

Installation and Operating Instructions

for use by engineers and heating contractors

VIESSMANN®

Vitoflex 300-UF 390, 530, 720, 950 AND 1250

Wood-fired Boiler

Output range: UF 390, 334 to 1331 MBH (98 to 390 kW)
UF 530, 450 to 1808 MBH (132 to 530 kW)
UF 720, 614 to 2457 MBH (180 to 720 kW)
UF 950, 812 to 3242 MBH (238 to 950 kW)
UF 1250, 1065 to 4265 MBH (312 to 1250 kW)



Vitoflex 300-UF



IMPORTANT

Please ensure that these instructions are read and understood before commencing installation and start-up. Failure to comply with these Installation Instructions will render all warranties null and void.

Working on the equipment

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

Ensure main power supply to equipment, the heating system and all external controls has been deactivated.

Take precautions in all instances to avoid accidental activation of power during service work.

Improper installation, service or maintenance can cause product/property damage, severe personal injury, and/or loss of life.

Product may not be exactly as shown

IMPORTANT

Read and save these instructions for future reference.



Safety, Installation and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation and service. 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

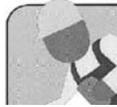
Information contained in this and related product documentation must be read and followed. Failure to do so renders the warranty null and void.



■ 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".*



■ 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. Refer to the Service and Maintenance Instructions for details.

■ 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.

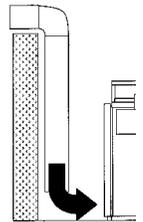
► *For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, refer to the "Safety" section.*



■ 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, refer to the "Combustion Air Supply" section.*



■ 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, refer to the "Safety" section. 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 manufacturer's maintenance schedule of the boiler contained in the "Service and Maintenance Instructions".

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

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

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

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

IMPORTANT

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



► This symbol indicates to note additional information



► This symbol indicates that other instructions must be referenced.

Note: Viessmann Manufacturing Company Inc. reserves the right to make product changes or updates without notice and will not be held liable for typographical errors or omissions in the product literature.

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Important Regulatory and Installation Requirements

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

Codes

The installation of this unit shall be in accordance with local codes. In the absence of local codes, use: CSA B365 (latest edition), Installation Code for Solid-Fuel Burning Appliances and Equipment.

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 where required by the authority having jurisdiction.

Mechanical room

Ensure the mechanical room complies with the requirements listed in this manual. See section entitled Mechanical Room.

Working on the equipment

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

Ensure main power supply to equipment, the heating system, and all external controls have been deactivated. Take precautions to avoid accidental activation of power during service work.

Technical literature

Literature applicable to all aspects of the Vitoflex 300-UF wood-fired boiler:

- Installation and Operating Instructions
- Service and Maintenance Instructions
- Field Wiring Diagram

▶ *Please carefully read this manual prior to attempting installation. 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.

We offer 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.*

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

▶ *This product comes with several safety instruction labels attached. Do not remove! Contact Viessmann immediately if replacement labels are required.*

Product Information

Viessmann solid-fuel boiler may only be installed and serviced by trained personnel.

Steel wood-fired hot water heating boiler.

For operation primarily with modulating boiler water temperatures in closed loop forced circulation hot water heating systems. Under certain conditions, open loop systems may also be considered. Contact Viessmann for details.

Maximum allowable working pressure (water)...30 or 60 psi

Maximum water temperature...250°F (120°C) (closed loop)

Maximum boiler temperature...210°F (99°C) (open loop)

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 the warranty null and void.

Codes

CSA B366.1-M91

Solid Fuel Fired Central Heating Appliances

CSA C22.2 NO. 3-M1988 (latest edition)

Electrical Features of Fuel Burning Equipment

UL2523

Solid Fuel-Fired Hydronic Heating Appliances, Water Heaters and Boilers

CSA B365 (latest edition)

Installation Code for Solid Fuel Burning Appliances and Equipment

ASME section IV boilers and pressure vessels.

Boiler Description

Description

The Vitoflex 300-UF Grate Firing System (patent no: EP 0 905 442 B1) was developed for automatic combustion of all dry to moist wood fuels (remnant wood, pellets and forest wood chips to max. W50, (see section "Wood Fuel Requirements") and combines the benefits of underfeed firing with the benefits of grate firing.

The Vitoflex 300-UF Grate Firing System is characterized by highest efficiencies and perfect combustion in all load stages. The Vitoflex 300-UF Boiler Plant has been built to ASME Sec. IV and has CRN for Canada. It is tested and approved to the applicable CSA / UL safety standards.

Function:

- The solid, powerful and heat-resistant in-feed auger moves the fuel into the burner trough and onto the descending and moving grate zone. An electrical and mechanical temperature sensor to operate the thermal extinguishing valve are located on the in-feed auger. Above the auger is the metering container with a light barrier for setting the level of the fuel insulating layer.
- The fuel is either ignited manually or automatically with an automatic igniter (optional). The boiler features a reliable burner trough, a descending grate and a moving burn-out grate made from highly-refractory cast steel [approx. ½ in. (12 mm)]. These items provide for excellent performance control and safety preventing back-burn in conjunction with an automatic de-ashing assembly with ash container (optional) for the combustion chamber.
The solid, horizontally positioned and large-volume combustion chamber door has been optimized in terms of combustion, consists of a high-quality refractory brick lining and has multiple layers of insulation for the lowest possible surface temperatures. A variable speed primary air blower provides preheated air to the combustion grates in the combustion chamber door.
- In the upper part of the combustion chamber door, the secondary air is blown into the gas space of the firing system by variable speed blower via an encircling ring with individually adjustable nozzles to achieve high turbulence. This mixes the fuel gases with fresh secondary air to achieve perfect combustion and very low emissions. The combustion chamber door is solidly constructed, air-cooled and very well insulated. The combustion chamber door is equipped with solid double-jointed hinges for easy maintenance. The heat is transferred to the water in the horizontal heat exchanger. The boiler is well insulated and highly accessible through the heat exchanger door on the front. A pneumatic cleaning system (optional) can be installed at the insulated heat exchanger door.
- The flue gas exhaust blower has been specially designed for wood burning boilers and quiet operation. The spring-suspended motor has a solid, heat-resistant design with a heat dissipation hub. The blower housing on the intake can be mounted radial by 360° and has a variable rotation speed and a round blow-out nozzle. It is mounted directly on the boiler or on the flue gas cyclone (optional).

Supplied with:

- Boiler with combustion chamber and pressure vessel/ heat exchanger including supply and return temperature sensors and over pressure monitor
- Combustion chamber with burner trough, descending grate, moving burn-out grate and light barriers for ember monitoring
- In-feed auger including insulating layer, safety end switch for maintenance lid, back-burn temperature sensor, thermostatic valve for extinguishing assembly, extinguisher water container with mounting bracket
- Flue gas exhaust blower including flue gas temperature sensor and oxygen sensor
- Boiler cleaning tools for the combustion chamber and heat exchanger
- Installation fittings including pressure relief valve, drain valve, low water cut off, safety temperature limiter, temperature and pressure gauges
- Control cabinet with integrated touch screen boiler control system

Customer supplied:

- Counter flanges for the boiler supply and return
- Piping to the 3-way mixing valve, boiler pump and thermal storage tank
- Piping for the safety heat exchanger
- Wiring to the control panel
- Insulation for the flue gas re-circulation line, the flue gas recirculation system is optional
- Separate electrical circuit for pneumatic cleaning system, air compressor when provided

Accessories for Vitoflex 300-UF Grate Firing System:

- Flue gas cyclone 63 USG (240 L)
- Flue gas cyclone 211 USG (800 L)
- Automatic de-ashing assembly with ash container, 63 USG (240 L)
- Automatic de-ashing assembly with ash container, 211 USG (800 L)
- Pneumatic cleaning system
- Automatic igniter
- Set of displacement rods (for Vitoflex 300-UF 720, 950 and 1250 only)
- Operating pressure 30 or 60 psi
- Two-stage in-feed auger
- Flue gas recirculation system
- Thermal safety flush valve
- Slide valve / Rotary valve
- Boiler pump and boiler mixing valve
- Boiler control system options:
- 5 sensor thermal storage tank management system
- External control module for field supplied extraction system
- Output module / Input module
- Input module 0-10V
- ModBus
- BacNet gateway
- Visualization

Transport and Installation

IMPORTANT

Precautions must be taken to avoid accidents and injury during the transportation of the boiler. Only hoist the boiler when it is entirely empty of water, fuel and ash.

Lifting

The combustion chamber has four lifting lugs that must be screwed in before lifting. Lifting gear can be attached to these lifting lugs.

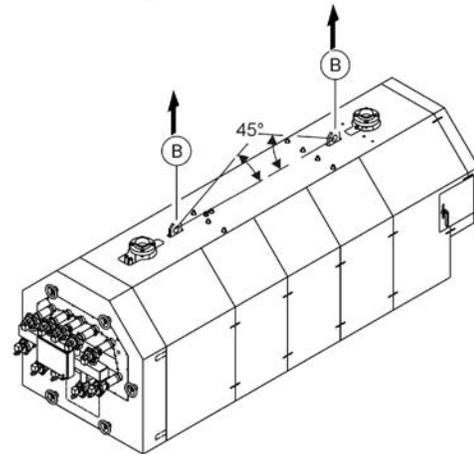
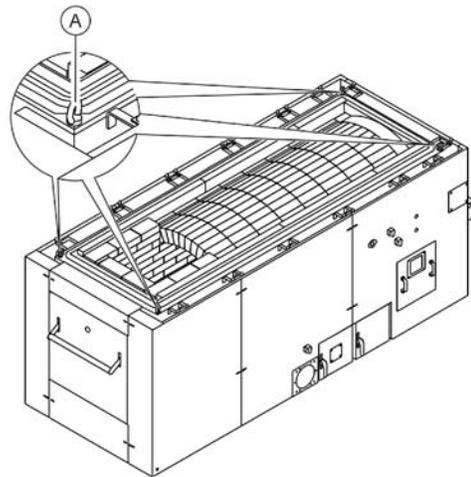
The pressure vessel of the Vitoflex 300-UF has two lifting lugs to which lifting gear may be attached.

A special crane (provided by the customer on site) is required to lift the combustion chamber and the pressure vessel.

Recommended minimum clearances to walls for installation and maintenance work must be observed. An anti-vibration boiler support should be provided if anti-vibration measures are required.

WARNING

Follow instructions for proper installation.
 For wood-fired installations:
 This wood-fired boiler must be installed in accordance with local codes if any; if not, follow CSA B365 Installation Code for Solid-Fuel Burning Appliances and Equipment (latest edition).



- Ⓐ Lifting lugs (screw in before lifting)
- Ⓑ Lifting lugs (pressure vessel)

Delivery Condition

Standard delivery condition

The standard delivery condition of the Vitoflex 300-UF boiler includes pre-assembled components as well as components that need to be assembled by the contractor in the field.

Components that are attached to the boiler at time of delivery:

- Heat exchanger door is mounted to the heat exchanger
- Combustion chamber door is mounted to the combustion chamber
- Flue gas collector is attached to the heat exchanger
- Pneumatic cleaning system (optional) is attached to the heat exchanger door

Components that are not attached or installed to the boiler at time of delivery (scope of the contractor):

- The pressure vessel is not mounted to the combustion chamber
- Brickwork to connect the combustion chamber and the heat exchanger, bricks and mortar are included
- Electrical components which include temperature sensors, oxygen sensor, light barriers for the combustion chamber, igniter, low water cut off, fixed high limit, negative pressure monitoring assembly and light barriers for the complete extraction system
- All wiring to the control cabinet
- Installation fittings which include pressure relief valve, drain valve, temperature and pressure gauges
- Drive for the combustion chamber grate is detached
- De-ashing assembly with ash container (optional) and drive for the de-ashing system
- Air compressor (optional) and connection to the pneumatic cleaning system (optional)
- The flue gas exhaust blower is not attached to the flue gas collector
- Primary air blowers are not attached to the combustion chamber
- Secondary air blowers are not attached to the combustion chamber
- Re-circulation system (optional)
- Flue gas cyclone (optional) comes in two pieces
- The in-feed auger is detached from the combustion chamber
- Fire extinguishing system for the in-feed auger
- Slide valve (optional) or rotary valve (optional)
- All components of the extraction system (optional), welding for flanges and support legs required
- Glass fiber insulation between any auger connections

Measurements for the combustion chamber as standard delivery condition

Boiler model	UF 390	UF 530	UF 720	UF 950	UF 1250
Minimum size door (W x H)	59 in. x 59 in. (1500 mm x 1500 mm)	63 in. x 69 in. (1600 mm x 1750 mm)	63 in. x 69 in. (1600 mm x 1750 mm)	74 ³ / ₄ in. x 73 ³ / ₄ in. (1900 mm x 1850 mm)	74 ³ / ₄ in. x 78 ³ / ₄ in. (1900 mm x 2000 mm)
Minimum ceiling opening (W x H)	59 in. x 149 in. (1500 mm x 3800 mm)	63 in. x 157 ¹ / ₂ in. (1600 mm x 4000 mm)	63 in. x 196 ³ / ₄ in. (1600 mm x 5000 mm)	74 ³ / ₄ in. x 196 ³ / ₄ in. (1900 mm x 5000 mm)	74 ³ / ₄ in. x 216 ¹ / ₂ in. (1900 mm x 5500 mm)

Measurements for the pressure vessel as standard delivery condition

Boiler model	UF 390	UF 530	UF 720	UF 950	UF 1250
Minimum size door (W x H)	59 in. x 59 in. (1500 mm x 1500 mm)	63 in. x 69 in. (1600 mm x 1750 mm)	63 in. x 69 in. (1600 mm x 1750 mm)	74 ³ / ₄ in. x 73 ³ / ₄ in. (1900 mm x 1850 mm)	74 ³ / ₄ in. x 78 ³ / ₄ in. (1900 mm x 2000 mm)
Minimum ceiling opening (W x H)	59 in. x 112 ¹ / ₄ in. (1500 mm x 2850 mm)	63 in. x 112 ¹ / ₄ in. (1600 mm x 2850 mm)	63 in. x 126 in. (1600 mm x 3200 mm)	74 ³ / ₄ in. x 130 in. (1900 mm x 3300 mm)	74 ³ / ₄ in. x 137 ³ / ₄ in. (1900 mm x 3500 mm)

Wood Fuel Requirements

The Vitoflex 300-UF is only suitable for burning fuels listed in this section. A prerequisite for approval is of a fuel by Viessmann is the approval for the fuel by the responsible public authorities.

Warranty claims for Viessmann Biomass boilers are excluded if the following fuel conditions are not met.

IMPORTANT

If different fuels are used, Viessmann will not assume any liability for the functioning or service life of the boiler plant. Refer to the "Warranty" section in the General Terms and Conditions of Delivery.

- Burn wood only
- Do not use chemicals or fluids to start fire.
- Do not burn garbage, gasoline, naphtha, engine oil, or other inappropriate materials.

Allowed fuels

- Forest wood and plantation wood (complete untreated trees and trunk wood):
Mature wood from trunks and branches, untreated, chopped to chips
- Compressed wood, pellets conforming to standards, as per CAN/CSA-B366.1-M91, size P1, P2, P4.

Untreated wood with limited bark content, compressed by machine and calibrated

Fuel	Minimal Diameter	Maximal Diameter
P1 - Pellets Small	---	3/8 in. (10 mm)
P2 - Pellets Medium	3/8 in. (10 mm)	3/4 in. (20 mm)
P4 - Briquettes (Pellets Large)	3/4 in. (20 mm)	2 1/2 in. (60 mm)

- Wood with an increased proportion of bark, tree cuttings from roadside trees (untreated):
Wood remnants from the forestry and sawmill industries or from landscape conservation (likelihood of elevated ash content).
- Remnants from derived timber products:
Usually a mixture of untreated and treated wood in the form of shavings from processing machinery and chips from choppers.
- Used wood:
This is untreated wood that has been used prior to its energetic utilization (e.g. pallets). It is reduced in size by shredders for thermal utilization. The metal parts have to be removed by magnetic separators.

Size of Wood Chips as per CAN/CSA-B366.1-M91, Grade C7

Total mass 100%			G 30 Fine	G 50 Medium
Coarse percentage max. 20%	Max. cross-section	in. ² (cm ²)	1/2 (3)	3/4 (5)
	Max. length	in. (cm)	3 1/3 (8.5)	4 3/4 (12)
	Coarse sieve nominal mesh width	in. (mm)	5/8 (16)	1 1/4 (31.5)
Main percentage 60 to 100%	Medium sieve nominal mesh width	in. (mm)	1/8 (2.8)	1/4 (5.6)
Percentage of fines (incl. ultrafine content) max. 20%	Fine sieve nominal mesh width	in. (mm)	1/25 (1)	1/25 (1)



CAUTION

Chips have to pass through a 1 in. (25 mm) sieve, additionally, a fraction of max. 5% of the fuel with a cross-section of max. 3/4 in.² (500 mm²) up to a length of max. 6 1/4 in. (160 mm) can be tolerated.

Size of briquettes:

- Fraction of one-offs. max. 5% with cross-section of max. 3/4 in.² (500 mm²) up to a length of max. 6 1/4 in. (160 mm).
- Frayed surface by chopping tools (shredders) or slow-running choppers.
- Briquettes, diameter max. 2 3/8 in. (60 mm).

Consequences of overstepping particle size:

- Increased maintenance because of a substantially higher risk of malfunction
- Shortened service life of the conveyor augers and drives

Wood Fuel Requirements *(continued)*

Maximum water content

The maximum allowable water content of the fuel for Vitoflex 300-UF systems is limited to 50%. The water content impacts the maximum boiler output.

Non-wood fuels

Non-wood fuels even if consisting of biomass, such as needles, foliage, grain, straw, fruit pits, etc, are unsuited as fuel for boiler operation and may not be used.

Limitation super fines and dust [wood particles smaller than $\frac{1}{32}$ in. (1.0 mm)]

Max. 10.0% of the total mass; if fuel does not comply with this limit the following process may occur:

- Temperature peaks
- Slag formation
- Even higher temperature
- This process leads to damage by overheating and can affect refractory materials.

Elevated values are especially critical for remnant wood in combination with elevated values of Chlorine and Sulphur.

Suitable fuel types for Vitoflex 300-UF systems

- Bulk density **S** in kg/m³ [lb/ft³], water content (**W**) in %, size C1, C7, P1, P2, P4 as per CAN/CSA-B366.1-M91.

Note: Fuel for Vitoflex 300-UF systems allow for a max. of 50% water content (**W**).

Saw dust

Fuel code	Bulk Density kg/m ³ [lb/ft ³]	Water content %	Fuel Size	Description
a	S130 [8.1]	W10 to W20	C1	Sawdust, untreated (planing shop)
b1	S200 [12.5]	W20 to W35	C1	Sawdust, untreated (sawmill)
c2	S250 [15.6]	W35 to W50	C1	Sawdust, untreated (sawmill)

Wood chips

Fuel code	Bulk Density kg/m ³ [lb/ft ³]	Water content %	Fuel Size	Description
b2	S200 [12.5]	W20	C7	Forest wood chips, soft, untreated
c1	S250 [15.6]	W20 to W35	C7	Forest wood chips, soft, untreated
d1	S300 [18.7]	W20 to W35	C7	Forest wood chips, soft/hard, untreated
d2	S300 [18.7]	W35 to W50	C7	Forest wood chips, soft, untreated
e1	S350 [21.8]	W20 to W35	C7	Forest wood chips, hard, untreated
e2	S350 [21.8]	W35 to W50	C7	Forest wood chips, soft/hard, untreated
f1	S400 [24.9]	W35 to W50	C7	Forest wood chips, hard, untreated

Shavings and chips

Fuel code	Bulk Density kg/m ³ [lb/ft ³]	Water content %	Fuel Size	Description
g	S130 [8.1]	Less than W15	C7	Shavings & chips from wood remnants, dry, mixed
h	S200 [12.5]	Less than W15	C7	Shavings & chips from wood remnants, dry, mixed
i	S250 [15.6]	Less than W15	C7	Shavings & chips from wood remnants, dry, mixed

Pellets and briquettes

Fuel code	Bulk Density kg/m ³ [lb/ft ³]	Water content %	Fuel Size	Description
j	S350 [21.8]	Less than W15	P4	Briquettes from wood remnants $\frac{3}{4}$ in. (20 mm) to max. 2 in. (60 mm)
k1	S650 [40.6]	Less than W10	P1	untreated up to $\frac{3}{8}$ in. (10 mm)
k2	S650 [40.6]	Less than W10	P2	untreated $\frac{3}{8}$ in. to $\frac{3}{4}$ in. (11 mm to 20 mm)

Note: For size of wood chips, see page 11.

Wood Fuel Requirements *(continued)*

Content limits for non-combustible substances

- No wood fuels may contain any foreign bodies, such as pieces of metal, stones, masonry remnants or plastics.

