

Service Instructions

for use by heating contractor



Vitocrossal 200 C12 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.

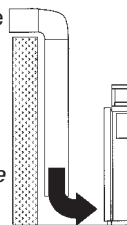
► *For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, please see subsection entitled "Mechanical room" and "Venting requirements" in this manual.*



■ 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).

Safety	Safety, Service and Warranty Requirements	2
General Information	About these Instructions	6
	Product Information	6
General Service Information	Service Equipment	7
	Important Regulatory Requirements	8
	Safety Instructions	9
	High Limit Safety Cut-Out Test	10
	Filling the Heating System with Water and Ventilating ..	10
Commissioning	Commissioning the System	10
	Commissioning the System with the Commissioning Assistant	11
	Fuel Conversion Labelling NG to LPG	16
	Adjusting the Heating Curves	16
	Setting the Max. Heating Output	18
	Setting the Boiler Flue System Length	19
	Preparing for Servicing of the Burner/Combustion Chamber	20
	Checking the Static Pressure and Supply Pressure ...	23
	Checking the CO₂ Content	25
	Checking the Combustion Quality	26
Service	Shutting Down the System	26
	Removing the Burner	27
	Cleaning the Burner	29
	Checking the Ignition Electrodes and Ionization Electrode ..	31
	Cleaning the Combustion Chamber and Heating Surfaces ..	31
	Checking all Connections on the Heating Water Side for Leaks	32
	Cleaning the Condensate Drain Pipe and Siphon Trap ...	32
	Checking/Cleaning the Neutralizing System (accessories) ..	33
	Cleaning Internal Gas Filters	33
	Burner Installation	33
	Checking for Leaks on the Flue Side	33
	Testing the Valves of the Gas Solenoid Valve for Leaks; Replacing if Necessary	34
	Checking the Filter Element in the Gas Line (if installed); Replacing if Necessary	34
	Checking the Connections on the Gas Side for Leaks ...	34
	Performing Final Checks	34
	Checking the Water Quality	34
	Checking the Safety Valve Function	34
	Checking the Expansion Vessel and System Pressure ...	35
	Checking the Mixing Valve for Ease of Operation and Leaks	35
	Checking the Thermal Insulation for Firm Seating	35
	Checking the Ventilation Air Opening of the Installation Room (visual inspection)	35
	Replacing the Air Filter (accessories) if used	35
	Instructing the System User	36
	Operating and Service Documents	36
Control Unit	Calling Up Parameters	37
	General	37
	Boiler	41
	DHW	44
	Heating circuit 1, Heating circuit 2, Heating circuit 3, Heating circuit 4	47
	Cascade	53
	Parameters with no Function	54

Service Checks

Service Menu	54
Checking Outputs (actuator test)	55
Maintenance Display	57
Emissions Test Mode	57
High Limit Safety Cut-Out Test	57

Troubleshooting

Fault Display on the Programming Unit	58
Calling up Fault Messages from the Fault Memory (message history)	59
Fault Messages	59
Burner Faults Without a Specific Message	75
Warning Messages	75
Information Messages	76
Service Messages	76
Fault Memory	76

Maintenance

Check Sensors	77
Replacing Components	79

Function Description

Boiler Water Temperature Control	80
Gas Consumption Meter	80
Boiler Active Frost Protection	81
Control of Boiler Circuit Pump	81
Minimum Burner Pause Time	81
Combustion Air Device	82
Test Functions	82
Cascade Control	82
Condensing Strategy	83
Cascade Strategy	83
Heating Circuit Control	85
Heating Zone Control	89
DHW Tank Temperature Control	89
Third Party Control of Boiler/Cascade System	90
Gas Pressure Switch GDW	92

Components

Overview of Burner Components	93
-------------------------------------	----

Reports

Water Quality Requirements	95
Maintenance Record	97
Maintenance Schedule	97

Specifications

Technical Data	99
----------------------	----

Additional Information

Lighting and Operating Instructions	101
---	-----

Dimensions

Boiler Dimensions	102
-------------------------	-----

Connection and Wiring Diagrams

Boiler Connection Diagram	103
Terminal block Vitocrossal CI2, 399 to 1000	105
Terminal block Vitocrossal CI2, 1500 and 2000	105
Wiring Panel	106
MZIO	107
HMU Heat Management Unit	108

Parts

Parts Lists	109
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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.

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

Technical information

The following is a list of literature applicable to the Vitocrossal 200 C12 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 107 of these instructions.

Order replacement components from your Viessmann distributor.



CAUTION

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

Important Regulatory Requirements

Instructing the system user

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

Initial start-up

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

Working on the equipment

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

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

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

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

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

- The Maintenance Record is located on page 95 of this manual.

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

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

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

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

Safety Instructions

Target group

These instructions are intended exclusively for qualified contractors.

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

Regulations

Observe the following when working on this system:

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

If you smell gas



WARNING

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

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

If you smell flue gas



WARNING

Flue gas can lead to life threatening poisoning.

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

Working on the system

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

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

Repair work

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

Auxiliary components, spare and wearing parts

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

Safety Instructions *(continued)*

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.

VISSMANN 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 92.
2. Record the fill volume, water hardness and pH value in the table on page 94.

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 approximately 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

Overview of the commissioning assistant

The boiler can be commissioned via the HMI or the ViGuide app using a commissioning assistant. There follows a brief overview of the function options. It's recommend using the ViGuide app for commissioning as more functions are available here.

	Single Boiler	Single Boiler with third party cascade	Viessmann Lead Boiler	Viessmann Lag Boiler
HMI				
Basic Configuration	X	X	-	-
Extended Configuration	-	-	-	-
ViGuide				
Basic Configuration	X	X	X	X
Extended Configuration	X	X	X	X

Commissioning assistant sequence	Explanations and references
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.   Cascade systems can only be commissioned using the software tool.
Applications	The boiler has 3 configurable applications: Single boiler ■ For operation as a single boiler with integral control unit for DHW and heating circuits ■ For operation as a lag boiler in a third party cascade Lead boiler ■ For operation as a lead boiler in a Viessmann cascade Lag boiler ■ For operation as a lag boiler in a Viessmann cascade
ID	For lag boilers, a unique identification number must be allocated here. This identification number will be required later, e.g. for configuring the boiler sequence



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.

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.

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.

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

Commissioning assistant sequence	Explanations and references
Commissioning	For Single and Lead Boiler
Units of measurement	■ Temperature: °C or °F ■ Length: m or ft ■ Date format: DD.MM-YY or MM/DD/YY ■ Time: 12/24 hour clock ■ Pressure: Bar/Psi
Summertime/Wintertime	Setting whether summer/wintertime is to be taken into account. (Available only on ViGuide app.) Factory setting: Summer/wintertime enabled
Date and time	Set the current time.
Operating mode	■ Weather-compensated operation The outside temperature sensor must be connected, operates at weather-compensated supply temperature according to heating curve ■ 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.

System Configuration

Heating circuits ■ Heating circuit 1 ■ Heating circuit 2 ■ Heating circuit 3 ■ Heating circuit 4	Settings for central heating according to the system components - Not available or heating circuit without mixing valve - Not available or heating circuit with mixing valve - Not available or heating circuit with mixing valve - Not available or heating circuit 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

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

Commissioning assistant sequence	Explanations and references
Heating zone/safety input ■ Heating zone 1 ■ Heating zone 2 ■ Heating zone 3	Settings for the heating zones or external safety equipment circuits according to the system components 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
Floating contact: Function selection plug 96	If a contact has been connected to plug 96.
■ No function ■ External demand ■ External blocking ■ Heat demand	Heat generator demand with adjustable target supply temperature (parameter 528.0) and target primary pump speed (parameter 1100.2) ■ If the contact is closed, burner activation is blocked (except in frost protection mode). ■ If the burner was previously running, the boiler circuit pump is stopped after a delay-off time of 60 s. ■ Storage tank loading pump is stopped. ■ Heating circuit pumps are stopped. For operation with an external temperature controller, the boiler can be controlled by a call for heat. Once the contact is closed, the boiler starts. Call for heat is shown on the display/menu as "Heating zone 4".
EM-EA1 (DIO): Function selection	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	Vitotrol 200-E
	Set the type of remote control and subscriber no. as assigned 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 ■ Boiler circuit pump	On/off control 0 to 10 V modulation control 0 to 10 V modulation control can be configured only via ViGuide app ■ Fixed speed (target speed of boiler circuit pump in % according to parameter 1100.2) ■ Output-dependent modulation (target speed of boiler circuit pump in % according to the burner modulation of the unit in %) ■ Delta T modulation of the boiler circuit pump: Target speed of boiler circuit pump is regulated according to a delta between supply and return.
Maintenance	Maintenance settings are made in the ViGuide app under extended boiler configuration.
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.

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

Commissioning assistant sequence	Explanations and references
Extended configuration, heating zones 1 to 4	Can be set only via ViGuide app. Settings for extended control of the heating zones (see chapter Function descriptions)
Heating zone name	Any name can be configured for the heating zone (this will appear in the display)
Supply temperature	Simplified pre-configuration of the heating curve via pre-selection of connected heating media (radiator, infloor heating)
Heating curve (for weather-compensated operation only)	Setting the heating zone supply temperature – setting the heating curve
Extended configuration, heating circuits 1 to 4	Can be set only via ViGuide app. Settings for extended control of the heating zones (see chapter Function descriptions)
Heating zone name	Any name can be configured for heating circuit (this will appear in the display)
Reduced temperature	Setting reduced temperature in time program
Standard temperature	Setting standard temperature in time program
Comfort temperature	Setting comfort temperature in time program
Time program	Setting the temperature stages (standard, comfort or reduced) in time program
Min. supply temperature	Setting a minimum supply temperature for the applicable heating circuit, below which temperature will not fall
Max. supply temperature	Setting a maximum supply temperature for the applicable heating circuit, which will not exceeded
Heating curve (for weather-compensated operation only)	Setting the heating curve
Extended configuration, DHW	Can be set only via ViGuide app. Settings for extended control of the DHW (see chapter Function descriptions)
Target DHW temperature	Setting the DHW tank temperature
Time program, DHW	Setting a time program for DHW tank heating
Time program, DHW recirculation pump	Setting a time program for DHW recirculation pump
Hygiene function	Setting whether and when the hygiene function is active.
Extended configuration, boiler	Can be set only via ViGuide app. Settings for extended control of the boiler
Maximum heating output	Setting the maximum heating output of the boiler (parameter 596.0)
Commissioning	For all lag boilers
Flue system type	■ Single connection Only one heat generator is connected to the flue system (factory setting). ■ Multiple connections Several heat generators are connected to the flue system.
Flue length adjustment	Specification of the effective flue and ventilation air length. To determine the effective flue and ventilation air length, see "Setting the Boiler Flue System Length" on page 19, chapter "Setting the Boiler Flue System Length".
System scheme, lag boiler	Settings for the extended parameters: Connection diagram of the lag boiler
Heating zones 1 to 3	Settings for the external safety equipment according to the system components. Heating zone 1: Plug ZI1 connected to external safety equipment. Choice of not available or digital safety equipment
Configuration, lag boiler	Setting the extended parameters of the lag boiler
■ Max. heating output	Setting the maximum heating output of the individual boilers. Note: This affects the starting and stopping of the boilers

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

Commissioning assistant sequence	Explanations and references
Commissioning	Cascade control unit
Boiler sequence	Settings for the boiler sequence of the lead and lag boilers. For function descriptions see "Cascade Strategy" on page 83
■ Dynamic	Settings for the dynamic sequence of the lead and lag boilers.
■ Fixed	Defined. The boiler sequence is manually specified and saved by the user.
Dynamic configuration (if dynamic selected)	Settings for extended parameters: Connection diagram of the lag boiler
■ First	Enter ID of the boiler that should always start first and be the last to go off.
■ Last	Enter ID of the boiler that should always start last and be the first to go off.
	Note Optional setting for the dynamic sequence of the lead and lag boilers
■ Optimization of hours run	Setting the hours run period after which the boiler sequence varies. The boiler with the fewest hours starts first after the changeover.
Fixed configuration (if fixed selected)	Setting the system diagram of the installed DHW tank
■ ID sequence	Setting the start and stop boiler sequence by assigning the boiler ID
Type of DHW supply	Settings for the system scheme of the installed DHW tank
■ Local	The DHW tank is supplied only from the integral heat generator of the lead boiler (heat manager).
■ Global	The DHW tank is supplied as required from all heat generators on the system in parallel.
"Network config"	
■ WiFi	Connection with an available WiFi router with internet connection
■ LAN	Connection via LAN cable with a router with internet connection

Emergency Mode

Emergency mode is activated when the lag boilers lose communication with the lead boiler in a cascade system. Emergency mode runs the boilers at a user configurable temperature setting until communication has been restored.

Note

For additional configurations, the commissioning assistant can be called up at a later point. See "Tap the following buttons:" on page 16.

Multi boiler system

Boilers in a multi boiler system are commissioned via the ViGuide app.

1. Open the gas shut-off valve.
 2. Switch on the boiler. The commissioning assistant starts automatically. If boiler has already been switched on: See chapter "Calling up the commissioning assistant at a later point", "Tap the following buttons:" on page 16.
 3. Open the ViGuide app. Log in with Partner Account or Lite Account (which can be used only for commissioning), or create a new account.
 4. In the ViGuide app, select "Commissioning, cascade" and follow the instructions.
- Select lead boiler as "Lead" and lag boilers as "Lag". The boilers are now all ready for commissioning (displayed in HMI).
 - The connection between the lead boiler and the ViGuide app can be made by means of manual entry or by scanning the QR code. It's recommend using the QR code to connect. Once successfully connected, the commissioning assistant starts to commission the lead boiler. The setting options here are identical to those of a single boiler, see table on page 41 onwards.
 - As the process continues, the lag boilers are commissioned using the connection from the lead boiler (see lag boiler table). The lag boilers are numbered by automatically setting the subscriber (ID).
 - Once all subscribers are configured, the cascade functions are configured. All PlusBus subscribers must be connected and switched on. Depending on the type of boiler, the accessories connected or other settings, not all menu points may be displayed.
 - After the commissioning assistant has finished, check that the actuators are connected and operating correctly. Start the actuator test: See "Checking Outputs (actuator test)" on page 55.

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

Connect the system to ViGuide Web

Once successfully commissioned, the boiler can be connected to ViGuide Web via the ViGuide app. Internet connection requirements

Tap the following buttons:

1. 
2. "Settings"
3. Select "Internet".
4. Select "Accesspoint".
5. Select "On".
6. Confirm with .

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



Apply WiFi access label here



If not yet done so, start the ViGuide app and log in with Partner Account. The ViGuide application offers the function "Connect system". Select the function, select the boiler and follow the instructions on the app. Save the email address of the system operator and confirm connection of the system in ViGuide Web (see the email that you receive). If the system is not confirmed within 30 days, the connection is terminated. After confirming the system, the system operator can access the system remotely.

Note

A Partner Account is required for connecting to ViGuide Web. If only a Lite Account is available, you must first register on the Viessmann website as a Partner. (Employee Accounts are not permitted.) The system should be assigned to the system operator (building owner), so before connecting the system, the email address of the system operator must be known. A Partner Account and access to ViGuide Web are required to complete registration. Remote access can be shared with other partners. For this purpose, only the email address of the partner who is sharing it is required. Depending on the ViGuide Web package ordered, different functions are available. More information on this can be found in ViGuide Web. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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"
6. Confirm with .

Fuel Conversion Labelling NG to LPG



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

Adjusting the Heating Curves

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.

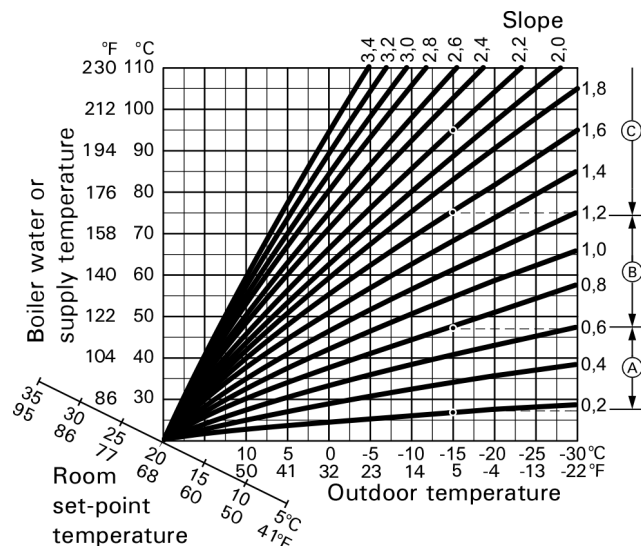
Factory settings:

- 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).

Adjusting the Heating Curves *(continued)*



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

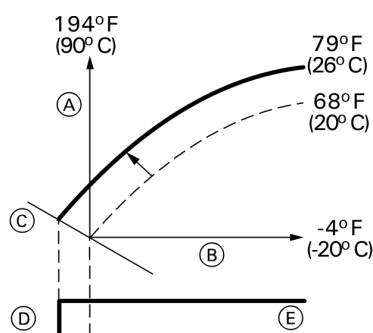
The differential temperature is adjustable using the following parameters:

- Heating circuit 2: Parameter 934.5
- Heating circuit 3: Parameter 935.5
- Heating circuit 4: Parameter 936.5

Selecting the set room temperature

Individually adjustable for each heating circuit. The heating curve is offset set 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.

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)

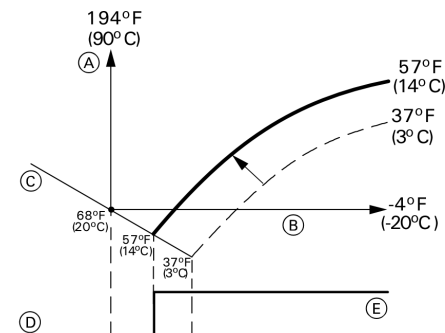
Legend

- Ⓐ 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

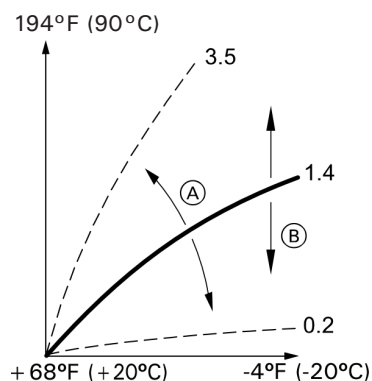
- Ⓐ Supply temperature
- Ⓑ Outside temperature
- Ⓒ Target room temperature
- Ⓓ Heating circuit pump "OFF"
- Ⓔ Heating circuit pump "ON"

Changing the reduced target room temperature

Operating instructions



Adjusting the Heating Curves *(continued)*



Legend

- (A) Changing the slope
- (B) 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

$$(20 - 18) \times (1 + 1.4) \times 8/4 = 9.6$$

Increase in supply temperature via heating curve value = 9.6 K

Setting the Max. Heating Output

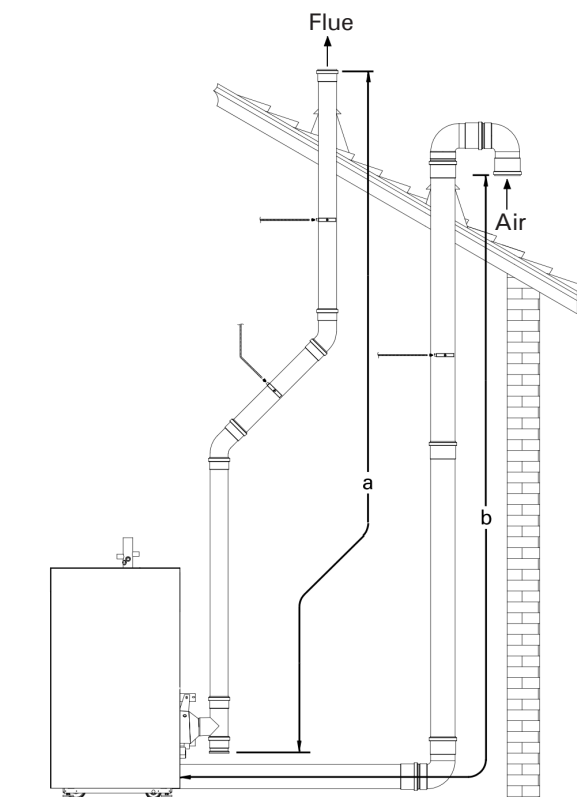
A limit can be set on the maximum heating output for heating operation. The limit is set via the modulation range.

Note:

Ensure sufficient heat transfer before setting the maximum 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 C12 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 – 33 ft. (10 m)
 $75 + 0 + 33 = 108$ ft. (23 + 0 + 10 = 33 m)
 Flue System Length setting in HMI/ViGuide mobile app
 108 ft. (33 m).

Example based on C12 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. (46 m).

Example based on C12 1500 equipped w/ 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 w/ Inline Filter Kit – 98 ft. (30 m)
 $75 + 60 + 98 = 233$ ft. (23 + 18 + 30 = 71 m)
 Flue System Length setting in HMI/ViGuide mobile app
 233 ft. (71 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

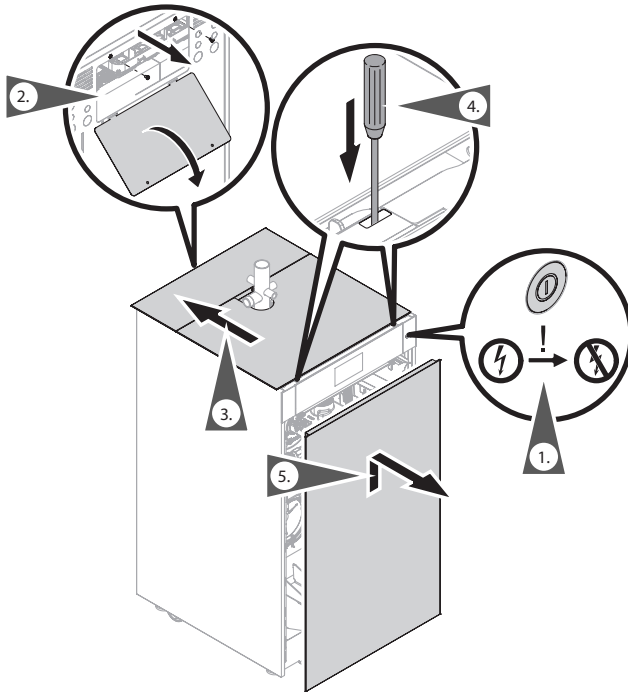
When connecting several boilers to a common vent system: Adjust the Flue System Length setting for each connected boiler to the common venting system, using the instructions above.

Value for installed combustion air intake accessories

C12 Boiler model		Burner filter	Direct vent kit	Direct vent with inline filter
399/500	ft. (m)	33 (10)	90 (28)	137 (42)
750	ft. (m)	202 (62)	65 (20)	85 (26)
1000	ft. (m)	202 (62)	65 (20)	85 (26)
1500	ft. (m)	144 (42)	72 (22)	98 (30)
2000	ft. (m)	202 (62)	85 (26)	151 (46)

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.

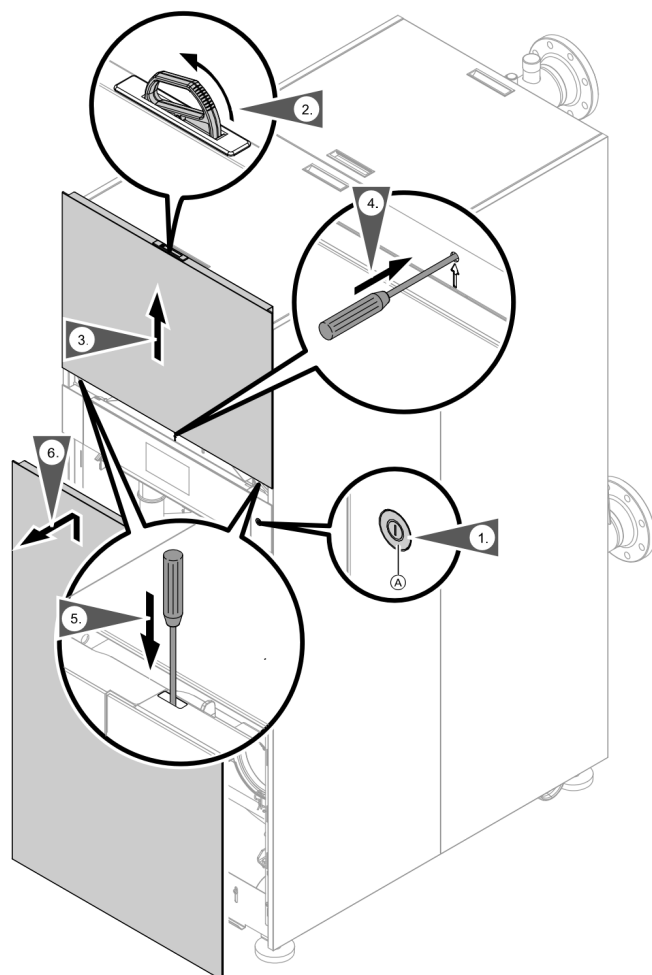
WARNING

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 C12 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

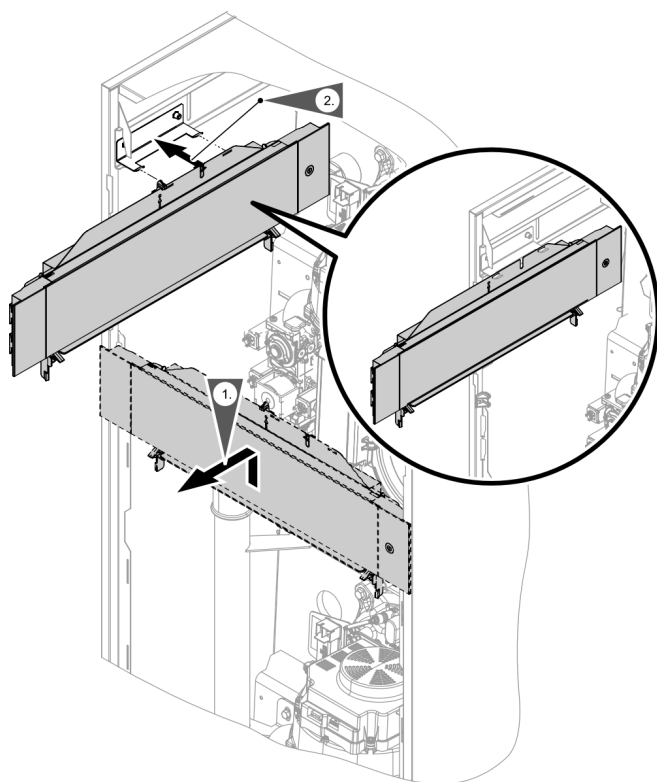
Touching hot parts can result in burns.
Only work on the burner when it has cooled down.

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.

