ordering Replacement Parts:

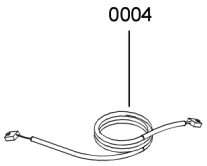
Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

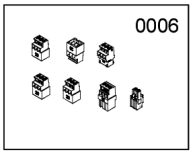
Parts for Control modules

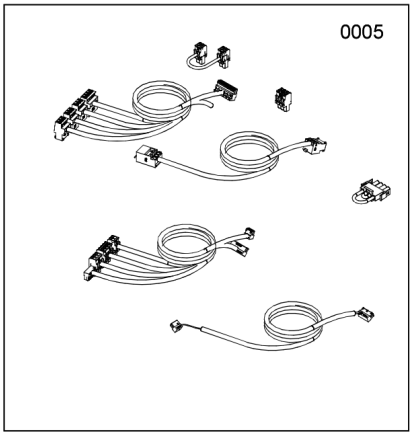
0001 Burner Control Unit BCU
0002 Heat Management Unit with Cover
0003 WP & MZIO with Cover and Sealing
0004 10 pole harness
0005 Burner control harness
0006 Accessory pack-Plugs
0007 Control partition wall











Parts Lists *(continued)*

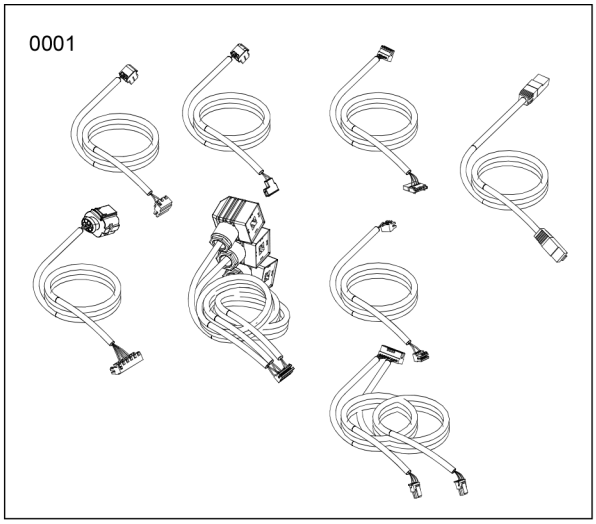
Model No.	**Serial No.**
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

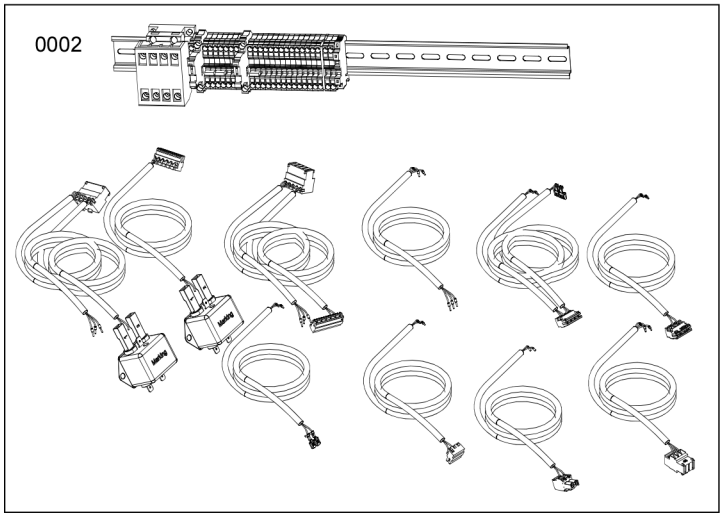
Ordering Replacement Parts:

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

Parts for Electrical harnesses

0001 Control harness
0002 DIN rail and cables





Parts Lists *(continued)*

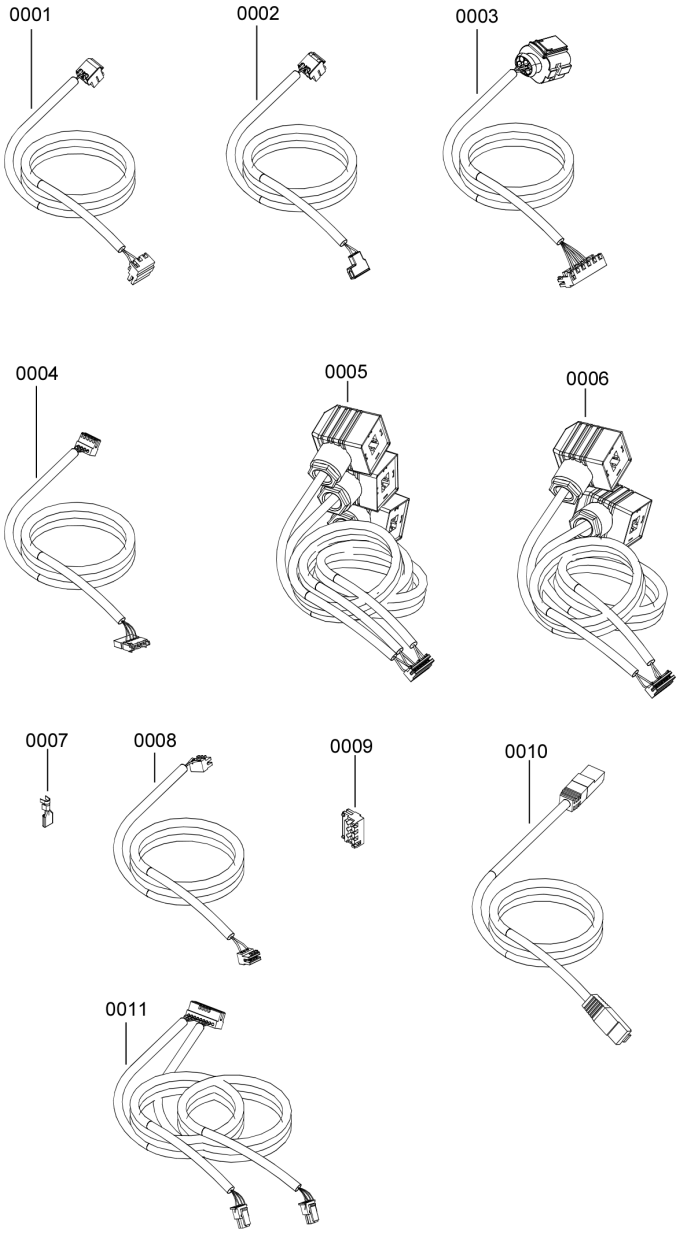
Model No.	**Serial No.**
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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 harnesses

0001 Ignition transformer cable
0002 Ionization electrode cable
0003 Oxygen sensor harness
0004 Gas-air network bus cable
0005 Gas pressure switch harness 1,2 and 3
0006 Gas pressure switch harness 1 and 3
0007 Ground wire
0008 Communication cable BCU-BCU
0009 Jumper
0010 LAN cable
0011 Boiler, flue gas temperature sensors harness