The following limits (per mg/kg of dry fuel) of contained non-combustible substances apply [ash analyzed at a temperature of 1500°F (815°C)]:

Substance	Limit	Comparative value untreated forest wood
Chlorine (Cl)	max. 300 ppm (300 mg/kg)	10 ppm (10 mg/kg)
Sulphur (S)	max. 1000 ppm (1000 mg/kg)	120 ppm (120 mg/kg)
Total Cl, S	max. 1000 ppm (1000 mg/kg)	130 ppm (130 mg/kg)
Ash content, total	max. 0.25 oz/lb (15.0 g/kg)	0.08 oz/lb (5.0 g/kg)
Alkali oxides in the ash (K ₂ O and Na ₂ O)	max. 0.016 oz/lb (1.0 g/kg)	0.006 oz/lb (0.35 g/kg)
Sintering point of the ash	min. 1800° F (1000° C)	approx. 2200°F (1200°C)

If fuel does not comply with these limits, there is a risk of corrosion within the heat exchanger and early sintering and melting of the ash which leads to:

- Shortened life of the heat exchanger
- Increased maintenance costs (firing, combustion chamber door)

The maintenance instructions need to be complied with in order to avoid a process, which will increasingly cause damage to the boiler.

If maintenance instructions are not complied with the following process may occur:

- Cinders change the airflow
- Temperature peaks
- More slag is produced
- More cinder builds up and changes the airflow more

This process leads to damage by overheating and may affect refractory materials.

Additives in remnant and used wood have to be free of heavy metals and halogen compounds.

Other information

- Ash and cleaning:
Untreated wood without bark produces less than 0.5% ash of the fuel mass supplied. All the specifications regarding cleaning are based on untreated wood with bark attached with an ash amount of 0.8% of the fuel mass. If the ash content is higher and/or the ash melting point is lower, increased maintenance and/or cleaning are required.
- Changing fuels:
A substantial change in fuel quality, such as bulk density, water content, dust proportion or ash content might require a manual correction of the firing parameters (see Operating section).

Carbon Monoxide

The U.S. Consumer Product Safety Commission strongly recommends the installation of carbon monoxide detectors in buildings in which wood-burning equipment is installed. Carbon monoxide (CO) is a colorless, odorless gas, which may be produced during incomplete combustion of fuel and/or when the flame does not receive an adequate supply of combustion air. Carbon monoxide can cause severe personal injury or loss of life.

Therefore, carbon monoxide detectors that are in compliance with a nationally recognized standard (e.g. ANSI/UL 2034-2002, CSA 6.19-01) should be installed and maintained in buildings that contain wood-burning equipment.

Note: Viessmann does not test any detectors and makes no representation regarding any brand or type of detector.

For safe operation

We recommend that you frequently:

- Check for debris which could obstruct the flow of flue gases. The vent or chimney must not be blocked. A blocked or partially blocked vent or chimney can cause flue gases to leak into the structure. Flue gases leaking into the house can cause injury or death. Blocked or partially blocked chimneys must have the blockage removed by a qualified heating contractor.
- Check the pressure gauge for correct system (water) pressure. Check for water on the floor from the discharge pipe of the pressure relief valve or any other pipe, pipe joint, valve or air vent.
- Check for moisture, water, or appearance of rust on the flue gas pipes, their joints as well as vent dampers, or side wall vent terminals (if so equipped).
- Ensure that nothing is obstructing the flow of combustion and ventilation air and no chemicals, garbage, gasoline, combustible materials, flammable vapors and liquids are stored (not even temporarily) in the vicinity of the boiler.
- DO NOT allow unsupervised children near the boiler.

Service/inspection of the boiler and the system must be performed on a regular basis. Maintenance, service and cleaning are specified in the "Service and Maintenance Instructions".

Before the heating season begins, it is recommended that the boiler be serviced by a qualified heating contractor.

WARNING

As there are no user-serviceable parts on the boiler, or control, the end-user must not perform service activities of any kind on system components. Failure to heed this warning can cause property damage, severe personal injury, or loss of life.

WARNING

Improper installation, adjustment, service, or maintenance can cause flue products to flow into living space. Flue products contain poisonous carbon monoxide gas, which can cause nausea or asphyxiation resulting in severe personal injury or loss of life.

WARNING

The operator/ultimate owner is required to have the heating boiler and controls checked, as a minimum once per year, by the original installer or by a competent heating contractor familiar with the equipment. Defects must be corrected immediately.

CAUTION

Do not use this boiler if any part has been under water. Immediately call a qualified heating contractor to inspect the boiler and to replace any part of the control system which has been under water.

Hazardous Materials

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.

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.

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.

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 water. 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.

Power Failure Provision

Customers must ensure that there is a supply of water independent of the electrical supply. This design ensures that in case of a power failure, the boiler will be reliably cooled by the thermal safety flush valve.

Venting Requirements

The Vitoflex 300-UF Grate Firing System is equipped with a flue gas exhaust blower.

This boiler must be properly vented. Use a vent material certified for use with solid-fuel fired equipment.

This boiler shall be connected to:

- a) a masonry chimney conforming to local regulations or, in the absence of such regulations, to the requirements of the National Building Code
- b) a certified factory-built chimney (refer to the NFPA 211 standard).

A flue pipe serving this boiler shall be constructed of steel or other suitable material with a melting point of not less than 2000°F (1100°C).

IMPORTANT

Do not use galvanized steel

For installations in Canada:

The boiler venting system must be tested and listed by a Nationally Recognized Testing Lab such as ULC/CSA for solid fuel burning appliances.

The Vitoflex 300-UF Grate Firing System is output-controlled within a range from 30%-100% of the rated boiler output. This produces flue gas temperatures from min. 212°F (100°C) to max. 482°F (250°C).

An insulated chimney should be provided to prevent sooting.

The distance from the flue gas exhaust blower to the chimney should be as short as possible. 90° elbows should be avoided if possible. Flue gas pipes of more than 3 ft. (1 m) in length must be insulated.

The connection to the chimney should be made such that it rises at an angle of 30°- 45° (to prevent excess ash accumulating in the lateral section of the vent pipe).

The flue gas line, including the lead-in into the chimney, must be gas-tight.

Mechanical Room

Ensure the mechanical room complies with the requirements in these instructions and local codes.

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

A separate, dry heating room must always be provided for the Vitoflex 300-UF Grate Firing System. No combustible materials may be stored in the heating room. The heating boiler may only be set up on a fire and temperature-resistant floor.

No temperature-sensitive pipes or lines may be installed in the floor beneath the heating boiler.

The temperature in the heating room must not exceed 104°F (40°C) while the system is in operation (in the area approx. 3 ft. (1 m) away from the boiler).

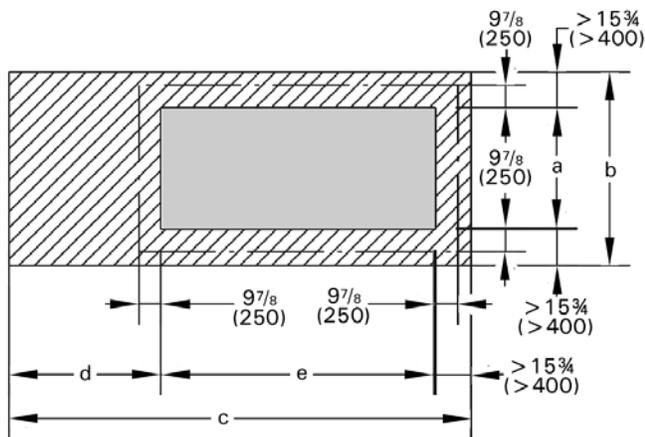
The temperature in the heating room must not fall below 50°F (10°C) while the system is in operation (measured at the inner side of exterior walls).

The load-bearing capacity of the heating room floor must be designed for the weight of the system plus filling with water and fuel. The load-bearing capacity of the floor in the area of the boiler bearing surface must be 512 lb/ft² (2500 kg/m²).

IMPORTANT

Always follow the most up-to-date local, municipal and building regulations and codes.

The minimum distance to the walls and ceiling required according to the table of dimensions for proper cleaning and maintenance of the boiler must be complied with. A sufficient supply of fresh air must be provided directly from outdoors into the heating room. Induced ventilation is necessary for heating rooms that are confined or enclosed.



Dimensions shown in. (mm)

Hatched surface Heat-resistant floor
 Medium grey surface Boiler supporting surface

Foundation dimensions

Boiler Model		UF 390	UF 530	UF 720	UF 950	UF 1250
a	in. (mm)	40 ³ / ₈ (1026)	40 ³ / ₈ (1026)	43 ³ / ₄ (1112)	53 ¹ / ₂ (1360)	53 ¹ / ₂ (1360)
b	in. (mm)	71 ⁷ / ₈ (1826)	71 ⁷ / ₈ (1826)	75 ¹ / ₄ (1912)	85 (2160)	85 (2160)
c	in. (mm)	166 ¹ / ₈ (4221)	166 ¹ / ₈ (4721)	193 ³ / ₈ (4912)	200 ⁵ / ₈ (5096)	222 ¹ / ₈ (5641)
d	in. (mm)	49 ⁵ / ₈ (1260)	49 ⁵ / ₈ (1260)	55 ¹ / ₈ (1400)	64 ¹ / ₈ (6030)	64 ¹ / ₈ (1630)
e	in. (mm)	100 ⁷ / ₈ (2561)	120 ¹ / ₂ (3061)	122 ¹ / ₂ (3112)	120 ³ / ₄ (3066)	142 ¹ / ₈ (3611)

Mechanical Room *(continued)***WARNING**

Incorrect ambient conditions can lead to damage to the heating system and put safe operation at risk.

Mechanical room conditions

Prevent the air from becoming contaminated by homogenate hydrocarbons (e.g. as contained in paints solvents or cleaning fluids) and excessive dust (e.g. through grinding or polishing work). Combustion air for the heating process, and ventilation of the boiler room must be free of corrosive contaminants. To that end, any boiler must be installed in an area that has no chemical exposure.

For the main, currently known sources refer to "Sources of combustion and ventilation air contaminants".

Avoid continuously high levels of humidity (e.g. through frequent drying of laundry).

Never close existing ventilation openings.

**WARNING**

The boiler must not be located in areas or rooms where chemicals are stored, or aggressive vapors (i.e. bleach, hair spray, methyl chloride, carbon tetrachloride or perchloroethylene) or high dust levels or humidity levels are present. Heat exchanger corrosion might occur and reduce the lifetime of the boiler significantly. If above criteria are not properly observed and boiler damage results, any warranty on the complete boiler and related components will be null and void.

IMPORTANT

Components which are not tested with the heating system may damage the heating system or affect its functions. Installation or replacement may only be carried out by a qualified heating contractor.

Sources of combustion and ventilation air contaminants

Areas likely to contain contaminants:

- New building construction
- Swimming pools
- Remodeling areas, hobby rooms
- Garages with workshops
- Furniture refinishing areas
- Dry cleaning/laundry areas and establishments
- Auto body shops
- Refrigeration repair shops
- Metal fabrication plants
- Plastic manufacturing plants
- Photo processing plants
- Beauty salons

Products containing contaminants:

- Chlorine-type bleaches, detergents and cleaning solvents found in household laundry rooms
- Paint and varnish removers
- Hydrochloric acid, muriatic acid
- Chlorine-based swimming pool chemicals
- Spray cans containing chlorofluorocarbons
- Chlorinated waxes and cleaners
- Cements and glues
- Refrigerant leaks
- Calcium chloride used for thawing
- Sodium chloride used for water softening salt
- Permanent wave solutions
- Adhesives used to fasten building products and other similar items
- Antistatic fabric softeners used in clothes dryers

Combustion Air Supply

Codes

Provision for combustion and ventilation air must be made in accordance with applicable local codes.

In the absence of local codes, use:

CSA B365, Installation Code for Solid Fuel Burning Appliances and Equipment.

Always use latest edition codes.

WARNING

Failure to provide an adequate supply of fresh combustion air can cause poisonous flue gases to enter living space. Flue gases entering living space can cause carbon monoxide poisoning which can result in severe personal injury or loss of life.

WARNING

Never cover the boiler or store debris or other materials near the boiler, or in any way block the flow of adequate fresh air to the boiler. Never cover the combustion air opening. Advise system operator / ultimate owner accordingly.

General

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

Whenever possible, install boiler near an outside wall so that it is easy to duct fresh air directly to the boiler area.

The boiler location must never be under negative pressure. Flue gas exhaust blowers, attic blowers, or dryer blowers may cause air to be exhausted at a rate higher than air can enter the structure for safe combustion.

The heating contractor shall ensure all of the following requirements are met:

- An adequate supply of combustion air must be available to ensure proper combustion.
- Ambient air temperatures must be maintained within safe operating limits.
- When a damper is provided in any opening intended to admit combustion air into the room within which the appliance is installed, the damper shall be interlocked to prevent any burner from starting before the damper is fully open.
- Each duct used to convey air from the outdoors shall have:
 1. a cross-sectional area throughout its length at least equal to the free area of the inlet and outlet openings which it connects,
 2. making a provision for outside combustion air, the intake shall not be less than 1 ft. (0.3 m) above the anticipated snow level for the location.
- The heating contractor must check with local authorities (municipal building department) for combustion air requirements particular to the area.

Confined spaces

When a furnace or boiler is enclosed in a space that has a volume less than 20% of that to be heated by the appliance, the space shall:

- a. have a permanent opening or openings for natural air circulation with a minimum net free area of 1.5 in² / 1000 Btu/h (3300 mm² / kW) input, and
- b. connect to another space or spaces such that the total volume of air available for natural air circulation is at least 30% of the total volume to be heated by the appliance.

The minimum dimension of any opening specified in item (a) shall be no less than 1 in. (25 mm) The lower edge of at least one opening shall be located within 1.5 ft. (0.5 m) of the floor of the enclosed space, and the upper edge of at least one opening shall be located within 1.5 ft. (0.5 m) of the ceiling of the enclosed space.

Note: The intent of this Clause is to allow either one long vertical opening or two shorter horizontal openings, one high and the other low, to allow for air circulation to prevent overheating of the appliance.

Unconfined spaces

Where the boiler is located in an unconfined space in a building having insufficient infiltration, additional air for combustion and ventilation shall be obtained from outdoors or from spaces freely communicating with the outdoors. Under these conditions, permanent opening(s) shall be provided so that the total air received through these openings will be at least as much as would be admitted by openings having a total free area of 1 in² / 5,000 Btu/h or (450 mm² / kWh) of the total input rating of all wood-fired appliances.

Louvers and grilles

In calculating free area as specified, consideration shall be given to the blocking effect of louvers, grilles, or screens that protect openings. Screens shall be no smaller than ¼ in. (6 mm) mesh and shall be readily accessible for cleaning. If the free area through a design of louver or grilles is known, it shall be used in calculating the size of opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louvers have 20 - 25% free area and metal louvers and grilles have 60 - 75% free area.

Negative pressure

Systems, including a combination of exhaust fans and a combination of air fans shall not be installed or controlled to permit the creation of a negative pressure in the boiler room relative to the breaching and flue.

Technical Data

Boiler model		UF 390	UF 530	UF 720	UF 950	UF 1250
Maximum output	MBH (kW)	1331 (390)	1808 (530)	2457 (720)	3242 (950)	4265 (1250)
Minimum output ¹	MBH (kW)	334 (98)	450 (132)	614 (180)	812 (238)	1065 (312)
Efficiency ²		85%				
Fuel Moisture content ³	%	W 50				
Size of wood chips ⁴		G 30 / G 50 as per CAN/CSA-B366. 1-M91				
Flue gas figures						
Connection flue gas pipe Ø A	in. mm	13½ (350)	13¾ (350)	13¾ (350)	15¾ (400)	17¾ (450)
Mass flow rate; W5; O ₂ 6%	lb/s (g/s)	0.48 (219)	0.65 (297)	0.89 (404)	1.17 (532)	1.54 (700)
Volume flow; W5; O ₂ 6%; 302°F (150°C)	ft ³ /s (m ³ /s)	9.18 (0.26)	12.71 (0.36)	17 (0.48)	22 (0.63)	29 (0.83)
Mass flow rate; W35; O ₂ 8%;	lb/s (g/s)	0.67 (303)	0.91 (412)	1.23 (560)	1.62 (736)	2.13 (968)
Volume flow; W35; O ₂ 8%; 302°F (150°C)	ft ³ /s (m ³ /s)	13 (0.37)	17.5 (0.50)	23.6 (0.67)	31 (0.88)	40.6 (1.15)
Average flue gas temperature at full load ⁵	°F (°C)	320 (160)				
Average flue gas temperature at partial load ⁵	°F (°C)	248 (120)				
Chimney draft required	Pa	±0				
Electrical connections						
Electrical connections, total	kW	6.42	8.28	8.28	9.51	11.31
Ignition device	kW	1.6	1.6	1.6	1.6	1.6
Flue gas exhaust blower	kW	1.5	2.2	2.2	2.2	4.0
In-feed auger	kW	1.1	1.5	1.5	2.2	2.2
Primary air blower ¹	kW	0.14	0.3	0.3	0.48	0.48
Primary air blower ²	kW	1.0	1.0	1.0	1.0	1.0
Secondary air blower	kW	.9	1.5	1.5	1.85	1.85
Grate drive unit	kW	0.12	0.12	0.12	0.12	0.12
Electric power consumption at full load	kW	3.36	4.68	4.68	5.29	6.91
Electric power consumption at partial load	kW	2.75	3.83	3.83	4.28	5.6
Heating						
Water side resistance (diff. 27°F / 15 K)	"wc (mbar)	5.12 (13)	9.23 (23)	17.26 (43)	10.5 (26)	18 (45)
Boiler water volume	USG (L)	303 (1150)	383 (1450)	488 (1850)	515 (1950)	660 (2500)
Heating surface	ft ² (m ²)	291.8 (27.1)	457.5 (42.5)	597.4 (55.5)	805.2 (74.8)	979.6 (91.0)
Volume on heating gas side	USG (L)	407 (1540)	602 (2280)	774 (2830)	1070 (4050)	1367 (5210)
Volume of ash container for grate ash	USG (L)	63 (221) - 240 (800)				
Volume of ash container for flue gas cyclone	USG (L)	63 (221) - 240 (800)				
Test pressure ⁶	psi (bar)	113 (7.8)				
Maximum allowable working pressure (water) ⁶	psi (bar)	30 or 60 (2 or 4)				
Maximum water temperature	°F (°C)	250 (120)				
Minimum return temperature	°F (°C)	149 (65)				
Weight						
Weight of combustion chamber	lb (kg)	6570 (2970)	9343 (4238)	10919 (4953)	12740(5779)	14374(6520)
Weight of pressure vessel (30 psi)	lb (kg)	4993 (2265)	7094 (3218)	9275 (4207)	12965 (5881)	14643 (6642)
Weight of pressure vessel (60 psi)	lb (kg)	4993 (2265)	7094 (3218)	9936 (4507)	13627 (6181)	15525 (7042)
Weight of displacement rods	lb (kg)	644 (292)	721 (327)	869 (394)	1186 (538)	1186 (538)
Weight of flue gas exhaust blower	lb (kg)	132 (60)	172 (78)	178 (78)	181 (82)	236 (107)
Weight of in-feed auger	lb (kg)	337 (153)	337 (153)	3.37 (153)	419 (190)	419 (190)
Total weight without water (30 psi) ⁷	lb (kg)	12820(5815)	17780(8065)	21572(9785)	27492(12470)	30858(13997)
Total weight without water (60 psi) ⁷	lb (kg)	12820(5815)	17780(8065)	22234(10085)	28153(12770)	31740(14397)
Total weight with water (30 psi) ⁷	lb (kg)	15355(6965)	20964(9509)	25675(11646)	31775(14413)	36330(16479)
Total weight with water (60 psi) ⁷	lb (kg)	15355(6965)	20964(9509)	26336(11946)	32437(14713)	37212(16879)

¹ Minimum load: Operation with modulated control (Infinitely variable power control)
Low load with ON Qmin / OFF (Stop-and-go mode)

² Moist fuels: Efficiency: Specification with displacement rods and flue gas recirculation system
or dry fuels (W5 to W20) without flue gas recirculation system-reduced values

³ Wet fuels: >W35 further limitations regarding output, degree of efficiency and control behavior