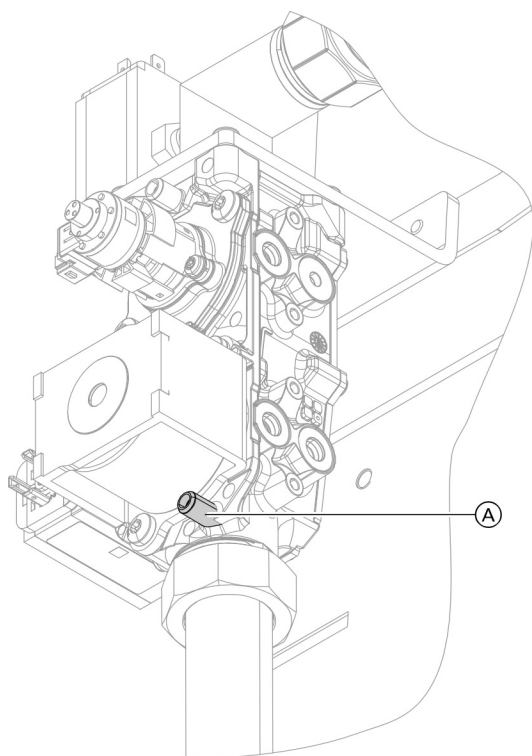
Preparing for Servicing of the Burner/Combustion Chamber *(continued)*

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.

Hooking the programming unit in the service position

Checking the Static Pressure and Supply Pressure



399/500 MBH burner

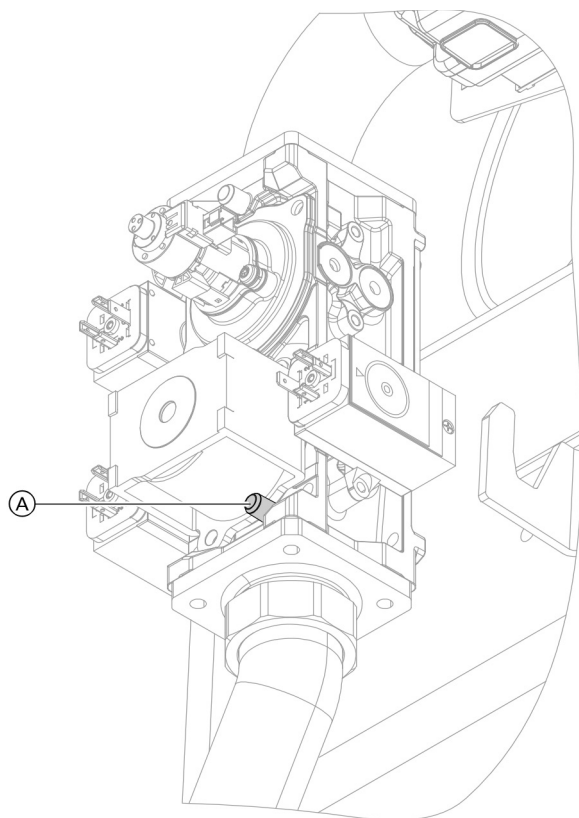
Checking the static pressure

1. Close the gas shut-off valve.
2. Undo screw in test connector (A), but do not remove.
3. Connect the pressure measuring device at test connector (A).
4. Open the gas shut-off valve.
5. Check the static pressure maximum 14" w.c.
6. Record the measured values in the report on page 95.



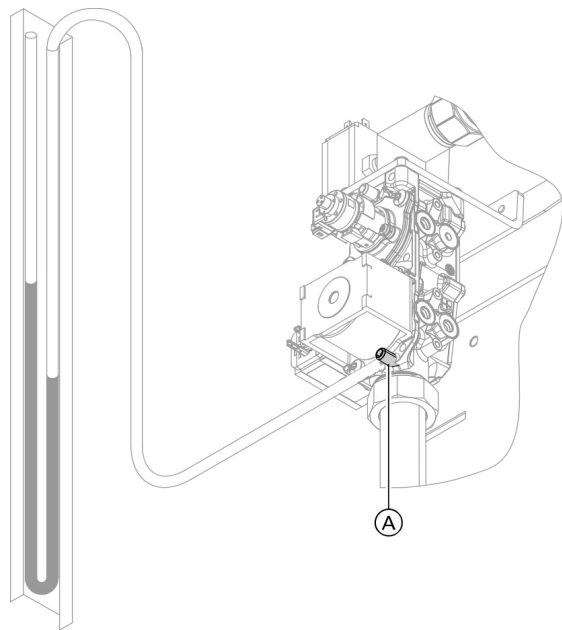
WARNING

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



750/1000 MBH burner

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.
Burner load at ignition is about 50% of burner capacity.

IMPORTANT

A CO₂ 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.

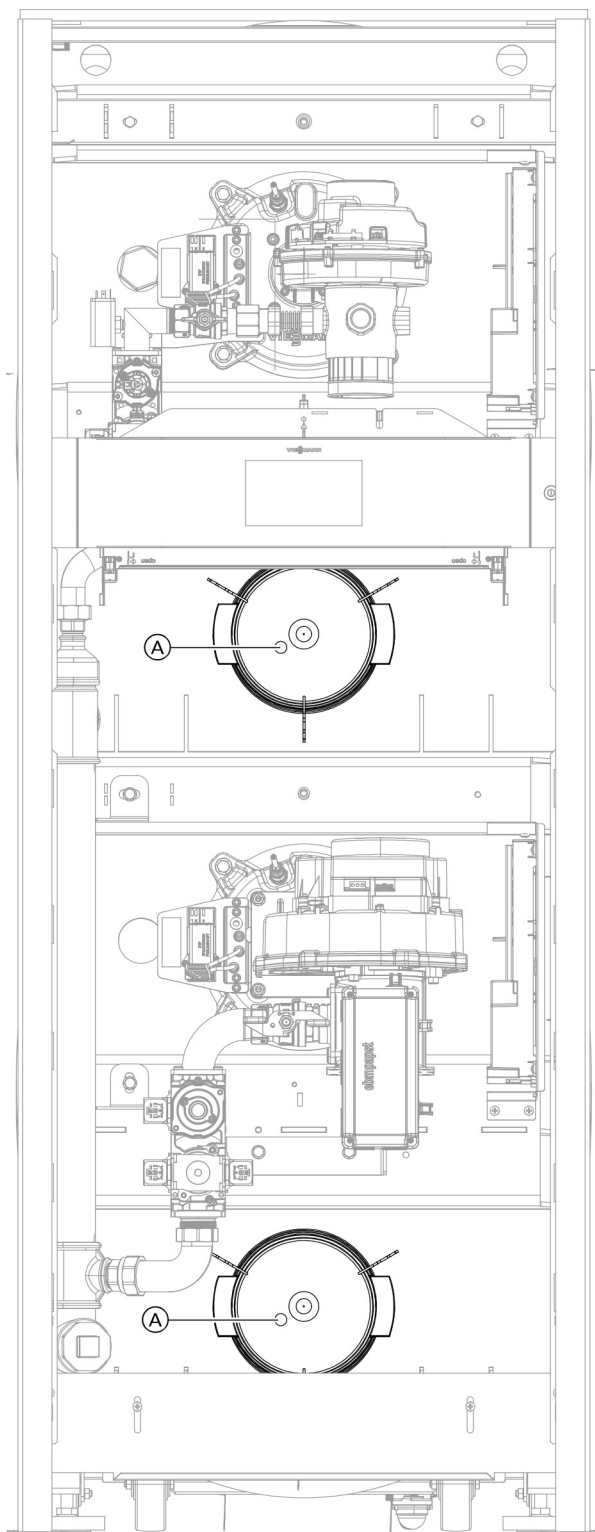
Supply pressure for NG/LPG

1. Start the burner.
Note:
Set the burner to maximum possible heating output. To do this, start the burner with maximum heat input in the actuator test in the service menu. The target maximum heating output is configured in Parameter 596. No account of this value is taken in the actuator test, however.
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.
GDW 1: Monitors for low gas pressure - setting 4 in. w.c. (10 mbar)
GDW 3: Monitors gas pressure at burner inlet pressure regulator - setting 2.8 in. w.c. (7 mbar)
GWD 2 (750/1000 MBH Burner Only): Monitors gas pressure at automatic gas valve - setting 2.8 in. w.c. (7 mbar).
3. Record the actual value in the maintenance record (on page 95).
 4. Close the gas shut-off valve.
 5. Remove the pressure tester and close test nipple (A).

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

Checking the CO₂ Content



Inspection ports **A** 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 **A** 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.

CO₂ 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 CO₂ or O₂ content. Record the results in the report on page 95.

Note:

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

Permissible CO₂

Operation with natural gas

- CO₂ content: 6.9 - 11%

Operation with LPG

- CO₂ content: 8.3 - 12.4%

O₂ Target Range - Natural Gas

	Partial Load	Full Load
399/500 MBH Burner	6 to 7%	5.5 to 6.5%
750/1000 MBH Burner	6.5 to 7.5%	5.5 to 6.5%

O₂ Target Range - LPG

	Partial Load	Full Load
399/500 MBH Burner	6 to 7%	5.3 to 6.3%
750/1000 MBH Burner	6.5 to 7.5%	5.2 to 6.7%

If the measured O₂ content is outside the respective range, proceed as follows:

- Check the flue gas/combustion air system for leaks.
- Check the burner gauze assembly for damage or contamination.
- Check whether the pressure drop on the flue gas side of the boiler is too high due to contamination.

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



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.

1. Switch off the breaker or the power supply. Safeguard against unauthorized reconnection.
2. Close the central gas shut-off valve.

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 20.

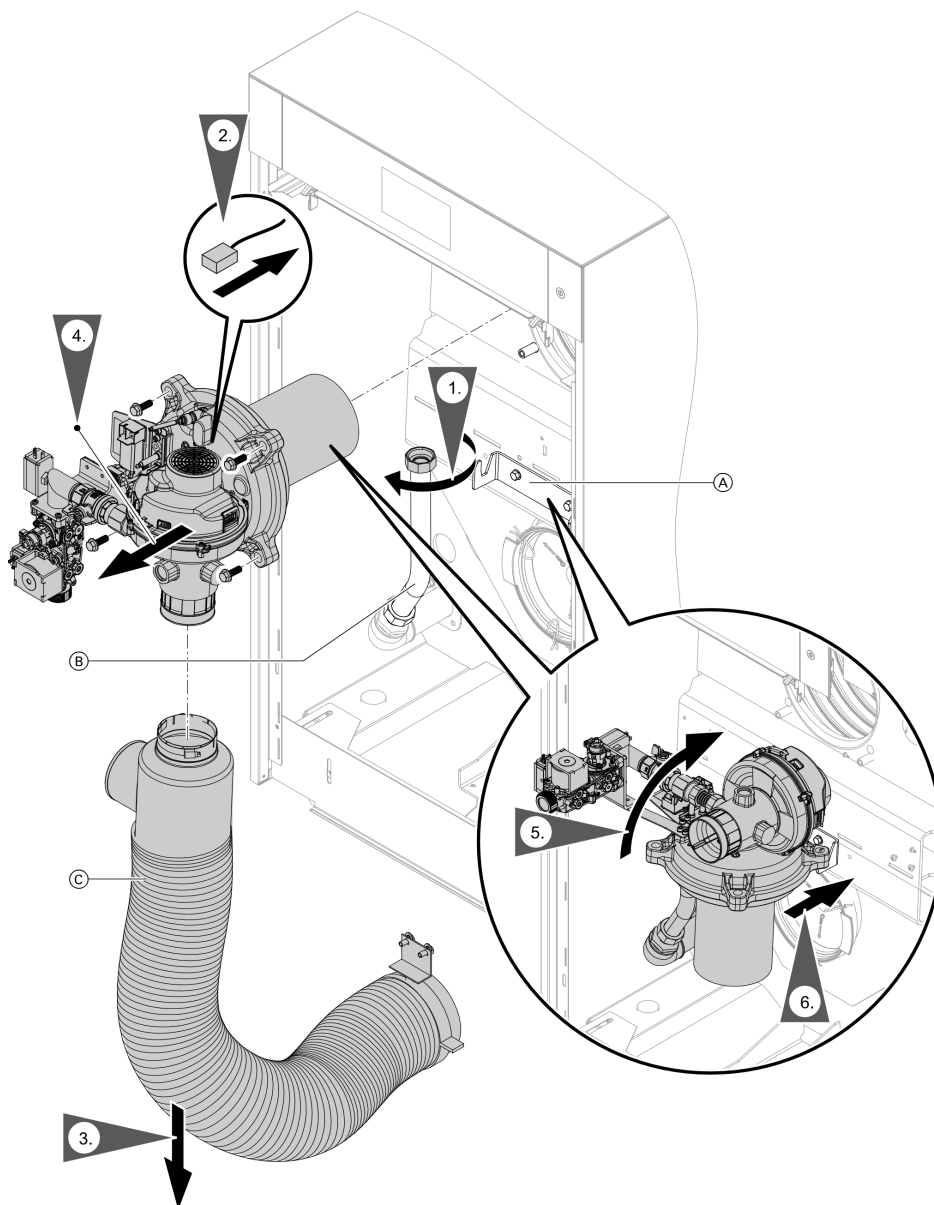
Note: Burner weight 399/500 MBH: 25 lb. (11.3 kg)
Burner weight 750/1000 MBH: 35.5 lb. (16.1 kg)

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 (A).

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

- (A) Burner maintenance bracket
- (B) Burner gas line
- (C) 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 20.

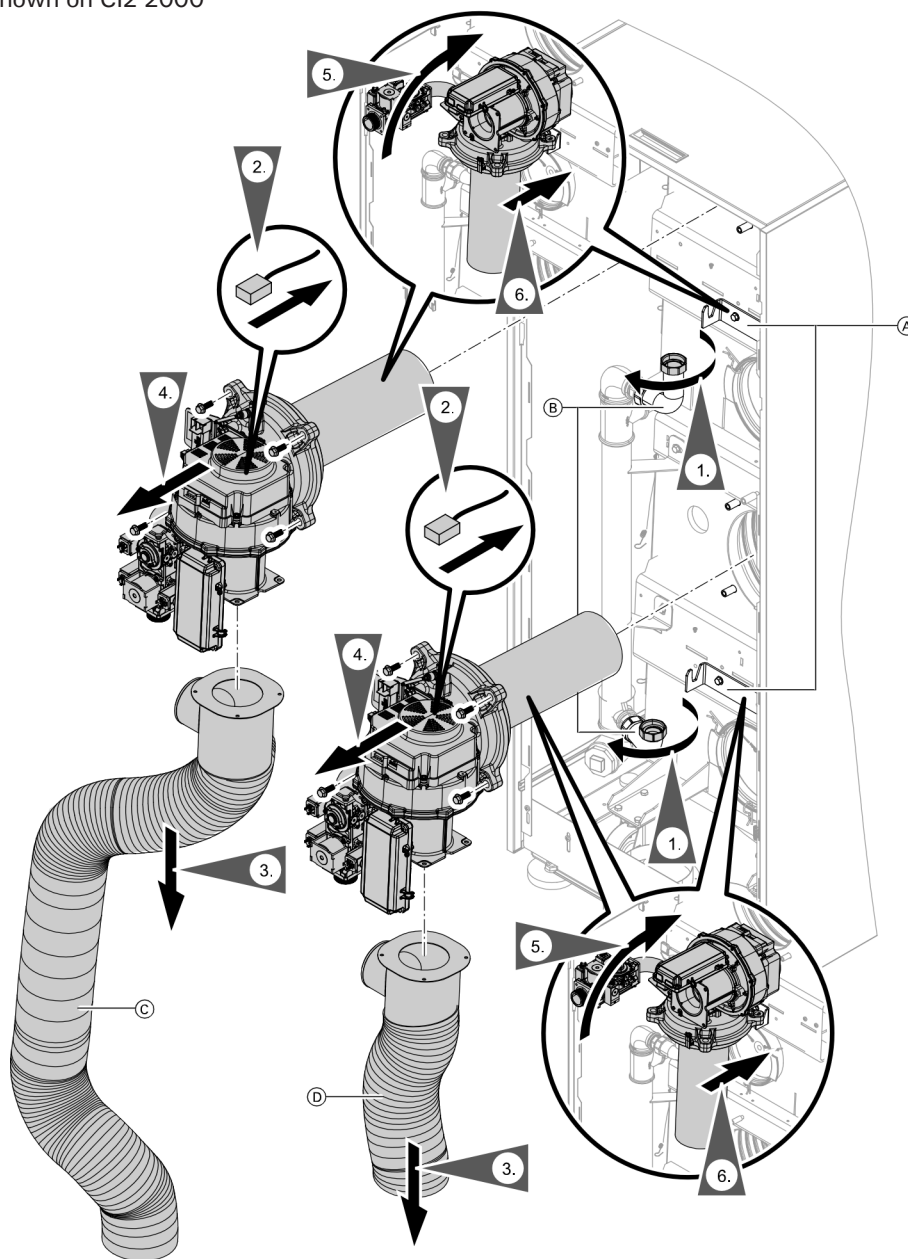
Note: Burner weight 399/500 MBH: 25 lb. (11.3 kg)
Burner weight 750/1000 MBH: 35.5 lb. (16.1 kg)

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 (A).

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

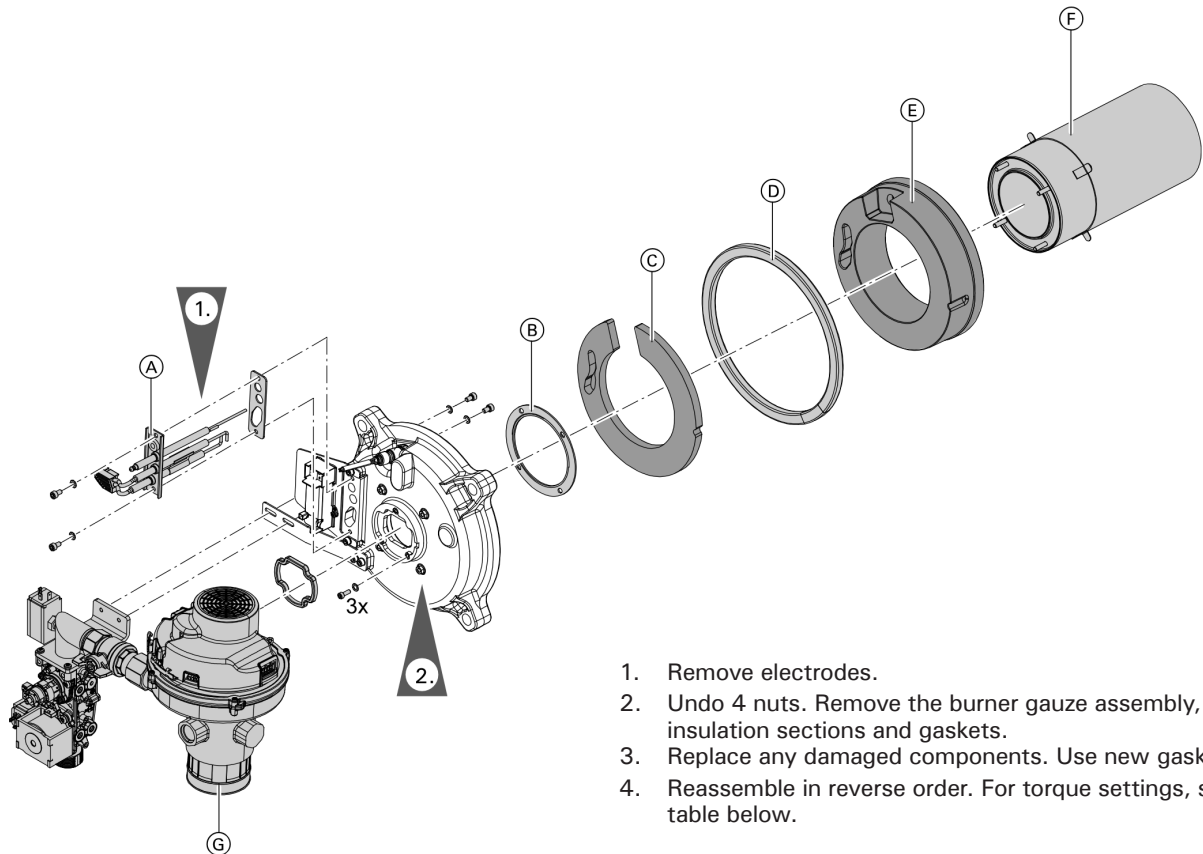


Legend

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

Cleaning the Burner

399/500 MBH burner



Legend

- (A) Electrode block
- (B) Burner gauze assembly gasket
- (C) Insulation mat
- (D) Burner door gasket
- (E) Thermal insulation block
- (F) Flame tube
- (G) 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)

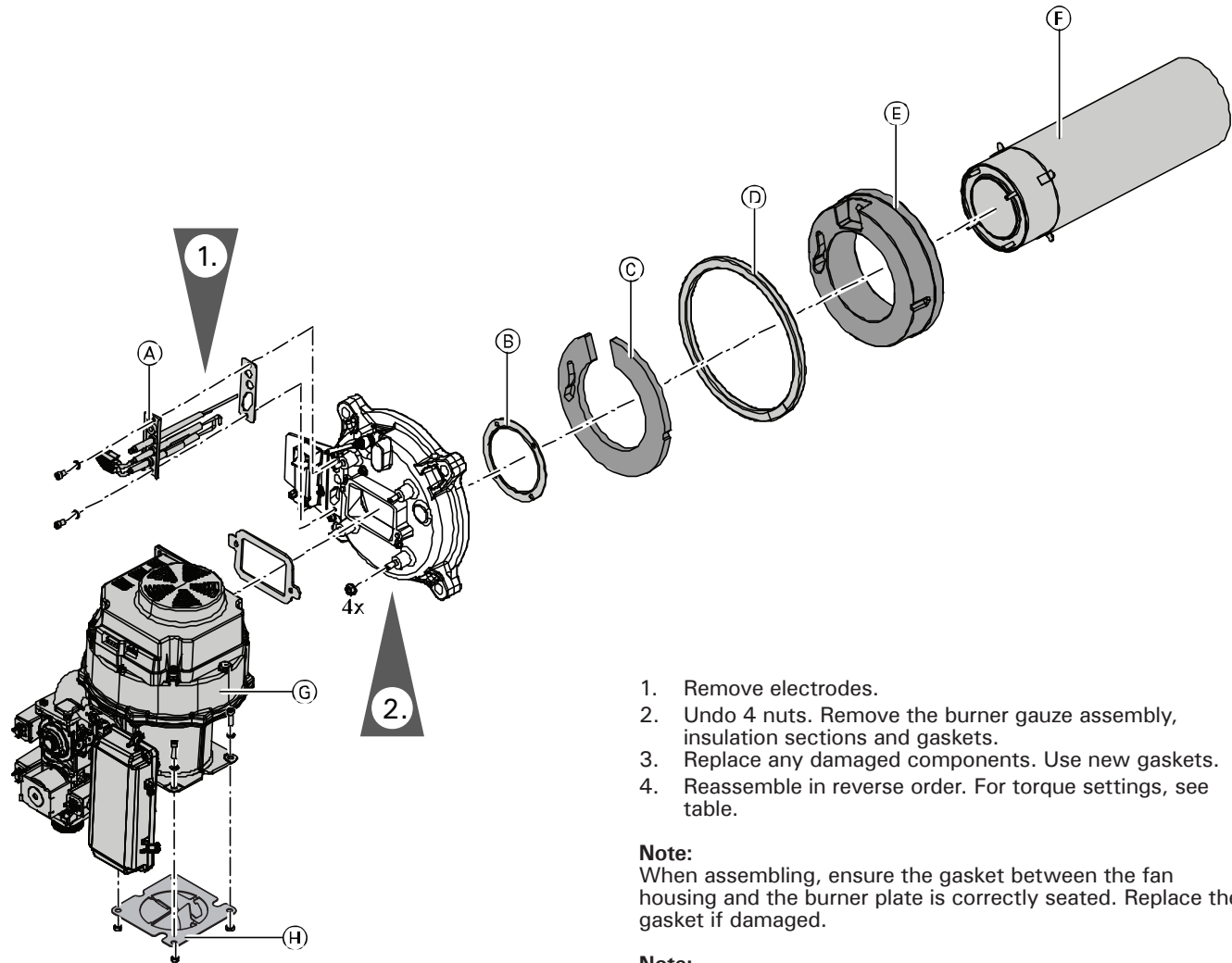


WARNING

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

Cleaning the Burner (continued)

750/1000 MBH burner



Legend

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

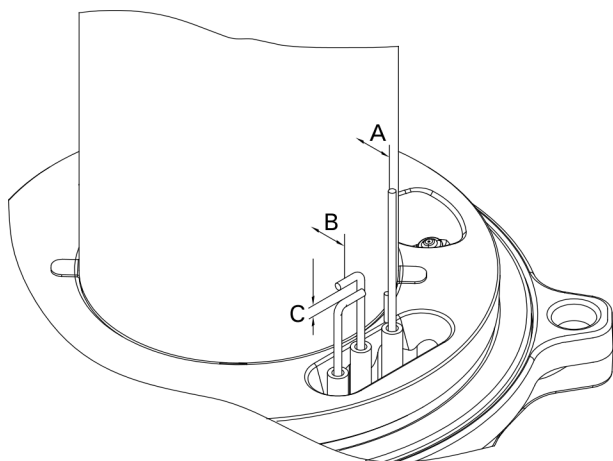
Burner	750/1000 MBH
Electrodes	35 in.lb (4 Nm)
Ignition transformer	13 in.lb (1.5 Nm)

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.

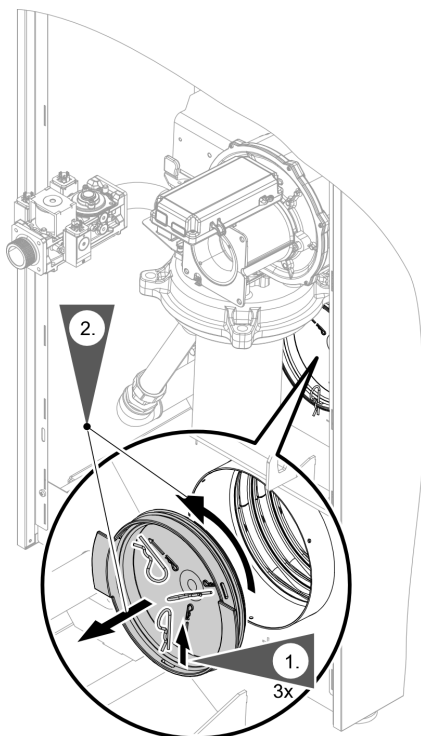
A	0.51 in. ± 0.04 in.	13 mm ± 1 mm
B	0.51 in. - 0.08 in.	13 mm -2 mm
C	0.18 in. ± 0.02 in.	4.6 mm ± 0.5 mm

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.

1. Remove 3 cotter pins.
2. Open inspection cover and remove.
3. Flush the combustion chamber and heating surfaces thoroughly with water using a 90° angled nozzle of a pressure washer.
4. Apply a cleaning agent into the combustion chamber and let soak according to the manufacturer's instructions.

Notes on cleaning agents:

- Consult your supplier to source cleaning agent that is safe for stainless steel.
 - 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.
5. Flush the combustion chamber and heating surfaces thoroughly using a 90° angled nozzle of a pressure washer so that no cleaning agent residue remains.
 6. Repeat as necessary.
 7. 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 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.



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.