Parts Lists *(continued)*

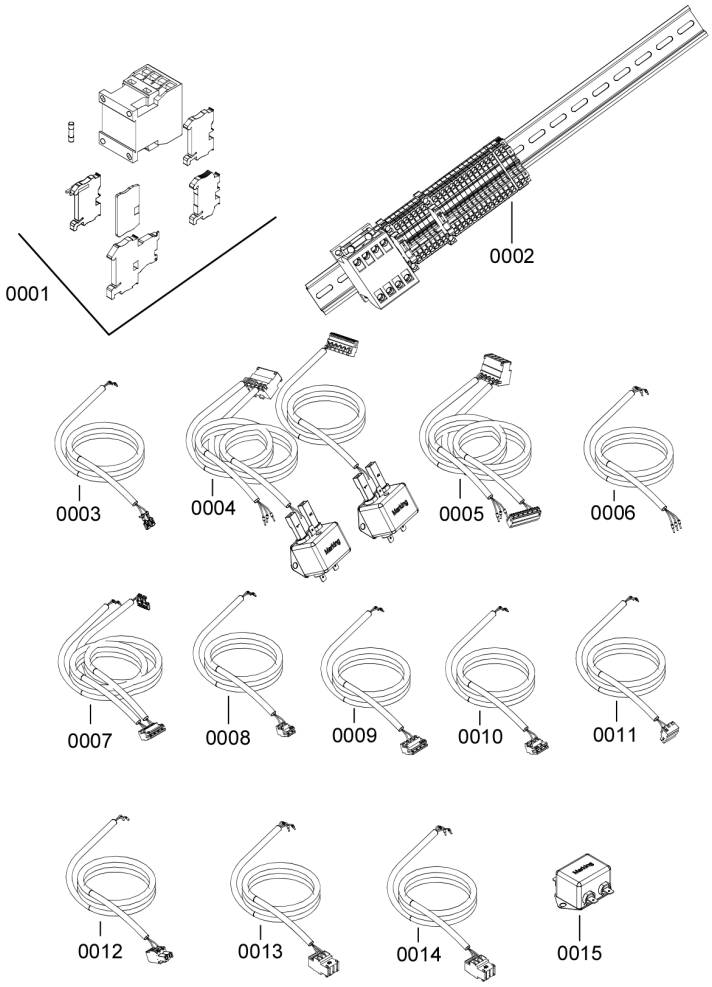
Model No.	Serial No.
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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 DIN rail and cables

0001 DIN rail terminals
0002 DIN Rail Wired
0004 Cable on/off switch
0005 Power Supply cable Brown 1.0 Burner
0006 Power Supply boiler control harness
0007 Water pressure
0008 Flue gas damper harness X3a
0009 Flue gas damper harness X3b
0010 Hydraulic valve harness
0011 Power Supply boiler pump harness
0012 Control cable
0013 Power Supply BCU1
0014 Power Supply BCU2
0015 Power Supply filter WE-CLFS Line 1.5A 300
0016 Cable low water alarm (not shown)