⁴ Specification: See Section Wood Fuel Requirements

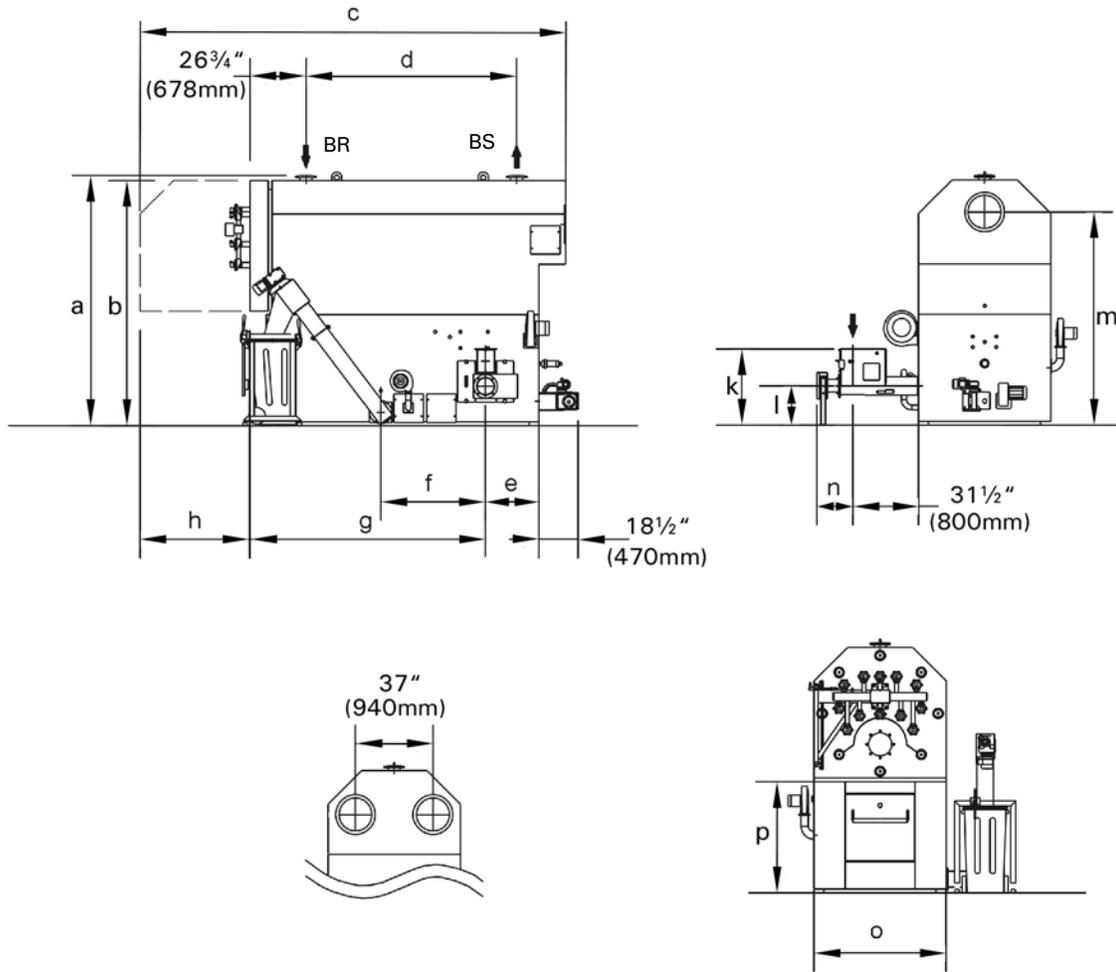
⁵ Flue gas temperature: An increase is possible by removing the displacement rods [Full load 86°F (30°C);
Partial load 50°F (10°C)]

⁶ Pressure: Per ASME Sec. IV

⁷ Overall weight: Includes displacement rods

Other influences: Fuel, water content, ash content, pneumatic cleaning system yes/no; track time (number of
operating hours without cleaning). Specifications for the start of the track time [toward the end of
the track time there is an increase in the flue gas temperature by approx. 59°F (15°C).

Boiler Dimensions

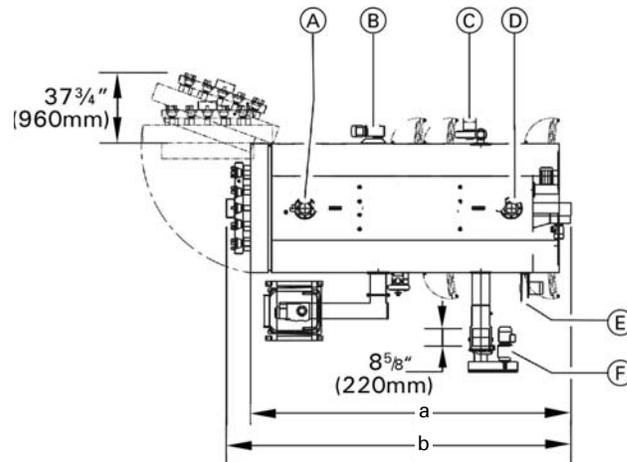


BR Boiler Return
BS Boiler Supply

Dimensions

Boiler Model		UF 390	UF 530	UF 720	UF 950	UF 1250
a	in. (mm)	93 ⁵ / ₈ (2378)	99 ⁷ / ₈ (2536)	111 ⁵ / ₈ (2834)	119 1/2 (3035)	127 ¹ / ₈ (3230)
b	in. (mm)	91 ⁵ / ₈ (2328)	97 ⁷ / ₈ (2486)	109 ⁵ / ₈ (2784)	117 ³ / ₈ (2981)	125 (3176)
c	in. (mm)	172 (4370)	191 3/4 (4870)	207 (5257)	214 1/2 (5447)	235 ⁷ / ₈ (5992)
d	in. (mm)	87 ¹ / ₈ (2060)	100 3/4 (2560)	100 ⁷ / ₈ (2562)	100 ⁷ / ₈ (2562)	122 ³ / ₈ (3107)
e	in. (mm)	22 3/4 (577)	22 3/4 (577)	22 3/4 (577)	25 ⁷ / ₈ (657)	25 ⁷ / ₈ (657)
f	in. (mm)	47 3/4 (1200)	47 3/4 (1200)	47 3/4 (1200)	50 3/4 (1275)	50 3/4 (1275)
g	in. (mm)	94 3/4 (2405)	114 ³ / ₈ (2905)	117 ⁷ / ₈ (2993)	112 ⁵ / ₈ (2861)	134 ¹ / ₈ (3406)
h	in. (mm)	42 3/4 (1086)	42 3/4 (1086)	54 ³ / ₈ (1380)	63 1/2 (1612)	63 1/2 (1612)
k	in. (mm)	31 ⁵ / ₈ (803)	31 ⁵ / ₈ (803)	31 ⁵ / ₈ (803)	36 ⁵ / ₈ (929)	36 ⁵ / ₈ (929)
l	in. (mm)	17 ⁷ / ₈ (453)	17 ⁷ / ₈ (453)	17 ⁷ / ₈ (453)	18 ⁷ / ₈ (479)	18 ⁷ / ₈ (479)
m	in. (mm)	81 3/4 (2077)	91 3/4 (2331)	98 ¹ / ₈ (2491)	96 1/4 (2444)	103 ⁷ / ₈ (2639)
n	in. (mm)	12 ¹ / ₈ (308)	12 ¹ / ₈ (308)	12 ¹ / ₈ (308)	17 ³ / ₈ (440)	17 ³ / ₈ (440)
o	in. (mm)	50 ¹ / ₈ (1274)	50 ¹ / ₈ (1274)	54 ³ / ₈ (1380)	63 1/2 (1612)	63 1/2 (1612)
p	in. (mm)	49 3/4 (1263)	55 3/4 (1417)	55 ⁵ / ₈ (1413)	51 ⁷ / ₈ (1317)	61 ⁵ / ₈ (1566)

Boiler Dimensions *(continued)*



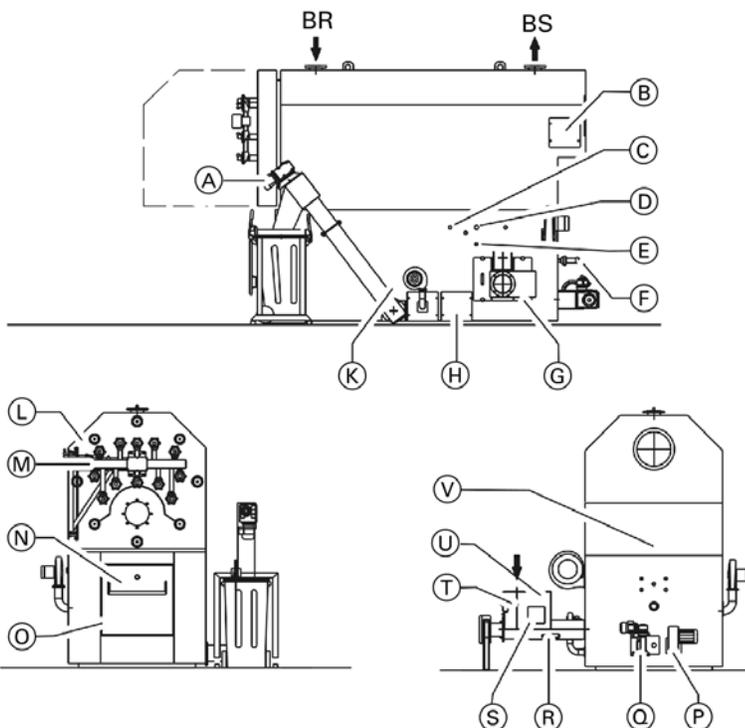
Legend

- (A) Boiler return
- (B) Motor for de-ashing assembly with ash container (optional)
- (C) Primary air blower 1
- (D) Boiler supply
- (E) Secondary air blower
- (F) In-feed auger

Dimensions

Boiler Model		UF 390	UF 530	UF 720	UF 950	UF 1250
a	in. (mm)	129 ^{3/16} (3282)	149 (3782)	152 ^{5/8} (3877)	151 (3835)	172 ^{1/2} (4380)
b	in. (mm)	149 ^{5/8} (3800)	169 ^{5/16} (4300)	174 ^{9/16} (4434)	173 (4392)	194 ^{3/8} (4937)

Boiler Components



Legend

- BS Boiler supply
- BR Boiler return
- (A) De-ashing assembly with ash container
- (B) Cleaning cover, heat exchanger
- (C) Combustion chamber temperature sensor
- (D) Negative overpressure monitoring assembly
- (E) Light barrier, combustion chamber
- (F) Igniter (optional)
- (G) Cleaning cover trough
- (H) Cleaning cover, external grate
- (K) Light barrier de-ashing system
- (L) Heat exchanger door
- (M) Pneumatic cleaning system
- (N) Combustion chamber door
- (O) Limit switch, combustion chamber door
- (P) Primary air blower 2
- (Q) Drive, in-feed grate
- (R) Temperature sensor in-feed auger
- (S) Limit switch, maintenance cover
- (T) Light barrier, in-feed auger
- (U) Extinguishing water connection
- (V) Boiler drain and fill valve

Flue Gas Cyclone

The flue gas cyclone minimizes dust emissions and is designed as a multi cyclone with axial function. The cyclone is fully insulated and has three covers for cleaning. The crude gas chamber is cleaned via the side cleaning cover. The clean gas chamber is cleaned via the upper or back cleaning cover (unused blower connection). The ash box has a carriage and is connected to the cyclone with quick-action fasteners. It can easily be pulled out for emptying. The flue gas exhaust blower can be installed either on the side or the top.

Supplied with:

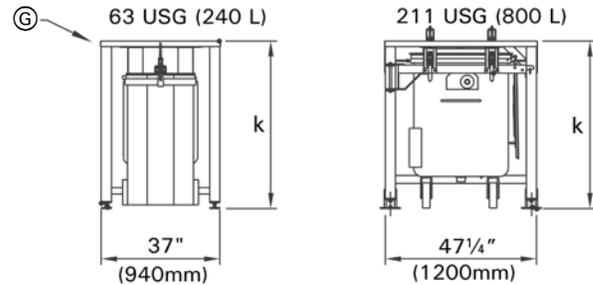
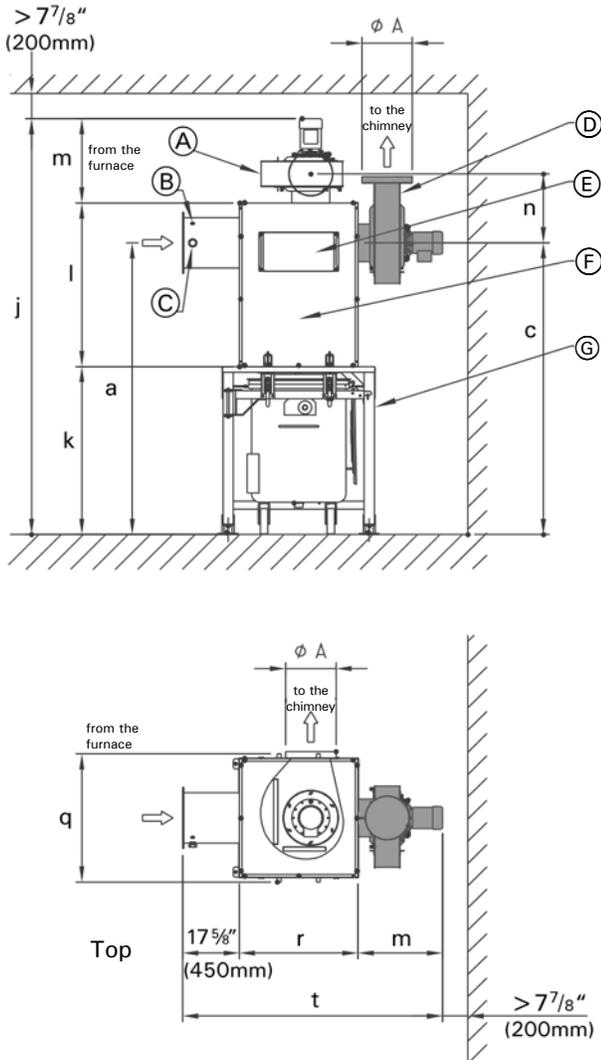
- 1 flue gas cyclone
- 1 ash container 63 USG (240L) or 211 USG (800L)

CAUTION

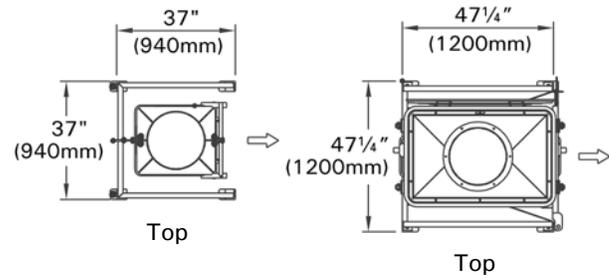
The effects of heat can create dangerous conditions.

Legend

- (A) Flue gas exhaust blower (with variable rotation)
 - Either top or side
 - Unused connection as cleaning cover
 - Alternate mounting of the flue gas exhaust blower (shown in dark grey)
- (B) Flue gas temperature sensor
- (C) Oxygen sensor
- (D) Flue gas exhaust blower - choice of top or side - unused connection as cleaning lid, variable rotation, clean gas chamber
- (E) Cleaning lid crude gas chamber
- (F) Cyclone (axial cyclone)
- (G) Ash bin support frame 63 USG (240 L) or 211 USG (800 L)

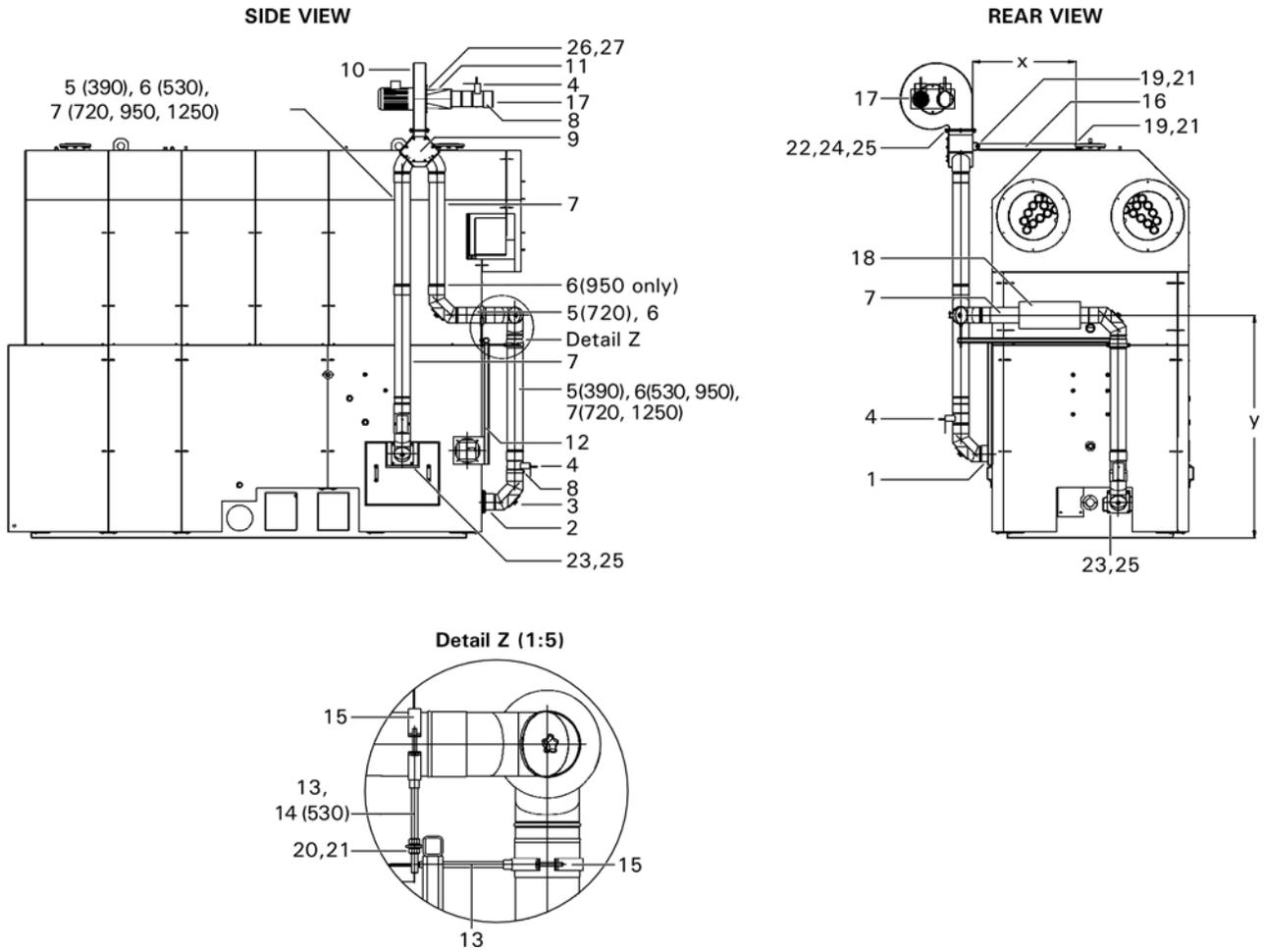


Ash bin support frame: positioning is possible in 4 x 90° (extraction, ash container) Drawn with extraction to the right



Boiler Model		UF 390	UF 530	UF 720	UF 950	UF 1250
A	in. (mm)	13 3/4 (350)	13 3/4 (350)	13 3/4 (350)	15 3/4 (400)	17 11/16 (450)
a	in. (mm)	81 7/8 (2080)	92 7/8 (2359)	98 1/16 (2491)	96 1/4 (2444)	103 7/8 (2639)
c	in. (mm)	92 7/8 (2359)	92 7/8 (2359)	98 1/16 (2491)	96 1/4 (2444)	103 7/8 (2639)
j	in. (mm)	125 1/2 (3186)	125 1/2 (3186)	133 (3378)	135 7/8 (3452)	146 3/8 (3717)
k	in. (mm)	52 3/8 (1330)	52 3/8 (1330)	57 9/16 (1462)	57 9/16 (1462)	65 1/4 (1657)
l	in. (mm)	49 1/2 (1256)	49 1/2 (1256)	49 1/2 (1256)	51 3/16 (1300)	51 3/16 (1300)
m	in. (mm)	23 5/8 (600)	23 5/8 (600)	26 (660)	27 1/8 (690)	30 (760)
n	in. (mm)	17 5/8 (447)	17 5/8 (447)	18 1/8 (461)	22 7/8 (579)	22 7/8 (579)
q	in. (mm)	49 5/8 (1260)	49 5/8 (1260)	49 5/8 (1260)	40 1/8 (1020)	40 1/8 (1020)
r	in. (mm)	24 1/2 (620)	24 1/2 (620)	24 1/2 (620)	37 1/2 (950)	37 1/2 (950)
t	in. (mm)	65 3/4 (1670)	65 3/4 (1670)	68 (1730)	82 (2083)	84 3/4 (2153)