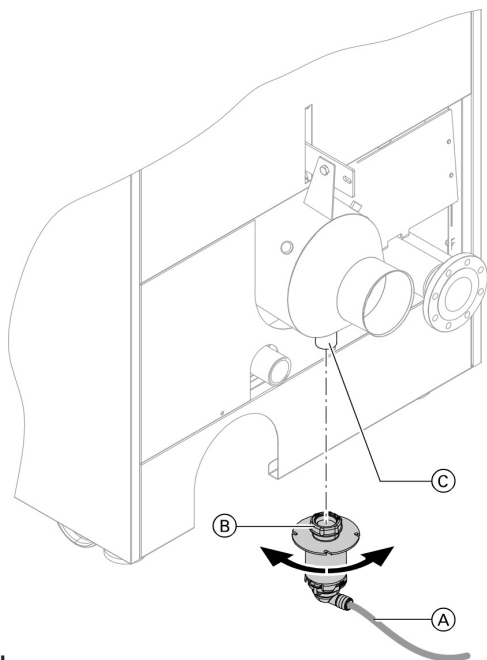
CAUTION

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

IMPORTANT

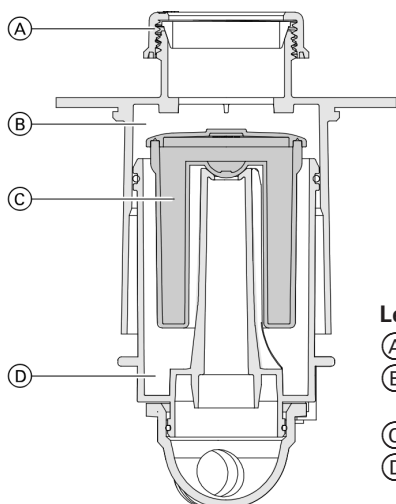
Ensure that connections for control equipment and minimum pressure monitor (low-water cutoff) are also leakage-free.

Cleaning the Condensate Drain Pipe and Condensate Trap



Legend

- (A) Condensate drain pipe to the neutralizing system
- (B) Condensate trap
- (C) Condensate trap connection at the boiler flue connection



Legend

- (A) Union nut
- (B) Upper part of condensate trap
- (C) Float
- (D) Lower part of condensate trap

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.

Checking/Cleaning the Neutralizing System (accessories)



Neutralizing system service instructions

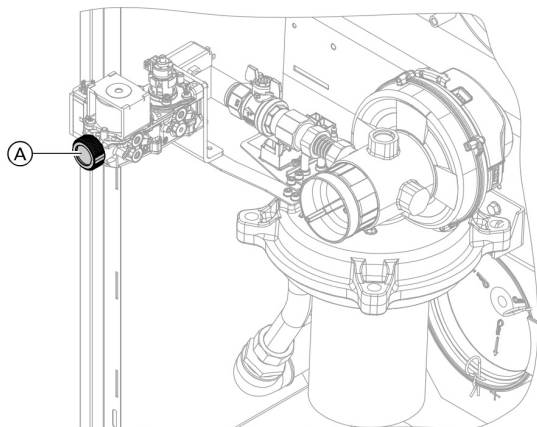
With the burner removed, pour water into the combustion chamber.

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



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

Legend

(A) Gas connector with tapered mesh 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.

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.

Check flue gas collector and boiler body for leakage.

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 95.

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 94. For water quality requirements, see page 95. 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.

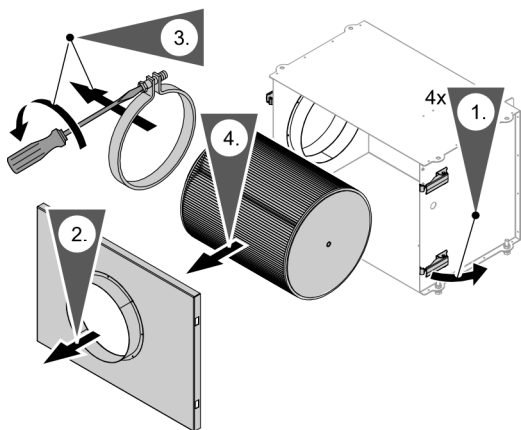
Checking the Thermal Insulation for Firm Seating

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.

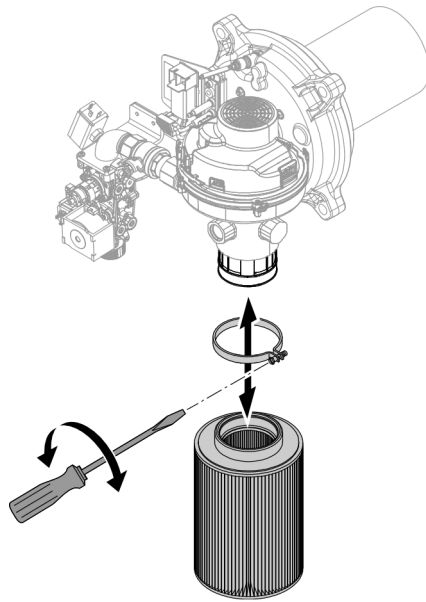
Note:

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

To remove filter

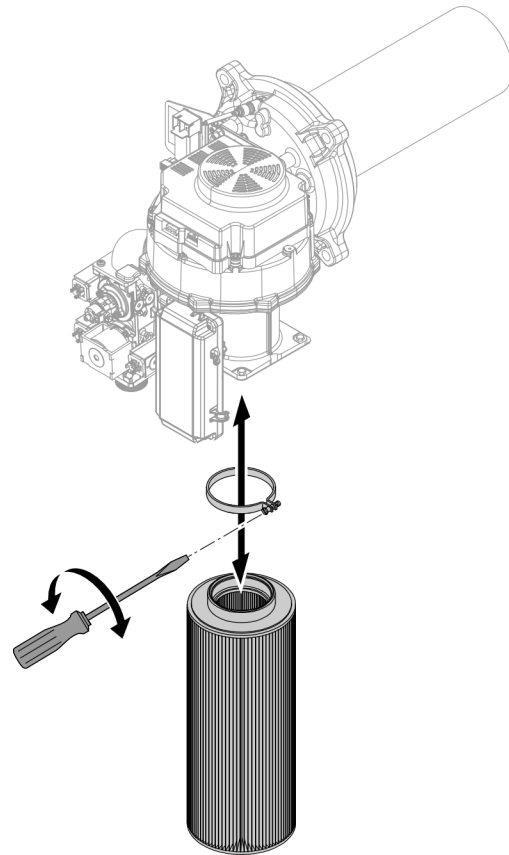
1. Release latches on the end of the combustion air filter box.
2. Remove filter box cover.
3. Release the filter clamp on the base of the filter.
4. Remove filter.
5. Re-install filter in reverse order.
6. If using the filter monitoring kit, once the new filter has been installed, cycle the boiler power to reset the P.36 contaminated air filter status message.

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

Note:

If using the filter monitoring kit, once the new filter has been installed, cycle the boiler power to reset the P.36 contaminated are filter status message

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

The boiler parameters can be configured in accordance with the guided commissioning process via HMI, ViGuide Web and the ViGuide app. The following table has a brief overview of the various tool functions and a guide to setting the parameters. ViGuide here means ViGuide Web or the ViGuide app.

	HMI	ViGuide app via local direct connection	ViGuide Web only with internet connectivity	ViGuide Web Plus only with internet connectivity
System overview dashboard	X	X	X	X
Extended configuration, single boiler	X	-	-	X
Extended configuration, cascade	-	-	-	X

Note

- For a description of the parameters, see chapter Function descriptions.
- Parameters or parameter values not shown have no function on this product.

The parameters can be set or altered on the HMI or via remote access with ViGuide Web.

- 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 depends on:

- Boiler
- Connected accessories and the functions associated with them
- Use of HMI or ViGuide Web

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

508.0 UTC time zone

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

528.0 Set flow temperature for external demand

Setting	Description
	Target supply temperature for external demand
70	Factory setting for supply water temperature 70°C (158°F)
20 to 90	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	Description
	Correction of measured outside temperature
0	Factory setting for outside temperature correction is OK (0°F)
-10 to +10	Correction adjustable from -10 to +10K (-18 to 18°F) in 1K (1.8°F) increments

General

912.0 Automatic summer/wintertime changeover	
Setting	Description
	Automatic time change over for daylight savings time
1	Factory setting automatic changeover is switched on
0	Automatic changeover switched off
912.1 Earliest day of changeover from winter to summertime	
Setting	Description
25	Earliest day of the month for summer daylight savings time change over Factory setting changeover from 02:00 am to 03:00 am occurs on the Sunday after or on this set date
1 to 31	Day of changeover adjustable from 1st to 31st of the month
912.2 Month of changeover from winter to summertime	
Setting	Description
3	Month of for summer daylight savings time change over Factory setting for month of changeover: March
1 to 12	Month of changeover adjustable from January to December
912.3 Earliest day of changeover from summer to wintertime	
Setting	Description
25	Earliest day of the month for winter daylight savings time change over Factory setting changeover from 02:00 am to 03:00 am occurs on the Sunday after or on this set date
1 to 31	Day of changeover adjustable from 1st to 31st of the month
912.4 Month of changeover from summer to wintertime	
Setting	Description
10	Earliest day of the month for summer daylight savings time change over Factory setting for month of changeover: October
1 to 12	Month of changeover adjustable from January to December
1093 Effective length of ventilation air/flue system	
Setting	Description
1	Equivalent length of combustion air/flue system Factory setting for equivalent length of combustion air/flue system
1 to 122	Equivalent length adjustable from 3.3 to 400 feet (1 to 122 m) in increments of 3.3 feet (1 m)
1098.4 Gas volume correction factor	
Setting	Description
1.0000	Value is provided on the gas supplier's bill. Factory setting used for gas consumption data.
0.7000 to 1.0000	Gas volume correction factor adjustable from 0.7000 to 1.0000 in increments of 0.0001.
1098.5 Calorific value	
Setting	Description
10.0000	Value is provided on the gas supplier's bill. Factory setting used for gas consumption data. Calorific value adjustable from 5.0000 to 40.0000 kWh/m ³ in increments of 0.0001
5.0000 to 40.0000	If you don't have a supplier's bill - Conversion factor for Natural Gas: 1kWh/m ³ = 96.6 BTU/ft ³ - Conversion factor for Liquid Propane Gas: 25.8745 kWh/m ³ = 2500 BTU/ft ³

General

1139.0 Outside temperature limit for cancelling reduced set room temperature	
Setting	Explanations
-5	Temperature limit for cancelling reduced target room temperature Factory setting for temperature limit -5°C (23°F)
-61 to +10	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	Temperature limit for raising the reduced target room temperature (See function description) Factory setting temperature limit -14°C (7°F)
-60 to +10	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	Selection of source for date and time
0	The setting depends on the boiler and accessories.
1	Factory setting: The date and time are adopted from the control unit. Internet protocol (see parameter "508.0")
2241.0 Source outside temperature sensor	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Selection of source for outdoor temperature sensor
0	Factory setting - not available
1	Hardwired
2	Home automation
2426.1 Economy function, outside temperature, heating circuit 1 (only for weather-compensated control units).	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Hysteresis for energy saving function of the heating circuit pump on heating circuit 1 for weather-compensated room heating
1	Factory setting energy saving function is active.
-9 to 5	If the outside temperature exceeds the selected target room temperature plus the value set in 2426.1, the pump switches off. If the outside temperature falls below the selected target room temperature plus the value set in 2426.1 minus 1K (1.8°F), the pump switches back on.
2427.1 Economy function, outside temperature, heating circuit 2 (only for weather-compensated control units).	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Hysteresis for energy saving function of the heating circuit pump on heating circuit 2 for weather-compensated room heating
1	Factory setting energy saving function is active.
-9 to 5	If the outside temperature exceeds the selected target room temperature plus the value set in 2427.1, the pump switches off. If the outside temperature falls below the selected target room temperature plus the value set in 2427.1 minus 1K (1.8°F), the pump switches back on.

General

2428.1 Economy function, outside temperature, heating circuit 3 (only for weather-compensated control units).	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Hysteresis for energy saving function of the heating circuit pump on heating circuit 3 for weather-compensated room heating
1	Factory setting energy saving function is active.
-9 to 5	If the outside temperature exceeds the selected target room temperature plus the value set in 2428.1, the pump switches off. If the outside temperature falls below the selected target room temperature plus the value set in 2428.1 minus 1K (1.8°F), the pump switches back on.
2429.1 Economy function, outside temperature, heating circuit 4 (only for weather-compensated control units).	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Hysteresis for energy saving function of the heating circuit pump on heating circuit 4 for weather-compensated room heating
1	Factory setting energy saving function is active.
-9 to 5	If the outside temperature exceeds the selected target room temperature plus the value set in 2429.1, the pump switches off. If the outside temperature falls below the selected target room temperature plus the value set in 2429.1 minus 1K (1.8°F), the pump switches back on.
2426.3 Economy function, room temperature, heating circuit 1 (only for weather compensated control units).	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Hysteresis for energy saving function of the heating circuit pump on heating circuit 1 for weather-compensated room heating.
1	Factory setting energy saving function is active.
-2 to 5	If the room temperature exceeds the selected target room temperature plus the value set in 2426.3, the pump switches off. If the room temperature falls below the selected target room temperature plus the value set in 2426.3 minus 1K (1.8°F), the pump switches back on.
2427.3 Economy function, room temperature, heating circuit 2 (only for weather compensated control units).	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Hysteresis for energy saving function of the heating circuit pump on heating circuit 2 for weather-compensated room heating.
1	Factory setting energy saving function is active.
-2 to 5	If the room temperature exceeds the selected target room temperature plus the value set in 2427.3, the pump switches off. If the room temperature falls below the selected target room temperature plus the value set in 2427.3 minus 1K (1.8°F), the pump switches back on.
2428.3 Economy function, room temperature, heating circuit 3 (only for weather compensated control units).	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Hysteresis for energy saving function of the heating circuit pump on heating circuit 3 for weather-compensated room heating.
1	Factory setting energy saving function is active.
-2 to 5	If the room temperature exceeds the selected target room temperature plus the value set in 2428.3, the pump switches off. If the room temperature falls below the selected target room temperature plus the value set in 2428.3 minus 1K (1.8°F), the pump switches back on.
2429.3 Economy function, room temperature, heating circuit 4 (only for weather compensated control units).	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Hysteresis for energy saving function of the heating circuit pump on heating circuit 4 for weather-compensated room heating.
1	Factory setting energy saving function is active.
-2 to 5	If the room temperature exceeds the selected target room temperature plus the value set in 2426.3, the pump switches off. If the room temperature falls below the selected target room temperature plus the value set in 2426.3 minus 1K (1.8°F), the pump switches back on.

Boiler

521.0 Interval in burner hours run until next maintenance	
Setting	Explanations
0	Number of burner hours to run until next service Factory Setting
0 to 25500	Burner hours until next service adjustable from 0 to 25500
522.3 Interval until next maintenance	
Setting	Explanations
0	Interval until next maintenance Factory setting - no interval selected
1	3 months
2	6 months
3	12 months
4	18 months
5	24 months
596.0 Maximum heating output	
Setting	Explanations
100	A limit can be set on the maximum heating output for heating operation. Heating output in the factory setting 100%
0 to 100	Adjustable from 0 to 100% (0% being minimum firing rate)
597.0 Limit, max. heating output for DHW heating	
Setting	Explanations
100	A limit can be set on the maximum heating output for DHW heating. Heating output in the factory setting 100%
0 to 100	Adjustable from 0 to 100% (0% being minimum firing rate)
1100.1 Maximum speed, primary circuit pump	
Setting	Explanations
100	Maximum speed of the primary circuit pump Factory setting 100%
0 to 100	Setting range in %
1100.2 Set speed of the primary circuit pump	
Setting	Explanations
100	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
0 to 100	Setting range in % (setting range depends on the boiler)
1240.0 Operating mode of primary circuit pump (not for weather-compensated operation)	
Setting	Explanations
1	Operating mode of primary circuit pump "Automatic" Factory setting switched on regardless of current temperature level
2	Modulating in line with the modulation level of the boiler. Boiler-specific min. and max. pump speeds are observed.
3	Pump with Δt control. Temperature differential for controlling the variable speed pump of the heat generator. The temperature differential is measured between the supply and return temperature sensors.

Boiler

1411.0 Clear maintenance messages	
Setting	Explanations
	Clear maintenance messages once maintenance has been performed.
0	Maintenance messages are active (if present).
1	Clear maintenance messages once.
1503.0 Minimum heating output	
Setting	Explanations
-	A limit can be set on the minimum heating output for heating operation.
	Factory settings defined by settings specific to the boiler
3 to 100	Adjustable from 3 to 100%
1606.0 Minimum burner pause time	
Setting	Explanations
	The minimum burner pause time can be set subject to boiler load. If set to '0', then additionally an on/off hysteresis of 8K (14°F) is applied. Minimum pause time is cancelled under the following conditions
	■ Actual boiler supply temperature is below 20°C (68°F) ■ Differential between target temperature and actual temperature is > 20K (36°F)
0	Fixed setting for minimum burner pause time: 4 minutes
1	Factory setting, integral method (see parameter 1606.4)
1606.4 Integral threshold for burner switch-off	
Setting	Explanations
	Only effective if parameter 1606.0 has been set to 1. 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.
50	Factory setting 50 K (90°F) x min
5 to 255	Adjustable from 5 to 255 K (9 to 459°F) x min
1706.0 Function selection MZIO	
Setting	Explanations
	Function selection of MZIO
0	Cannot be selected
1	Individual (plug  and 0-10V input have no function)
2	Heating zone with temperature controller
3	Ext. temperature demand via 0-10V input
4	Ext. modulation demand via 0-10V input
5	Fault message output via plug 
6	Fault message output and ext. temperature demand
7	Fault message output and ext. modulation demand
8	Additional call for heat via plug  (parameter 2445 in the software tool)
9	Additional call for heat via plug  and ext. temperature demand via 0-10V input
10	Additional call for heat via plug  and ext. modulation demand via 0-10V input

Boiler

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	Factory setting 2 minutes
1 to 10	Range adjustable from 1 to 10 minutes
2451.0 Emergency mode program when communication is disrupted	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Emergency mode program when communication from a cascade is disrupted
0	Factory Setting emergency mode program off
1	Lag boiler starts the emergency mode program when communication is disrupted.
2451.1 Target value when communication from a cascade is disrupted	
Setting	Explanations
Can only be set by using ViGuide Web Pro	Lag boiler target temperature when boiler is in emergency mode
60	Factory temperature setting 60°C (140°F)
0 to 80	Temperature in emergency mode by lag boiler adjustable from 0 to 80°C (32 to 176°F)
2779.0 Delta T target temperature at 20°C (68°F) supply temperature	
Setting	Explanations
Set via ViGuide Mobile commissioning assistant and via ViGuide Web Pro	Target temperature spread between supply and return at 20°C (68°F) supply temperature
5	Factory Setting
5 to 10	Adjustable range
2779.1 Delta T target temperature at 90°C (194°F) supply temperature	
Setting	Explanations
Set via ViGuide Mobile commissioning assistant and via ViGuide Web Pro	Target temperature spread between supply and return at 90°C (194°F) supply temperature
20	Factory Setting
5 to 20	Adjustable range
2809.0 Minimum pump speed	
Setting	Explanations
	Minimum boiler circuit pump speed
0	Factory setting for minimum boiler circuit pump speed
0 to 100	Setting range 0 to 100 %

DHW

396.0 DHW set temperature	
Setting	Explanations
	DHW tank temperature setpoint
50	Factory setting DHW tank temperature 50°C (122°F)
10 to 65	Adjustable between 10-65°C (50-149°F)
497.0 Operating mode of DHW recirculation pump	
Setting	Explanations
	DHW recirculation pump operation
0	The DHW recirculation pump runs continuously within the time program during the set time phases.
4	The DHW recirculation pump operates with the cycles set in 497.3
497.1 DHW recirculation pump for auxiliary function DHW heating	
Setting	Explanations
	Operation of the DHW recirculation pump while the function for increased DHW hygiene is active.
	 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.
	Note The respective operating status of the DHW recirculation pump depends on the setting of parameters 497.0 to 497.3 and on the respective operating status of the system.
0	The DHW recirculation pump runs in accordance with the set time program, irrespective of the increased DHW hygiene function. The DHW recirculation pump is switched on every time the increased
1	DHW hygiene function is activated, irrespective of the time program for the DHW recirculation pump. With this setting, the pipework can also be integrated into the increased DHW hygiene function.
497.2 DHW recirculation pump for DHW heating	
Setting	Explanations
	The DHW recirculation pump is operated during tank heating.
	Note The respective operating status of the DHW recirculation pump depends on the setting of parameters 497.0 to 497.3 and on the respective operating status of the system.
	Example: ■ Parameter 497.0 set to 0. ■ Parameter 497.2 set to 0. ■ A time phase is active in the time program for the DHW recirculation pump. ■ Tank heating is active.
	The DHW recirculation pump is operating in accordance with setting 497.0. However, since the tank is currently being heated, the DHW recirculation pump is switched off.
0	The DHW recirculation pump is switched off during tank heating.
1	The DHW recirculation pump runs in accordance with the setting in 497.0, including during tank heating.

DHW

497.3 Number of cycles, DHW recirculation pump

Setting	Explanations
	If 497.0 is set to 4, the DHW recirculation pump runs within the time program at the set number of cycles per hour. 1 cycle lasts 5 min. The run cycles occur at equal intervals over the 1 hour period. Example: Setting 497.3: 4 corresponds to 5 cycles per hour Overall runtime of DHW recirculation pump per hour: 5 x 5 min = 25 min
0	1 cycle per hour
1	2 cycles per hour
2	3 cycles per hour
3	4 cycles per hour
4	5 cycles per hour
5	6 cycles per hour

503.0 Scald protection

Setting	Explanations
	Scald protection limits the tank temperature to max. 60°C (140°F).  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. 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
0	Scald protection off - DHW tank can be heated to the maximum tank temperature.
1	Scald protection on - DHW heating ends when the tank temperature reaches 60°C (140°F).

534.0 Circulation pump run-on

Setting	Explanations
	DHW pump run-on after storage tank heating
120	Factory setting 120 sec run-on
0 to 900	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 run-on time to < 120 sec.

874.0 Target temperature, hygiene function

Setting	Explanations
Can only be set by using ViGuide Web Pro	DHW tank target temperature during hygiene function
65	Factory setting 65°C (149°F) target temperature for DHW when hygiene function is active.
60 to 80	Setting range adjustable from 60 to 80°C (140 to 176°F)

DHW

875.0 Hygiene function start time	
Setting	Explanations
Adjustable in HMI under 'Hygiene function'	At specified intervals, the hygiene function heats the tank to the target temperature set in parameter 874.0. In this parameter the hour for the beginning of the interval is set.
22:30	Factory setting hygiene function starts at 22:30 (10:30 PM)
24 Hours	Set the time (hh:mm)
876.0 Hygiene function start time	
Setting	Explanations
Adjustable in HMI under 'Hygiene function'	Hygiene function starts on the specified day
Friday	Factory setting: Friday
Monday...Sunday or Daily	Select the day of week or daily
1085.0 Cylinder heating: Set start point	
Setting	Explanations
	Start point for DHW heating below target DHW temperature
25	Factory-set start point 2.5K (5°F) below target DHW temperature
10 to 100	10: 1.0K (1.8°F) to 100: 10.0K (18°F)
	Stop point is 2.5K (5°F) above the target DHW temperature.
1087.0 Max. duration, DHW heating	
Setting	Explanations
	DHW heating stops after expiry of the set time duration, irrespective of whether the tank target temperature has been reached.
240	Factory setting 240 min
0	No time limit for DHW heating
1 to 240	Duration of DHW heating adjustable from 1 to 240 min in 1 min increments
1087.1 Min. delay until next time DHW is heated	
Setting	Explanations
	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.
60	Factory setting, delay of 60 min
60 to 240	Delay adjustable from 60 to 240 min in 1 min increments
2257 Offset, tank heating	
Setting	Explanations
20	Configurable offset for the DHW target value
0 to 40	If parameter >0, the supply temperature is derived from the target value plus the offset.

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

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
	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"
0	Factory setting increase 0 K (0°F)
0 to 20	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
	Duration for target supply temperature increase See also chapter "Function description"
60	Factory setting 60 min
0 to 120	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
	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"
0	Factory setting increase 0 K (0°F)
0 to 20	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
	Duration for target supply temperature increase See also chapter "Function description"
60	Factory setting 60 min
0 to 120	Temperature rise adjustable from 0 to 120 min

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
	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"
0	Factory setting increase 0 K (0°F)
0 to 20	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
	Duration for target supply temperature increase See also chapter "Function description"
60	Factory setting 60 min
0 to 120	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
	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"
0	Factory setting increase 0 K (0°F)
0 to 20	Temperature rise adjustable from 0 to 20 K (0 to 36°F)

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

430.4 Duration for set flow temperature increase, heating circuit 4	
Setting	Explanations
	Duration for target supply temperature increase See also chapter "Function description"
60	Factory setting 60 min
0 to 120	Temperature rise adjustable from 0 to 120 min
933.3 DHW heating priority, heating circuit 1	
Setting	Explanations
	Priority of DHW heating over the heating circuit
0	No priority for DHW heating (only if the DHW tank is installed downstream of the low loss header)
1	With DHW heating priority
933.6 Operating mode of heating circuit 1	
Setting	Explanations
	Only adjust for systems with one heating circuit, in conjunction with room temperature sensor.
4	Weather-compensated without room temperature influence
7	Weather-compensated with room temperature influence (see also parameter 933.7)
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
0	No priority for DHW heating (only if the DHW tank is installed downstream of the low loss header)
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	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
	In conjunction with room temperature sensor.
4	Weather-compensated without room temperature influence
7	Weather-compensated with room temperature influence (See also parameter 934.7)

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

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
935.3 DHW heating priority, heating circuit 3	
Setting	Explanations
	Priority of DHW heating over heating circuit pump and mixing valve
0	No priority for DHW heating (only if the DHW tank is installed downstream of the low loss header)
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	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
	In conjunction with room temperature sensor
4	Weather-compensated without room temperature influence
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 2	
Setting	Explanations
	Priority of DHW heating over heating circuit pump and mixing valve
0	No priority for DHW heating (only if the DHW tank is installed downstream of the low loss header)
1	With DHW heating priority

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

936.5 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	Differential temperature in factory setting 8 K (14°F)
0 to 20	Differential temperature adjustable from 0 to 20 K (0 to 36°F)
936.6 Operating mode of heating circuit 4	
Setting	Explanations
	In conjunction with room temperature sensor.
4	Weather-compensated without room temperature influence
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
1192.0 "Minimum flow temperature limit, heating circuit 1"	
Setting	Explanations
	Minimum supply temperature limit for the heating circuit
20	Minimum limit in the factory setting 20°C (68°F)
1 to 90	Setting range limited by boiler-specific parameters
1192.1 "Maximum flow temperature limit, heating circuit 1"	
Setting	Explanations
	Maximum supply temperature limit for the heating circuit
74	Maximum limit in the factory setting 74°C (165°F)
10 to 100	Setting range limited by boiler-specific parameters

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

1193.0 "Minimum flow temperature limit, heating circuit 2"	
Setting	Explanations
20	Minimum supply temperature limit for the heating circuit
1 to 90	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	Maximum supply temperature limit for the heating circuit
10 to 100	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	Minimum supply temperature limit for the heating circuit
1 to 90	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	Maximum supply temperature limit for the heating circuit
10 to 100	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	Minimum supply temperature limit for the heating circuit
1 to 90	Minimum limit in the factory setting 20°C (68°F)
	Setting range limited by boiler-specific parameters
1195.1 "Maximum flow temperature limit, heating circuit 4"	
Setting	Explanations
74	Maximum supply temperature limit for the heating circuit
10 to 100	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	Heating circuit pump logic function (summer economy control): Heating circuit pump switches off when outside temperature 1K (1.8°F) above selected value. Heating circuit pump switches back on when outside temperature 1K (1.8°F) below selected value.
10 to 35	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	Heating circuit pump logic function (summer economy control): Heating circuit pump switches off when outside temperature 1K (1.8°F) above selected value. Heating circuit pump switches back on when outside temperature 1K (1.8°F) below selected value.
10 to 35	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

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

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

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

2229 Thermostat function terminal 1

Setting	Explanations
Can only be set by using ViGuide Web Pro	0 No Setting
	1 Thermostat Function Enabled
	2 Safety Function Enabled

2230 Thermostat function terminal 2

Setting	Explanations
Can only be set by using ViGuide Web Pro	0 No Setting
	1 Thermostat Function Enabled
	2 Safety Function Enabled

2231 Thermostat function terminal 3

Setting	Explanations
Can only be set by using ViGuide Web Pro	0 No Setting
	1 Thermostat Function Enabled
	2 Safety Function Enabled

Cascade - Requires ViGuide Web Pro

2235 Dynamic strategy		
Setting	Explanations	
Can only be set by using ViGuide Web Pro	The sequence in which the boiler are switched on and off is determined according to number of burner hours run.	
	0	The cascade is controlled without dynamic strategy.
	1	The cascade is controlled with dynamic strategy.
2235 Fixed first heat generator		
Setting	Explanations	
Can only be set by using ViGuide Web Pro	One boiler is permanently configured as the first (lead) boiler.	
	0	Cascade is controlled with no specified starting boiler.
	1	Cascade is controlled with a specified starting boiler.
2235 Fixed last heat generator		
Setting	Explanations	
Can only be set by using ViGuide Web Pro	One boiler is permanently configured as the last boiler.	
	0	Cascade is controlled with no specified last boiler.
	1	Cascade is controlled with a specified last boiler.
2235 Manual strategy		
Setting	Explanations	
Can only be set by using ViGuide Web Pro	The boiler sequence is manually specified and saved by the user.	
	0	The cascade is controlled without manual strategy.
	1	The cascade is controlled with manual strategy.
2235 Runtime optimization		
Setting	Explanations	
Can only be set by using ViGuide Web Pro	300	After 300 hours run, the sequence of cascade subscribers is changed.
	0-XXX	Runtime in hours
2235 Specification of boiler sequence, 1st subscriber		
Setting	Explanations	
Can only be set by using ViGuide Web Pro	Specification of starting boiler	
	0	Not selected
	1	Lead boiler
	2	Lag boiler 1
	3... 16	Lag boiler 2 to lag boiler 15
2235 Specification of boiler sequence, lag boiler 1 to 15		
Setting	Explanations	
Can only be set by using ViGuide Web Pro	Specification of starting boiler	
	0	Not selected
	1	Lead boiler
	2	Lag boiler 1
	3... 16	Lag boiler 2 to lag boiler 15
2235 Integral limit value OFF		
Setting	Explanations	
Can only be set by using ViGuide Web Pro	The integral limit value OFF is the threshold for switching boilers in a cascade off. The limit value reflects a zone derived from temperature and time. Shutdown is determined either by temperature or time behaviour.	
	40	Factory setting 40 K·min.
	5...255	The higher the value, the later a running boiler switches off.