Parts Lists *(continued)*

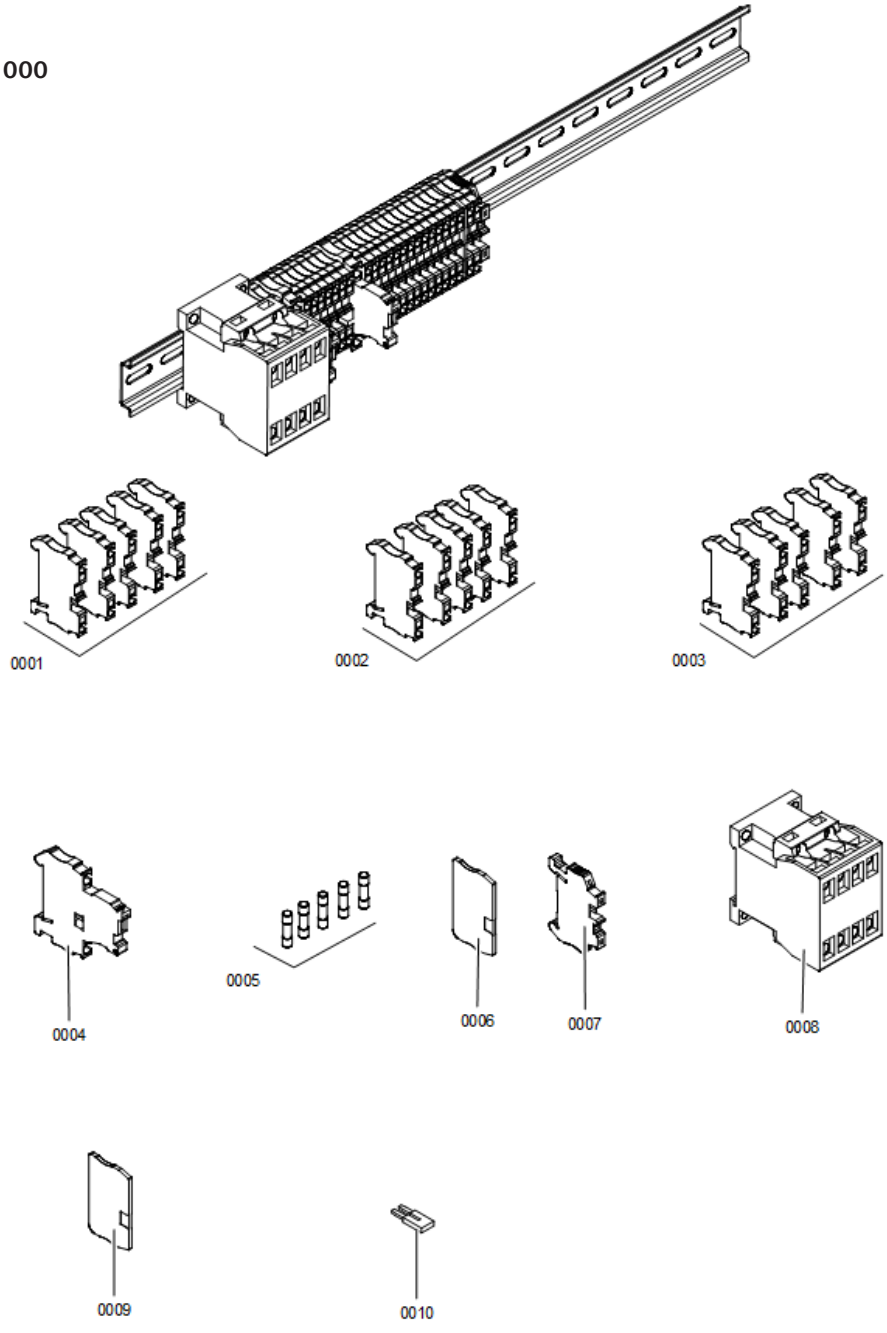
Model No.	**Serial No.**
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□

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 DIN rail 399, 500, 750 and 1000

0001 DIN Terminal
0002 DIN Terminal
0003 DIN Terminal
0004 Fuse terminal
0005 Fuses
0006 Terminal Separator
0007 End block
0008 Contactor
0009 Terminal Separator
0010 Terminal Bridge (2)



Parts Lists *(continued)*

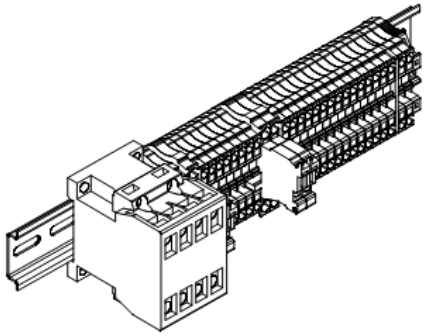
Model No.	**Serial No.**
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

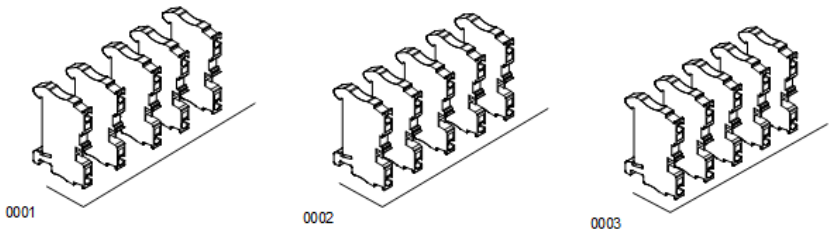
Ordering Replacement Parts:

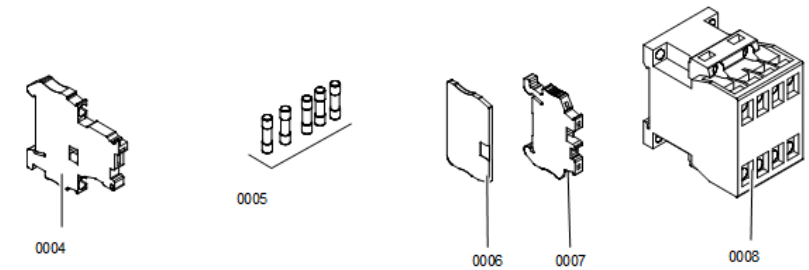
Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.
Order replacement components from your Viessmann distributor.

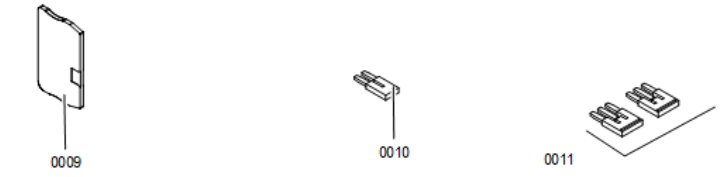
Parts for DIN rail 1500 and 2000

0001 DIN Terminal
0002 DIN Terminal
0003 DIN Terminal
0004 Fuse terminal
0005 Fuses
0006 Terminal Separator
0007 End block
0008 Contactor
0009 Terminal Separator
0010 Terminal Bridge (2)
0011 Terminal Bridge (3)









Parts Lists *(continued)*

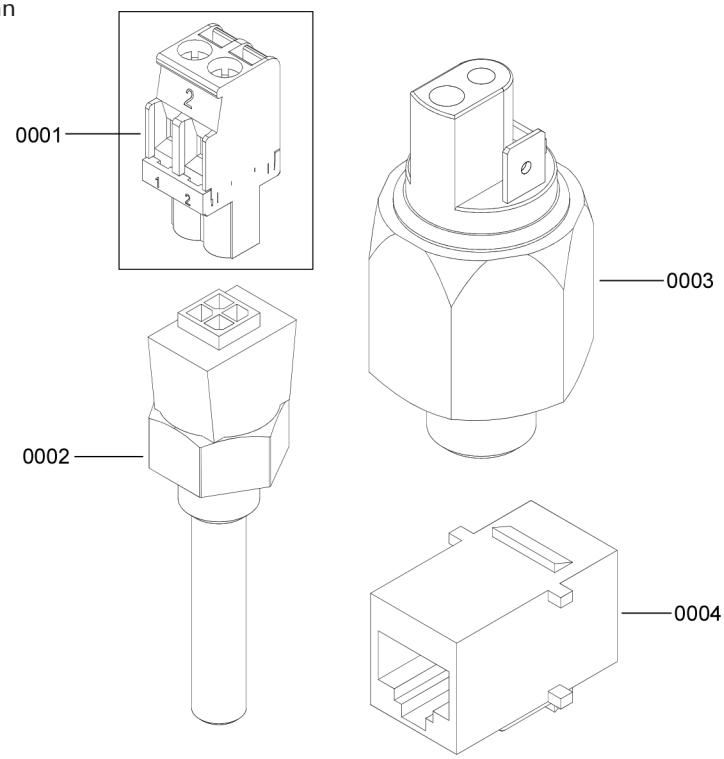
Model No.	**Serial No.**
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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 Sensors

0001 Return temperature sensor with cable
0002 Temperature sensor NTC Duplex 10K
0003 Pressure switch PSW-M4
0004 Coupling RJ45