Recirculation System



Recirculation System *(continued)*

Item no.	Boiler Model Description	UF 390 Quantity	UF 530 Quantity	UF 720 Quantity	UF 950 Quantity	UF 1250 Quantity
1	Pipe adaptor primary air 1	1	1	1	1	1
2	Pipe adaptor primary air 2	1	1	1	1	1
3	Elbow 130 x 0.9/90° with PD	5	5	5	5	5
4	Flue damper blade D = 5½ in. (130 mm)	4	4	4	4	4
5	Pipe 130 x 0.6 L = 9 ⁷ / ₈ in. (250 mm)	2	--	1	--	--
6	Pipe 130 x 0.6 L = 19 ⁵ / ₈ in. (500 mm)	1[1x L = 8 ⁷ / ₈ in. (225 mm)]	3[1x L = 8 ⁷ / ₈ in. (225 mm)]	1[1x L = 9 in. (228 mm)]	3[1x L = 12 ¹ / ₈ in. (308 mm)], 1[1x L = 16 ¹ / ₈ in. (409 mm)]	1[1x L = 12 ¹ / ₈ in. (308 mm)]
7	Pipe 130 x 0.6 L = 39 ¹ / ₈ in. (1000 mm)	3[1x L = 31 ³ / ₄ in. (805 mm)], 1[1x L = 36 in. (914 mm)]	3[1x L = 31 ³ / ₄ in. (805 mm)], 1[1x L = 32 ⁵ / ₈ in. (830 mm)], 1[1x L = 36 in. (915 mm)]	5[1x L = 18 ¹ / ₈ in. (460 mm)], 1[1x L = 28 ⁵ / ₈ in. (720 mm)], 1[1x L = 33 ¹ / ₄ in. (845 mm)]	4[1x L = 36 in. (915 mm)]	5[1x L = 36 in. (915 mm)]
8	Clamping band 130 with gasket	18	18	18	19	20
9	Distributor	1	1	1	1	1
10	Fan DMVL	1	1	1	1	1
11	Intake cone	1	1	1	1	1
12	Recirculation bracket	1	1	1	1	1
13	Threaded rod M12 L = 7½ in. (190 mm)	2	1	2	2	2
14	Threaded rod M12 L = 9 ⁷ / ₈ in. (250 mm)	--	1	--	--	--
15	Pipe clamp 125-130 M12	2	2	2	2	2
16	Fan bracket	1	1	1	1	1
17	Mesh 8 x 8	1	1	1	1	1
18	Pipe insulation L = 39 ⁵ / ₈ in (1000 mm)	4	5	5	6	6
19	Bolt M12 x 1 in. (25 mm)	4	4	4	4	4
20	Nut M12	4	4	4	4	4
21	Lock washer M12	8	8	8	8	8
22	Bolt M8 x 1 in. (25 mm)	6	6	6	6	6
23	Bolt M8 x ¾ in. (20 mm)	8	8	8	8	8
24	Nut M8	6	6	6	6	6
25	Lock washer M8	14	14	14	14	14
26	Bolt M5 x ¾ in. (20 mm)	4	4	8	8	8
27	Lock washer M5	4	4	8	8	8
x	Distance between the recirculation fan and the supply flange.	27 ³ / ₈ in. (695 mm)	27 ³ / ₈ in. (695 mm)	28 ⁷ / ₈ in. (735 mm)	33 ¹ / ₄ in. (845 mm)	33 ¹ / ₄ in. (845 mm)
y	Height of the horizontal recirculation section.	41½ in. (1055 mm)	51¼ in. (1303 mm)	49½ in. (1258 mm)	51½ in. (1299 mm)	71 ⁷ / ₈ in. (1825 mm)

Note: Items 6 and 7 need to be lengthened by the customer.

Safety Devices

1. Install the pressure relief valve, discharge pipe, air vent and pressure gauge as illustrated in section piping and installation of safety devices.
 A 30 or 60 psi pressure relief valve is supplied with the boiler (standard equipment).
 The UF 1250, 30 psi will have 2 PRVs.
2. Install a discharge pipe on the pressure relief valve.
 The end of the pipe must not be threaded. The pressure relief discharge pipe should extend to a floor drain and end approximately 6 in. (150 mm) above the drain.

IMPORTANT

DO NOT install a shut-off valve in the discharge pipe.
DO NOT reduce the discharge pipe diameter.
DO NOT pipe the discharge to outdoors!

IMPORTANT

Install an approved factory supplied pressure relief valve. Air vent(s) in the system supply must be installed to purge the air from the system. To ensure the boiler can be purged of all air, ensure supply / return water lines do not contain restrictive piping where air could be trapped.



WARNING

Do not install an isolation valve between the boiler and the pressure relief valve. The discharge pipe for the pressure relief valve must be oriented to prevent scalding of attendants. Pipe the pressure relief valve discharge pipe close to floor drain. Never pipe the discharge pipe to the outdoors.

IMPORTANT

This boiler does not require a flow switch. A low water cut-off may be required by local codes. If the boiler is installed above radiation level, a low water cut-off device of approved type must be installed in all instances. Do not install an isolation valve between boiler and low water cut-off.

Fire extinguishing water tank

The self-activating extinguishing device must be installed next to the boiler feed system. Refer to section fire extinguishing systems for the assembly.

The fire suppression is performed by means of an extinguishing valve, which is not dependent on an electric current. A float-type switch monitors the water level and should be electrically connected (see field wiring diagram).

Expansion

With closed expansion, the supply pressure to the expansion tank should be equal to the max. amount of the system pressure plus 3 psi (0.2 bar).

The boiler system with 3-way mixing valve

To reliably prevent boiler corrosion through condensation of the flue gases, the boiler return temperature must never be below 149°F (65°C).

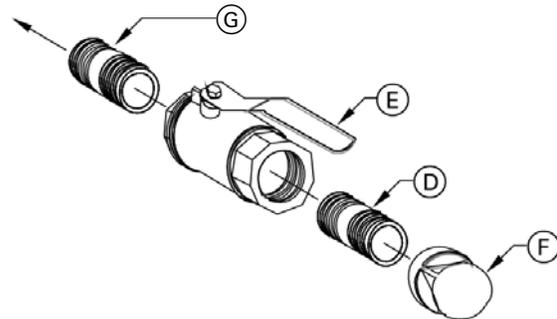
The stepless control of the Vitoflex 300-UF Grate Firing System output requires a constant flow through the boiler of the water to be heated. The boiler circuit, the boiler pump and boiler-mixing valve must therefore be installed according to section piping and installation of safety devices.

The boiler circuit should be designed that the temperature difference between the boiler supply and the boiler return temperature is equal to or less than 27°F (15°C).

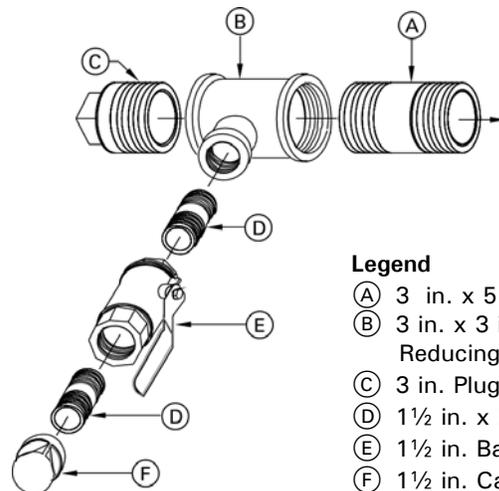
The activation of the boiler pump and boiler mixing valve is integrated in the custom control panel.

Drain inspection port

UF 390 - 720



UF 950 - 1250



Legend

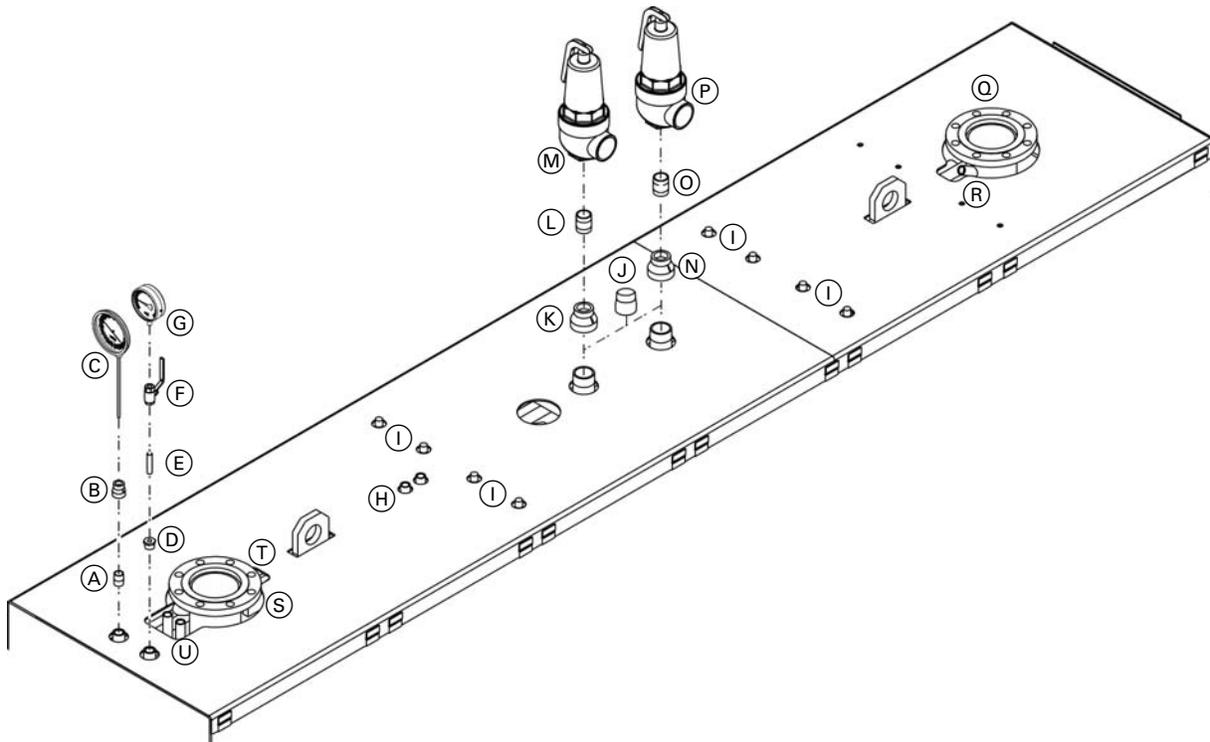
- (A) 3 in. x 5 in. Nipple
- (B) 3 in. x 3 in. x 1 1/2 in. Reducing Tee
- (C) 3 in. Plug
- (D) 1 1/2 in. x 2 in. Nipple
- (E) 1 1/2 in. Ball Valve
- (F) 1 1/2 in. Cap
- (G) 1 1/2 in. x 5 in. Nipple

Safety Devices *(continued)*

The safety equipment for the heating installation must be installed by a heating contractor authorized to do so.

Legend

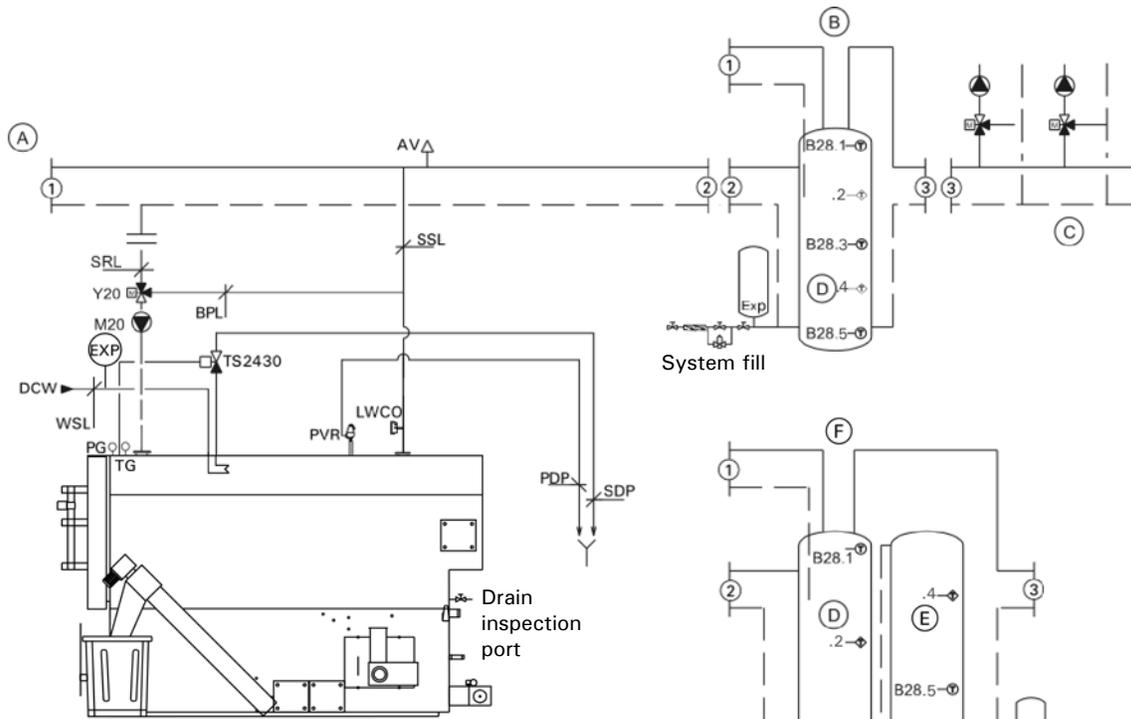
- (A) Nipple, 3/4 in. x 1 1/2 in.
- (B) Reducing coupling, 3/4 in. x 1/2 in.
- (C) Boiler water temperature gauge
- (D) Bushing 3/4 in. x 1/4 in.
- (E) Nipple 1/4 in. x 2 1/2 in.
- (F) Ball valve 1/4 in.
- (G) Pressure gauge
- (H) Sensor well - fixed high limit (sensor supplied)
- (I) Safety heat exchanger connections, NPTM 1/2 in. ¹
- (J) PRV Pressure Relief Valve connection cap ²
- (K) Reducing bushing
- (L) Nipple
- (M) Pressure relief valve, 30 psi or 60 psi
- (N) Reducing bushing (UF 1250, 30 psi only)
- (O) Nipple (UF 1250, 30 psi only)
- (P) Pressure relief valve, 30 psi or 60 psi (UF 1250, 30 psi only)
- (Q) 4 in. or 6 in. Boiler supply flange ³
- (R) Supply sensor well (sensor supplied)
- (S) 4 in. or 6 in. Boiler return flange ³
- (T) Return sensor well (sensor supplied)
- (U) Sensor wells for thermal safety flush valve (R 1/2 in.) (sensor supplied)



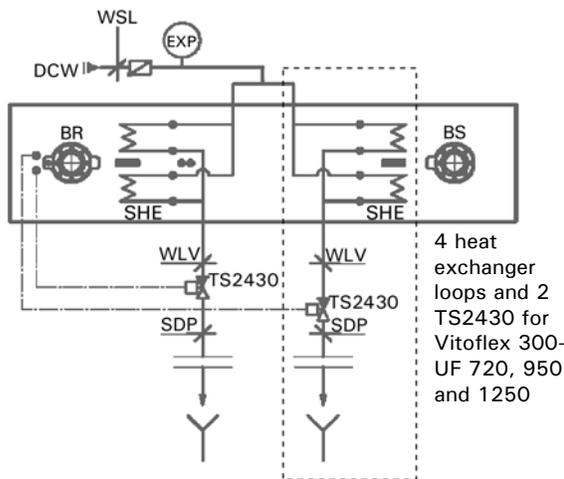
- ¹ See section Piping and Installation of Safety Devices
- ² Two PRVs must be installed on the UF 1250 - 30 psi boiler. One PRV must be installed and the other PRV connection must be capped on the UF 1250 - 60 psi boiler. All other models have only one PRV connection.
- ³ 4 in. boiler flange for Vitoflex 300-UF 390-720, 6 in. boiler flange for Vitoflex 300-UF 950-1250

Note: All fittings shown and sensors indicated are factory supplied. The size and quantity are matched to the specific boiler model.

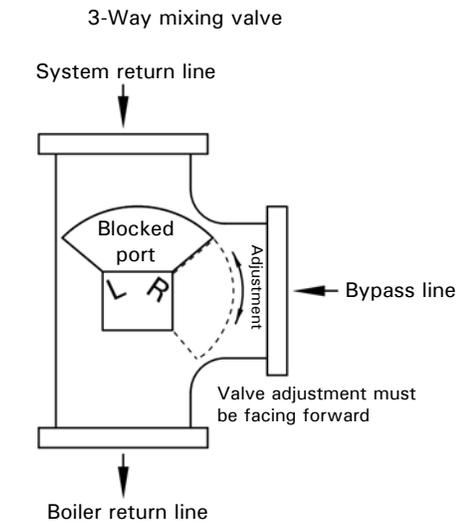
Piping and Installation of Safety Devices



Safety heat exchanger top view



4 heat exchanger loops and 2 TS2430 for Vitoflex 300-UF 720, 950 and 1250



Legend

- Ⓐ Additional heat source
- Ⓑ Thermal storage tank as low loss header (option A, 5 sensors)
- Ⓒ Distributor, heat consumer
- Ⓓ Thermal storage tank #1
- Ⓔ Thermal storage tank #2
- Ⓕ Two thermal storage tanks as low loss header (option B, 5 sensors)

①, ② and ③ indicates system connections

Piping and Installation of Safety Devices *(continued)*

Note: To reliably prevent boiler corrosion caused by condensation of flue gases, the boiler return temperature must not under any circumstances be below 150°F (65°C).

A Viessmann sized boiler pump with a boiler mixing valve are provided according to the tables below. The boiler circuit should be designed such that the temperature difference between the supply and the return temperature is equal to or less than Δt 27°C (15°C).

The expansion tank has to be connected to the boiler without any isolation valves.

Safety equipment supplied by Viessmann:

- **M 20** Boiler pump
- **Y 20** Boiler mixing valve
- **PRV** Pressure relief valve, pressure set to 30 or 60 psi
- **TS2430** Thermal safety flush valve R ¾ in., approved component; special-purpose, designed for opening at a temperature of 122 - 248°F (50 - 120°C), (safety heat exchanger loop built into boiler). The Vitoflex 300-UF 390 and Vitoflex 300-UF 530 have two safety heat exchanger loops and require one thermal safety flush valve.

The Vitoflex 300-UF 720 to Vitoflex 300-UF 1250 have four safety heat exchanger loops and require two thermal safety flush valves.

- **LWCO** Low water cut-off
- **PG** Pressure gauge
- **TG** Temperature gauge (thermometer)
- **SHE** Safety heat exchanger, water volume 1.1 USG (4.2L) per loop, NPTM ½ in.

Design Recommendation:

Thermal safety flush valve

Boiler Model	Thermal safety flush valve TS-2430 (Quantity)	Water throughput required at 36 psi (2.5 bar)		Supply line WSL	Supply line WLV	Drain pipe SDP ²
		L/h	GPM			
UF 390	1	1637	7.2	R ¾ in.	R ¾ in.	R 1 in.
UF 530	1	2224	9.8	R ¾ in.	R ¾ in.	R 1 in.
UF 720	2	3020	13.3	R 1 in.	R ¾ in.	R 1 in.
UF 950	2	3986	17.6	R 1 in.	R ¾ in.	R 1 in.
UF 1250	2	5246	23.0	R 1¼ in.	R ¾ in.	R 1 in.

Pressure relief valve

Boiler model	Pressure relief valve Conbraco ¹		Drain pipe PDP ²	
	30 psi	60 psi	30 psi	60 psi
UF 390	1¼ in.	1 in.	1½ in.	1¼ in.
UF 530	1½ in.	1¼ in.	2 in.	1½ in.
UF 720	2 in.	1¼ in.	2½ in.	1½ in.
UF 950	2 in.	1½ in.	2½ in.	2 in.
UF 1250	2 in.	2 in.	2½ in.	2 in.

Customer supplied:

- **PDP** Pressure relief valve drain pipe
- **DCW** Cold water inlet, min. 36 psi (2.5 bar), max. 51 psi (3.5 bar)
- **AV** Air separator / vent
- **EXP** Expansion tank closed;
 - for safety heat exchanger required (size according to volume of safety heat exchanger loops and volume of piping)
 - for heating system (optional)
- **WSL** Water supply line for safety heat exchanger
- **WLV** Water supply line for thermal run-off safety valve
- **SDP** Safety heat exchanger drain pipe
- **SRL** System return line to the boiler from the system
- **SSL** System supply line from the boiler to the system
- **BPL** Bypass line
- **BR** Boiler return
- **BS** Boiler supply

Note: The UF 1250, 30 psi will have 2 PRVs.