Cascade - Requires ViGuide Web Pro

2235 Integral limit value ON

Setting		Explanations
Can only be set by using ViGuide Web Pro	60	Factory setting 60 K·min.
	5...255	The higher the value, the later the boiler switches on

Parameters with no Function

The following parameters are displayed but have no function:

1101.0, 1102.0, 1102.1, 1103.0, 1103.1, 1104.0, 1104.1, 1102.0, 1105.1

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
Test mode	
	Emissions test mode
	High limit safety cut-out test
Change passwords	
Commissioning	
Appliances detected	
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.

Note:

On lag boilers, the service menu is reached via the fault display  and on the next screen via the service symbol .

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:

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. If the max. heating output is restricted by parameter 596.0, the boiler is ignored in the actuator test.

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, ☐ Off set value ☐ Min. heating output ☐ Max. heating output 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 Hydraulic shut-off valve	Modulation level (in accordance with specific boiler settings) Open or closed Open or closed
Heating group	
Primary circuit pump speed Target value Primary circuit 1 pump speed On/Off Primary circuit 2 pump speed On/Off Primary circuit 3 pump speed On/Off Primary circuit 4 pump speed On/Off Mixer HC2 Open Stop Close Mixer HC3 Open Stop Close Mixer HC3 Open Stop Close Heating zone pump 1 On Off Heating zone pump 2 On Off Heating zone pump 3 On Off	Circulation pump speed in % Speed, heating circuit pump, heating circuit 1 without mixing valve Speed, heating circuit pump, heating circuit 2 with mixing valve Speed, heating circuit pump, heating circuit 3 with mixing valve Speed, heating circuit pump, heating circuit 4 with mixing valve Output for "Mixer open" active (mixing valve extension kit) Current position is maintained Output for "Mixer close" active Output for "Mixer open" active (mixing valve extension kit) Current position is maintained Output for "Mixer close" active Output for "Mixer open" active (mixing valve extension kit) Current position is maintained Output for "Mixer close" active
DHW group	
Circulation pump for On DHW tank heating Off DHW recirculation pump On Off	

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

Note:

On lag boiler, exit using the chimney sweep button on the "home screen".

Tap the following buttons:

1. 
2. "Service"
3. Enter password "viservice".
4. Confirm with .
5. "Service"
6. "Test mode"
7. "Emissions test mode"
8. Confirm with .

Note: Ensure adequate heat transfer.

9. Use  to end Test mode.



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. "Service"
6. "Test mode"
7. "Test mode"

Note: For lag boilers, test mode is accessible via the software tool.

8. Confirm with .

Note: Ensure adequate heat transfer.

9. 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. "Message history"
5. "Faults" to call up saved fault messages.
6. If you wish to delete the list, tap .
- . 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.184	Burner in a fault state	Short circuit, supply temperature sensor	■ Check supply temperature sensor. ■ Check plug-in connection and lead to sensor. ■ Replace sensor if necessary. ■ Reset the appliance.
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.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
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 fuses on DIN rail. ■ 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.
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.347	Safety shutdown / restart	Oxygen content has fallen below 0%. O ₂ sensor readings out of range	■ Check combustion air and flue system for possible blockage. ■ Check whether the gas type on the boiler is set correctly. ■ Check whether the exhaust length is set correctly
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 burner fan.
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 the burner fan.
F.364	Burner in a fault state	Internal system fault	Replace BCU burner control 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.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.369	Burner in a fault state	Flame is lost immediately after flame formation (during safety time).	Check gas supply (gas pressure and gas flow switch). Check balanced flue system for flue gas recirculation. Check ionization electrode: ■ Clearance to burner gauze assembly ■ Contamination on electrode ■ Reset the appliance.
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.371	Safety shutdown/restart	Fan speed not reached, reported fan speed below minimum speed.	■ Check exhaust length setting. ■ Check the fan for blockages or sluggish movement ■ Power supply and connecting cables, check blower. ■ Check fan control. ■ If the error occurs repeatedly, replace the fan.
F.378	Burner in a fault state	Flame loss during stabilization or operating phase.	■ Check gas supply (gas pressure and gas flow switch). ■ Check balanced flue system for flue gas recirculation. ■ Check burner gauze assembly for contamination. Check ionization electrode: ■ Electrode contaminated/damaged; replace if necessary. ■ Ionization electrode connecting cables Reset the boiler.
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.
F.381	Burner in a fault state	Flame is lost immediately after flame formation	■ Check gas supply (gas pressure and gas flow switch). ■ Check balanced flue system for flue gas recirculation. ■ Check burner gauze assembly for contamination. Check ionization electrode: ■ Electrode contaminated/damaged; replace if necessary. ■ Ionization electrode connecting cables Reset the boiler.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.382	Boiler locked out	System fault counter has exceeded its limit value (30). Fault as a consequence of too many non-lockout faults in succession.	Reset the boiler. Work through fault analysis using fault history.
F.383	Burner in a fault state	Fuel valve does not close.	■ Check gas line for contamination. ■ Check the gas supply pressure. ■ Replace gas fan if necessary. Reset the boiler.
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.446	Burner in a fault state	Fault in boiler supply temperature sensor	■ Check supply temperature sensor. ■ Check plug-in connection and lead to sensor. ■ Replace sensor if necessary. Reset the boiler.
F.453	Burner in a fault state	Error in scheduled program run monitoring. Control unit in fault state.	Notify contractor. Reset the boiler. If the fault occurs repeatedly, replace burner control unit.
F.454	Burner in a fault state	Wrong software or version. Control unit in fault state.	Notify contractor. Check version of operating software for the HMU electronics module, BCU, TCU and HMI. Install correct software version if required.
F.457	Burner in a fault state	Fan sluggish or blocked.	Reset the boiler. Check fan for sluggishness. In the case of severe contamination or grinding noises, replace fan unit.
F.473	No call for heat	Communication error, heat management unit (HMU)	Check connecting cable between burner control unit (BCU) and HMU.
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.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
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.541	Burner in a fault state, fan in ventilation mode	No feedback: Flue gas damper closed.	Check the cable and function of the flue gas damper.
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)
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. ■ Check 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. Check 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

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
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. ■ Check 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
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.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
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)
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)

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
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.
F.694	Burner in a fault state	Fault in heat generator supply temperature sensor	■ Check supply temperature sensor. ■ Check plug-in connection and lead to sensor. ■ Replace sensor if necessary. Reset the appliance.
F.762	System in a fault state	System pressure too low	Top up with water. Vent the system. If the fault recurs: ■ Check Low water cutoff on terminal block: Boiler is locked if a break is detected between contacts 16 and 17 ■ 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.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.889	System in a fault state	O ₂ probe malfunction: Cyclic probe check failed	If the fault occurs directly after installation or after changing the O₂ probe/BCU: ■ Train the burner to the current O₂ probe by running the burner for between 2 and 6 minutes, cause a regular shut down before the fault appears (remove heat demand). Repeat up to 5 times until the burner can run for more than 10 min fault occurring. If the fault occurs after the burner was running without a previous fault: ■ Check the electric connection to the O₂ probe (cable, connectors at the probe). ■ Check for loose connectors on the BCU and probe. Check for damaged or broken pins or wires. Check the probe: ■ Check for a damaged or contaminated probe tip. Something might be blocking the probe openings. ■ Check the O₂ probe heater by measuring the resistance of the heating coil between pins 3 and 5 on the all-black sensor, or pins 2 and 3 on the black-yellow sensor. The resistance should be about 2-3 Ohm. ■ Hardware faults detected during pre-purge by the BCU. ■ Compare the O₂ value measured by the probe with the O₂ value measured with a flue gas analyzer during operation. If the calibration was done with air and 20.8-21% O₂ content: the difference should be less than 0.5% O₂. If the difference is greater than 1% O₂ try with another probe. If the difference is still greater than 1% O₂ with another probe, try with another BCU. ■ Check for internal and external flue gas recirculation. ■ Check for possible contamination of the intake air and its O₂ content. ■ Check for potential flue gas intake from other devices. Using flue gas analyzer measure incoming combustion air for contaminated air (it should be always about 20.7-21% O₂): ■ Room air dependent combustion air: measure at the fan intake during pre-purge & burner operation ■ Ducted combustion air: measure through the flap (before fan intake) pre-purge & burner operation ■ Check for blocked venting and air intake. ■ Check for signs of condensate blockage. ■ Look for signs of condensate build up within the heat exchanger ■ Check pressure drop over combustion air filters (if installed). Pressure difference greater than 0.6 in w.c. (150 Pa) during post purge indicates a dirty filter. ■ Check the installation side for possible wind or pressure changing events. ■ Verify that the venting and combustion air terminations conform to the layouts described within the boiler installation instructions

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.890	System in a fault state	O ₂ probe malfunction: Cyclic probe check failed	■ Check for internal and external flue gas recirculation. ■ Check for possible contamination of the intake air and its O₂ content. ■ Check for potential flue gas intake from other devices. Using flue gas analyzer measure incoming combustion air for contaminated air (it should be always about 20.7-21% O₂): ■ Room air dependent combustion air: measure at the fan intake during pre-purge & burner operation ■ Ducted combustion air: measure through the flap (before fan intake) pre-purge & burner operation ■ Check for blocked venting and air intake. ■ Check for signs of condensate blockage. ■ Look for signs of condensate build up within the heat exchanger ■ Check pressure drop over combustion air filters (if installed). Pressure difference greater than 0.6 in w.c. (150 Pa) during post purge indicates a dirty filter. ■ Check the installation side for possible wind or pressure changing events. ■ Verify that the venting and combustion air terminations conform to the layouts described within the boiler installation instructions
F.891	System in a fault state	O ₂ probe malfunction: Probe not ready for operation in pre/post purge	■ Check the electric connection to the O₂ probe (cable, connectors at the probe). ■ Check for loose connectors on the BCU and probe. Check for damaged or broken pins or wires. Check the probe: ■ Check for a damaged or contaminated probe tip. Something might be blocking the probe openings. ■ Check the O₂ probe heater by measuring the resistance of the heating coil between pins 3 and 5 on the all-black sensor, or pins 2 and 3 on the black-yellow sensor. The resistance should be about 2-3 Ohm. ■ Hardware faults detected during pre-purge by the BCU. Method of Probe Verification: Install the O₂ probe from a faulting burner into a functioning burner, if the probe cause an F.891 on the previously functioning burner the probe is broken. If burner starts without a F.891 the probe is working, replace the BCU on faulty burner. If F.891 intermittent or only in the error history: ■ Room air dependent combustion air: measure at the fan intake during pre-purge & burner operation ■ Ducted combustion air: measure through the flap (before fan intake) pre-purge & burner operation ■ Check for blocked venting and air intake. ■ Check for signs of condensate blockage. ■ Look for signs of condensate build up within the heat exchanger ■ Check pressure drop over combustion air filters (if installed). Pressure difference greater than 0.6 in w.c. (150 Pa) during post purge indicates a dirty filter. ■ Check for internal and external flue gas recirculation.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
F.892	Burner in a fault state	O ₂ probe malfunction: Calibration failed	■ Check for internal and external flue gas recirculation. Using flue gas analyzer measure incoming combustion air for contaminated air (it should be always about 20.7-21% O₂): ■ Room air dependent combustion air: measure at the fan intake during pre-purge & burner operation ■ Ducted combustion air: measure through the flap (before fan intake) pre-purge & burner operation ■ Check for blocked venting and air intake. ■ Check for signs of condensate blockage. ■ Look for signs of condensate build up within the heat exchanger ■ Check pressure drop over combustion air filters (if installed). Pressure difference greater than 0.6 in w.c. (150 Pa) during post purge indicates a dirty filter.
F.893	Burner in a fault state	O ₂ probe malfunction: Calibration failed	■ Check for internal and external flue gas recirculation. Using flue gas analyzer measure incoming combustion air for contaminated air (it should be always about 20.7-21% O₂): ■ Room air dependent combustion air: measure at the fan intake during pre-purge & burner operation ■ Ducted combustion air: measure through the flap (before fan intake) pre-purge & burner operation ■ Check for blocked venting and air intake. ■ Check for signs of condensate blockage. ■ Look for signs of condensate build up within the heat exchanger ■ Check pressure drop over combustion air filters (if installed). Pressure difference greater than 0.6 in w.c. (150 Pa) during post purge indicates a dirty filter.
F.894	Burner in a fault state	O ₂ probe malfunction: Probe heating	Check Lambda probe plug and replace if necessary. Replace burner control unit.
F.895	Burner in a fault state	O ₂ 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.

Fault Messages *(continued)*

Displayed fault code	System characteristics	Cause	Measures
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.
F.1061	Burner in a fault state	Faulty burner control unit or faulty lead from O ₂ probe to burner control unit	Replace faulty parts.
F.1062	Burner in a fault state	Discrepancy between value measured on O ₂ controller and comparative measurement on burner control unit	Check plug/lead on O ₂ probe. Replace burner control unit.

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.

Warning Messages

Display	Warning	Cause	Measure
A.18 A.48	Output reduction on system	Condensate backed up 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. Check flue length adjustment.
A.19	System in a fault state Heat generator is set to standby for as long as the warning/excess temperature is active.	Maximum temperature threshold 199°F (93°C) has been exceeded.	If the fault recurs, check that the flow rate in the hydraulic system is adequate. If necessary, check external boiler (maximum temperature settings). Wait until temperature has fallen below 190°F (88°C).
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

Information Messages

Display	Message	Measure
I.57	Boiler locked out externally	None

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

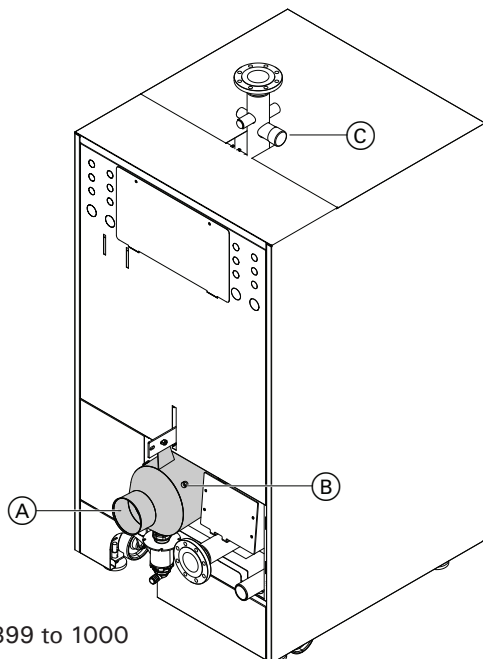
Fault Memory

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.

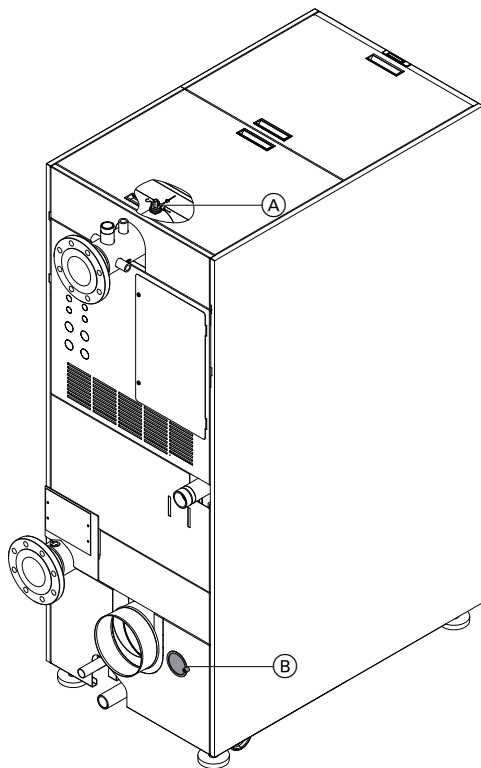
Check Sensors



CI2 399 to 1000

Legend

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



CI2 1500 to 2000

Legend

- Ⓐ Supply temperature sensor (under jacketing)
- Ⓑ Inspection cover of flue gas temperature sensor

Flue gas and supply temperature sensor

A manual check of the sensors is not necessary. The flue gas and supply temperature sensors are both double temperature sensors. By continuously comparing the individual temperatures, the measured temperatures are electronically checked for plausibility. If a sensor is faulty, the appliance is automatically locked out. It can be unlocked at the programming unit. In the case of a faulty sensor, a fault message is generated. Flue gas temperature sensor faulty: F.694 Supply temperature sensor faulty: F.446

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 $\frac{1}{4}$ 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 $\frac{1}{4}$ turn to install it.



WARNING

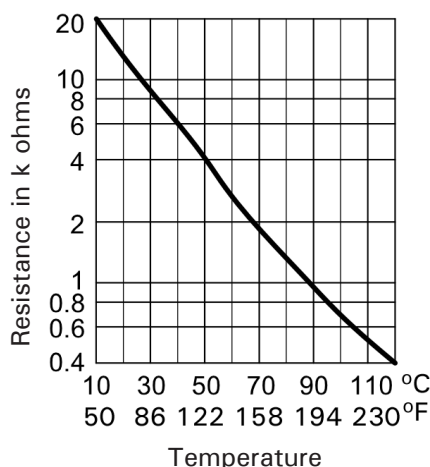
Escaping flue gas can cause poisoning.
When restarting, check for leaks on the flue gas side.

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)*

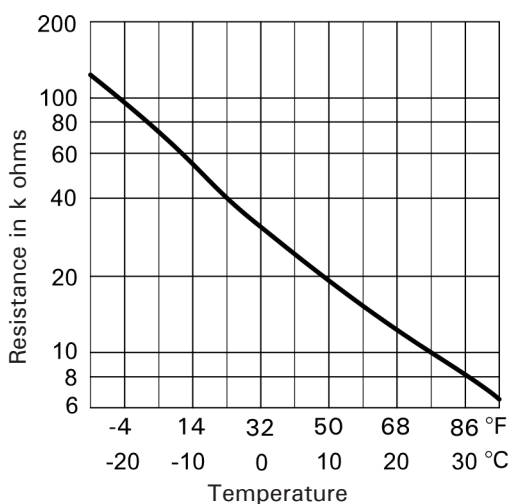
Viessmann NTC 10 k Ω (blue ID label)

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



Viessmann NTC 10 k Ω

- 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.



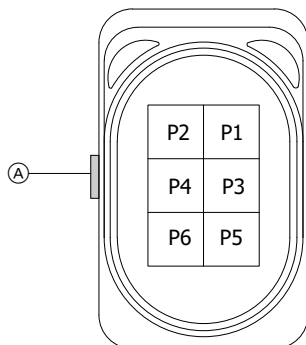
Vitotrol 200-E installation and service instructions

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 mm²). Depending on the result, replace the lead or the outside temperature sensor.

Replacing Components

All-black O₂ Sensor with a locking clip on the side:



Legend:

Ⓐ Locking clip

PIN 1: Compensation resistance

PIN 2: Ip (+) (white) compensation resistance

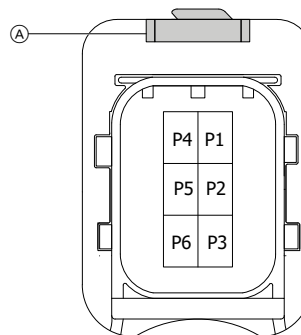
PIN 3: Heater (-) (yellow)

PIN 4: Vs (+) (gray)

PIN 5: Heater (+) (blue)

PIN 6: COM (-) (black)

O₂ Sensor with a large yellow clip on both connectors:



Legend:

Ⓐ Yellow locking clip

PIN 1: Compensation resistance

PIN 2: Heater (-) (yellow)

PIN 3: Heater (+) (blue)

PIN 4: Ip (+) (white) compensation resistance

PIN 5: Vs (+) (gray)

PIN 6: Ip (-)/Vs (-) (black)

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.

Replacing the gas solenoid valve on a lag boiler

On lag boilers, the gas solenoid valve cannot be replaced using the ViGuide app. To load the current parameters using the ViGuide app, lag boilers must first be put into single boiler mode. Once the replacement has been successfully completed, the boiler is then reincorporated into the cascade.



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 heat management unit (HMU) and burner control unit (BCU).

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.

Note on replacing burner control unit (BCU) on a lag boiler

On lag boilers, the burner control unit cannot be replaced using the ViGuide app. To load the current parameters using the ViGuide app, lag boilers must first be put into single boiler mode. Once the replacement has been successfully completed, the boiler is then reincorporated into the cascade.



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).
- The starting output of the boiler can be configured. By configuring the starting output, the maximum or minimum value for burner modulation is restricted to the value set.
 - The minimum heating output of the boiler is configured with parameter 1503.0
 - The maximum heating output of the boiler is configured with parameter 596.0
 - The maximum heating output of the boiler for DHW heating is configured with parameter 597.0

Note:

For the CI2 1500 and 2000, the upper burner is always switched on first.

Gas Consumption Meter

The boiler has an integral gas consumption meter. Gas consumption can be read off on the HMI and via ViGuide Web. The measurements distinguish between consumption for DHW heating and consumption for the heating circuits.

Consumption displays

- Current consumption
- Consumption in the past 7 days
- Consumption in the current month
- Consumption last month
- Consumption in the current year
- Consumption last year

The measurement shows the output provided in relation to the gas volume correction factor and the gross calorific value of the gas. To optimize the measurement, the gas volume correction factor (parameter 1098.4) and gross calorific value (parameter 1098.5) can be configured on the HMI or via ViGuide Web Pro.

Note

- The gas volume correction factor and the gross calorific value of the gas can be requested from the supplier or found on the gas bill.
- The gas consumption of lag boilers can similarly be read off using the above parameters. To configure via ViGuide Web Pro, select the heat management unit (HMU) of the lag boiler.

Boiler Active Frost Protection

If a temperature of below 41°F (5°C) is measured on the supply temperature sensor, the boiler receives a target value demand of 68°F (20°C). This activates the boiler control unit and regulates it accordingly. Each lag boiler determines the frost risk individually through the supply temperature sensor and ensures protection from frost. The lag boiler reports the situation in the cascade to the lead boiler (system pump demand).

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. The 120 V output of the boiler circuit pump is actuated independently of the 0-10 VDC output for the speed-controlled pump. The delay-off time therefore applies to speed-controlled pumps as well.

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.

The target spread is derived through interpolation of 2 support points. At a supply temperature of 68°F (20°C), the spread is determined through parameter 2779.0 (factory setting 9°F [5°C]). At a supply temperature of 194°F (90°C), the spread is determined through parameter 2779.1 (factory setting 36°F [20°C]). If the ACTUAL spread lies below the interpolation line, the speed setting is reduced. If the ACTUAL spread lies above the interpolation line, the speed setting is increased.

Minimum Burner Pause Time

To prevent the burner cycles becoming too frequent, a minimum burner pause time applies between switching off the burner and switching it on again. Via parameter 1606.0 (boiler group), either temperature hysteresis or integral method can be selected.

Integral method

- The minimum pause time is determined by means of an integral derived from the actual/target variation in the boiler supply temperature and the switch-off time. If the integral limit, which is set via parameter 1606.4 (factory setting: min. 50 K), is exceeded, the minimum pause time is regarded as having been completed.

Temperature hysteresis

The parameters for the temperature hysteresis cannot be configured.

The following values are pre-specified:

- The standard minimum pause time is 4 min. Under the following conditions, the minimum pause time is suspended
 - Supply temperature falls below a fixed temperature threshold (factory setting: 68°F [20°C]).
 - Difference between target and actual temperature exceeds a fixed threshold (factory setting: 36°F [20K]). In addition, a differential of 14°F (8K) between startup and shutdown applies each time burner operation is switched ON or OFF.

Combustion Air Device

If the boiler receives a call for heat, the ventilation air damper is opened. The feedback signal is used to check that the ventilation air damper has opened within the set time (parameter 2344.0). The burner is not enabled until the feedback signal is received. If the boiler does not receive the feedback signal within the set period of time, the burner is prevented from starting and fault F.691 is issued. While the fault event (CAI air damper does not open) is active, the control unit has to continuously actuate the air damper for safety reasons. This makes it possible to troubleshoot the fault.

Test Functions

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. After 30 min, the emissions test function is automatically terminated. The boiler returns to normal operation.

Test function, high limit safety cut-out

This function allows the working of the high limit safety

cut-out to be tested. It does so by operating the boiler at a load of 100% with zero flow (boiler circuit pump is deactivated). The test is successfully completed if the appliance switches off at a supply temperature of 210°F (99°C). If the temperature limit of 210°F (99 °C) is not reached, the test is aborted after 30 min.