Parts Lists *(continued)*

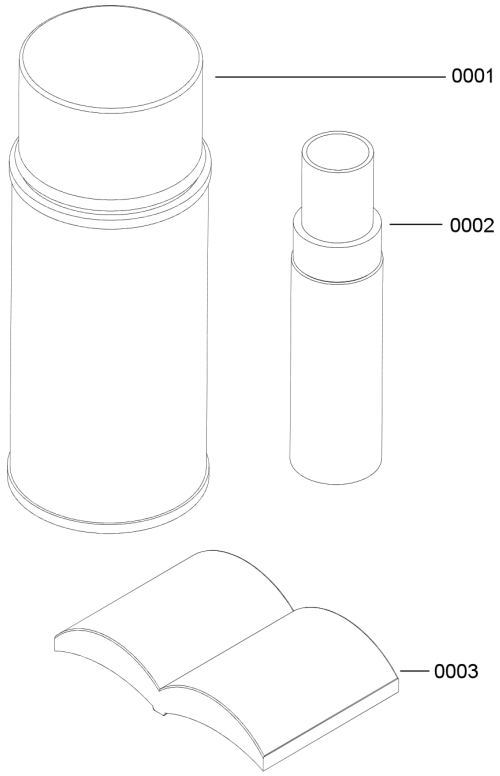
Model No.	Serial No.
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

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 Miscellaneous

0001 Spray paint, Vitographite 150 ml
0002 Touch up paint
0003 Installation and service instruction



Parts Lists *(continued)*

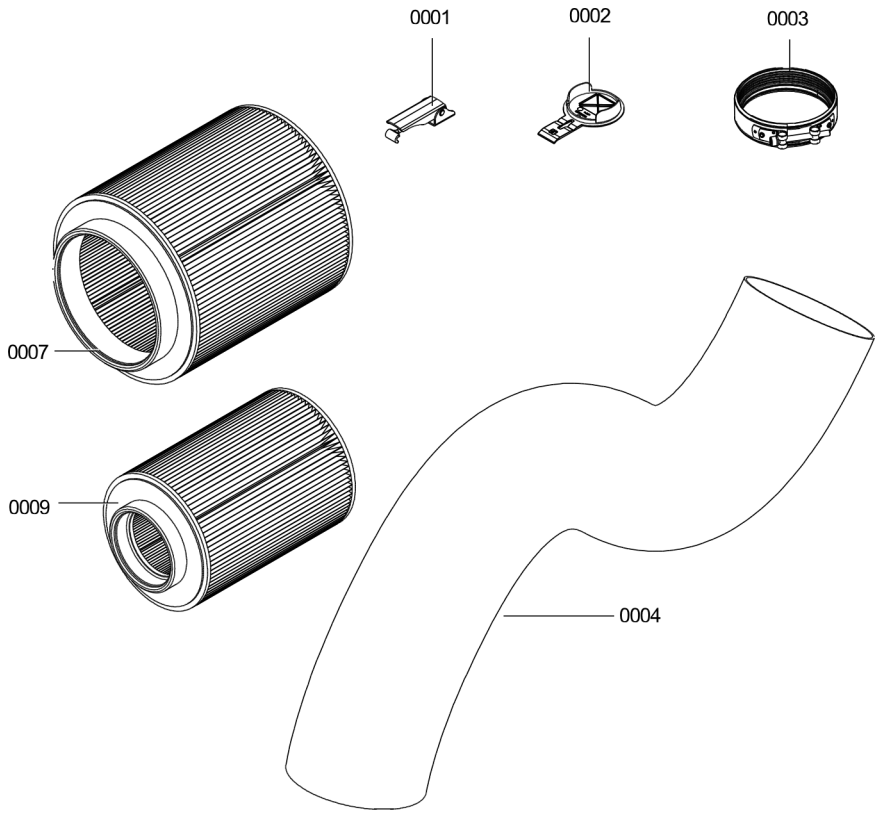
Model No.	**Serial No.**
CI2 399 Boiler	7720741□□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□□

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 Combustion air and flue connection

0001 Toggle fastener
0002 Relief damper
0003 Locking band w/clamp
0004 Spiral hose D150
0007 Air filter, filter box
0009 Air filter, burner