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¹ Threaded connection for supply line

² Length of the drain pipe up to 13 ft. (4.0 m)

Piping and Installation of Safety Devices *(continued)*

Design Recommendation (continued):

Boiler pump

Boiler model	Pump	Frequency	Phase and voltage
UF 390	UPS 50-80/4 F	60 Hz	3 ph 208 VAC
UF 530	UPS 50-80/4 F	60 Hz	3 ph 208 VAC
UF 720	UPS 80-160 F	60 Hz	3 ph 208 VAC
UF 950	UPS 80-160 F	60 Hz	3 ph 208 VAC
UF 1250	TP 100-80/4	60 Hz	3 ph 208 VAC

Mixing valve

Boiler model	Nominal pipe size	Valve
UF 390	3 in.	3-way mixing valve
UF 530	4 in.	3-way mixing valve
UF 720	5 in.	3-way mixing valve
UF 950	5 in.	3-way mixing valve
UF 1250	6 in.	3-way mixing valve

Viessmann ASME recommended tank sizes (U-stamped)

Boiler model	Tank size	
	L	USG
UF 390	3785	1000
UF 530	5678	1500
UF 720	6624	1750
UF 950	9464	2500
UF 1250	12492	3300

Fire Protection

Follow local regulations for wood-fired heating systems.

Power failure provision

The customer must ensure that there is a supply of water independent of the electrical supply. This design ensures that in case of a power failure, the boiler will be reliably cooled by the thermal run-off safety valve.

Protection against back-burn for the boiler plant

The following safeguards are part of the scope of delivery for the Vitoflex 300-UF Grate Firing System:

- **Preventing overfilling of the combustion chamber door**
A level monitor must be installed to prevent overfilling of the combustion chamber door. The Vitoflex 300-UF Grate Firing System has a light barrier to monitor the embers.
- **Preventing back-burn**
With a temperature sensor directly on the in-feed auger, any danger of back-burn initiation will be detected and quickly counteracted at an early stage by increasing the fuel conveyance speed into the combustion chamber door.
- **Back flash safeguard**
The Vitoflex 300-UF Grate Firing System is operated with continuous negative pressure and is equipped with a back flash prevention device. This device prevents back flashes caused by flying embers or combustible gases that may ignite the fuel system.

- Automatic in-feed auger extinguishing system

The supplied fire extinguishing system is necessary on the in-feed auger. This system should reliably prevent back-burn in case of a malfunction (such as a power failure). For safety reasons and to prevent damage by flooding, connecting the extinguishing system directly to the water network is not advisable.

This extinguishing system must be equipped with a 6.6 USG (25 L) extinguishing water tank with a float-type switch and an adjustable Danfoss extinguisher valve. The tank for the extinguishing system must be equipped with a level monitoring system.

If there is a shortage of water, the Vitoflex 300-UF Grate Firing System will switch off automatically.

In case of excess temperature, the in-feed auger will be flooded reliably but in a limited fashion.

IMPORTANT

The heating contractor must perform the installation of the fire extinguishing system as specified in section Fire Extinguishing Systems.

Fire Protection *(continued)*

Back-burn safeguard for the fuel supply system

The fire extinguishing system for the conveyor auger and the down pipe depends on specific requirements (location, size of the fuel storage site, material, pressure conditions and regulations), these being accessories to the scope of delivery ordered from Viessmann according to their descriptions.

Automatic triggering system for the fuel supply system

Approved in part as a variation to the shut-off valve in pressure-less fuel storage units.

Slide valve

The slide valve is approved in pressure-less fuel storage units and is a suitable safeguard against back-burn. The slide valve is optional and closes in case of standstill, danger of back-burn, or power failure with the help of a spring return motor.

IMPORTANT

We recommend installing a rotary valve for the Vitoflex 300-UF Grate Firing System. In addition to being a safeguard against back-burn, this will also prevent any penetration by air leaking in via the in-feed auger.

Rotary valve

The rotary valve is optional and used if remnant wood is moved into fuel storage spaces with blowers, then, in order to reduce pressure applied, at least one rotary valve is necessary to reduce pressure between the fuel storage unit and the boiler. The rotary valve is suited to reduce pressure and at the same time is considered a suitable safeguard against back-burn.

Max. overpressure allowed in fuel storage unit:
+ 500 Pa (+ 2.00 inch wc).

Max. negative pressure allowed in fuel storage unit:
+ 0 Pa (+ 0 inch wc).

Double rotary valve with pressure compensation system

If, due to special circumstances, any mechanically produced negative pressures or extraordinarily high overpressures are expected in the fuel storage unit, then two rotary valves must be installed in the material transport route according to the respective project plan with a pressure compensation line to the outdoors.

Max. overpressure allowed in fuel storage unit:
+ 3000 Pa (+ 12 inch wc).

Max. negative pressure allowed in fuel storage unit:
-3000 Pa (-12 inch wc).

IMPORTANT

The supplier of the silo must confirm the maximum weight that is to be expected on the rotary valve.

The rotary valve below the silo extraction system can become leaky due to wear of the sealing elements or through large pieces of wood that cannot be conveyed. This leakage can make it possible for low-temperature gases to flow back from the boiler into the silo.

A smoke alarm must be installed between the rotary valve and the silo extraction system, which, when triggered, will disconnect the system and create negative pressure in the silo.

Down pipe

A vertical drop-off section interrupts the connected line of burning material.

Fire protection for fuel storage space

Viessmann does not provide fire protection for the fuel storage space.

IMPORTANT

The local building codes and regulations must be followed by the heating contractor.

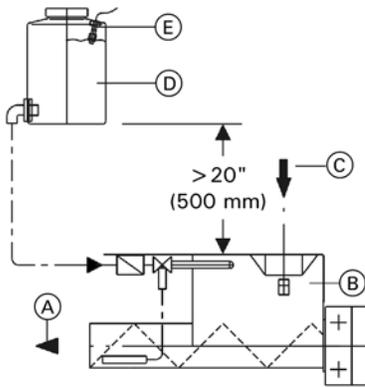
Fire Extinguishing System

The fire extinguishing system functions independent from the electrical power and is flooding the material which is still remaining in the in-feed auger in case of back-burn. The activation temperature is approximately 200°F (95°C)

Fire extinguishing system for the in-feed auger

Note: The fire extinguishing system for the in-feed auger is part of the boiler.

- Line from the extinguishing water container to the ½ in. valve (as short as possible).
- Valve thermostatic, Danfoss AVTA 15 122°F - 194°F (50°C - 90°C) position 3 equals approximately 176°F (80°C).
- The lines must be executed as hard piping in metal (½ in.).
- It must not be possible to shut off the cold water inlet without the aid of tools.
- Be especially sure to comply with the instruction in the Fire Protection section.

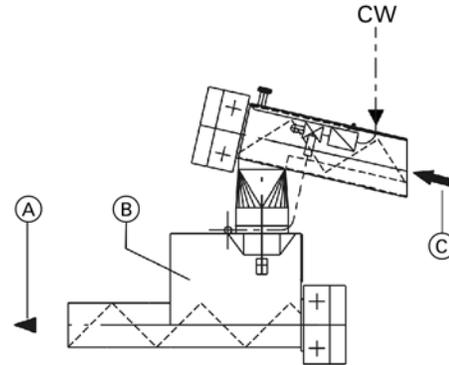


Legend

- (A) Combustion
- (B) Metering Container
- (C) Fuel supply
- (D) Extinguishing water container 6.6 USG (25 L)
- (E) N25 floater switch
- CW Cold water supply ½ in. min. 30 psi (2.0 bar), max. 45 psi (3.0 bar)

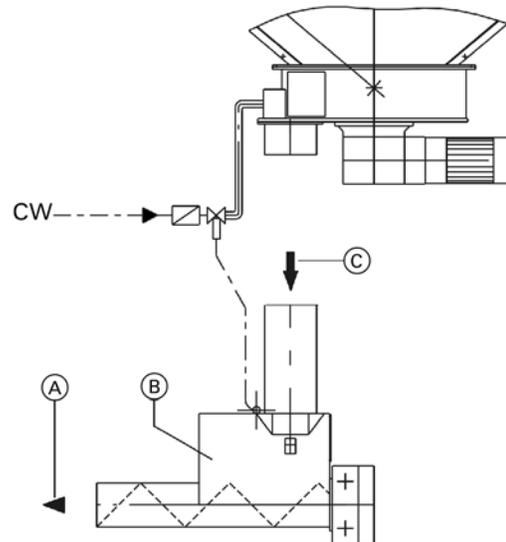
Fire extinguishing system for the conveyor auger

Note: The fire extinguishing system for the conveyor auger is optional.



Fire extinguishing system for the down pipe

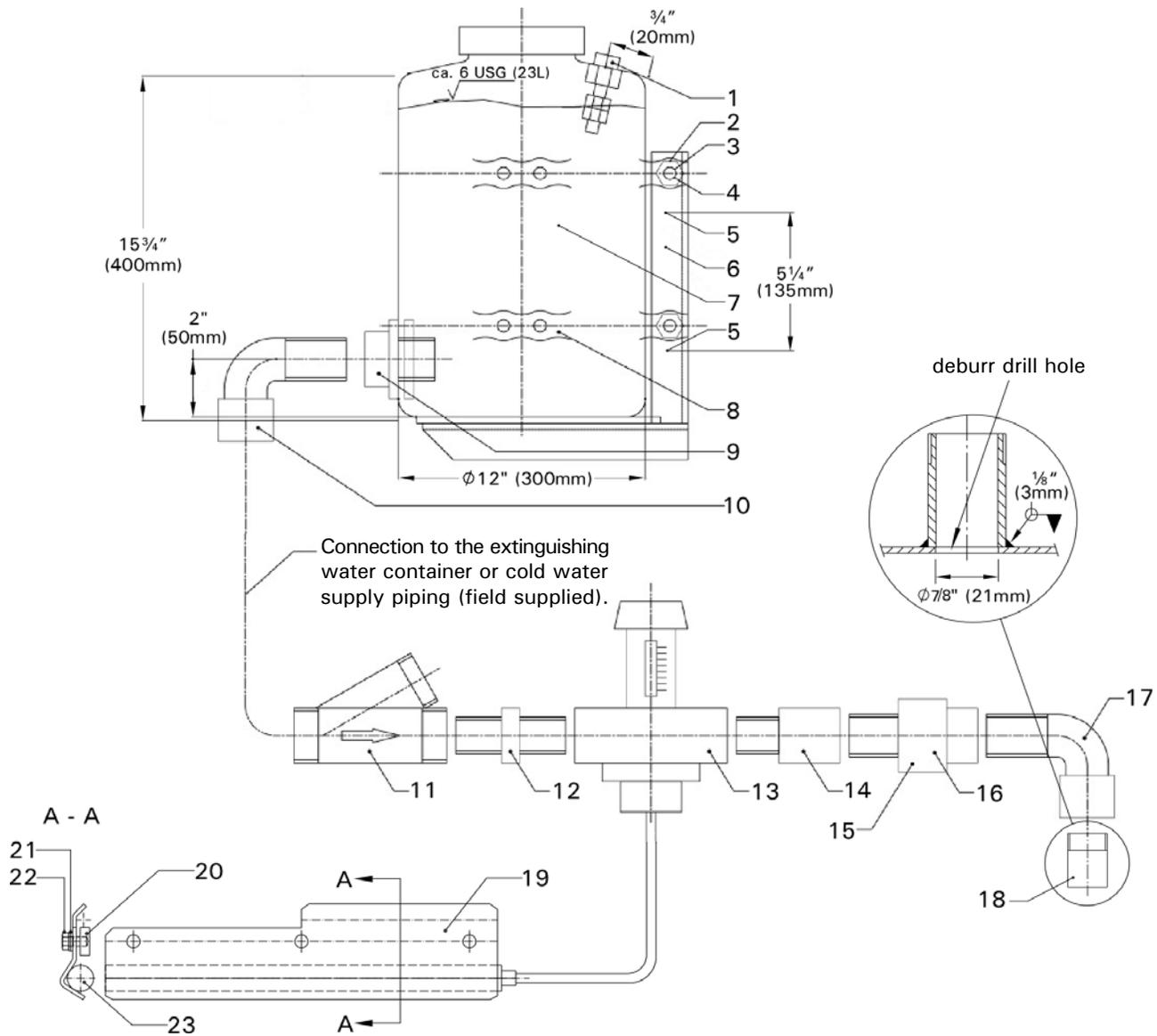
Note: The fire extinguishing system for the down pipe is optional.



Note: A slide valve is required as standard for an unpressurized material store or a rotary valve for a material storage with overpressure or underpressure (charging with blower, e.g. wood processing operations).

The lines must be executed as hard piping in metal (½ in.). It must not be possible to shut off the cold water inlet without the aid of tools. Be especially sure to comply with the instruction in the Fire Protection section.

Assembly of the Fire Extinguishing System



Item No.	Quantity	Description
1	1	Floater switch (N25)
2	4	Washer
3	2	Hex nut M6
4	2	Threaded rod M6
5	2	Stud anchor 3/8 in. x 4 1/4 in. (10 mm x 108 mm)
6	1	Mounting bracket
7	1	Plastic container 6.6 USG (25 L)
8	2	Clamping band
9	1	Duct 1/2 in.
10	1	90° street elbow 1/2 in.
11	1	Strainer 1/2 in.

Item No.	Quantity	Description
12	1	Connector 1/2 in.
13	1	Danfoss AVTA
14	1	Reducer 3/4 in. - 1/2 in.
15	1	Union 3/4 in.
16	1	Gasket 3/4 in.
17	1	90° street elbow 3/4 in.
18	1	Weld on nipple 3/4 in.
19	1	Clamp
20	3	Bracket
21	3	Strain washer
22	3	Hex nut
23	1	Sensor

Assembly of the Fire Extinguishing System *(continued)*

The following assembly instructions for the fire extinguishing system are to be used with the layout and description shown on page 32.

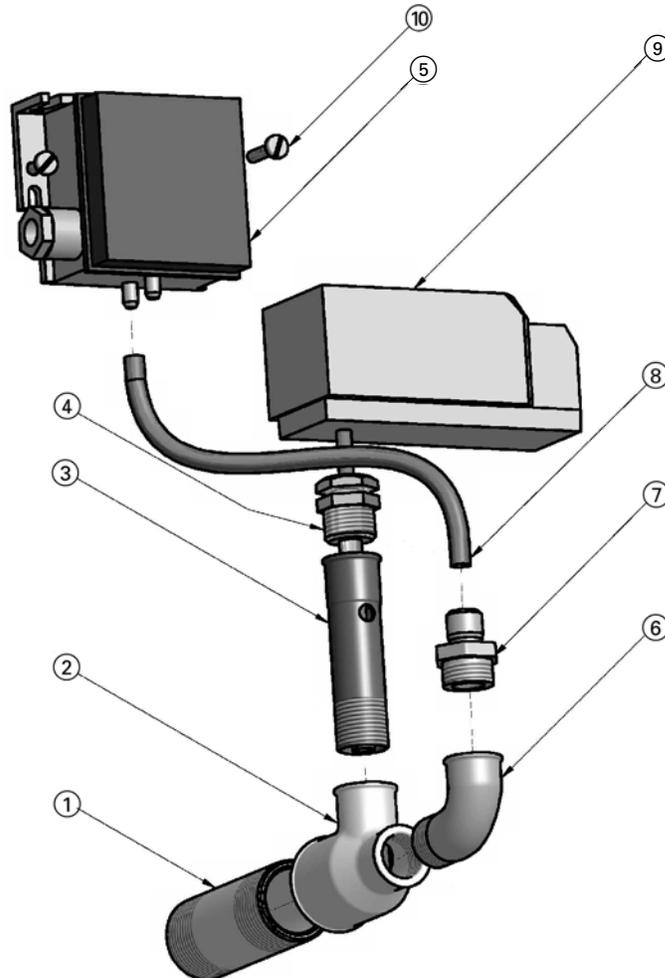
- Install the mounting bracket (6) near the in-feed auger at a minimum height of 20 in. (500 mm) with the stud anchors (5) for wall mount.
- Install the plastic container (7) to the mounting bracket (6) with the clamping bands (8), the threaded rods (4), washers (2) and the hex nuts (3).
- Attach the 90° street elbow (10) to the duct (9)
- Assemble the strainer (11), connector (12), thermostatic valve (13), reducer (14), union (15), gasket (16) and the 90° street elbow (17) and connect the assembly to the weld on nipple (18).

Note: The Weld on nipple (18) is pre-installed at the metering container. The Weld on nipple (18) needs to be welded on for the fire extinguishing system for the conveyor auger and the fire extinguishing system for the down pipe (18). The fire extinguishing system for the conveyor auger and the fire-extinguishing system for the down pipe are optional.

- Install a ½ in. line from the 90° street elbow (10) to the strainer (11). This piping is field supplied.
- Install the sensor (23) to the in-feed auger with the clamp (19), the bracket (20) which is welded onto the in-feed auger, the strain washer (21) and the hex nut (22)

Note: Make sure the bending radius of the capillary tube does not exceed 2 in. (50 mm).

Negative Pressure Monitoring Assembly

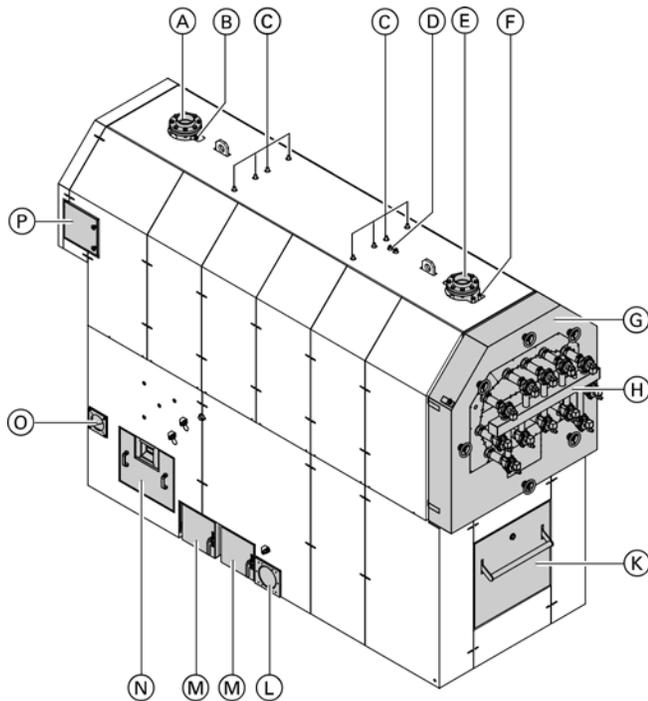


Legend

- ① Nipple 1 in. x 1 in.
- ② Tee 1 in. x ½ in. x ½ in.
- ③ Extension with hole
- ④ Sensor well ½ in.
- ⑤ Differential pressure transducer

- ⑥ 90° street elbow ½ in.
- ⑦ Adapter ½ in.
- ⑧ Pressure hose
- ⑨ STB-RAK
- ⑩ Screw

Appliance Description



The Vitoflex 300-UF is a fully automatic solid fuel boiler with grate combustion.

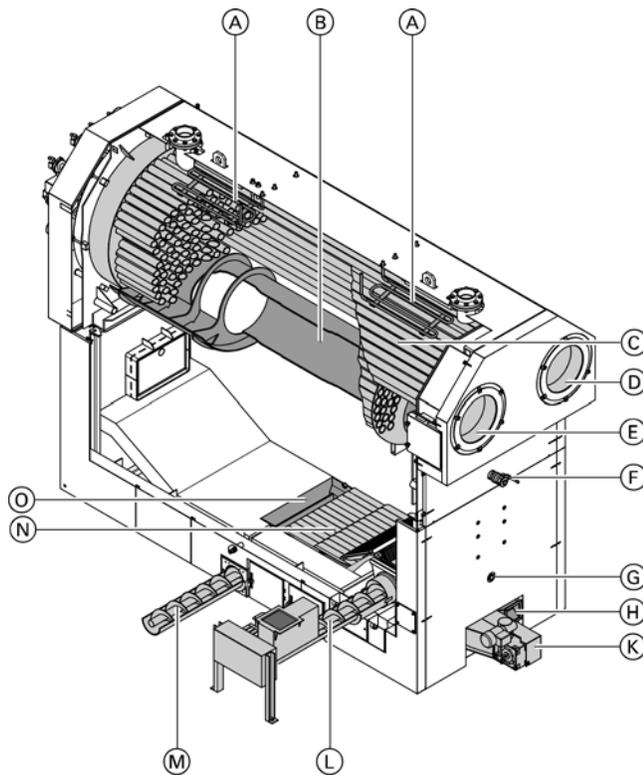
The boiler is made of steel and is lined with firebricks. The combustion retort and the infeed grate are installed in the combustion chamber.

In the Vitoflex 300-UF, fuels as defined in chapter "Ordering fuel" can be combusted in an automatic process.