Cascade Control Unit

Brief description

The cascade is controlled via the lead boiler. The guided commissioning of the functions can be performed only through the ViGuide app. The listed parameters can be altered subsequently only through ViGuide Web Pro or by carrying out the commissioning again. The supply temperature is regulated by starting or stopping the burners or by starting/stopping individual burner stages.

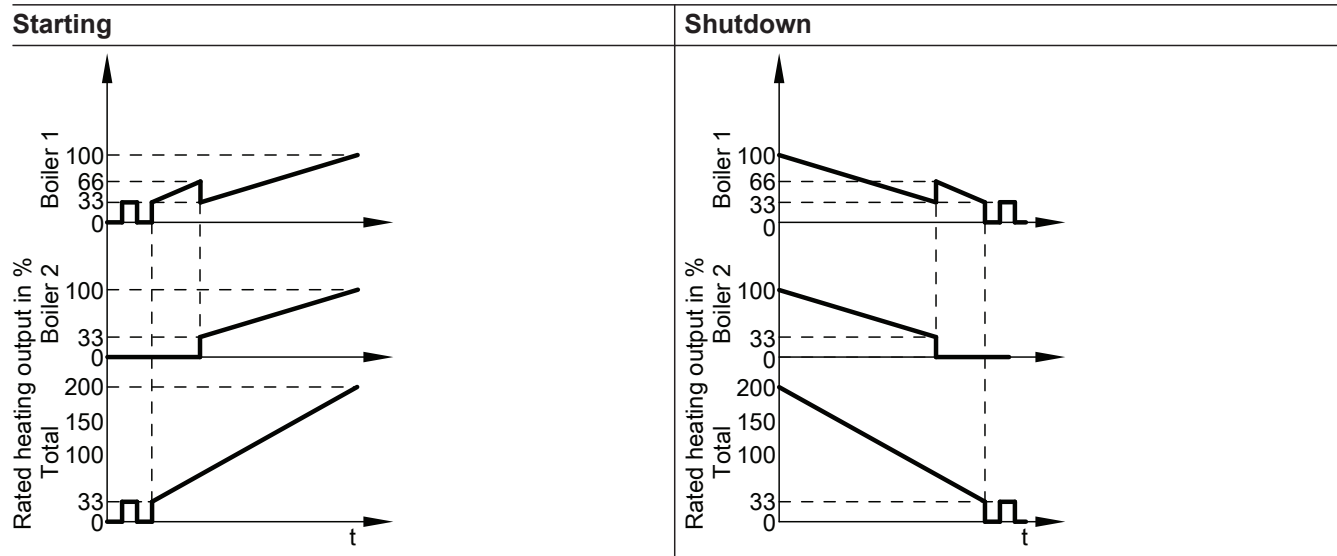
Target supply temperature

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

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.



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).

The regular boiler sequence can be influenced by various settings and events, e.g. temporary events. These events can also occur in parallel. Priorities must be observed here. The boiler sequence can be configured during commissioning or in ViGuide Web Pro with parameter 2235.

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

If a fault occurs, a corresponding general fault message F.764 is issued. The boiler is excluded from heat production, and demand to the boiler is rejected until the fault event has disappeared. (For example, if the CAI air damper on a lag boiler does not open within the specified time.)

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 during commissioning or through ViGuide Web Pro with parameter 2235. 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.

3. Configurable specification of the boiler sequence

Dynamic determination of the sequence can be influenced by the following configurations.

Setting options

- Fixed 1st boiler
- Fixed last boiler
- Runtime optimization of the burners

Cascade Strategy *(continued)*

3.1 Fixed first boiler

Specification of boiler sequence, 1st subscriber A boiler can be specified as the 1st subscriber by means of the boiler number. The boiler is permanently configured as the lead 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. As an example, take a system with 4 boilers, where boiler 3 should always be switched on first. Switch on 3-1-2-4, switch off 4-2-1-3.

3.2 Fixed last boiler

A fixed last boiler can be defined by specifying a boiler number. One boiler 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. As an example, take a system with 4 boilers where 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 has elapsed for the 1st boiler within the boiler sequence, 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 on the 1st lead boiler (parameter 2235). After the event, the boiler sequence is sorted by the burner runtime – the boiler with the lowest burner runtimes takes first position. 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 value 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 re-initialized.

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 (parameter 2451.0 via ViGuide Web Pro). The time between the communication failure and the transition to emergency mode is 60 s. Until emergency mode starts, the individual boilers regulate to the last received value. The boiler target temperature for emergency mode can be activated via parameter 2451.1. Boiler frost protection monitoring remains active < 41°F (< 5 °C).

Emergency operation program, lead boiler

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)

Parameter 2451.1 can be configured to between 32°F and 176°F (0°C and 80°C)

5. Control of cascade-specific applications

Local DHW tank

In the case of local DHW supply, the tank is supplied only by the integral boiler of the lead boiler. Where demand exists, the lag boilers can continue to supply heat to the heating system (heating circuits, heating circuit thermostats). Local DHW heating is a time-limited state. Local DHW heating active: DHW pump is active and is supplied with heat by the lead boiler. Heating circuit pumps are active and are supplied with heat by the lag boilers. The target value for the lead boiler is determined by DHW heating. The target value for the lag boilers is calculated without reference to the DHW storage system. During active local DHW heating, the boiler disconnects itself from the lead boiler. (Bit status: Boiler not available). While local DHW heating is active, no account is taken of the boiler. The rest of the consumers (heating circuits) are supplied via the remaining lag boilers. DHW heating must be enabled during commissioning.

Cascade Strategy *(continued)*

Global DHW tank

In the case of global DHW supply, the tank is supplied as necessary by all boilers on the system in parallel. From the point of view of the lead boiler, the tank is treated as a regular consumer. The target demand from the DHW storage system during active tank heating is taken into account in determining the maximum value. The individual heating circuits apply DHW tank priority during tank heating according to their individual settings.

Global DHW heating active: Heating circuit and DHW pumps remain active on the lead boiler for heating and DHW operation. The heating circuits apply DHW priority when tank heating is active according to their individual settings. DHW heating must be enabled during commissioning.

Boiler Isolation Valve

The boiler isolation valve is actuated by each boiler individually. As soon as the boiler's burner is switched on, the isolation valve is opened. When the burner is switched off, the isolation valve closes.

Flue gas damper

The flue gas dampers are actuated by each boiler individually. As soon as the boiler's burner is switched on, the flue gas damper is opened. When the burner is switched off, the flue gas damper closes. Through the feedback signal, the boiler identifies whether the flue gas damper is closed. If the shut-off damper does not close, a fault is reported and the boiler fan is activated. The lead boiler notices the change in flue gas pressure and switches off.

Heating Circuit Control Unit

Brief description

- The control unit has control circuits for one heating circuit without mixing valve A1 (heating circuit 1) and 3 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).
- Unless otherwise noted, the parameters specified in the heating circuit control functions can be set via HMI in the "Heating circuit" service area. All parameters can be configured in ViGuide Web Pro.
- During commissioning, the choice can be made between weather-compensated mode and constant mode. A mixed installation is not possible.

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"

Heating Circuit Control Unit *(continued)*

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.

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

$(RT \text{ target} - RT \text{ actual}) \times (1 + \text{slope}) \times \text{room influence factor} / 4 = \text{raising the supply temperature via heating curve value}$
 $(20 - 18) \times (1 + 1.4) \times 8 / 4 = 9.6$
 Increase in supply temperature via heating curve value = 9.6 K

Heating circuit pump logic – Economy circuits

Hysteresis for energy saving function on the heating circuit pump. The heating circuit pump is switched off (target supply temperature set to 32°F [0°C]) 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 with weather-compensated control unit): 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 50°F (10°C).

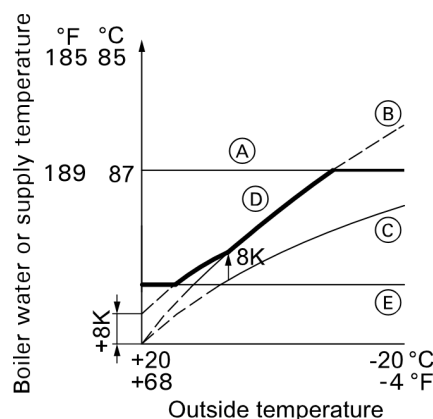
Supply temperature control

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.



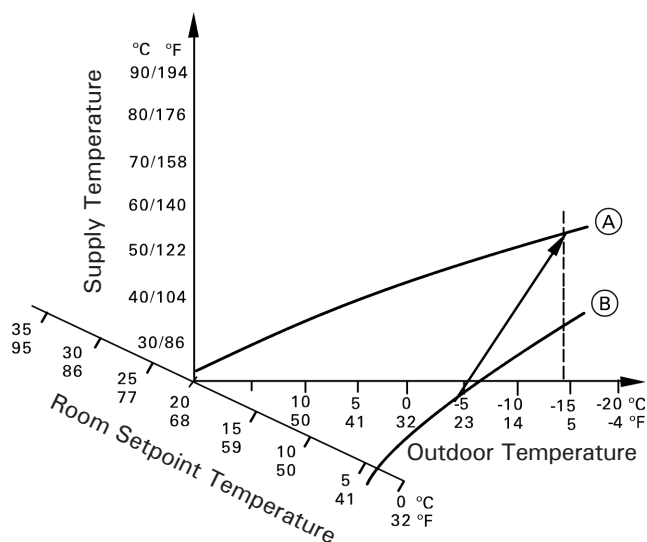
Legend

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

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.

Heating Circuit Control Unit *(continued)*



Reducing the heat-up time

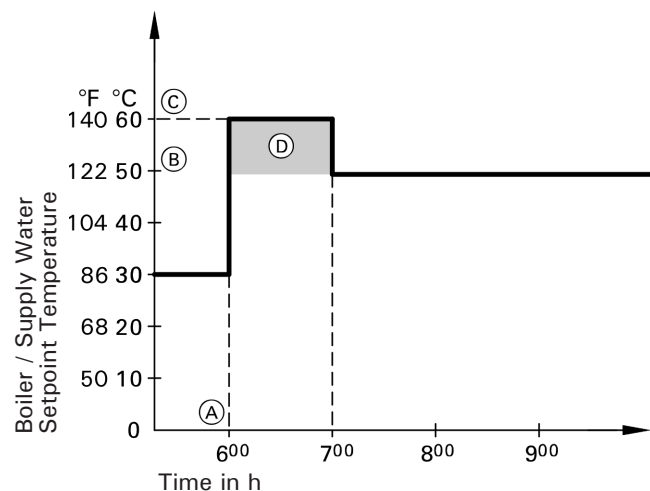
During the transition from operation at reduced room temperature to operation at standard room temperature or comfort room temperature, the supply temperature will be raised in accordance with the selected heating curve.

The value and duration of the additional increase in the target supply temperature is adjusted in parameters 424.3 and 424.4.

Configuration of heating circuits 2, 3 and 4 in parameters 426, 428 and 430

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

Heating Circuit Control Unit *(continued)*

Constant heating circuit control

The constant temperature control operating mode determines the call for heat from a heating circuit on the basis of the target supply temperature for that circuit selected by the user. No calculation is made as to how high the current supply temperature should be on the basis of external factors such as outside temperature, room temperature or heating curve. 3 temperature levels (reduced, standard and comfort) are available, each of which can be altered by the user. The temperatures are applied by the HMU heat management unit on the basis of the time program. The time program specifies the time and temperature level to be used by the heating system. The flow rate of the heating circuit is controlled with no reference to the temperature level from heat generation. On the basis of the overall call for heat from all circuits on the system, a maximum target supply temperature is determined for the boiler.

Control sequence

If the measured temperature of the heating circuit falls below the required target temperature, a call for heat is issued to the burner. The mixing valve is regulated to the target value. Once the target value for the mixed heating circuit has been reached, the boiler (ADIO) closes the mixing valve.

Supply temperature control

In constant mode, the heating circuit is regulated to the target supply temperature. For each heating circuit, the supply temperatures can be preset for reduced, standard, and comfort mode according to the time program. The supply temperature can be configured either with the following parameters or directly on the programming unit.

- Target supply temperature, heating circuit 2: Parameter 1556
- Target supply temperature, heating circuit 3: Parameter 1557
- Target supply temperature, heating circuit 4: Parameter 1558

The supply temperature of the boiler exceeds that of the heating circuit by a configurable value/ temperature differential (factory setting 8 K [14.4°F]). The supply temperature can be increased only via ViGuide Web Pro or on the programming unit, with the following parameters.

Differential temperature/target increased supply temperature

- Heating circuit 2: Parameter 934.5
- Heating circuit 3: Parameter 935.5
- Heating circuit 4: Parameter 936.5

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.

DHW temperature

Priority control

- With priority control:
The target supply temperature is adjusted to 32°F (0°C) during tank heating. The mixing valve closes and the heating circuit pump is switched off.
- Without priority control:
The heating circuit control unit continues to operate with the same target value.
- Without priority control:
In conjunction with low loss header, this is possible only if the DHW tank is connected downstream of the header.
- Priority control can be applied to each heating circuit separately. The function is switched off/on with the following parameters:
 - Heating circuit 1: Parameter 933.3
 - Heating circuit 2: Parameter 934.3
 - Heating circuit 3: Parameter 935.3
 - Heating circuit 4: Parameter 936.3

Mixing valve heating circuit, emergency mode

If a connection via PlusBus to a mixing valve extension kit is lost, the corresponding heating circuit switches to emergency mode after 20 min. The mixing valve is closed and the pump switched on. Until emergency mode is activated, the outputs from the mixing valve extension kit remain in the most recent active control condition from before the communication error was identified. Through the HMU, the corresponding input/output conditions of the mixing valve extension kit are removed from the info/ diagnosis menu in the HMI. Fault message F.92 is issued.

Heating Zone Control

Heating zone control sequence

While the thermostat contact is closed, the boiler heats to the set supply temperature. The associated pump output is active. If DHW priority control is active, the pump output is switched off.

When the contact is open, the associated pump output is inactive and issues no call for heat to the boiler for the heating zone.

Supply temperature control, heating zone

Up to 4 heating zones can be configured with a supply temperature controller during commissioning. A distinction is drawn between weather-compensated and constant mode. In constant mode, the circuit is regulated to the set supply temperature. In constant mode, the target supply temperatures for heating zones 1 to 4 are set via parameters 1559 to 1562.

In weather-compensated mode, the supply temperature is regulated according to the heating curve. Settings for heating zones 1 to 4 are made via parameters 884 to 887.

Note

- With plug [96], an additional thermostatic controller can be configured (call for heat). This controller functions in an equivalent way to the heating zone controller.
- No internal frost protection functions are stored in the heating zone controller. Frost protection must be ensured on site.

DHW Tank Temperature Control

Brief description

Unless otherwise noted, the parameters specified in the DHW tank temperature control functions can be set via HMI in the "DHW" service area. All parameters can be configured in ViGuide Web Pro.

- Tank temperature control is a constant temperature control. It operates by starting and stopping the DHW pump.
The switching differential is $\pm 2.5 \text{ K}$ ($\pm 5^\circ\text{F}$).
- When the DHW tank is heated, a target supply temperature is specified that is 20 K (36°F) above the target DHW temperature. This can be changed via parameter 2257 in ViGuide Web Pro.
- If the final temperature is not reached within a maximum of 240 min (parameter 1087.0), DHW heating is aborted.
- A fresh attempt to heat the DHW will be started after 60 min (parameter 1087.1).

Note:

DHW tank temperature control can be prioritized over heating circuit control.

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.

Aquastat function

The control principle for the Aquastat function is equivalent to DHW tank heating. The boiler receives the external DHW demand from the temperature switch (Aquastat) and regulates to the target value of 122°F (50°C). (factory setting) specified in parameter 396.

Conditions for Aquastat function

- System scheme selected during commissioning (parameter 952):
 - Tank with temperature switch (Aquastat) or
 - Tank with temperature switch and DHW recirculation pump
- Plug [5] on the wiring panel is closed.

Frost protection

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

DHW Tank Temperature Control *(continued)*

DHW hygiene

For optimum DHW hygiene, avoid DHW temperatures that are < 122°F (50°C). For larger systems and systems with low water exchange, the temperature should not drop below < 140°F (60°C).

Hygiene function

The DHW is heated to a specified (higher) target DHW temperature for a period of 1 hour. To activate the function, see the operating instructions.



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.

The hygiene function is configured via HMI or ViGuide Web Pro with parameters 874.0 to 876.0.

Note

For the duration of the hygiene function, parameter 1087.0 can be used to switch off the DHW if the final temperature is not reached. The duration must be adjusted to 60 min. Factory setting is 240 min.

Target DHW temperature

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

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 each day.

Control sequence

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

Tank heating

The DHW tank goes cold (target value -5°F [-2.5K], adjustable via parameter 1085.0):

- The common target supply temperature is set 36°F (20K) higher than the target DHW temperature (adjustable via parameter 2257).

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

- 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 run-on (parameter 534.0).

Third Party Control of Boiler/Cascade System

System characteristics during external call for heat:

Single boiler

- The boiler is operated according to the highest current call for heat that it receives. The consumers (including DHW heating) remain in normal operation.

Lead boiler

- The highest current call for heat to the cascade is controlled by the lead boiler and all cascade subscribers are operated according to this. The connections are made on the lead boiler. The consumers (including DHW heating) remain in normal operation. Hydraulic dampers open on the boiler as it delivers its output. Modulation demand is possible only with single boilers

Lag boiler

- No external demands can be issued to the lag boiler. It is controlled solely via the lead boiler (CAN bus).

Single boiler in third party cascade

- The boiler is operated according to the highest current call for heat that it receives. The consumers (including DHW heating) remain in normal operation. Hydraulic damper is not actuated by the single boiler. The cascade controller must open the hydraulic damper for the boiler.

Third Party Control of Boiler/Cascade System *(continued)*

External call for heat (input)

The following options are available for initiating a call for heat from outside to the boiler.

- Via 0 to 10 V In connection (parameter 1706)
Selecting during commissioning:
 - Temperature demand that is included when determining the maximum value of all temperature demands
 - Or selecting a modulation demand.
- Jumper between pins 5 and 6 via plug  (during commissioning, select external demand or call for heat). When the contact is closed, the external target supply temperature is set according to parameter 528.
- Via the WAGO gateway, the target values for all heating circuits and DHW can be set and an external call for heat can be activated on the boiler. No determination of maximum value takes place in this case; the temperature demand is used.
- With the WAGO gateway, the required parameters for a building management system can be configured with the WAGO configurator.

Additional call for heat to an external heat generator

If the output from the available boiler is not sufficient to achieve a target temperature in good time, an additional heat generator can be enabled via plug  (parameter 1706).

Condition of startup: The additional call for heat is started if the integral burner is running but the target temperature minus a specified delta of 36°F (20K) has not been reached within a defined period of 600 s.

Example: The boiler needs to achieve a target supply temperature of 176°F (80°C) within 700 s. At 138°F (59°C) the temperature stops rising: Contact on plug  switches.

Condition of stopping: Demand to the additional heat generator is stopped when the internal burner is stopped.

Note

Function is available only with single boilers. If there is a burner fault, no additional call for heat is activated.

Additional call for heat (output)

The boiler can send the following information to third party boilers:

- Via 0 to 10 V Out connection: The boiler transmits as for the current modulation value.
- Plug : Depending on programming, the boiler can demand additional heat digitally. The demand is issued if the final temperature is not reached or if a digital fault is issued so that readiness for operation is not signalled.

External blocking demand

For all blocking demands, the contact is closed.

Contact closed:

- Controlled shutdown of the burners on each boiler in the system. In a cascade, applies to lead and lag boilers
- Boiler circuit pump switches off after a 60 s delay-off time.
- Message I.57 is displayed.

External blocking via DIS

Boiler is blocked via the DIS contact. "External blocking" function is activated by a jumper between the DIS contacts.

External blocking via plug

The boiler is blocked via contact .

Plug  can be configured for "external blocking" either during commissioning or subsequently via ViGuide Web Pro parameter 1232.

To activate "external blocking", contact between contacts 5 and 6 must be bridged.

External blocking via DIO electronics module

The boiler can be extended with an external DIO electronics module. Among other things, the module offers the option of using a blocking contact.



"EM-EA1 extension, DIO electronics module" installation and service instructions

External safety input

Boiler shutdown via safety contact behavior during safety shutdown:

- Controlled shutdown of the burners on each boiler in the system. In a cascade, applies to lead and lag boilers
- Boiler circuit pump switches off after a 60 s delay-off time.

Blocking via safety input Z11, Z12, Z13

To use the function, select safety inputs during commissioning. Can be set subsequently via ViGuide Web Pro with parameters 2229, 2230 and 2231. If contact between R/T and W/T is opened, the safety shutdown takes place.

Blocking via (on-site) low water cutoff

Low water cutoff on terminal block:

Boiler is locked if a break is detected between contacts 16 and 17 (fault message F.762).

Gas Pressure Switch GDW

For the location of the gas pressure switches, see "Overview of Burner Components" on page 93.

Gas pressure switches 1 and 3

Gas pressure switch 1 (marked with yellow) monitors the minimum pressure in the gas grid and is set to 4" w.c. (10 mbar).

Gas pressure switch 3 (marked with green) monitors the maximum 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

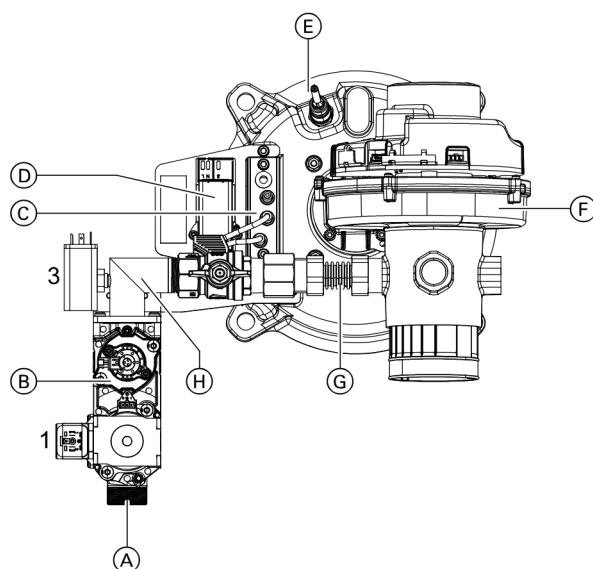
The 750/1000 MBtu burner is equipped with an additional gas pressure switch.

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.

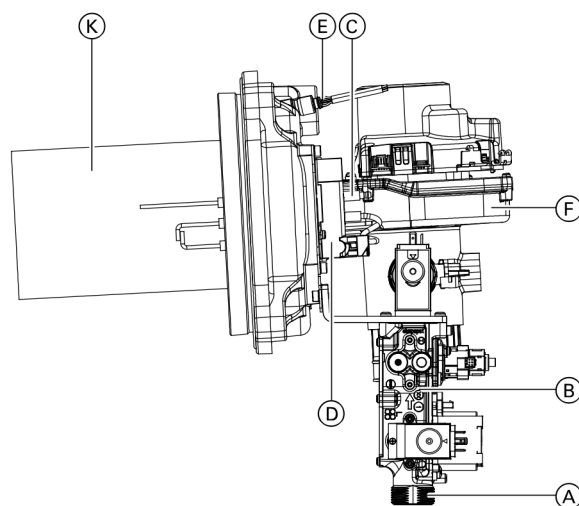
Overview of Burner Components



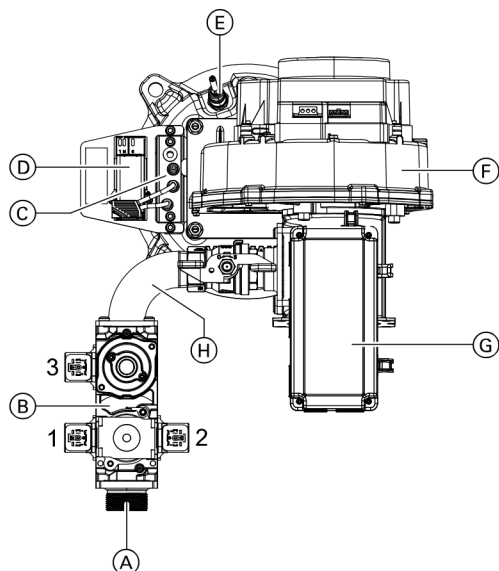
399/500 MBH burner

Legend

- (A) Gas supply pipe
- (B) Gas solenoid valve with gas pressure switch 1 (GDW1 marked yellow)
- (C) Ignition and ionization electrode block with sight glass
- (D) Ignition module
- (E) Lambda probe (O₂ sensor)



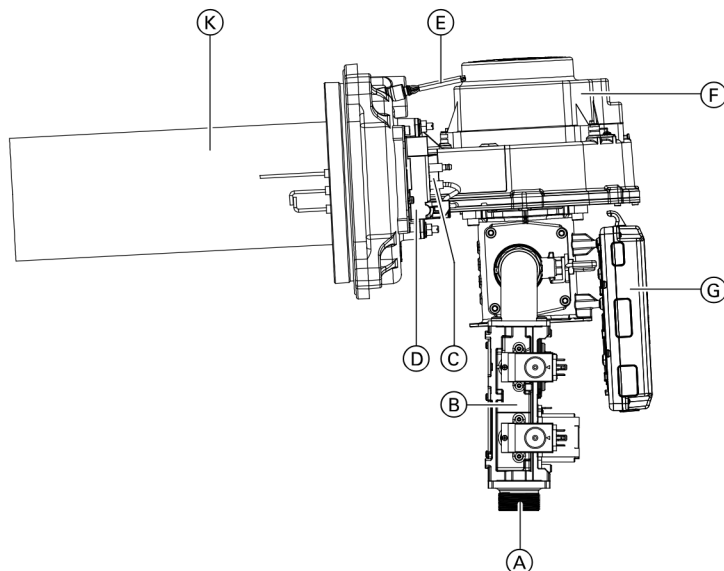
- (F) Gas fan
- (G) Flexible section of pre-assembled gas line
- (H) Pre-assembled gas line (gas ball valve, pipe bend, gas pressure switch 3 (GDW3 marked green))
- (K) Burner gauze assembly



MBH 750/1000 burner

Legend

- (A) Gas supply pipe
- (B) Gas solenoid valve with 3 gas pressure switches (GDW1 marked yellow, GDW2 marked red, GDW3 marked green)
- (C) Ignition and ionization electrode block with sight glass
- (D) Ignition module
- (E) Lambda probe (O₂ sensor)



- (F) Gas fan
- (G) E-Box (valve electronics)
- (H) Pre-assembled gas line (gas ball valve, pipe bend, pressure switch)
- (K) 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 water but with water which fulfils the requirements given in the table above, the following should also be considered for commissioning:
 - Start the system step by step with a high heating water flow rate, starting with the lowest boiler output. This prevents localized concentration of lime scale deposits on the boiler heating surfaces.
 - In multiple boiler systems, start all boilers simultaneously to prevent the entire lime scale deposit settling in the heat exchanger of just one boiler.
 - Where water treatment is required, treat the first fill of the heating system prior to start-up. This also applies to any subsequent filling, e.g. when adding top-up water or after a repair, or for any system expansion. The build-up of lime scale deposits on the heating surfaces will be minimised if these instructions are followed.