Parts Lists *(continued)*

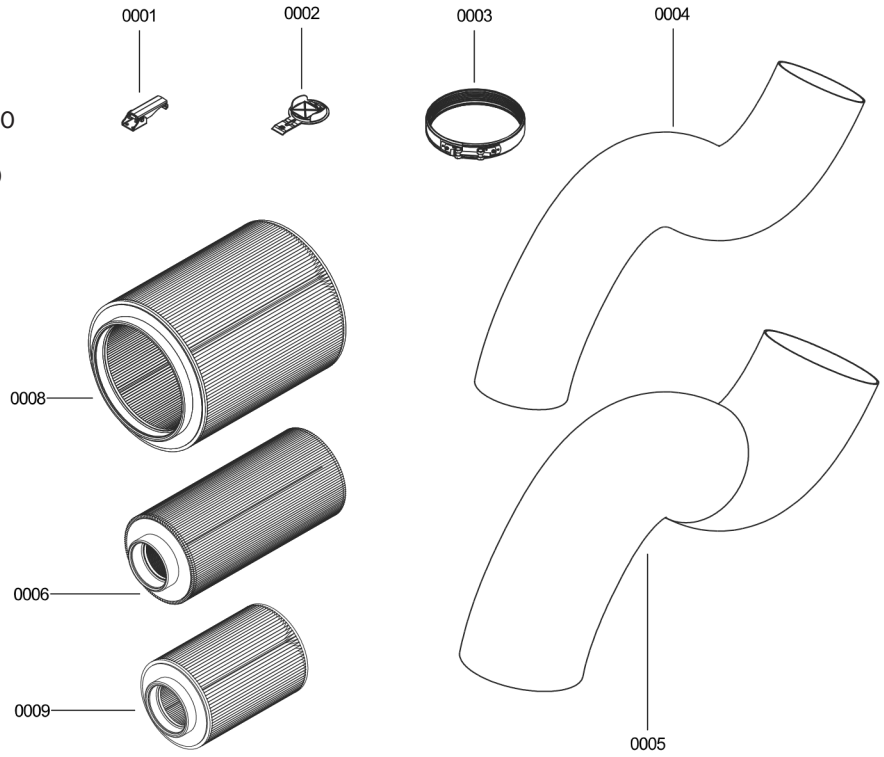
Model No.	**Serial No.**
CI2 1500 Boiler	7721353□□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□□

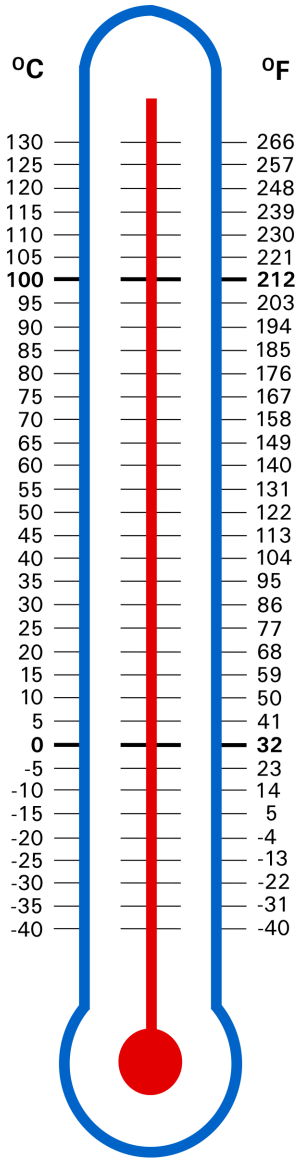
Ordering Replacement Parts:

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

Parts for Combustion air and flue connection

0001 Toggle fastener
0002 Relief damper
0003 Locking band w/clamp
0004 Spiral hose D150
0005 Spiral hose D200
0006 Air filter, burner 750/1000
0008 Air filter, filter box
0009 Air filter, burner 399/500





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