Legend

- Ⓐ Boiler supply
- Ⓑ Boiler water temperature sensor
- Ⓒ Safety heat exchanger
- Ⓓ Temperature sensor, high limit safety cut-out
- Ⓔ Boiler return
- Ⓕ Sensor well for thermally activated safety valve
- Ⓖ Heat exchanger door
- Ⓗ Pneumatic cleaning system (optional)
- Ⓚ Combustion chamber door
- Ⓛ Connection, ash removal screw conveyor
- Ⓜ Cleaning aperture
- Ⓝ Cleaning cover, combustion retort
- Ⓞ Connection, secondary air fan
- Ⓟ Cleaning cover, flue gas collector

Appliance Description *(continued)*



Legend

- Ⓐ Safety heat exchanger
- Ⓑ Flame tube
- Ⓒ Heat exchanger
- Ⓓ Ⓔ Flue outlets
Up to 720 kilowatts: 1 flue outlet, centre
From 950 kilowatts: 1 flue outlet, left or righthand side (alternative flue outlet is closed off)
- Ⓕ Drain outlet
- Ⓖ Ignition fan connection
- Ⓗ Connection, primary air fan 2
- Ⓚ Drive, infeed grate
- Ⓛ Feed screw conveyor
- Ⓜ Ash removal screw conveyor
- Ⓝ Infeed grate
- Ⓞ Ash collector trough

Controller

The system controller regulates and controls the combustion system and all associated components.

Fuel supply

The feed system transports fuel from below into the combustion retort. A feed screw conveyor is installed **at the side for this purpose.**

Infeed grate

Burning fuel is pushed out of the combustion retort onto the sloping grate and from there onto the infeed grate. The infeed grate has moving parts which can transport the spent fuel towards the ash removal area.

Ash removal

The infeed grate pushes ash into the ash trough. From here, an ash removal screw conveyor transports the ash out of the combustion chamber.

Boiler safety equipment

The heat exchanger contains a high limit safety cut-out (HLSC) and water pressure switches (positive and/or vacuum pressure).

Positive pressure limiters are installed in the combustion chamber.

In the fuel supply area, safety limit switches are installed on the inspection covers.

Burn-back protection

Burn-back protection on the feed screw conveyor is provided either by a shut-off gate valve or a rotary lock valve. The type of locking device used depends on the position and size of the fuel store and the pressure conditions in the fuel transport system. An extinguishing device is also installed which floods the feed screw conveyor with water when a selectable response temperature is reached.

Operating instructions

The operating instructions form part of this product.

All persons working with the product must have read and understood the contents of these operating instructions. Pass on the operating instructions to every user.

Integration into an overall system

The Vitoflex 300-UF is part of an overall system. The boiler's sensors and drive units are connected with the control panel via the electrical installation. The heating system installation links the boiler to the heating system circuit. The energy generated is supplied to the consumers.

Operating States

In automatic mode, the boiler can assume the various operating states listed in the following table. The current operating state for any given moment is displayed on the programming unit.

Operating condition	Description
"OFF"	The system is switched off.
"Filling"	Fuel is transported into the combustion chamber for a set duration. The duration is set via the "Combustion chamber fill time" parameter.
"Ignition"	The ignition system is in operation.
"Load"	The system is in heating mode.
"Maintaining"	If the supply temperature rises above the "Firebed maintenance ON" value, the boiler switches to the "Maintaining" operating state. Output is reduced and fuel is supplied in a pre-selected amount. The amount of fuel is selected via the "Cycle, maintaining" parameter. If the supply temperature drops below the "Firebed maintenance OFF" value, the boiler switches to the "Load" operating state.
"Standby"	The boiler switches to the "Standby" operating state if the supply temperature rises above the "Standby ON" value. The feed is run to empty with a cycle time specified in "Cycle, maintaining". The boiler switches to the "Filling" operating state if the supply temperature drops below the "Standby OFF" value.
"Burnout"	Operating state after the system has been switched off via the programming unit or as a result of a fault. A controlled system shutdown is performed. To do this, the feed is run to empty with the selected "Cycle, maintaining" parameter. Exception: The system switches to the "Emergency burnout" operating state if the following faults occur: <ul style="list-style-type: none"> ■ "O₂ measurement fault" ■ "Vacuum press. measurement fault" ■ "Fault, combustion chamber sensor" After burnout, the controller switches to the "OFF" operating state.
"Emergency burnout"	The system has been switched off automatically as a result of one of the following faults: <ul style="list-style-type: none"> ■ "O₂ measurement fault" ■ "Vacuum press. measurement fault" ■ "Fault, combustion chamber sensor" The feed is run to empty with the selected "Cycle, emergency mode" parameter. After burnout, the controller switches to the "OFF" operating state.

Commissioning

Commissioning and adjusting the control unit to local conditions and the structural characteristics of the building must be carried out by your heating contractor. As the user of new combustion equipment, you may be obliged to notify your local flue gas inspector of the installation [check local regulations]. Your local flue gas inspector [where applicable] will also provide you with information on additional activities concerning your combustion equipment (such as regular testing, cleaning, etc.).

Control Panel

Mounting of the control panel

A certified electrician shall mount the control panel. Optimum positioning of the control panel will minimize the time and costs of the installation.

The control panel should be in an area where the heat radiation (front side of boiler, rear side of boiler with flue gas cyclone and flue gas exhaust blower as well as recirculation line) and the exposure to dust during cleaning is at a minimum.

The ambient temperature for the control panel approx. 4 in. (100 mm) away from the control cabinet) should not exceed 104°F (40°C) while the system is in operation. The minimum temperature must not be less than 50°F (10°C) In case of doubt, preference should be given to placing the control panel outside the mechanical room near the heating room door.

Electrical connection

- Install the control panel according to the field wiring diagram. The field wiring diagram is supplied with the control panel.
- In the area of hot parts (flue gas exhaust blower, flue gas pipe), the lines should be installed in steel pipes at an appropriate distance so as to be protected from excessive temperatures. See section Boiler Wiring.
- The cable bushings to the motors and equipment must be dust-tight and provided with a strain relief.

General safety instructions

- Retighten all wire holding screws inside the control panel before start-up.
- Provide fusible disconnect means according to local code.
- DHW safety aquastat is to be installed in the tank well.

The aquastat can be installed on the DHW building supply line if a recirculating DHW pump is used. Please check the local building code. The DHW safety aquastat does NOT replace scald protection devices required by local code.

CAUTION

The Viessmann supplied field wiring diagram is not a complete system drawing. It is the installer's responsibility to assure that the control is suitable for the respective installation, and all necessary safety equipment is installed.

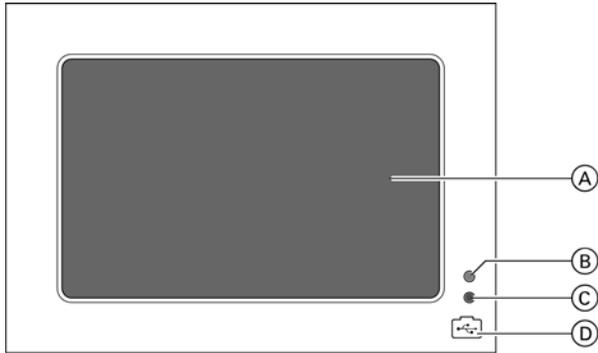
CAUTION

The information about wire type, wire number and wire gauge made in the wiring diagrams is not obligatory. The final decision of these settings has to be made by the executing installation company taking into consideration the local codes and regulations.

CAUTION

Any alteration of the control cabinet will void the warranty.

Programming Unit



Each programming unit is equipped with a touchscreen. To make settings and call up information, press the on-screen keys.

Legend

- (A) Touchscreen
- (B) Green LED
This LED is lit when the controller is in operation.
- (C) Red LED
This LED flashes while the controller is ramping up. The LED remains dark in operation.
- (D) USB connection



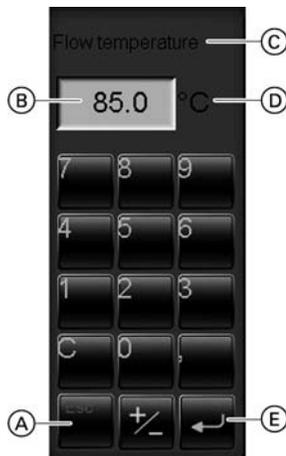
Keyboard

Assistance with touchscreen input

Some controller screens allow you to enter text and values. Tap an entry field and a keyboard or number pad will appear on the touchscreen.

Legend

- (A) ESC key
The keyboard is closed and no data is saved.
- (B) Entry field
Contents can be changed by typing into the box by means of the keyboard.
- (C) Enter key
Saves the entered data and closes the keyboard.

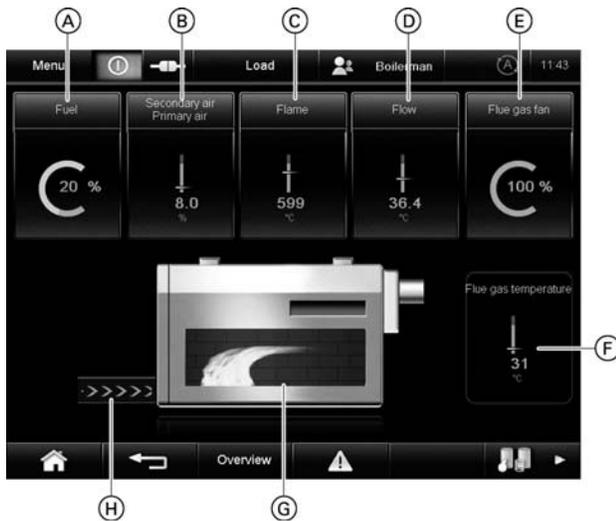


Number pad

Legend

- (A) ESC key
The number pad is closed and no data is saved.
- (B) Entry field
Contents can be changed by typing into the box by means of the number pad.
- (C) Displays the name of the variable you are changing or entering
- (D) Displays the unit of the displayed value
- (E) Enter key
Saves the entered data and closes the number pad.

Default Display



The default display shows either a detailed view or an overview.

The “Fuel”, “Secondary air”/“Primary air”, “Flame”, “Flow” and “Flue gas fan” keys give you access to the screen with the associated sub-area.

If a component is in manual mode, this is indicated by the symbol in the associated key.

The headers and footers of the default display follow the same structure in all user interfaces of the controller.

Detailed view

In the detailed view, the large keys **A** to **E** show the actual value for the main parameter of each sub-area.

Legend

- A** “Fuel”
Displays the fuel supply in %
- B** “Secondary air”/“Primary air”
Displays the flue gas oxygen content in %
- C** “Flame”
Displays the combustion chamber temperature in °C
- D** “Flow”
Displays the supply temperature in °C
- E** “Flue gas fan”
Displays flue gas fan utilisation level in %
- F** “Flue gas temperature” (no key)
Flue gas temperature display in °C
- G** Boiler, animated flame
The flame is depicted in three different sizes depending on the selected output.
- H** Fuel supply, animated
Green arrows indicate that fuel is currently being supplied.



Overview display

In the overview display, the large keys show the status of the sub-areas. The symbol shows that all components in the sub-area are OK.

Legend

- A** Header
- B** Operating and display area
- C** Footer

Default Display *(continued)***Header and footer on the programming unit**

Header	
"Menu"	This takes you to the menu screen, see page 42.
	System is currently switched on. You can switch the system off.
	System is currently switched off. You can switch the system on.
	No faults in the system
	Faults in the system
"Load" etc.	Shows the current operating state.
"Boilerman"	You can switch to the "Observer" user group. As the boilerman, you can switch the heating system on and off and change system parameters.
"Observer"	As an observer, you can only view the controller screens and activate automatic mode from the default display.
	A component is currently in manual mode. You can switch manual mode off. When you do so, all components which are in manual mode are switched back to automatic mode simultaneously.
	System is currently in automatic mode. Color of symbol: Green
Time (e.g. 10:39)	Set the date and time via a window.
Footer	
	Back to the default display.
	This takes you back one screen. You can scroll back a maximum of 19 screens.
"Overview"	This takes you to the detailed view.
"Details"	This takes you to the overview display.
	This takes you to the fault messages. Symbol colors: Grey = Currently no fault messages Yellow = There is a warning Red = There is a fault

Manual Mode and Other Scans

The “Fuel”, “Secondary air”/“Primary air”, “Flame”, “Flow” and “Flue gas fan” keys give you access to the screens of the associated sub-area. From there, you can display set values, actual values and status information for the selected sub-area. The Manual mode and Automatic mode keys enable you to operate components manually or automatically. See page 49.

Parameters



On each sub-area screen, the  key gives you access to the sub-area’s parameter level. The parameters may be assigned to several tabs. See page 56.

Menu



The “Menu” screen gives you access to further screens with a variety of functions. Tapping the key opens the associated screen. The functions are described in various sections of these instructions.

Note: The “Service” and “Settings” keys provide access to screens that are only available to the “Engineer” user group.

Information on Starting Up / Shutting Down

WARNING

Risk of injury due to untrained personnel. Only allow trained and experienced personnel to operate the product. Personnel under training must only work on the product under supervision. During the heat-up phase, the heating system must be permanently supervised by trained and experienced personnel.

CAUTION

Risk of burns due to hot system components. Only touch handles and identified parts. Never touch sight glasses or their retainers. The sight glasses and retainers are connected directly to the combustion chamber.

WARNING

There is a risk of deflagration when the combustion chamber door is opened. Poking around in the firebed leads to oxygenation, which can produce a flash. Both can result in severe burns. Never open the combustion chamber door whilst the system is in operation. Before opening the combustion chamber door, ensure that you are standing in a safe place. Never poke around in the firebed.

Starting Up

1. Switch on the system at the programming unit using the  key.

With ignition system (automatic)	Without ignition system (manual)
The ignition system starts.	<ol style="list-style-type: none"> 2. Open the combustion chamber door. 3. Light a fire inside the combustion chamber at the front using kindling. 4. Slide the burning kindling into the combustion retort. 5. Close the combustion chamber door.

The combustion retort is automatically filled with fuel. The amount of fuel can be adjusted in manual mode in "Fuel supply" (Default display > Fuel), see page 44. The controller then switches to the "Ignition" operating state.

Fuel with moisture content above W 40

If the fuel moisture content is above W 40, the combustion chamber must first be heated. Even if an ignition system is installed, you will still need to perform steps 2 to 5 described in the above table. To keep the fire lit, add more kindling if necessary. After one hour, start the ignition either automatically or manually.

Ignition monitoring

The ignition is monitored by the controller. After no more than 45 minutes, the oxygen content in the flue gas must drop below 15% for a set period. You can adjust the required period via the "Delay, O₂, heatup" parameter. If the oxygen content has dropped sufficiently, the boiler switches to the "Load" operating state. The ignition phase is completed.

If the oxygen content has not dropped sufficiently, the fault message "Fault, repeat heat-up" is displayed. Check the fuel. If necessary, use drier fuel or pre-heat. Also check the amount of fuel. If necessary increase the amount of fuel supplied. Acknowledge the fault message.

Shutting Down

Switch off the system with the  key. The controller switches the system off automatically.

Parameter Level



On each sub-area screen, the key  gives you access to the sub-area's parameter level. The parameters may be assigned to several tabs. The number of parameters varies depending on the system configuration. Parameters are set using the entry fields.

Fuel



"Feed" tab

Parameter	Description	Setting range	Standard value:
"Combustion chamber fill time"	Length of time that the feed screw conveyor is in operation to supply fuel. Applies only to cold starts, i.e. at low combustion chamber temperatures. In the "Filling" operating state: If the feed system is empty, it is filled first until the feed light barrier is triggered. Note: For ignition to be successful, there must be an adequate amount of fuel, level with the ignition system, after the combustion chamber fill time has elapsed. Setting in seconds	10 to 1200	80
"Screw conveyor fill time"	Length of time that the feed system is filled on system start-up. Applies only to warm starts, i.e. when the combustion chamber temperature is sufficiently high. Setting in seconds	10 to "Combustion chamber fill time"-10	60
"Fuel hopper emptying time"	Time delay for filling the fuel hopper Setting in seconds	0 to 100	25
"Cycle after heatup" Left entry field	Cycle time in "Ignition" operating state Setting is a % of the system's inherent maximum cycle time for fuel feed	1 to 100	20
"Delay" Right entry field	Length of time after which the feed system is enabled again if the ignition process was successful. Settings in minutes	1 to 60	20

Fuel *(continued)***"Feed" tab** *(continued)*

Parameter	Description	Setting range	Standard value:
"Delay, O ₂ , heat-up"	Length of time for which ignition is monitored in the "Ignition" operating state The boiler switches to the "Load" operating state if the O ₂ value drops below 15% during this set time. Setting in seconds	10 to 300	90
"Cycle, maintaining" Left entry field	Cycle time in the "Maintaining", "Standby" and "Burnout" operating states The feed screw conveyor runs until the feed system is empty. Setting is a % of the system's inherent maximum cycle time for fuel feed	0.1 to 10	5
"Cycle, emergency mode" Right entry field	Cycle time in the "Emergency burnout" operating state Setting is a % of the system's inherent maximum cycle time for fuel feed	1 to 100	30
"Minimum cycle, feed screw conveyor" Left entry field	Lower cycle time limit in the "Load" and "Burnout" operating states If a value greater than the maximum cycle for the feed screw conveyor has been entered, the controller automatically changes to a value 1 % below the maximum cycle. Setting is a % of the system's inherent maximum cycle time for fuel feed	0 to 99	20
"Maximum cycle, feed screw conveyor" Right entry field	Upper cycle time limit in the "Load" and "Burnout" operating states Setting is a % of the system's inherent maximum cycle time for fuel feed	1 to 100	100
"Limit temperature, feed pipe"	Feed temperature at which safety measures are initiated. If the temperature at the feed pipe reaches the selected temperature limit, the warning message "Feed warm" is displayed. If the temperature at the feed pipe continues to rise, a fault message is displayed and the feed is switched on to move fuel into the combustion chamber. Setting in °C	20 to 90	70
"Firebed/delay"	Switching delay for firebed monitoring in the combustion chamber. After the firebed light barrier has triggered in the combustion chamber, the fuel feed stops after the set time has elapsed. Setting in seconds	10 to 600	100
"Firebed/cycle ramp"	After the firebed light barrier has triggered in the combustion chamber, the feed cycle is ramped down in steps of 0.5% each. The cycle continues to be ramped down until 50% of the current cycle is reached. "Firebed/cycle ramp" is used to set the interval between each rampdown step. Setting in seconds	10 to 600	20

Fuel (continued)



“Charging” tab

Parameter	Description	Setting range	Standard value:
“Conveyor device 1”			
“Delay ON”	Start delay Setting in seconds	0 to 100	2
“Pulse”	Period of time for which the component is on/off: ■ Pulse = Component is on. ■ Pause = Component is off. Tip: Pause = 0 means continuous operation. Setting in seconds	1 to 10	1
“Pause”		0 to 10	0
“Transverse screw conveyor”			
“Delay ON”	Start delay Setting in seconds	0 to 100	2
“Delay OFF”	Shutdown delay Setting in seconds	0 to 20	2.5
“Runtime, transverse screw conveyor, maximum”	If the maximum runtime of the transverse screw conveyor has been exceeded, the container or pushrod discharge will operate with the pause and pulse times specified under “Emergency mode”. Setting in seconds	10 to 1000	80
“Container” or “Hydraulics”			
“Delay ON”	Start delay Setting in seconds	0 to 200	2
“Emergency mode”	If the runtime monitoring function for the transverse screw conveyor is triggered, it is assumed that bridging has occurred in the trough. The discharge will then run using the times specified here until the container is empty. See above for a definition of pulse/pause.	“Pulse”	0 to 200 5
		“Pause”	0 to 600 10
Selection field Auto, etc.	■ Auto (Automatic): If there is more than one container, the system changes over to the next container if a fault occurs or if the container is empty. ■ Manual 1, 2 or 3: Container 1, 2 or 3 is in manual mode. The container in question is ignored in the changeover.		
“Delay, empty message”	Delay for empty message In the event of an empty message, the system changes over to the next available container. If no further containers are available, a controlled system shutdown is performed. Setting in seconds	10 to 800	300

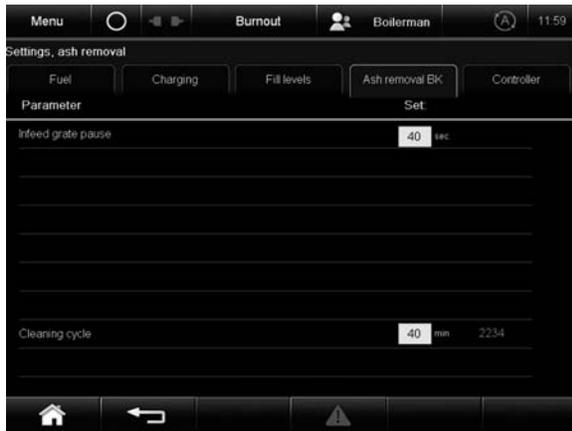
Fuel (continued)

“Fill levels” tab



Parameter	Description
“Light barrier, feed”	Fill level indicator for the feed screw conveyor If the light barrier is triggered, the message “Full” is displayed and the status display illuminates green.
“Light barrier, screw conveyor 1”	Fill level indicator for the screw conveyor If the light barrier is triggered, the message “Full” is displayed and the status display illuminates green.
“Container”	Fill level indicator for the transverse screw conveyor for the respective container If the light barrier is triggered, the message “Full” is displayed and the status display illuminates green.
“Push floor status”	Displays the push floor’s operating mode Possible operating modes: <ul style="list-style-type: none"> ■ Automatic mode ■ Emergency mode

Fuel (continued)



“Ash removal” tab

Note: The ash removal screw conveyor may be damaged if unburned fuel drops into the ash channel. Adjust the speed of the infeed grate so that only fully spent fuel residue drops into the ash channel.