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 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)*

[illegible]

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 (CO₂)					
At the upper rated heating output	% by Vol.				
At the lower rated heating output	% by Vol.				
Oxygen Content (O₂)					
At the upper rated heating output	% by Vol.				
At the lower rated heating output	% by Vol.				
Flue Gas Temperature (Gross)	°F (°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**	%	97	97	96.9	96.8	96.6	96.5
Thermal efficiency**	%	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 (including insulation and jacketing)	in.	39	39	47¼	47¼	56¼	56¼
	mm	992	992	1200	1200	1428	1428
Overall Boiler Width (including insulation and jacketing)	in.	29½	29½	29½	29½	29½	29½
	mm	750	750	750	750	750	750
Overall Boiler Height (including insulation and jacketing)	in.	64½	64½	64½	64½	78¾	78¾
	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
	m ²	6.1	6.1	12.0	12.0	18.2	24.0
Fixed High Temperature Limit (Manual Reset)	°F	210	210	210	210	210	210
	°C	99	99	99	99	99	99
DHW Production	°F	194	194	194	194	194	194
	°C	90	90	90	90	90	90
Maximum Adjustable Operating Temperature Limit (Auto Reset)	°F	185	185	185	185	185	185
	°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

** 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. mm	2 50	2 50				
Boiler supply and return (BS), (BR) (ANSI flanges)	in. mm			2½ 65	2½ 65	4 100	4 100
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. mm	4 104.2	4 104.2	6 155	6 155	6 155	8 205.2
Combustion Air							
Internal diameter (with combustion air intake kit)	in. mm	4 104.2	4 104.2	6 155	6 155	6 155	8 205.2
Flue Gas Values							
Temperature (at a return temperature of 86°F (30°C))							
at rated input	°F °C	97 36	104 40	97 36	100 38	108 42	108 42
at partial load	°F °C	88 31	88 31	91 33	93 34	93 34	93 34
Temperature (at a return temperature of 140°F (60°C))							
at rated input	°F °C	145 63	149 65	145 63	149 65	154 68	154 68
Mass flow rate (of flue gas)							
at rated input	lbs/h kg/h	359 163	452 205	675 306	899 408	1351 613	1799 816
at partial load	lbs/h kg/h	108 49	136 62	202 92	270 122	405 184	540 245
Max. Condensate Flow Rate for NG and LPG	USG/h L/h	4 14.6	5 18.4	7 27.5	10 36.6	15 55.0	19 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 W %	2870 841 0.8	2870 841 0.7	2930 858 0.4	2930 858 0.3	4590 1345 0.3	4590 1345 0.3
NOx @3% O2 (NG)*2		< 20 ppm					
Communication Module (integral)							
WiFi Frequency Band	MHz	2400 to 2483.5					
Maximum Transmission Power	dBm	15					
Lower Power Radio Frequency Band	MHz	2400 to 2483.5					
Maximum Transmission Power	dBm	6					

*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

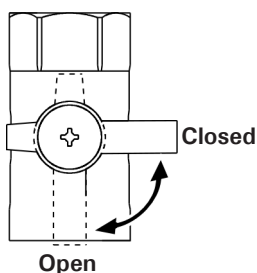
W A R N I N G: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- 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 appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
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.

Manual gas shutoff

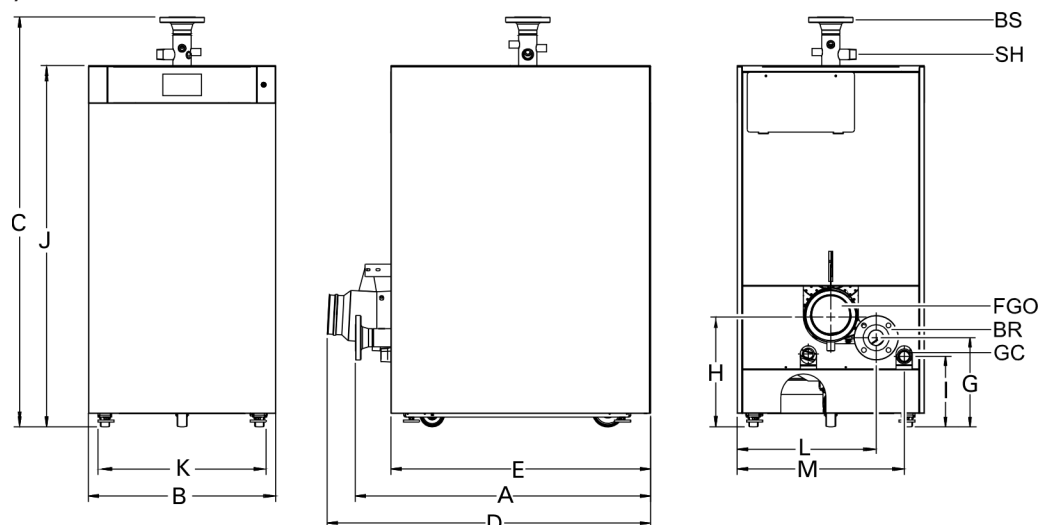


TO TURN OFF GAS TO APPLIANCE

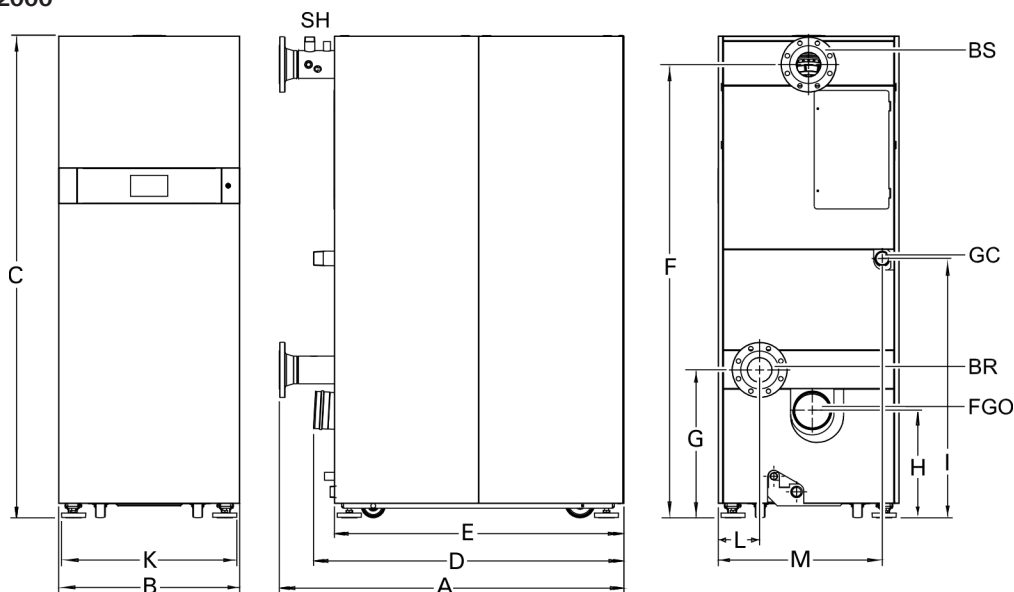
1. Set thermostat or other operating control to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Close main gas shut-off valve.

Boiler Dimensions

CI2 399, 500, 750 and 1000



CI2 1500 and 2000



Dimensions

Boiler Model	399/500	750/1000	1500/2000
A	in. (mm) 35 ³ / ₄ (909)	46 ¹ / ₂ (1183)	56 ¹ / ₄ (1428)
B	in. (mm) 29 ¹ / ₂ (750)	29 ¹ / ₂ (750)	29 ¹ / ₂ (750)
C*	in. (mm) 64 ¹ / ₂ (1640)	64 ¹ / ₂ (1640)	78 ³ / ₄ (1998)
D	in. (mm) 39 (992)	47 ¹ / ₄ (1200)	51 (1297) 1500 51 (1295) 2000
E	in. (mm) 32 (812)	41 (1040)	47 ¹ / ₄ (1200)
F	in. (mm) --	--	74 (1875)
G	in. (mm) 14 ¹ / ₂ (366)	14 (358)	24 (612)
H	in. (mm) 18 (457)	17 ¹ / ₄ (444)	15 ³ / ₄ (398) 1500 15 (383) 2000
I	in. (mm) 11 (283)	11 (283)	42 ¹ / ₄ (1073)
J	in. (mm) 57 (1452)	57 (1452)	--
K	in. (mm) 26 ¹ / ₂ (674)	26 ¹ / ₂ (674)	28 ¹ / ₂ (726)
L	in. (mm) 22 (557)	22 (557)	6 ³ / ₄ (172)
M	n. (mm) 26 ¹ / ₂ (670)	26 ¹ / ₂ (670)	26 ³ / ₄ (680)

Note: dimensional tolerance of $\pm \frac{1}{4}$ in. (± 5 mm)

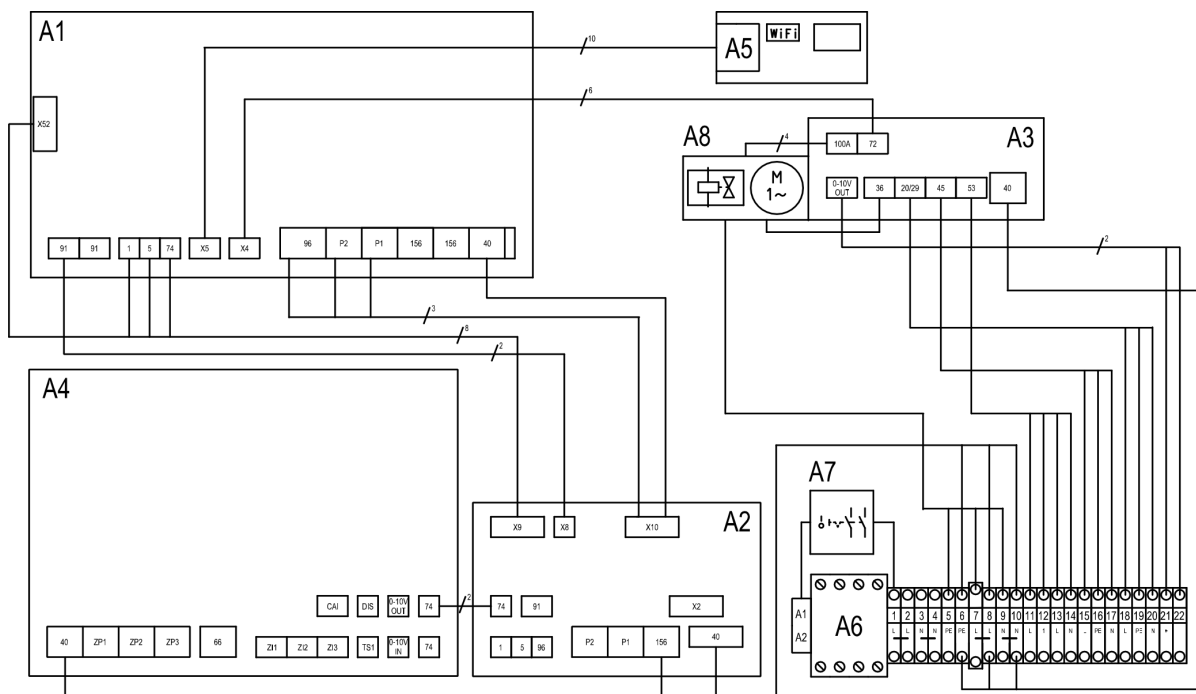
Legend

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

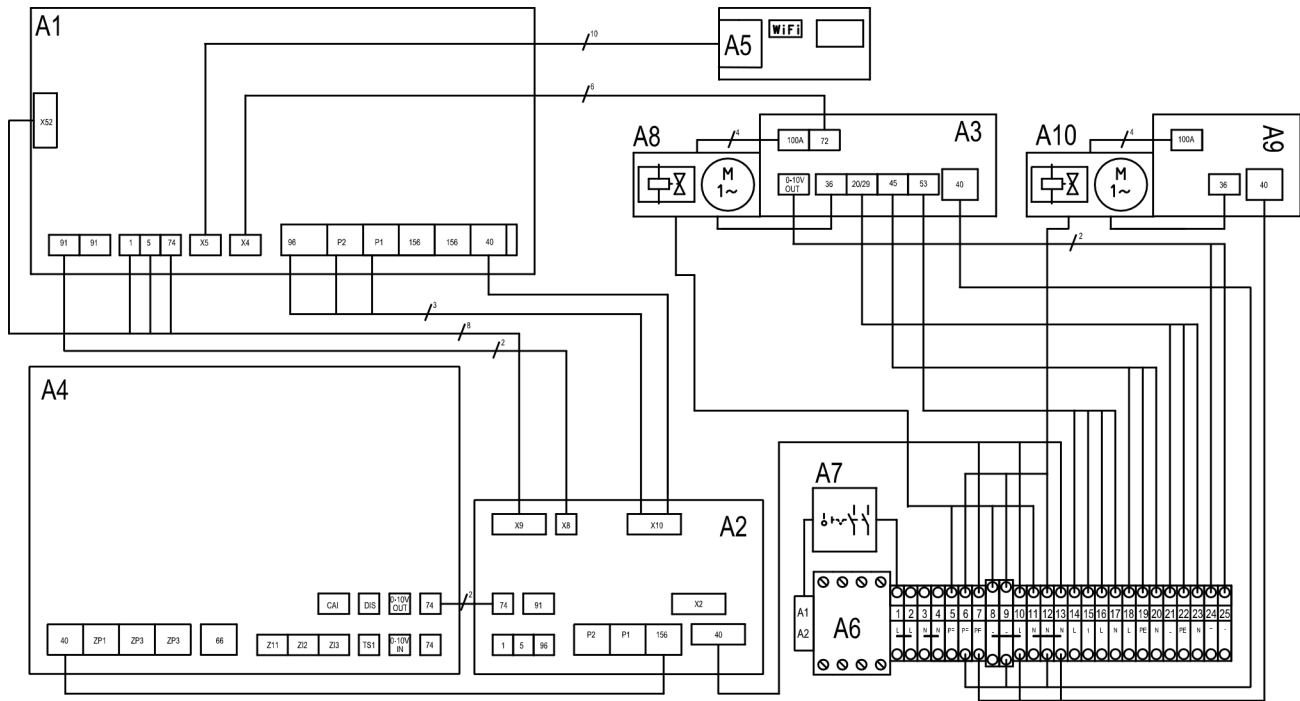


Legend

- 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)

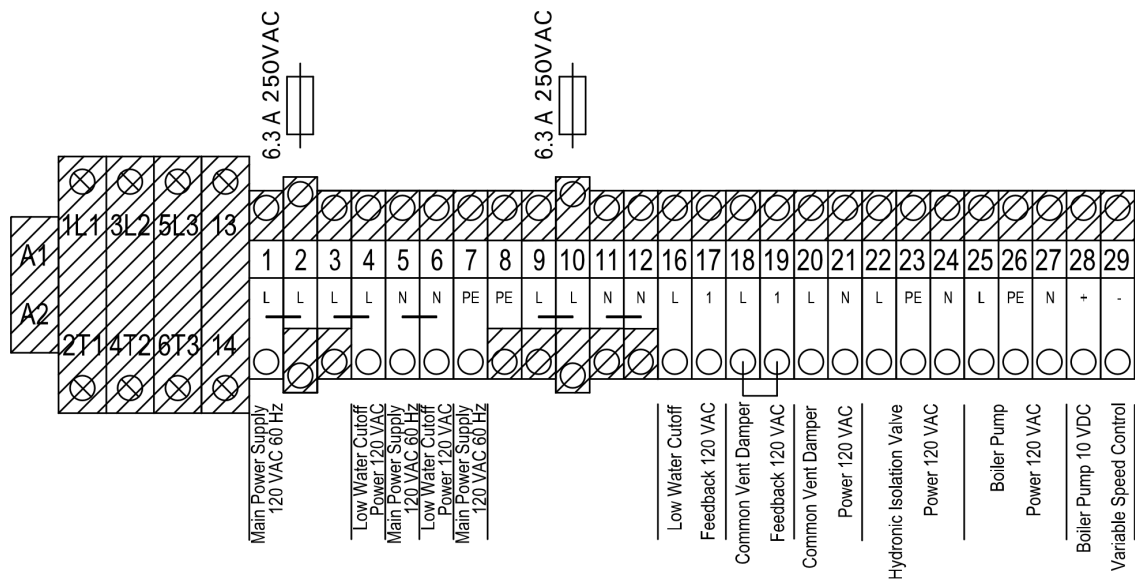
Overview 1500 and 2000 MBTU



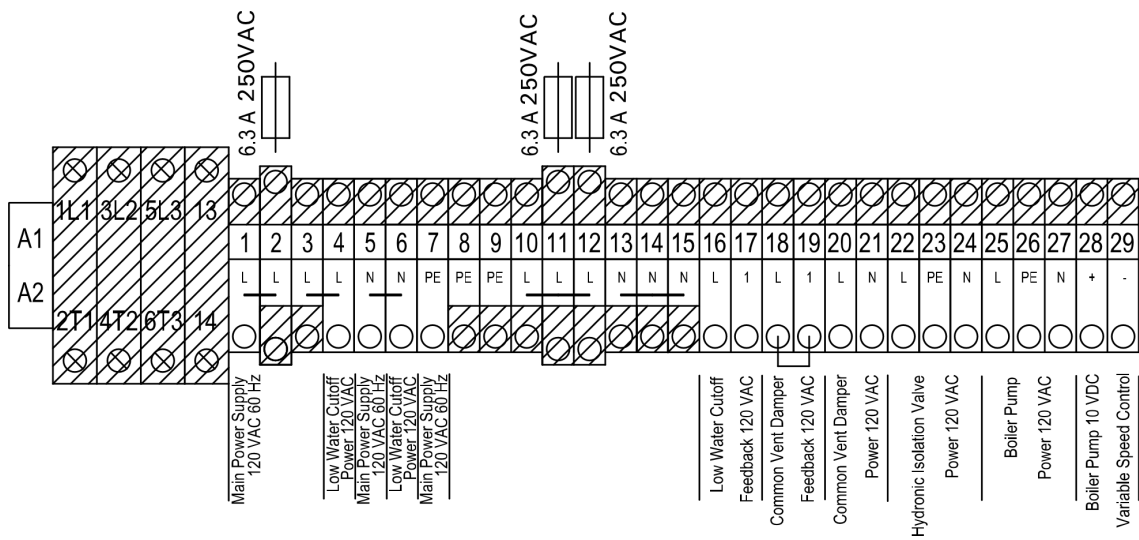
Legend

- 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

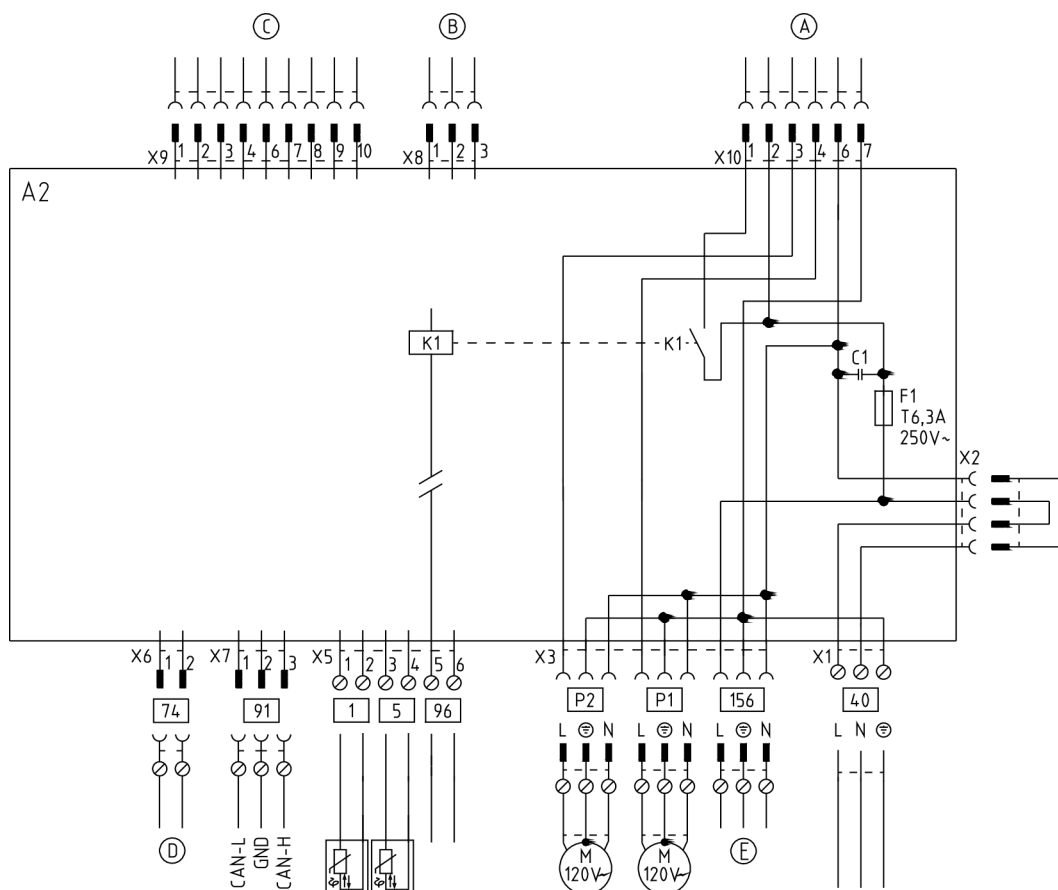
Terminal block Vitocrossal CI2, 399 to 1000



Terminal block Vitocrossal CI2, 1500 and 2000

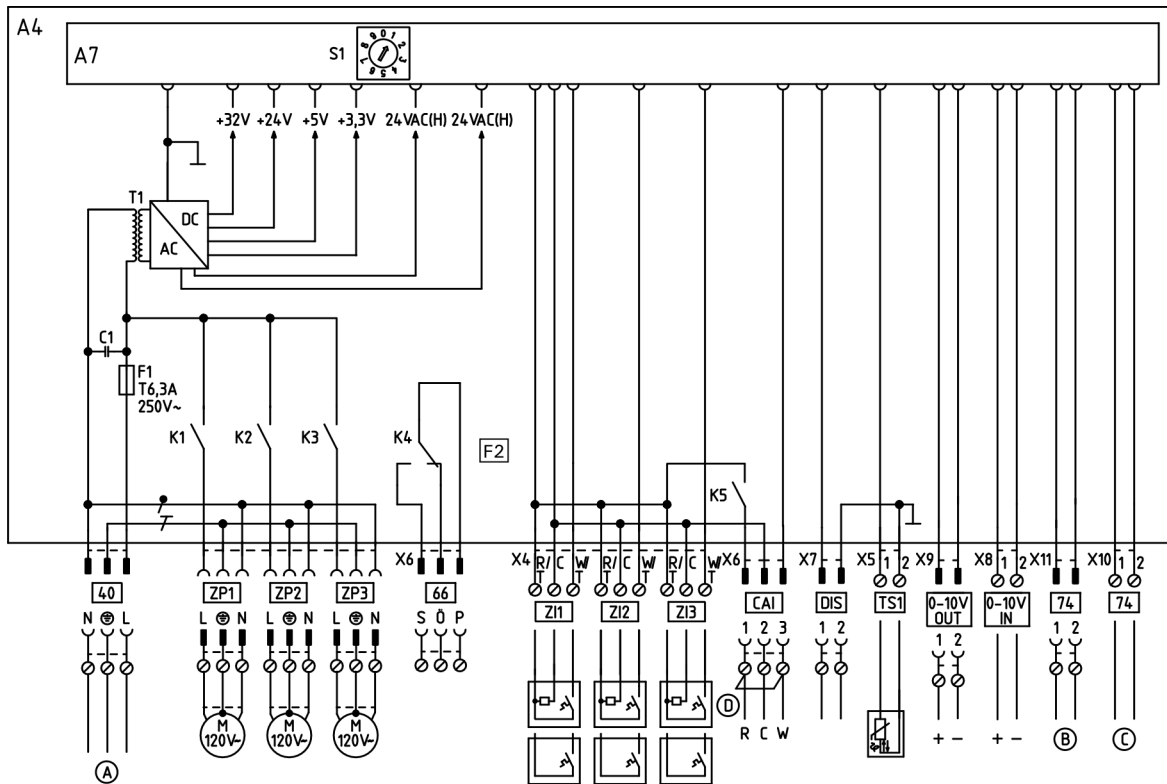


Wiring Panel



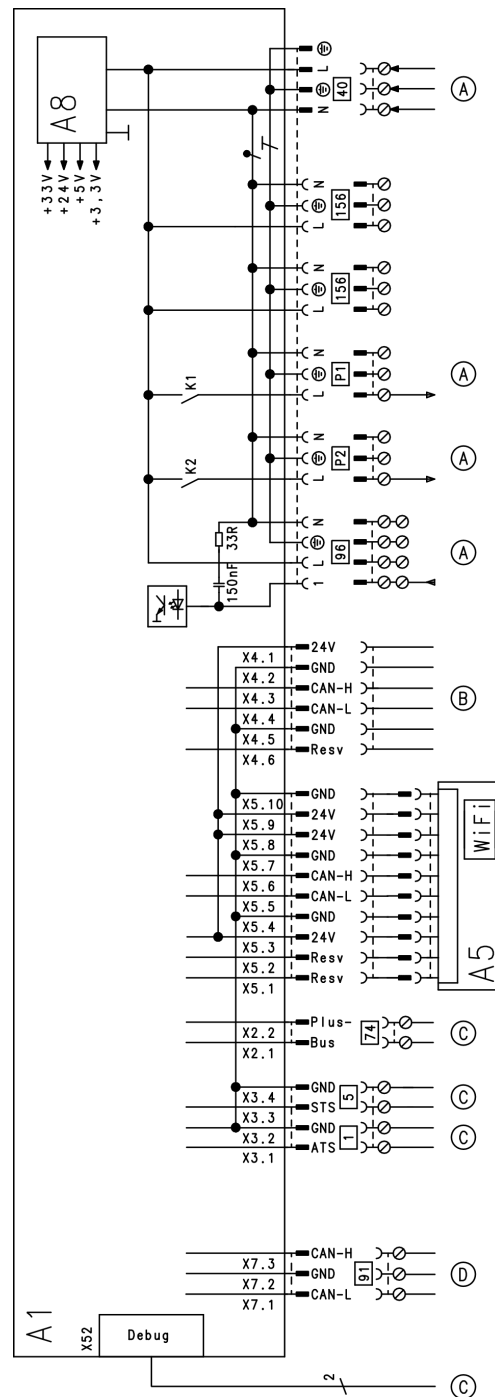
Legend

- 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
- A 120V connection, HMU heat management unit
- B CAN plug 91
- C HMU heat management unit extra low voltage
connection
- D PlusBus MZIO plug 74
- E 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
A	Power supply, electronics module wiring panel plug 156
B	PlusBus electronics module, wiring panel plug 74
C	PlusBus accessories
D	Jumper (remove when making this connection)
Z11	Zone 1 or external safety device 1
Z12	Zone 2 or external safety device 2
Z13	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

- B Burner control unit 72
- C Electronics module wiring panel X9
- D Electronics module wiring panel X8
- 1 Outdoor temperature sensor
- 5 Tank temperature sensor
- 91 CAN connection accessories
- 74 PlusBus connection for accessories
- K1 Relay
- A 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:

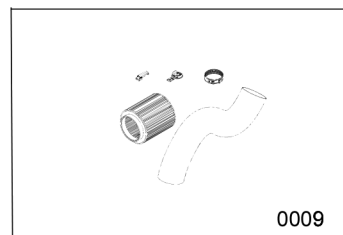
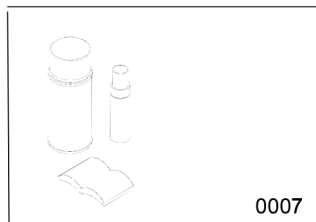
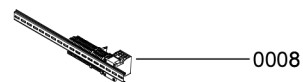
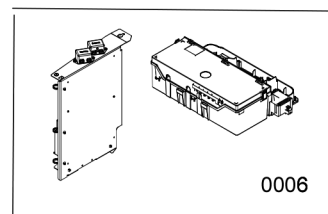
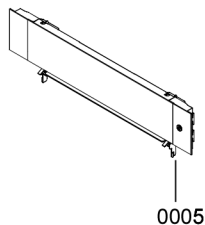
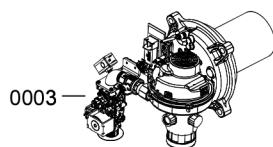
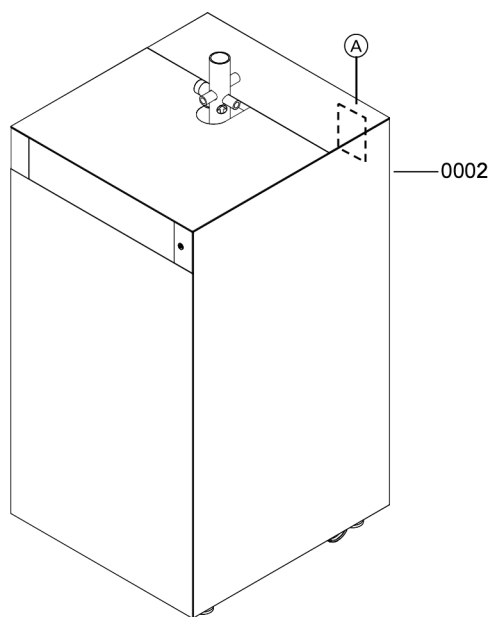
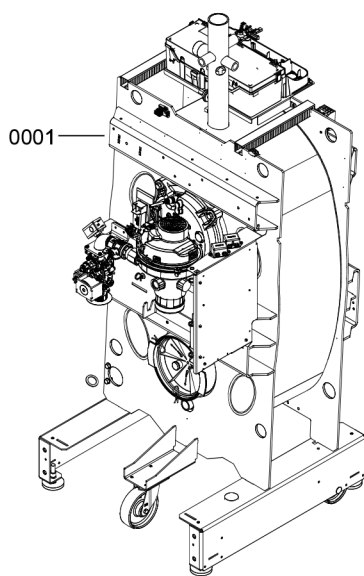
Please provide Model and Serial Number from CSA rating plate (A) when ordering replacement parts.

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

(A) 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□□□□□□□□

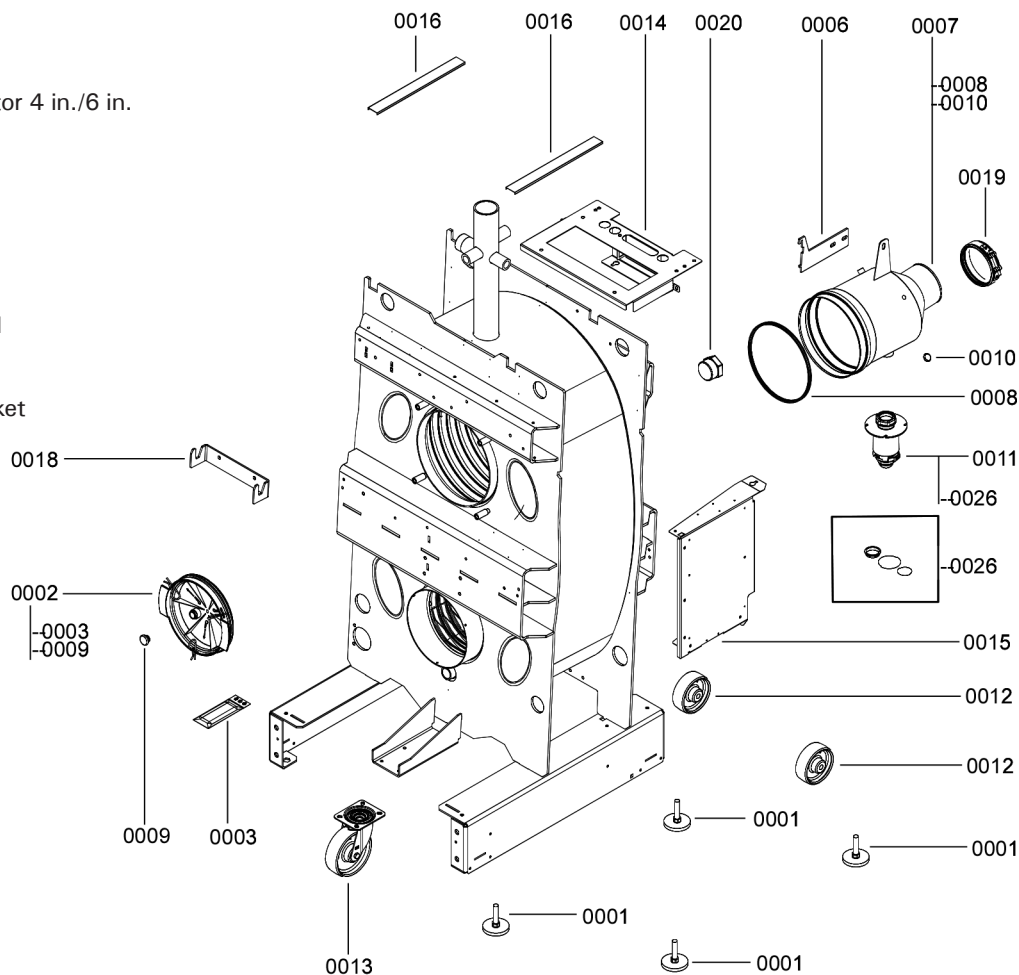
Ordering Replacement Parts:

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□□□□□□□□

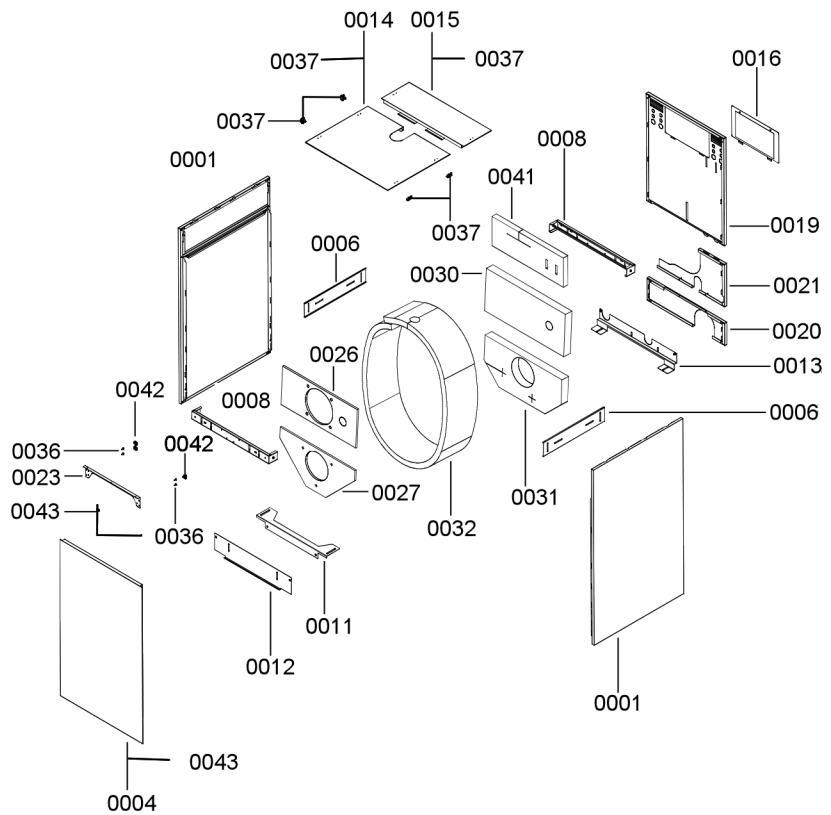
Ordering Replacement Parts:

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□□□□□□□□

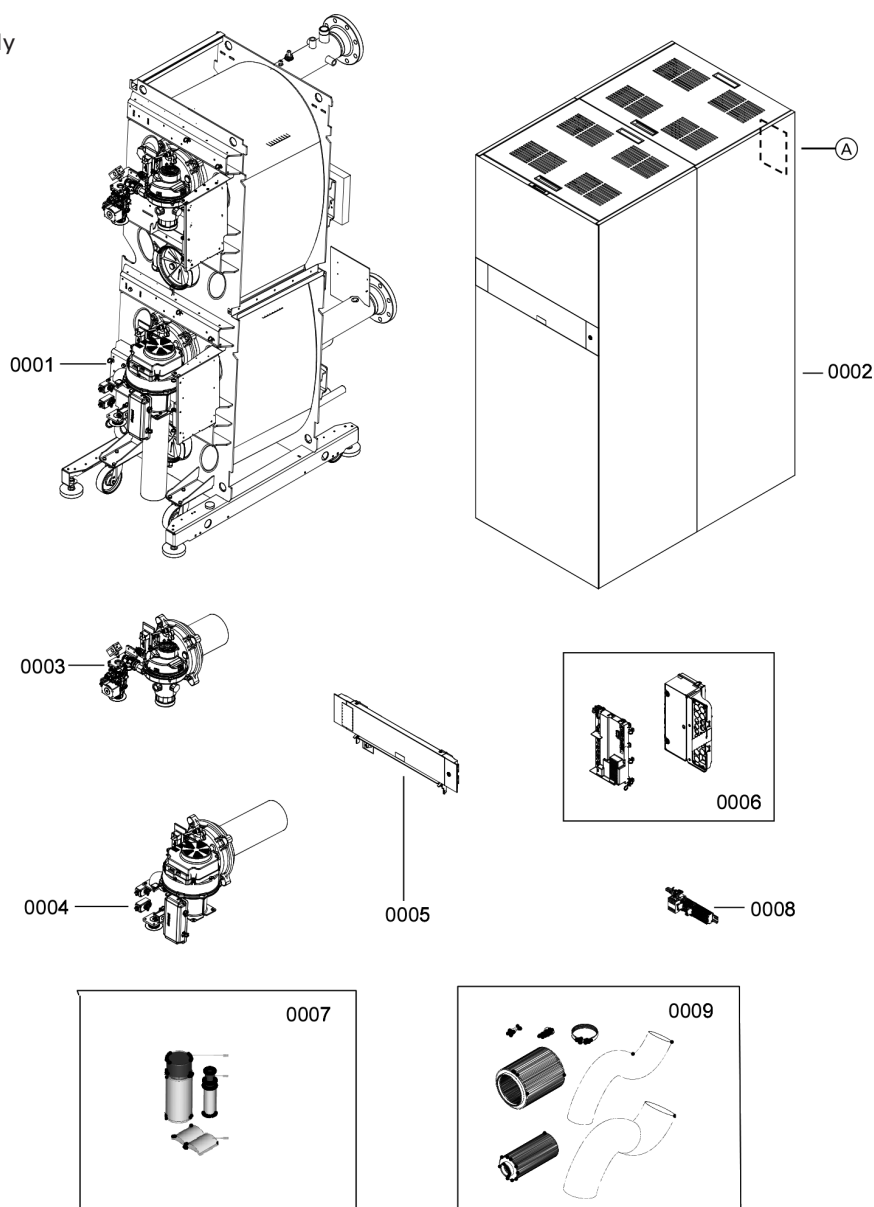
Ordering Replacement Parts:

Please provide Model and Serial Number from CSA rating plate (A) 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

(A) Rating Plate



Parts Lists *(continued)*

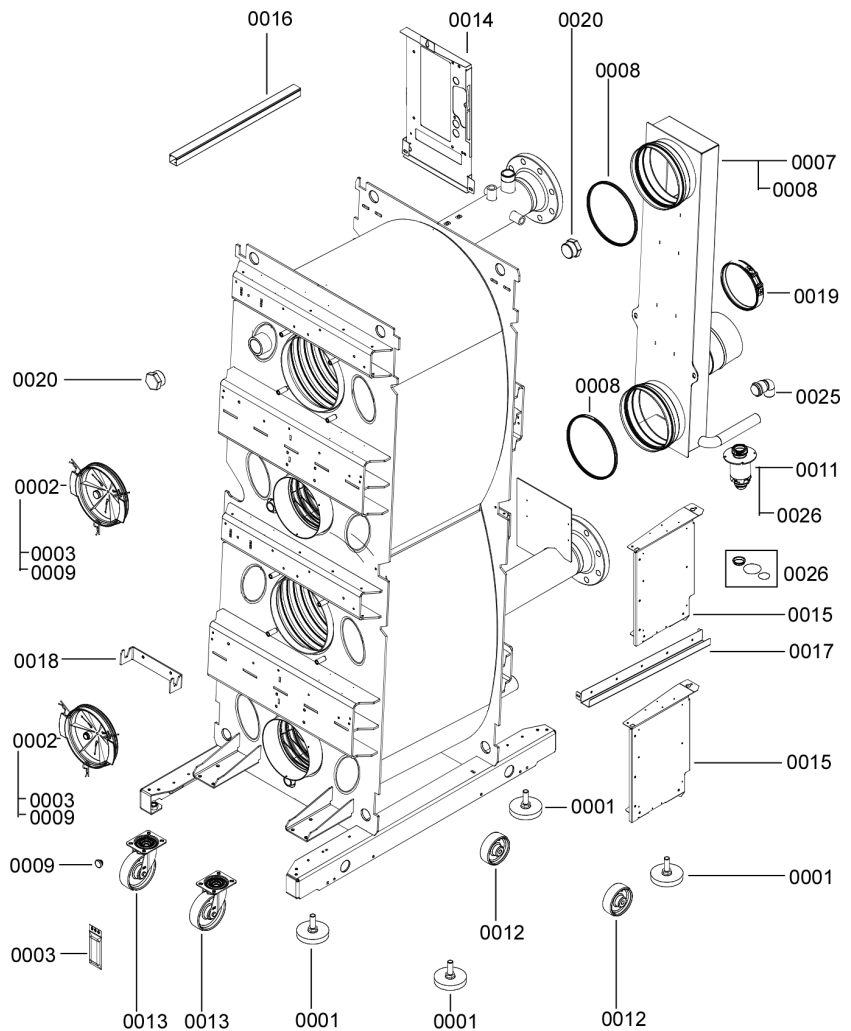
Model No.	Serial No.
C12 1500 Boiler	7721353□□□□□□□□
C12 2000 Boiler	7721352□□□□□□□□

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)*

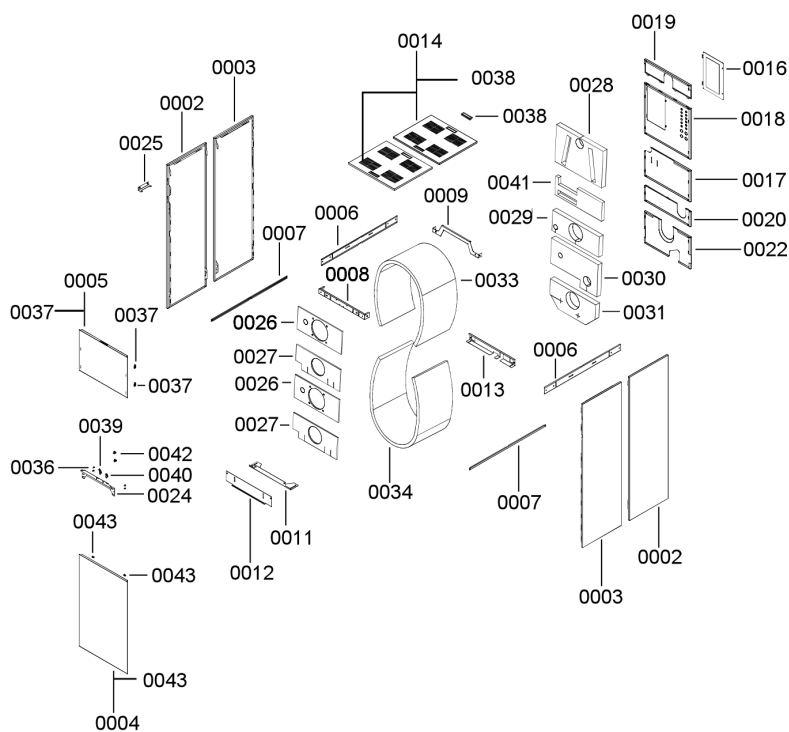
Model No.	Serial No.
CI2 1500 Boiler	7721353□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□

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.
C12 399 Boiler	7720741□□□□□□□□
C12 500 Boiler	7721356□□□□□□□□
C12 1500 Boiler	7721353□□□□□□□□

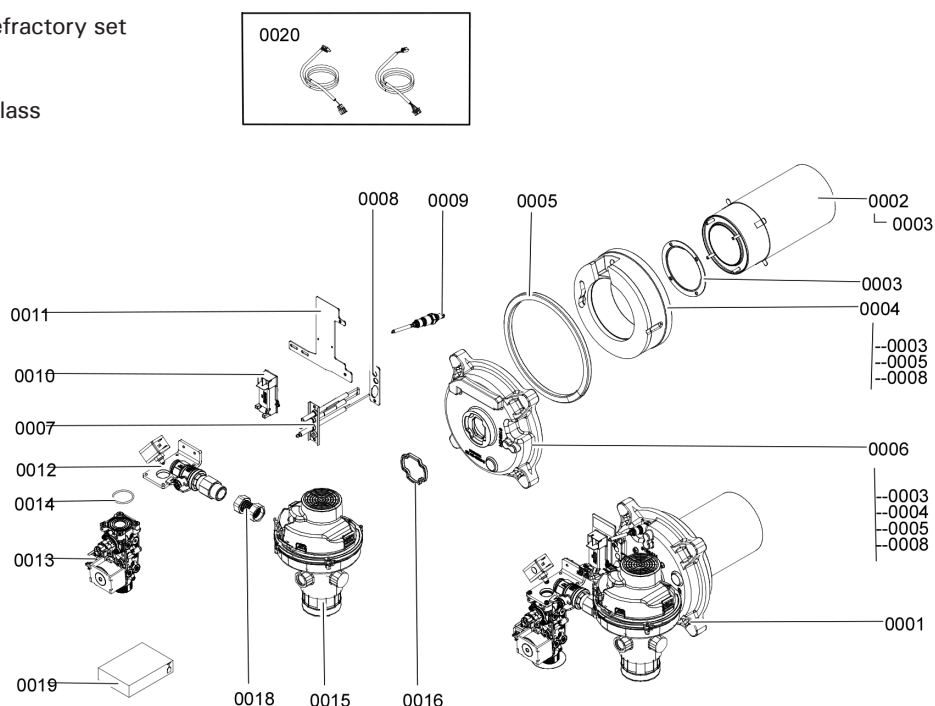
Ordering Replacement Parts:

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



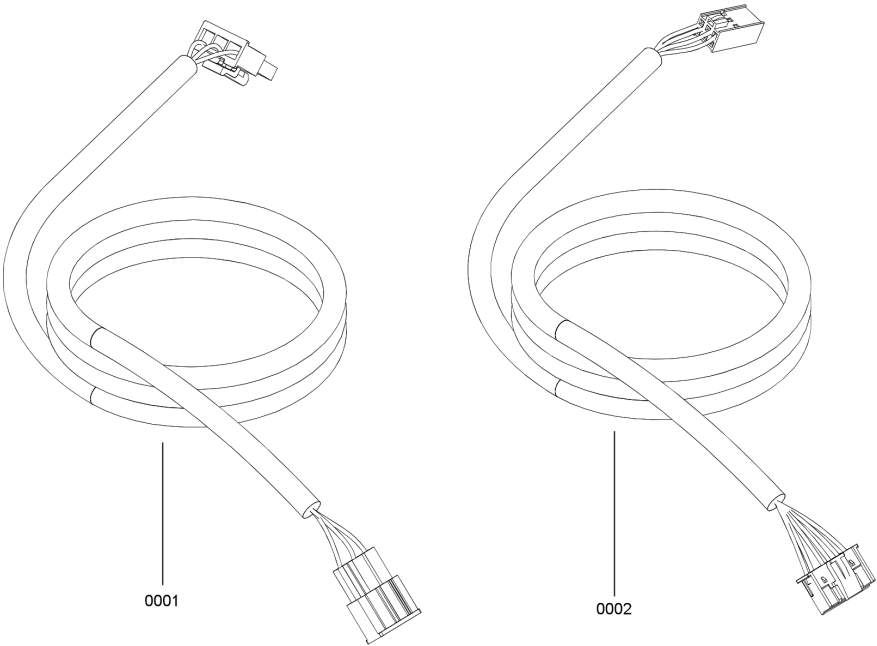
Parts Lists *(continued)*

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□□□□□□□□

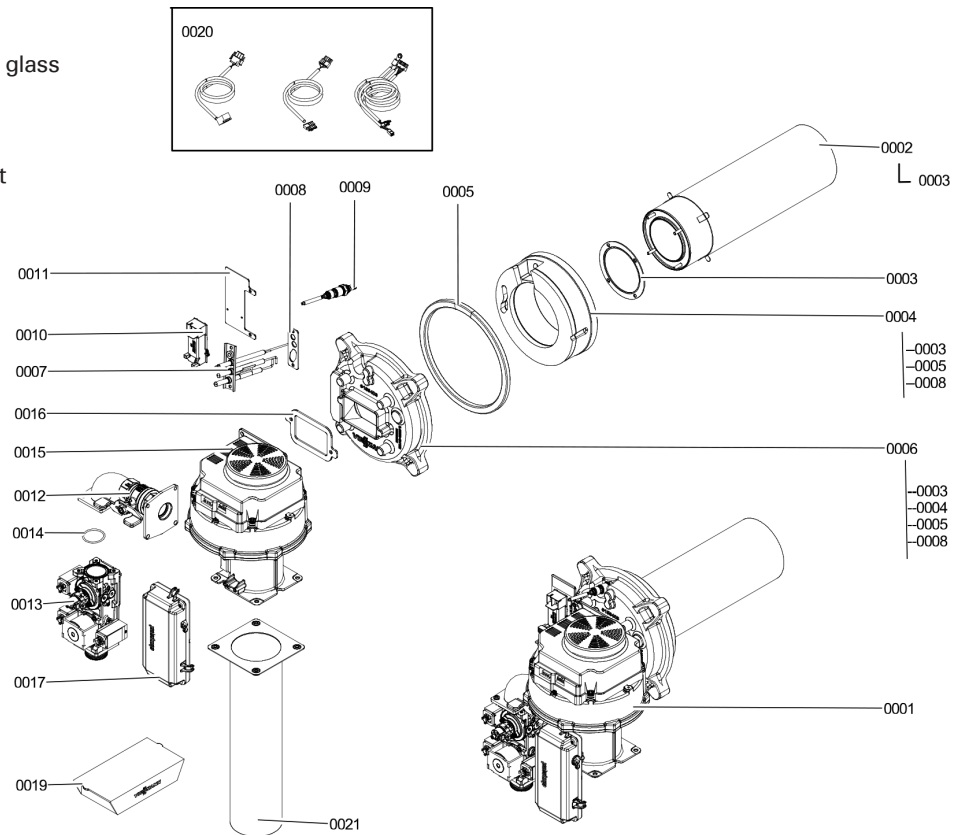
Ordering Replacement Parts:

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.

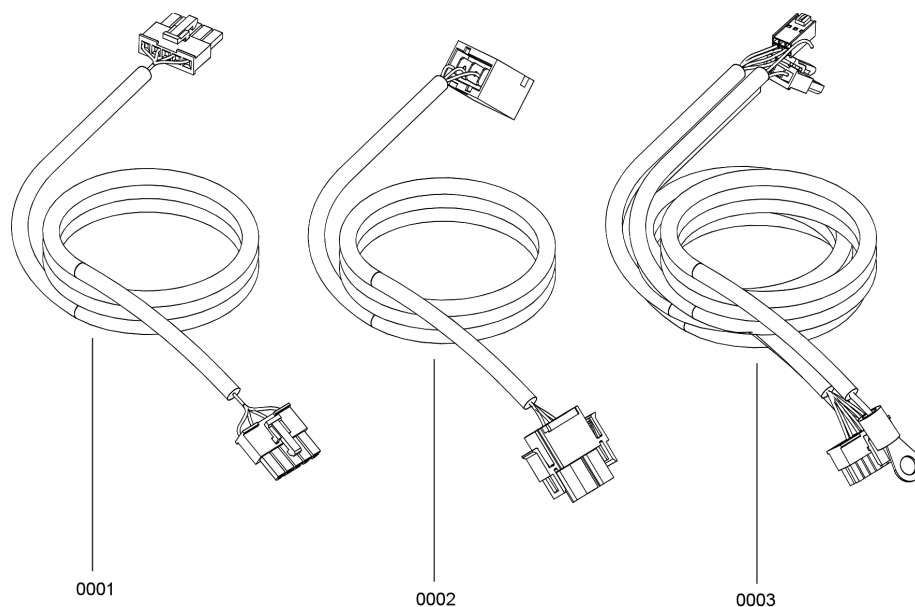
Order replacement components from your Viessmann distributor.