Parameter	Description	Setting range	Standard value:
“Infeed grate pause”	Pause time of the infeed grate Setting in seconds	0 to 1200	40
“Pneumatic cleaning pause”	Duration of pause between the cleaning cycles of the pneumatic cleaning system Settings in minutes	20 to 120	40
“Blocking time, cleaning”	Period of time for which the pneumatic cleaning system remains switched off. Tap and enter the start and end times individually. If you do not wish to block the pneumatic cleaning system, enter 00:00 to 00:00. Times are in the [hh:mm] format, hh = hours, mm = minutes	00:00 to 23:59 h	00:00
“Run-on, ascending ash screw”	Run-on time of the ascending ash screw If the light barrier for the ash level no longer detects any ash, the ash removal screw conveyor stops and the ascending ash screw runs on for the period of time set with this parameter. Setting in seconds	10 to 60	20



“Controller” tab

Parameter	Setting range	Standard value:
“P factor”	1 to 100	20
“I factor”	0 to 100	0
“D factor”	1 to 100	30
“Cycle time”	1000 to 15000	5000

Secondary Air



“General” tab

The secondary air parameters are used to determine the heating output.

The amount of secondary air regulates the oxygen content in the flue gas. Secondary air is blown in through the side openings in the combustion chamber walls. If the set value for the amount of secondary air is exceeded, the amount of fuel supplied is reduced.

Parameter	Description	Setting range	Standard value:
“Secondary fan, full load”	Utilisation level of the secondary air fan at full load Actual: Current utilisation level of the secondary air fan Setting in %	25 to 90	60
“Secondary air fan, partial load”	Utilisation level of the secondary air fan at partial load Setting in %	10 to 50	40
“Current set value”	Displays the current set value for the secondary air fan Sliding value between the set value for the secondary air fan at full load and the set value at partial load		
“Residual O ₂ ”	Set value for the residual oxygen content, control variable for secondary air control Setting in %	4 to 18	7
“Residual O ₂ , partial load, offset”	Sliding increase in the residual oxygen content at partial load Full load: 0 % increase, minimum partial load: Up to 4% increase Setting in %	0 to 4	0
“Current set value”	Displays the current set value for the residual oxygen content Minimum value: residual O ₂ setting (at full load) Maximum value: residual O ₂ setting and partial load offset (at partial load: maximum 4%)		
“Minimum output”	Minimum heating output of the heating system in automatic mode Setting is a % of the system’s inherent maximum heating output	30 to 99	30
“Maximum output”	Maximum heating output of the heating system in automatic mode Setting is a % of the system’s inherent maximum heating output	30 to 100	100

Secondary Air *(continued)*



“Controller” tab

Parameter	Setting range	Standard value:
“P factor”	1 to 100	20
“I factor”	0 to 100	0
“D factor”	1 to 100	30
“Cycle time”	1000 to 15000	5000

Flame



“Temperatures” tab

With flue gas recirculation, flue gas is fed into the combustion chamber. This has the effect of reducing the flame temperature due to the lower oxygen content in the flue gas. Combustion efficiency increases as a result. The proportion of flue gas fed into the combustion chamber depends on the output.

Parameter	Description	Setting range	Standard value:
“Recirculation fan, full load”	Upper limit for the control range of the recirculation fan Setting in %	11 to 100	80
“Recirculation fan, partial load”	Lower limit for the control range of the recirculation fan Setting in %	10 to “Recirculation fan, full load”	20
“Current set value”	Displays the current set value for the recirculation fan. Sliding value between set value for recirculation fan at full load and set value at partial load.		
“Combustion chamber temperature”	Set value for combustion chamber temperature Setting in °C	450 up to “Combustion chamber temperature, maximum”- 50	650
“Combustion chamber temperature, maximum”	Maximum combustion chamber temperature Setting in °C	500 to 1050	800
“Combustion chamber temperature, burnout - OFF”	Combustion chamber temperature at which the changeover from the “Burnout” to the “Off” operating state occurs. Setting in °C	200 to 400	250

Flame *(continued)*



“Controller” tab

Parameter	Description	Setting range	Standard value:
“P factor”	--	1 to 100	10
“D factor”	--	1 to 100	10
“Min - max opening”			
Min opening	Minimum opening of recirculation damper, lower control limit Setting is a % of the maximum opening	10 to 99	20
Max opening	Maximum opening of the recirculation damper, upper control limit Setting is a % of the maximum opening	11 to 100	80

“Controller, fresh air damper”

Parameter	Description	Setting range	Standard value:
“P factor”	--	1 to 100	10
“D factor”	--	1 to 100	10

“Min - max opening”

Parameter	Description	Setting range	Standard value:
Min opening	Minimum opening of the fresh air damper, lower control limit Setting is a % of the maximum opening	10 to 99	20
Max opening	Maximum opening of the fresh air damper, upper control limit Setting is a % of the maximum opening	11 to 100	80

Flow

“Settings” tab



Parameter	Description	Setting range	Standard value:
“Flow temperature”	Supply temperature Setting in °C	75 to 95	85
“Return temperature, minimum”	Minimum return temperature Setting in °C	65 to 80	70
“Return temperature, calculated”	Displays the sliding set value for the return temperature Only if flow control is activated, see page 70		
“Dissipate excess heat”	If the boiler water temperature rises above this temperature, a floating contact is switched. The contact is provided for on-site actuation of heat consumers. Setting in °C	50 to 110	95
“Runtime, boiler valve”	Runtime of the boiler valve (actual: displays the valve position as a % of maximum opening) Setting in °C	80 to 500	140
“Runtime, boiler circuit pump, minimum”	Minimum boiler circuit pump runtime Settings in minutes	1 to 30	10
“Firebed maintenance ON”	If the supply temperature rises above this value, the boiler switches to the “Maintaining” operating state. Setting in °C	“Flow temperature” + 3 to 100	90
“Firebed maintenance OFF”	If the supply temperature drops below this value, the boiler switches to the “Load” operating state. The value for “Firebed maintenance OFF” must not be greater than or equal to the value for “Firebed maintenance ON”. Setting in °C	“Flow temperature” + 1 to “Firebed maintenance ON”-2	88
“Standby ON”	If the supply temperature rises above this value, the boiler switches to the “Standby” operating state. Setting in °C	“Flow temperature” + 5 to 105	100
“Standby OFF”	If the supply temperature drops below this value, the boiler switches to the “Filling” operating state. The value for “Standby off” must not be greater than or equal to the value for “Standby on”. Setting in °C	“Flow temperature” to “Firebed maintenance OFF”-1	87
“Minimum standby time”	Minimum standby time in the “Standby” operating state Settings in minutes	0 to 60	10

Flow *(continued)*



“Controller” tab

Flow controller

Parameter	Setting range	Standard value:
“P factor”	1 to 100	50
“I factor”	0 to 100	0
“D factor”	1 to 100	50
“Cycle time”	1000 to 15000	5000

Return controller

Parameter	Setting range	Standard value:
“P factor”	1 to 100	20
“I factor”	0 to 100	0
“D factor”	1 to 100	30
“Cycle time”	1000 to 15000	5000

Flue Gas Fan



“Settings” tab

To keep dust emissions low, the vacuum pressure inside the combustion chamber should be as constant as possible. Pressure fluctuations inside the combustion chamber are the result of a changing volume of fire. The pressure fluctuations can be balanced out by changing the rotational speed of the flue gas fan.

The set value for the vacuum pressure (“Current set value”) is calculated by the control unit as a function of the heating output. When doing so, the “Vacuum pressure, partial load” and “Vacuum pressure, full load” limits cannot be exceeded.

Parameter	Description	Setting range	Standard value:
“Flue gas temperature, burnout - OFF”	A low flue gas temperature is a clear sign for there being no longer any firebed in the combustion chamber. If the flue gas temperature drops below this value, the control system switches from the “Emergency burnout” operating state to the “Off” operating state. Setting in °C	50 to 150	70
“Delay, burnout - OFF”	Delay before changeover of operating state when “Flue gas temperature, burnout - OFF” is reached Settings in minutes	10 to 60	10
“Vacuum pressure, full load”	Vacuum pressure in the combustion chamber at full load, upper control limit Setting in Pa	50 to 120	80
“Vacuum pressure, partial load”	Vacuum pressure in the combustion chamber at partial load, lower control limit Setting in Pa	30 to 80	50
“Current set value”	Displays the sliding set value for vacuum pressure in the combustion chamber in Pa		



“Controller” tab

The vacuum pressure in the boiler’s combustion chamber is regulated by the flue gas fan. The set value is set automatically as a function of boiler output.

Parameter	Setting range	Standard value:
“P factor”	1 to 100	50
“I factor”	0 to 100	0
“D factor”	1 to 100	50
“Cycle time”	1000 to 15000	5000

Cleaning the Touchscreen



Tap the following keys:

1. "Menu"
2. "Panel"
3. "Cleaning screen"
The touchscreen is inactive for 15 seconds and can be touched without effect.
4. Clean the touchscreen.

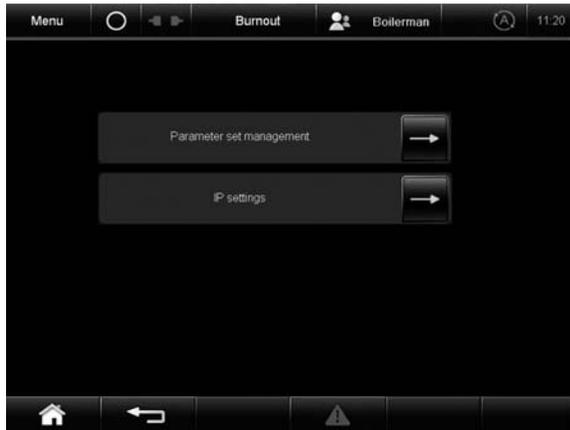
Setting the Language



Tap the following keys:

1. "Menu"
2. "Panel"
3. Flag
Symbol for the available languages
The text in the user interfaces is changed to the selected language.

Parameter Set Management



Tap the following keys:

1. "Menu"
2. "Special functions"
3. "Parameter set management"

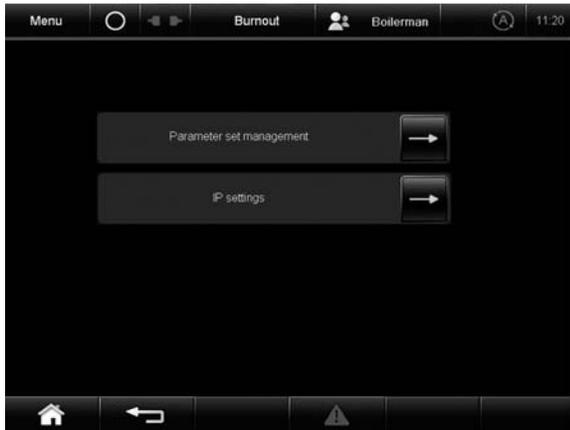
The "Parameter set management" window opens. Parameter sets allows you to save parameters specific to a particular fuel and retrieve them again at a later date.



Legend

- (A) Entry field for parameter name
Here you can enter the name of a new parameter set or change an existing parameter set.
- (B) Parameter selection field
Tap to select a parameter set.
The selected parameter set is highlighted against a grey background.
- (C) "Save"
Saves the currently set parameters to the selected parameter set.
- (D) "Load"
Loads the selected parameter set.
- (E) "Create"
Creates a new parameter set.
- (F) "Delete"
Deletes the selected parameter set.
- (G) "Load factory setting"
Resets the controller to its factory settings.

IP Settings



Legend

- (A) Entry field "IP address"
- (B) Entry field "Subnet mask"
- (C) Entry field "Gateway"

Tap the following keys:

1. "Menu"
2. "Special functions"
3. "IP settings"

The following screen opens.

By entering the correct IP settings, you can link the controller into a network.

Displaying your own network settings

Most networks incorporate a DHCP server which automatically assigns an IP address to appliances in the network and enables them to communicate with each other.

You can find out whether the computer has an IP address and if so which one, with the "ipconfig" DOS command:

1. On the computer, press the Windows and R key combination.
2. In the entry field, enter "cmd".
3. Confirm with OK. The command line window opens.
4. In the command line window, enter the command "ipconfig".
5. Press Enter to confirm. The computer's current IP address, subnet mask and default gateway are displayed under "Ethernet adapter Local Area connection".
6. Note down the IP address, subnet mask and default gateway for subsequent configuration.

Configuring the controller network

Ensure that the following requirements are met:
 Controller and computer are connected to the network.
 Controller is switched on.

1. On the programming unit, tap on "IP settings".
2. Select an available IP address in the same network segment to which the computer is connected.
3. **Note:** When entering the address, use the full stop on the number keypad as separator. Enter the available IP address in the "IP address field".
4. Enter the values you previously noted down under "Subnet mask" and "Gateway". The network is now configured. It is possible to access the controller with a VNC viewer.

Accessing the controller via the network

1. Start your VNC viewer.
2. In the VNC viewer, enter the IP address of the controller.
3. Start the connection process. The controller's screen contents are shown in the VNC viewer. You can now operate the heating system via the viewer.

User Administration



Tap the following keys:

1. "Menu"
2. "User administration"
The following screen opens.

Column	Description
Name	User name entry fields
Password	Password entry fields

You can manage users from this screen. You can create up to 5 users in each user group. Users can be created for the following user groups:

- Boilerman
- Engineer (in-house)
- Viessmann (in-house)

Note: The "Observer" user group cannot manage users.

Creating users

1. Tap an empty "Name" field.
The "Change user" window is displayed.
2. Enter the name and the password.
3. To save the changes:
Tap "OK".
or...
To reject the changes:
Tap "Cancel".

Changing user and/or password

1. Tap the name or password field you wish to change.
The "Enter password" prompt is displayed.
2. If you have entered the correct password: change the name or password by tapping the appropriate field.
3. To save the changes:
Tap "OK".
or...
To reject the changes:
Tap "Cancel".

Charts



The charts screen has 5 chart templates.

The actual values are stored in a 30 minute ring buffer. For this, values are recorded every 10 seconds. You can display up to 4 freely selectable variables per chart.

Tap the following keys:

1. "Menu"
2. "Charts"
3. Select a chart representation. For this, tap a chart symbol.

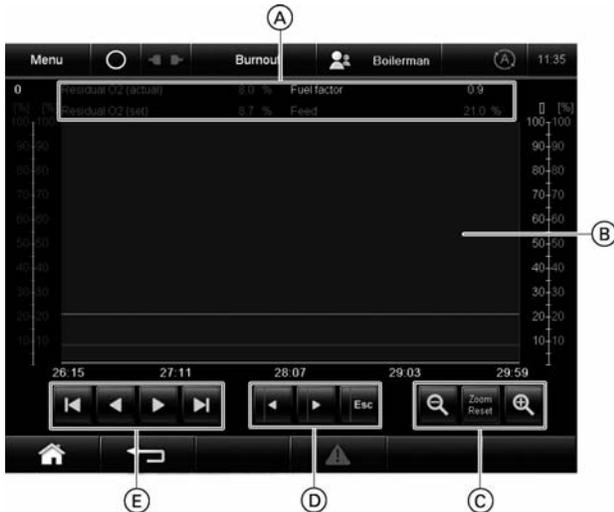


Chart representation

Legend

- (A) Overview of displayed variables
Gives the values for the current cursor position. Tap in this area to display the chart settings screen, see page 60.

Legend

- (B) Chart with the selected variables
Tap the chart to zoom into the time axis.
- (C) Zoom
 - Shows the time axis in a higher resolution in the chart.
 - Sets the time range to 30 minutes.
 - Shows a greater time range.
- (D) Current cursor position
 - ◀ Moves the cursor to the left.
 - ▶ Moves the cursor to the right.
 - |Esc Positions the cursor on the current time point.
- (E) To move the time axis
 - ◀◀ Skips to the beginning.
 - ◀ Jumps back one screen.
 - ▶ Jumps forward one screen.
 - ▶▶ Skips to the end.

Charts *(continued)*



Chart settings

Legend

- (A) List of parameters
Overview of all parameters which can be shown in the charts.
Tap the overview to open or close the list of parameters.
Tap a parameter. The parameter is highlighted with a blue background and is selected.
Add the selected parameter to the parameters of the current chart with "Trend +".
- (B) Parameters in the current chart
A maximum of 4 parameters can be displayed.
Tap a parameter. The parameter is highlighted with a blue background and is selected.
Configure the selected parameter in the chart with "Color:", "Limit max:" and "Limit min:".
Delete the selected parameter from the current chart with "Trend-".
- (C) "Color:", drop-down menu
Sets the color of the selected parameter in the chart.
- (D) "Limit max"
Sets the upper scale value along the Y axis for the selected parameter.
- (E) "Limit min"
Sets the lower scale value along the Y axis for the selected parameter.
- (F) "Trend-"
Removes the selected parameter from the current chart.
- (G) "Trend + "
Adds the selected parameter to the current chart.

Shutting Down the Heating System for an Extended Period

1. Switch off the system with the  key.
The controller switches the system off automatically.
- 2.



WARNING

There is a risk of deflagration when the combustion chamber door is opened. Poking around in the firebed leads to oxygenation, which can produce a flash. Both can result in severe burns.

Never open the combustion chamber door while the system is in operation.

Before opening the combustion chamber door, ensure that you are standing in a safe place.

Never poke around in the firebed.

Allow the existing firebed to burn out completely.

3. Open the combustion chamber door.
4. Allow the combustion chamber time to cool down.
5. Switch off the system at the control panel using the mains isolator.

Cleaning and checking the combustion chamber

Note: Always clean and check the entire combustion chamber at the end of the heating season.

Pay particular attention to the following combustion chamber components and parts:

1. Clean off any slag deposits, etc. from the secondary air apertures.
2. Check the ash removal zones under the grate through the maintenance cover. Remove all ash.
3. Clean the grate elements and check for damage.
4. Have damaged grate elements replaced by the Technical Services department.
5. Check the flanged connections of the fuel supply system.
6. Tighten any slack screws.
7. Replace damaged gaskets.

Restarting the system

1. Switch ON the mains isolator on the control panel.
2. Switch ON the system, see page 43.

What to do in the Event of a Fault Message

WARNING

Risk of injury due to faults in the heating system that have not been rectified.

In the event of faults, shut down the heating system and safeguard against reconnection.

Immediately notify faults to the responsible body or individual.

Rectify faults immediately.

When rectifying a fault, no-one else should be present in the danger zone around the heating system.

Prior to starting the heating system ensure that no-one else is within the danger zone around the heating system.

1. Locate the fault.
2. Check the fault.
3. Decide whether to: repair the fault yourself or inform the Technical Services department.
4. Eliminate the cause of the fault.
5. Acknowledge the fault message on the programming unit.

What to do in the Event of a Warning Message

1. Eliminate the cause of the warning.
2. Acknowledge the warning message in the controller.

Table of Fault Messages

Fault message	Cause	Remedy
Fault, high limit safety cut-out	Incorrect set supply temperature (too high)	Check set supply temperature.
	Faulty system component (boiler circuit pump or return valve)	Check boiler circuit pump and return temperature raising facility.
	Amount of heat drawn drops suddenly	Check the heat drawn. If boiler water temperature is below 158°F (70°C): remove protective cap on HLSC and press reset button.
Fault, combustion chamber, pressure	Flue gas fan failure	Check flue gas fan.
	Vacuum pressure measurement failed	Check vacuum pressure measurement.
	Heat exchanger heavily soiled	Clean heat exchanger.
Fault, repeat heat-up	No combustion detected Insufficient fuel or fuel too wet	Add fuel. If fuel is above W40: preheat the combustion chamber. Or use suitable dry fuel.
Fault, boiler sensor faulty	Temperature sensor or lead faulty	Consult a qualified electrician.
Fault, boiler return sensor faulty	Temperature sensor or lead faulty	Consult a qualified electrician.
Fault, feed sensor faulty	Temperature sensor or lead faulty	Consult a qualified electrician.
Fault, flue gas temperature sensor	Temperature sensor or lead faulty	Consult a qualified electrician.
Fault, material shortage	Fuel store empty	Fill fuel store.
	Material blockage	Switch OFF mains isolator and remove material blockage.
	Shut-off gate valve jammed	Check shut-off gate valve for ease of operation.
Fault, water level in extinguishing water tank	Too little water in the extinguishing water tank	Fill the extinguishing water tank.
Fault, motor protection, conveyor devices	Motor overloaded due to blockage (foreign body)	Remove foreign body.
	Bearing damage	Check bearings for ease of operation.
Fault, maintenance cover open	Maintenance cover open	Close maintenance cover.
Fault, light barrier, firebed monitoring	Sight glasses dirty	Remove and clean both sight glasses.
	Ash deposits in apertures	Remove dust and ash deposits from the apertures.
	Light barrier dirty or faulty	Clean or replace the light barrier sensors.
O ₂ measurement fault	Lambda probe heavily soiled or faulty, or O ₂ transducer faulty	Contact Viessmann Technical Service.
Warning, combustion chamber door open	Combustion chamber door open or not fully closed	Close combustion chamber door.