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)*

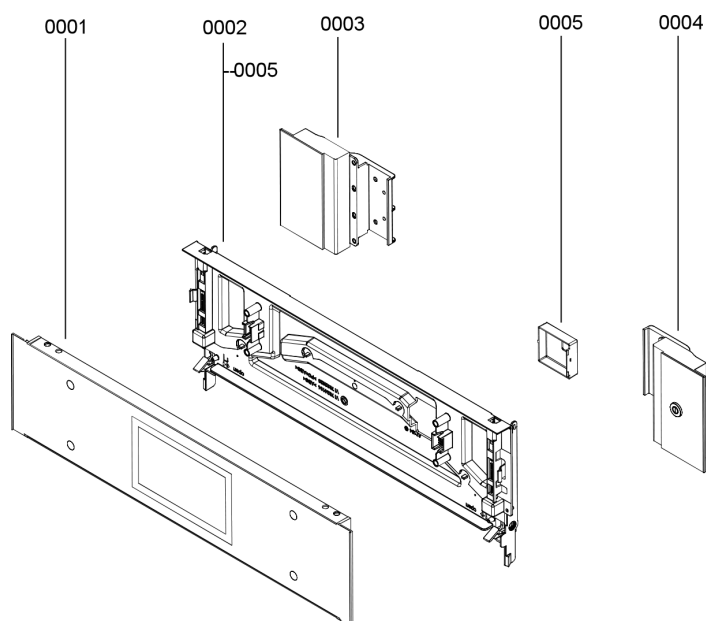
Model No.	Serial No.
CI2 399 Boiler	7720741□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□

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□□□□□□□□

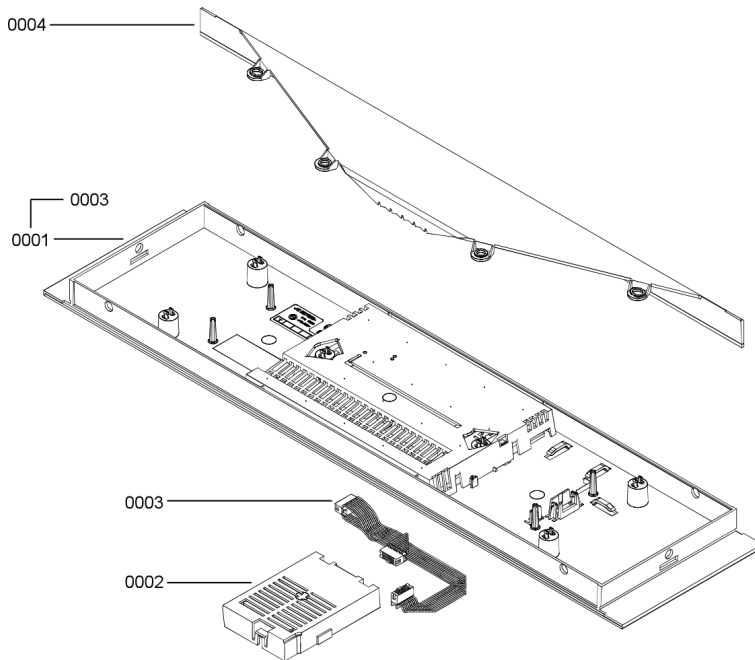
Ordering Replacement Parts:

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)*

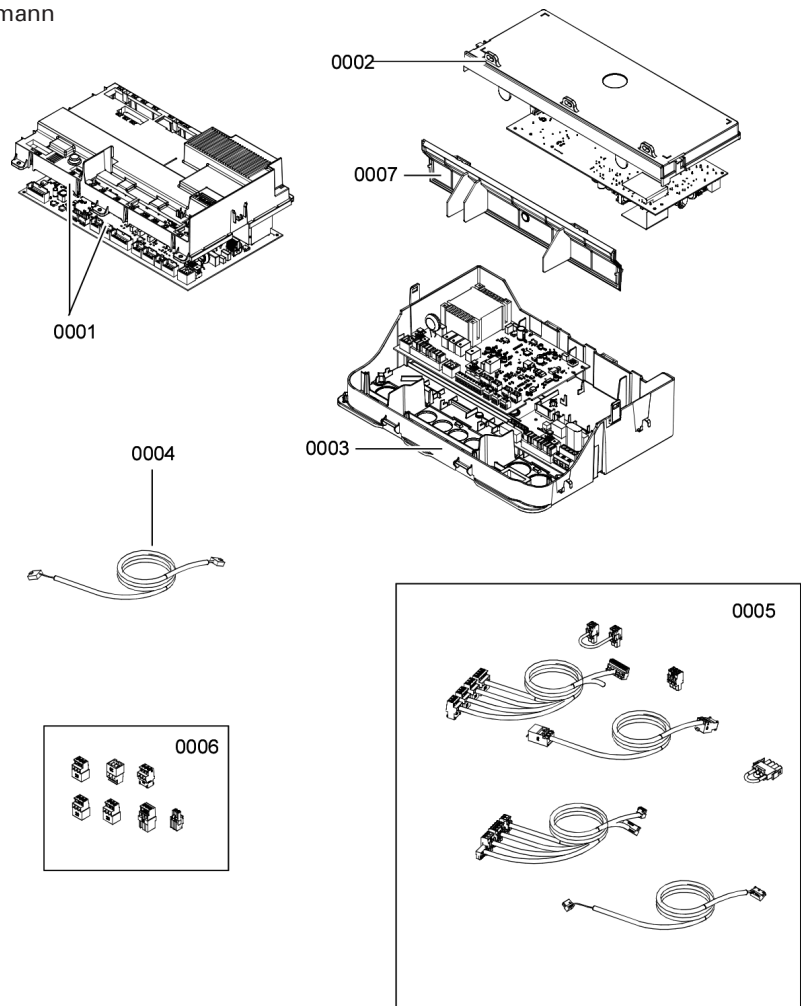
Model No.	Serial No.
CI2 399 Boiler	7720741□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□

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□□□□□□□□

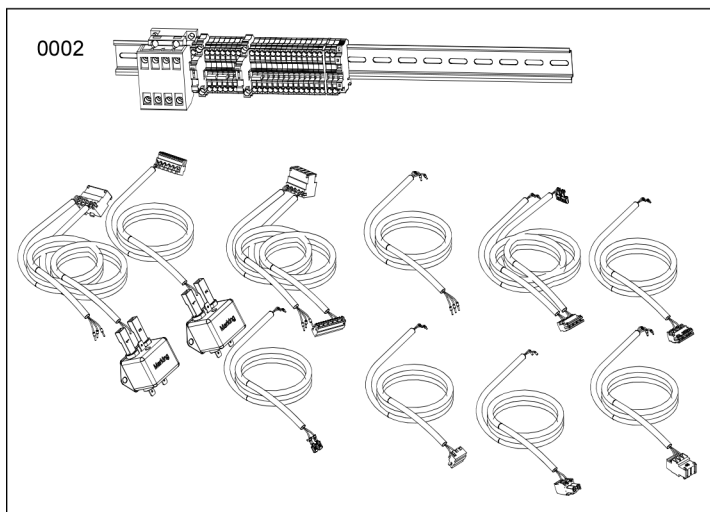
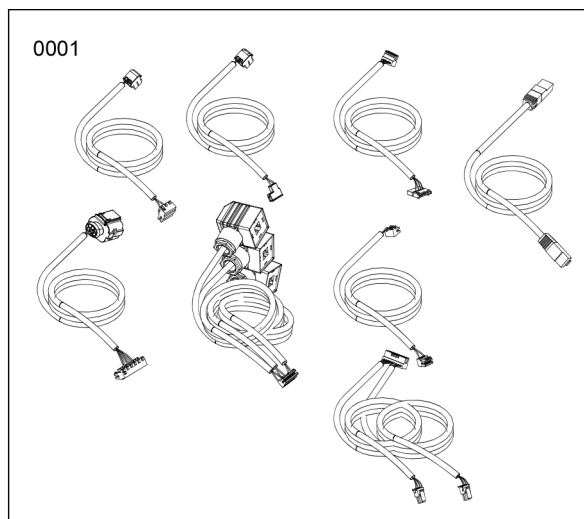
Ordering Replacement Parts:

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□□□□□□□□

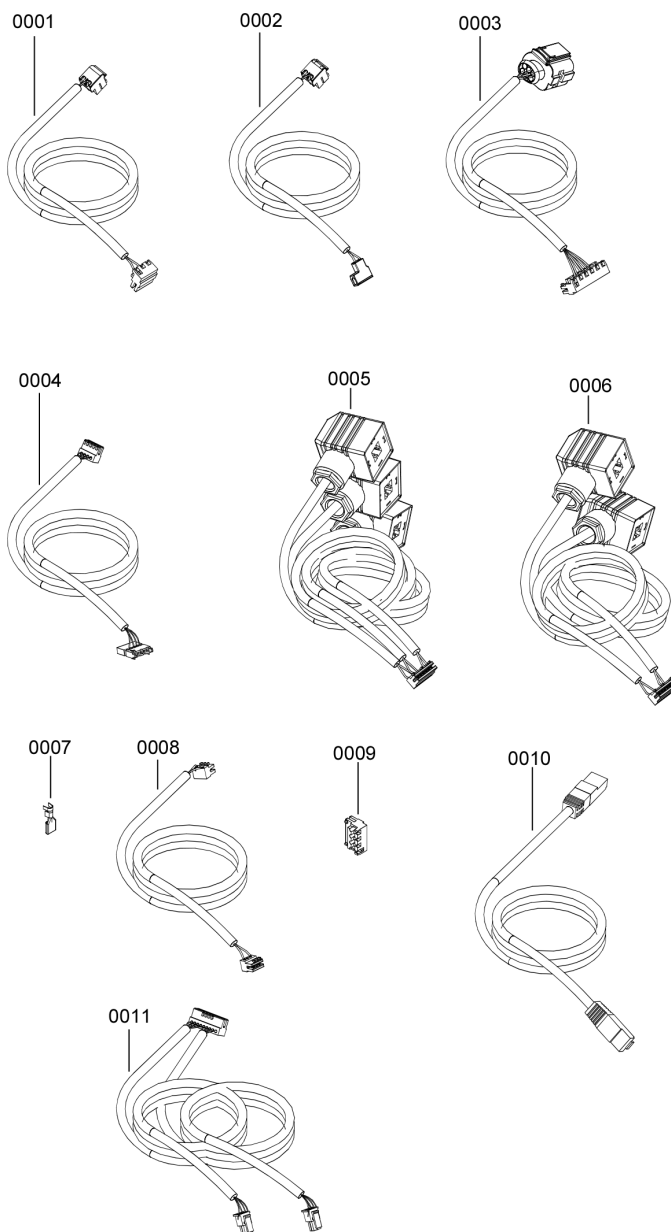
Ordering Replacement Parts:

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□□□□□□□□

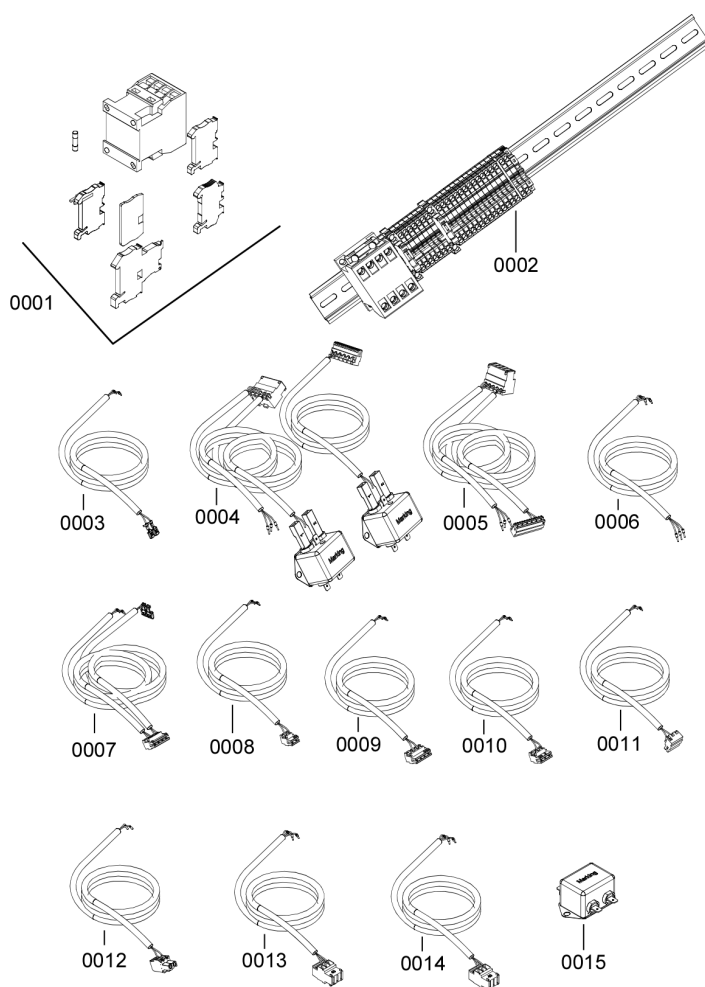
Ordering Replacement Parts:

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.
C12 399 Boiler	7720741□□□□□□□□
C12 500 Boiler	7721356□□□□□□□□
C12 750 Boiler	7721355□□□□□□□□
C12 1000 Boiler	7721354□□□□□□□□

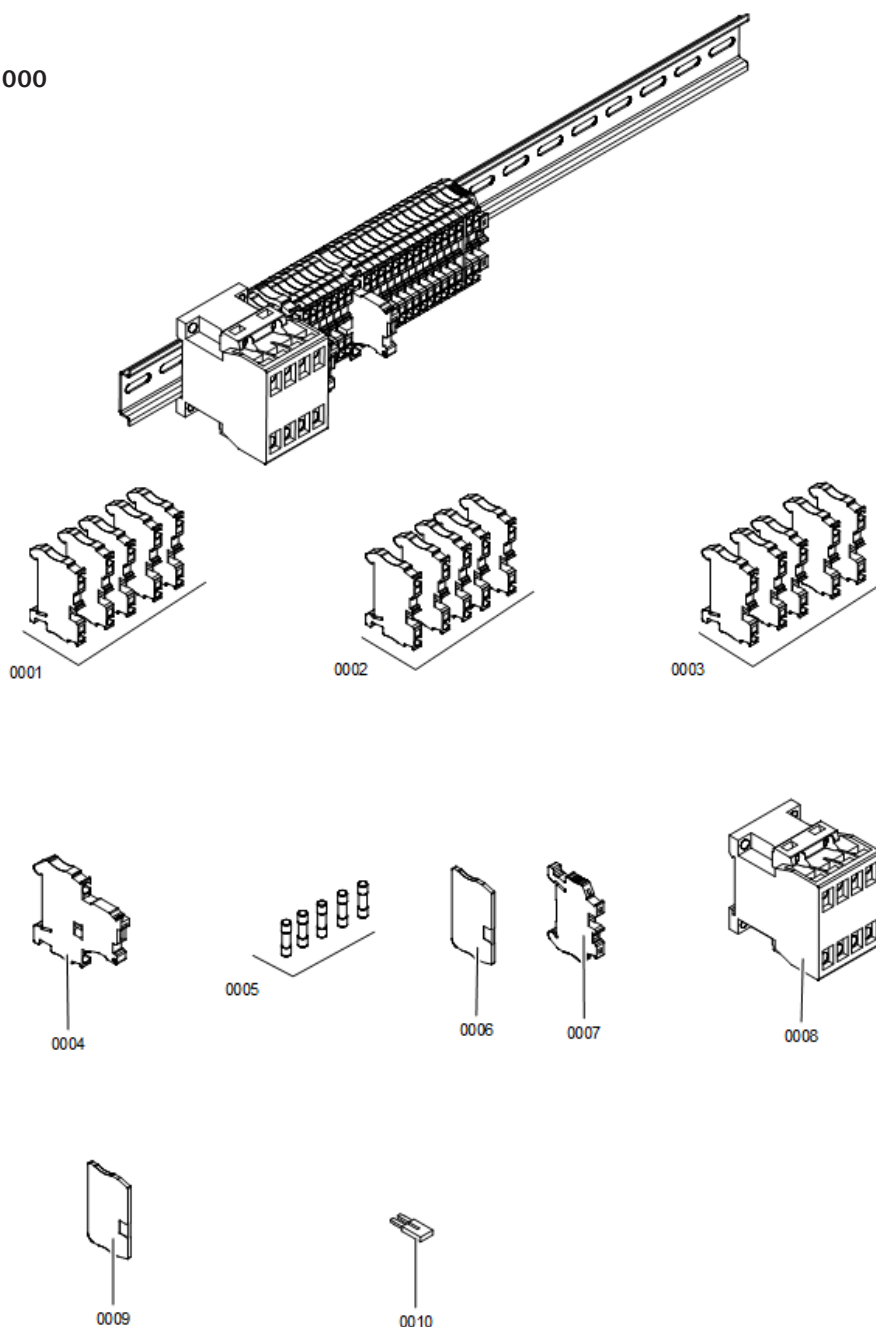
Ordering Replacement Parts:

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)*

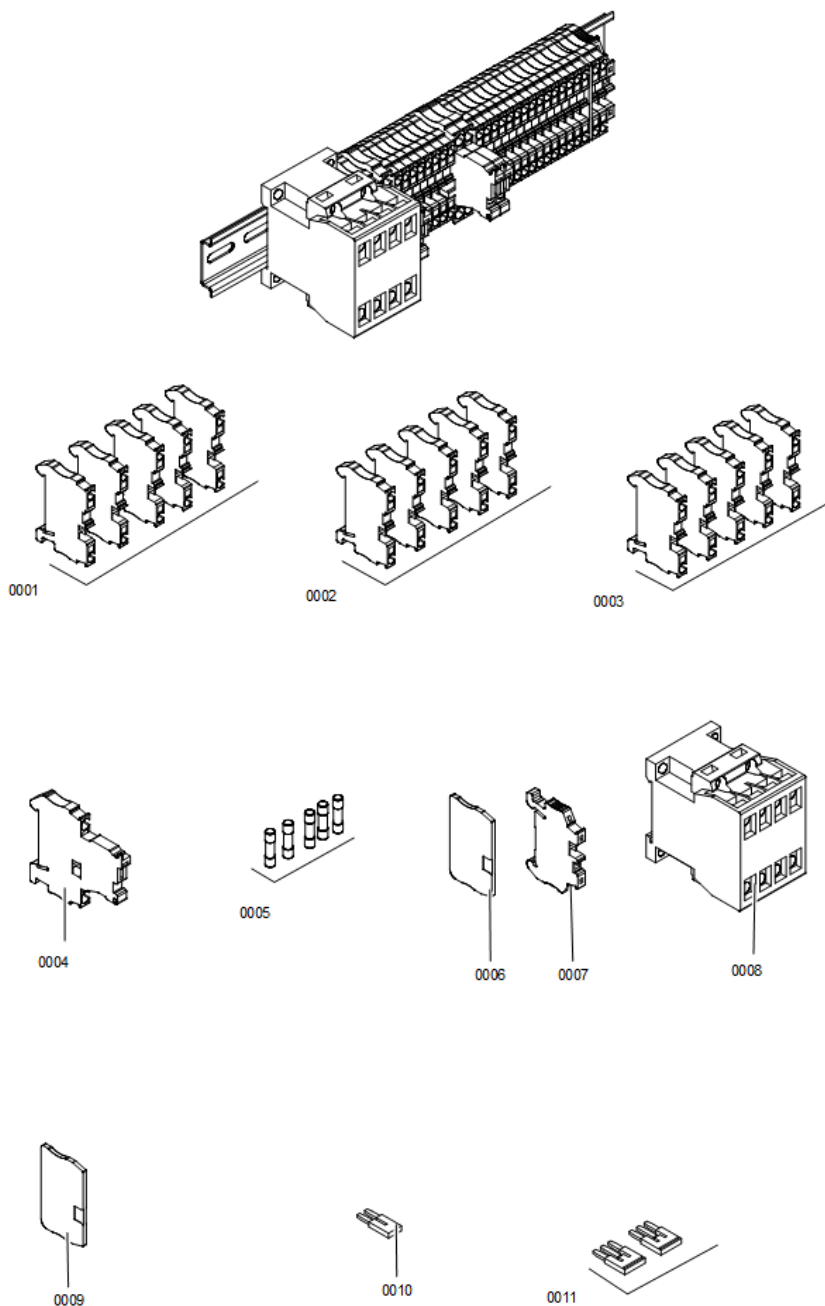
Model No.	Serial No.
CI2 1500 Boiler	7721353□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□

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□□□□□□□□

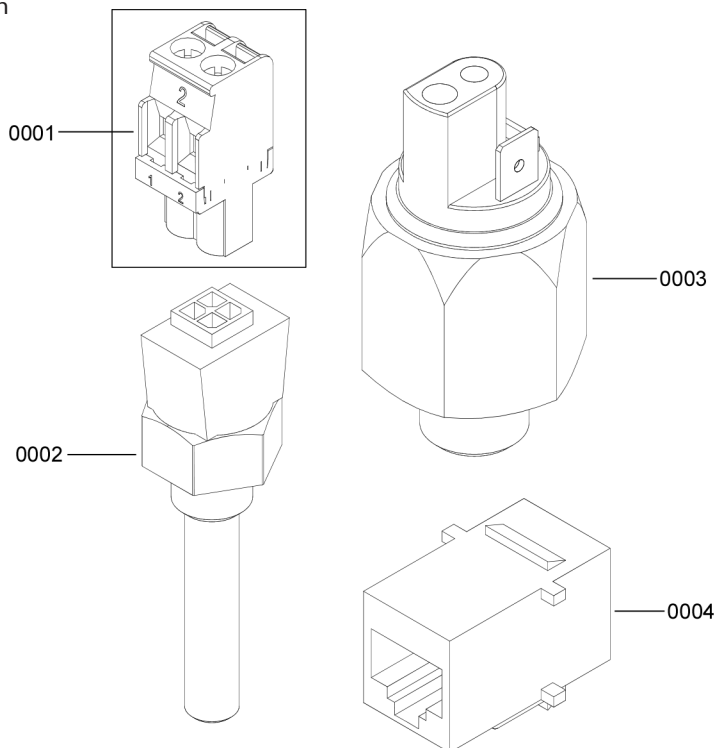
Ordering Replacement Parts:

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)*

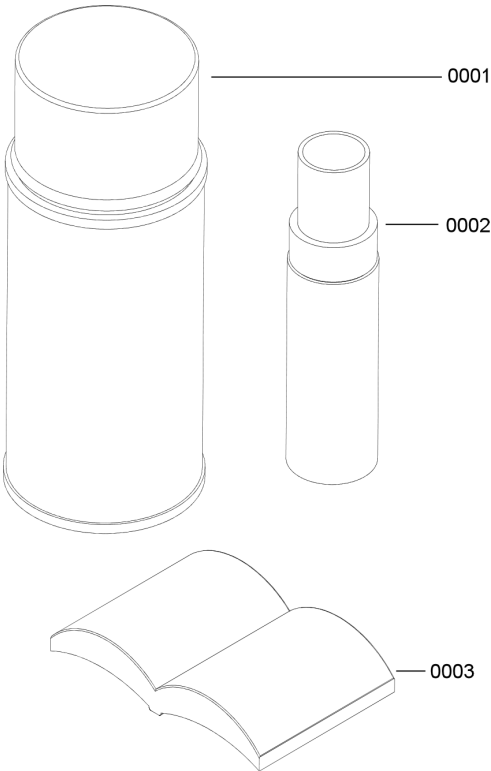
Model No.	Serial No.
CI2 399 Boiler	7720741□□□□□□□□
CI2 500 Boiler	7721356□□□□□□□□
CI2 750 Boiler	7721355□□□□□□□□
CI2 1000 Boiler	7721354□□□□□□□□
CI2 1500 Boiler	7721353□□□□□□□□
CI2 2000 Boiler	7721352□□□□□□□□

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□□□□□□□□

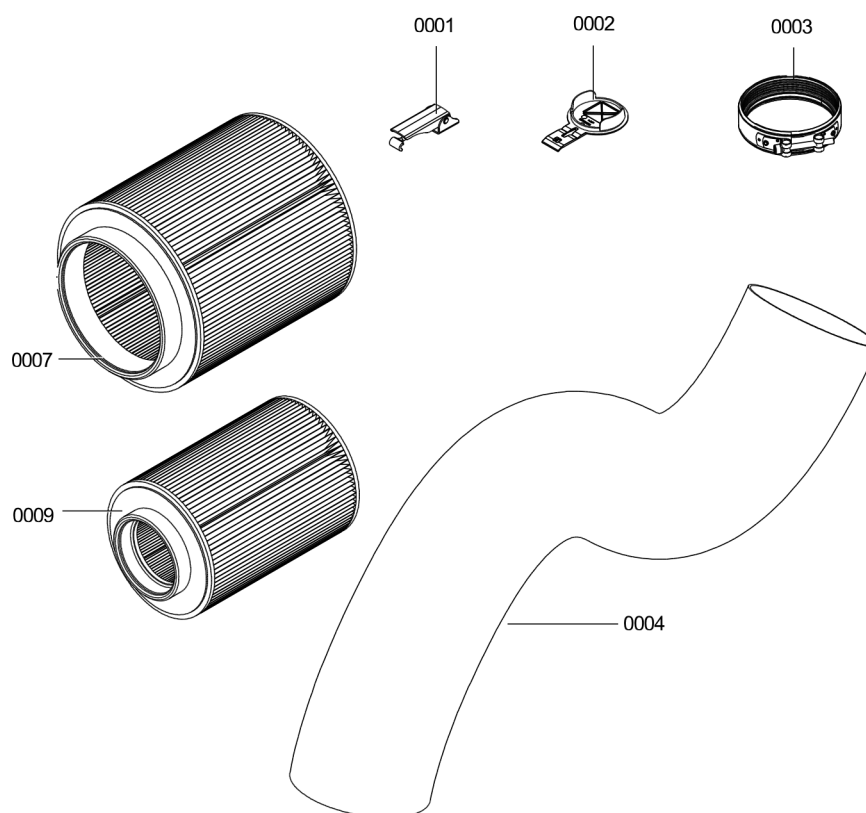
Ordering Replacement Parts:

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□□□□□□□□

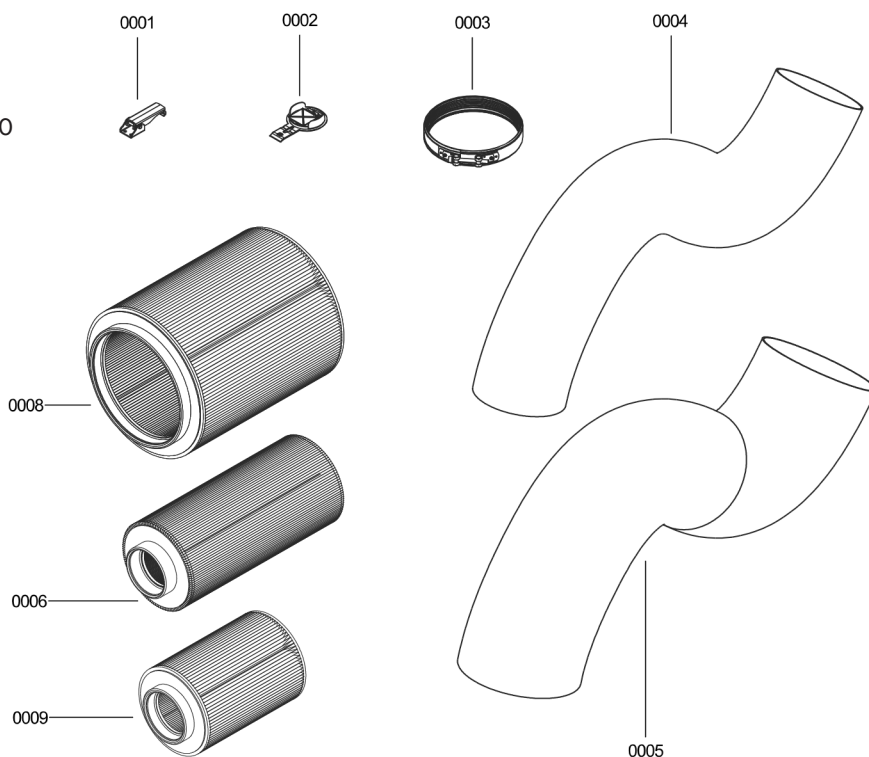
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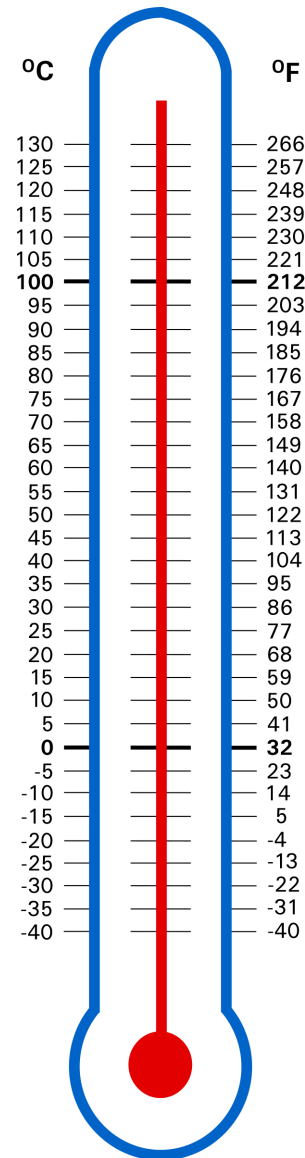
Please provide Model and Serial Number from CSA rating plate when ordering replacement parts.

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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Technical information subject to change without notice.



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