Adjusting the Fuel Supply and Air Supply

The boiler is commissioned by Viessmann engineers. As part of this process, the boiler will be adjusted so that the available fuel in conjunction with the amount of air supplied will result in optimum combustion.



WARNING

Risk of poisoning from carbon monoxide and carbonization gas as a result of incomplete combustion caused by overfilling with fuel.

Ensure that the fuel supply and air supply are adjusted correctly.

When changing to a different fuel, adjust the parameters to suit the new fuel.

Note: Overloading the combustion chamber leads to ash glazing on the fireclay walls and thereby to premature damage to the combustion chamber. The lining, grates and metal parts in the combustion chamber are wearing parts. Excessively high loads will cause the parts to wear more quickly. Overloading the system will also have an increased impact on the boiler, dust extractor and chimney causing them to wear more quickly too. Ensure that the fuel supply and air supply are adjusted correctly.

Note: The composition of the fuel may differ in terms of particle size, type of wood, moisture content, bulk density and other characteristics. When changing to a different fuel, adjust the parameters to suit the new fuel. This will ensure optimum combustion of each fuel type, that the combustion chamber is not overloaded and that emission values are observed.

Adjusting the Ash Removal

The amount of ash in the combustion chamber depends on the ash content of the fuel. The Vitoflex 300-UF removes ash automatically by moving the grate. The intervals at which the grate is moved can be adjusted to individual requirements. The ash is discharged automatically via the ash removal system.

The ash removal cycle is matched to the relevant fuel type during commissioning. Check the runtimes and pause times of the ash removal cycle during operation. The contractor or suitably trained persons must adjust the times to suit the relevant fuel.

When setting the ash removal cycles, observe the following principles:

- Short runtime
- Long pause time between ash removal events

Small pieces of fireclay (fragments) may break away from the combustion chamber lining as a result of normal wear. These fireclay fragments are removed by the ash removal system. The breaking off of small fireclay particles has no negative impact on the standard service life of the combustion chamber.

Visual Inspection of Combustion

CAUTION

Risk of burns due to hot machine components
Only touch handles and identified parts.
Never touch sight glasses or their retainers.
These components are connected directly to the combustion chamber.

During operation, the controller controls, regulates and monitors all components and system parts automatically.

Check flames in the combustion chamber through the sight glass.

The ideal flame is yellow to light yellow. This indicates normal combustion in which the fuel burns cleanly.

Unjamming the Ash Removal Screw Conveyor

CAUTION

Risk of crushing by and entanglement in the ash removal screw conveyor.
Never reach in through the maintenance cover.

Note: Wear personal protective equipment.

Always wear a face mask when handling ash or slag.

Requirements:

The system is switched off.

The firebed is completely burned down. Check the firebed through the sight glass.

1. At the programming unit, switch to manual mode under "Fuel" – "Combustion chamber ash removal".

2.

WARNING

There is a risk of deflagration when the combustion chamber door is opened. Poking around in the firebed leads to oxygenation, which can produce a flash. Both can result in severe burns.

Never open the combustion chamber door during operation.

Before opening the combustion chamber door, ensure that you are standing in a safe place.

Never poke around in the firebed.

Open the combustion chamber door.

3. Select the "Fuel" screen, then under "Combustion chamber ash removal" alternately select "Clockwise rotation" and "Anti-clockwise rotation".

The ash removal screw conveyor runs forwards and backwards alternately. This action will unjam the ash removal screw conveyor.

4. Stop the movement of the ash removal screw conveyor. The ash removal screw conveyor comes to a halt.

5.

CAUTION

Hot ash and slag may result in burns.

Wear protective gloves when handling ash and slag.

Remove large bits of slag with a poker or similar.

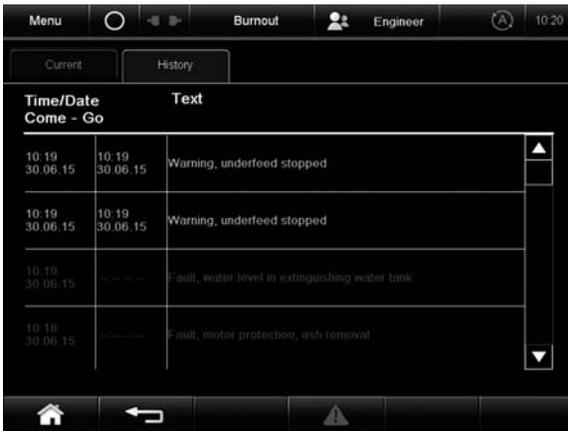
6. Close the combustion chamber door.

7. On the programming unit, switch back to automatic mode. The ash removal screw conveyor is now unjammed.

Fault Messages



“Current” tab



“History” tab

Current fault messages

This screen displays unprocessed fault messages.

Display	Description
“Time/Date”	Time the fault message occurred.
“Text”	Displays the fault text. Warning: Information or minor system fault Fault: Serious system fault
“Acknowledge”	You can use this key to acknowledge the fault message after the fault has been rectified. Tapping on “Acknowledge” acknowledges all currently unacknowledged fault messages. Once acknowledged, the fault message is then only displayed under History.

All fault messages

All fault messages, including those already acknowledged, are shown on this screen. The latest fault message is always at the top. Once the number of fault messages reaches 100, the oldest message is deleted when a new one is generated.

Note: Acknowledged messages are displayed in grey. Unacknowledged messages are displayed in red.

Display	Description
“Time/Date Come”	Time the fault message occurred.
“Time/Date Go”	Time the fault message was acknowledged.
“Text”	Displays the fault text. Warning: Information or minor system fault Fault: Serious system fault

Operating Data



Tap the following keys:

1. "Menu"
2. "Operating data"

This is where operating data such as hours run are displayed.

Parameter	Description
"Hours run, load"	Displays the number of hours run in the "Load" operating state.
"Hours run, firebed maintenance"	Displays the number of hours run in the "Firebed maintenance" operating state.
"Hours run, standby"	Displays the number of hours run in the "Standby" operating state.
"Hours run, boiler 2"	Displays the number of hours run by boiler 2 (external heat generator).

I/O Modules



Tap the following keys:

1. "Menu"
2. "I/O modules"

Note: The I/O modules screen is a display-only screen and is used for checking and troubleshooting inputs and outputs.

Legend

- (A) Designation of the input and output module in the controller
- (B) Displays the function of the inputs and outputs
Tap the display to switch to the next screen.
- (C) Designation of the input and output
- (D) The status display is illuminated if the input and output are active.

Manual Mode and Other Scans

The sub-area screens are accessed from the default display via the “Fuel”, “Secondary air”/“Primary air”, “Flame”, “Flow” and “Flue gas fan” keys. The screens are divided into manual mode and information display areas.

Manual mode

Components can be operated manually via keys.

Scanning

The sub-area screens display set and actual values as well as status information. Many of the actual values are displayed graphically in the form of a scale.

Keys for Manual Mode

The Manual mode and Automatic mode keys enable you to operate components manually or automatically.

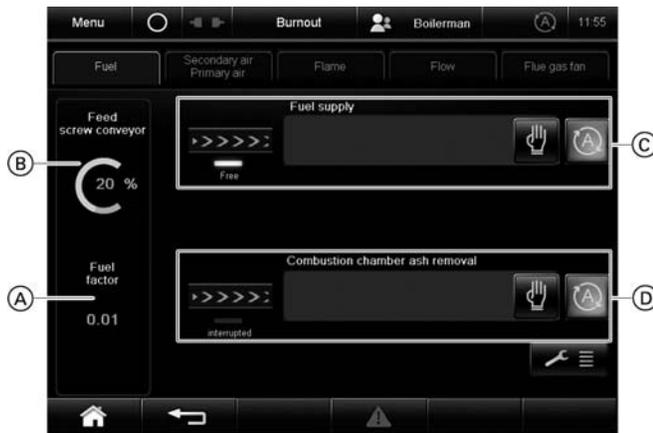
 Switches manual mode for the component on or off.
 Symbol colors:
 Orange = active
 Neutral = off

 Switches automatic mode for the component on or off.
 If automatic mode is switched off, this means that the component is in manual mode.
 Symbol colours:
 Green = active
 Neutral = off

Additional keys in manual mode

Symbol	Description
	Opens the damper.
	Closes the damper.
	Switches the function on and off alternately. When the function is switched on, the symbol is depicted as pressed.
	Switches the function off and on alternately. When the function is switched on, the symbol is depicted as pressed.
	Increases the value.
	Reduces the value.
	Stops the movement.

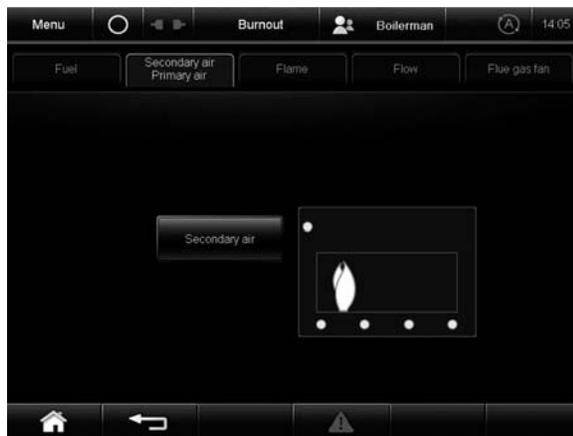
Fuel



Legend

- (A) Fuel factor, value range 0 to 1
- (B) Feed cycle time in %
- (C) "Fuel supply"
Green arrow is animated: fuel feed active ___/"Free": light barrier of the feed screw conveyor is clear ___/"interrupted": light beam [of the light barrier] of the feed screw conveyor is interrupted
- (D) "Combustion chamber ash removal"
Green arrow is animated: ash removal active ___/"Free": Light barrier for ash removal is clear ___/"interrupted": Light beam of [the light barrier] for ash removal is interrupted

Secondary Air



If you tap the "Secondary air/Primary air" key in the default display, the following screen is shown.

Tap on the following key:
"Secondary air"
The following sub-area screen appears.



Legend

- (A) Display of actual and set oxygen content in the flue gas in %
- (B) Display of actual and set secondary air fan utilization level in %
- (C) "Secondary fan"
Fan animated: secondary air fan active

Flame



Legend

- (A) Display of actual and set combustion chamber bottom temperature in °C
- (B) Display of utilisation level of recirculation fan in %
- (C) "Recirculation fan"
Fan animated: recirculation fan active
- (D) "Recirculation damper"
Opening of recirculation damper in %
The damper's current opening position is depicted as an animation.
- (E) "Fresh air damper"
Opening of fresh air damper in %
The damper's current opening position is depicted as an animation.

Flow



Legend

- (A) Display of actual and set return temperature in °C
- (B) Display of actual and set supply temperature in °C
- (C) "Flow temperature controller"
key: disables flow control.
key: enables flow control.
- (D) "Return mixer"

Flue Gas Fan



Legend

- (A) Display of actual and set vacuum pressure in Pa
- (B) Displays flue gas fan utilisation level in %
- (C) "Flue gas fan"
Fan animated: flue gas fan active

Boiler Wiring

CAUTION

The Viessmann supplied field wiring diagram is not a complete system drawing. It is the installer's responsibility to assure that the control is suitable for the respective installation, and all necessary safety equipment is installed.

CAUTION

Any alteration of the control cabinet will void the warranty.

CAUTION

The information about wire type, wire number and wire gauge made in the wiring diagrams is not obligatory. The final decision of these settings has to be made by the executing installation company taking into consideration the local codes and regulations.

- Lines arranged in metal pipe with minimum distance of 6 in. (150 mm) to the base. Use support with cable routing for light barrier. No support on base.
- Screw cable channel (metal design) onto the foot plate on top of the boiler with minimum distance of ½ in. (10 mm).
- Fasten cable channel (metal design) on casing with minimum distance of ¾ in. (20 mm).
- Cable channel (metal design) over entire width of boiler: fastening on the bottom of the boiler jacket (it is not water-bearing).
- Mount cable channel (metal design) with minimum distance of 7¾ in. (200 mm) to the feed auger: no support on the feed auger.
- Arrange lines in protective cable hose with sufficient leeway to open and close the door (mind the door stop).

Commissioning

Initial startup

Only a Viessmann or another trained specialist may put a newly installed system into operation for the first time. Before the system is commissioned, the system must be filled with water, and the fuel for the commissioning and the installation itself must be inspected.

Note: It is mandatory to complete the Viessmann biomass project pre-commissioning form.

IMPORTANT

Be absolutely sure to follow the instructions. No warranties may be claimed for damages in cases of initial start-ups carried out improperly at one's own initiative.

First check:

- Is there enough water in the heating system?
- Has the heating system been bled of air?
- Are the slide valves open for the heating-system's supply and return flow?
- Can enough fresh air get into the heating room?
- Is the ash bin empty?
- Are the doors and lids on the boiler closed leak-tight?
- For safety, keep firing and ash pit doors tightly closed.

Filling the heating system

The first filling is usually performed with chemically untreated filtered water free of any suspended solids. Ensure that the air is carefully bled out while filling the boiler. Use appropriate water treatment specific to the local water conditions.

Note: The system fill pressure when the system is cold should be approximately 1.5 psi (0.1 bar) greater than the supply pressure of the closed expansion tank.

Water quality

Treatment for boiler feed water should be considered in areas with known problems, such as where a high mineral content and hardness exist. In areas where freezing might occur, it recommended that an antifreeze be added to the system water for protection against freezing. Please adhere to the specifications given by the antifreeze manufacturer. Do not use automotive silicate-based antifreeze. Please observe that an antifreeze/water mixture may require a back flow preventer within the automatic water feed and influence components such as diaphragm expansion tanks, radiation, etc. A 40% antifreeze content will provide freeze-up protection to -10°F (-23°C). Do not exceed 50% antifreeze mix ratio and do not use antifreeze other than specifically made for hot water heating systems.

Total output (MBH)	Total Hardness (ppm as ca CO ₃)
> 1 Total ≤ 680	≤ 200
> 680 to ≤ 2050	≤ 150
> 2050	≤ 2

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

Oxygen diffusion barrier under floor tubing

The boiler warranty does not cover pressure vessel failure resulting from corrosion caused by the use of underfloor plastic tubing without an oxygen diffusion barrier. Such systems without oxygen diffusion barrier must have the tubing separated from the boiler with a heat exchanger. Viessmann always recommends the use of underfloor plastic tubing with an oxygen diffusion barrier.

Fuel for the commissioning

For the commissioning, sufficient dry fuel (max. W 20%) should be stored for approx. 10-24 full operating hours:

Vitoflex 300-UF 390	approx.	5100 lb. (2313 kg)
Vitoflex 300-UF 530	approx.	6600 lb. (2994 kg)
Vitoflex 300-UF 720	approx.	8800 lb. (3992 kg)
Vitoflex 300-UF 950	approx.	11660 lb. (5289 kg)
Vitoflex 300-UF 1250	approx.	14960 lb. (6786 kg)

Since the boiler plant will be cold, and residual moisture will be drawn from the refractory concrete during the initial operation, the material to be burned for the initial operation has to be at least air dry. For the first three hours, the heating-up process should be carried out at low output.

To ensure that the silo extraction system is functioning properly, only place a minimal amount of fuel in the silo in case there is a problem. This enables the extraction system to be cleaned out quickly and the problem to be identified and corrected.



CAUTION

Ensure that a Viessmann or another trained specialist is present for the boiler start-up and that it is done in a timely manner. The warranty becomes null and void if this procedure is not followed.

Commissioning and hand over

A qualified person from the owner's side must be present for the commissioning and hand over.

The heat dissipation from the boiler plant has to be assured by the operating organization or by the heating contractor.

The heating contractor must confirm that the installation has passed inspection and signed off.

Compliance with these Installation Instructions and the Operating Instructions will ensure a safe and convenient heating with wood.

IMPORTANT

These Installation and Operating Instructions should be kept near the system on a permanent basis.

Filling the Fuel Storage Unit

When storage facilities for wood are required, the wood should be kept at least 5 ft. (1.5 m) from the heating appliance.

CAUTION

Risk of fire when fuel is being blown into the fuel store. Dangerous pressure changes arise in the combustion chamber as a result. Switch off the heating system at the mains isolator before blowing in fuel. Safeguard the system against reconnection.

Systems with horizontal and flexible agitator discharge

If the fuel store is empty, fill the fuel store until the articulated arms or leaf springs are covered by approx. 12 in. (300 mm) of fuel.

Turn the "Silo filling" key switch. The arms are rotated for 90 seconds and then come to rest. After this, the function of the "Silo filling" key switch is blocked for 10 minutes.

Fill the fuel store until it is full.

Fill the fuel store without delay when there is still more than approx. 12 in. (300 mm) of fuel above the articulated arms or leaf springs.

Systems with funnel discharge

So as not to damage or block the screw conveyor, it must be moved to a vertical position when filling the fuel store. If it can be ensured that the specified pressure conditions in the fuel store can be maintained, the system can be switched on while the fuel store is being filled. This ensures that the screw conveyor remains vertical.

Horizontal extraction system and spring extraction system

If any excess or negative pressure develops in the silo during the filling, the facility has to be switched off using the silo filling key switch on the control panel.

After doing so, complete filling the silo evenly and turn the facility back on, using the silo filling key switch on the control panel. Carry out refilling in the same manner.

By blowing in

IMPORTANT

The heating system has to be shut off (danger of excess pressure or negative pressure caused by the action of blowing-in). Filling procedure as described in the section "By dumping".

Fixing malfunctions in the feed system

Refer to the Installation and Operating Instructions for details on the automatic fuel-feeding device.

If fuel hopper is installed, do not alter equipment in any way. The cause of motor malfunctions in-feed systems is usually clogging by large pieces of wood or foreign matter.

Switch off the facility using the function button on the control panel and wait until there is no more fuel in the feed auger. Fill the silo evenly to approximately 12 in. (300 mm) above the articulated arm or over the spring-mounted blades, switch on the facility using the function button on the control panel and wait until the articulated arms or the spring-mounted blades go under the cup washer.

CAUTION

DANGER OF INJURY:

Always turn OFF the main switch before carrying out any repair of a malfunction on feed systems and every time before a maintenance lid is opened or a protective device is removed!

Because of the automatic operation of the system it is impossible to foresee the time the conveying equipment will be turned on.

Note: Viessmann recommends the installation of carbon monoxide detector(s) inside the fuel storage area.

IMPORTANT

The fuel storage area/room must be designed, operated and maintained to national, provincial and local codes and requirements.

WARNING

The wood chip/pellet storage room must be adequately and permanently ventilated. Ensure the door or latches are securely locked open during presence in the room. No smoking, fires or open flames are permitted.

Excess Conditions

Excess temperature/power failure

 **CAUTION**

DANGER OF THIS EQUIPMENT SUDDENLY GOING UP IN FLAMES:
DO NOT open the doors or lids on the boiler plant!

- Switch on additional heat loads.
- The flue gas exhaust blower shuts down.
- The temperature-limiting safety switch triggers.
- The thermal safety flush valve opens at approx. 203°F (95°C). The excess heat is being dissipated into the drain.

IMPORTANT

If the fixed high limit has triggered, it has to be manually unlocked. The fixed high limit is situated at the top of the boiler.

To reset, unscrew the black cap and press the button.

Note: Resetting is only possible when the temperature has fallen to approx. 158°F (70°C).

Possible causes for excess temperature:

- Incorrect setting on the control module.
- Defective component of the system (pump or valve).
- Sudden drop in output to zero. The in-feed auger still has to be emptied. The heat yet produced by this can result in surplus temperature.
 Activate "DISSIPATE SURPLUS HEAT" function!

Low water/excess water pressure

Possible causes:

- Low water: Leakage in the heating system.
- Excess water pressure: The expansion tank is not functioning.

In either case, the boiler should be examined by a qualified heating contractor.

Note: Unlock this malfunction with either the reset button for the water level control system or for the negative overpressure monitoring assembly, and by pressing the OK button on the control panel.

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