

Installation and Operating Instructions

for use by engineers and heating contractors

VIESSMANN®

Vitoflex 300-RF 150, 220, 300, 400 and 540
Wood-fired Boiler

Output range: RF 150 154 to 512 MBH (45 to 150 kW)
RF 220 205 to 751 MBH (60 to 220 kW)
RF 300 273 to 1024 MBH (80 to 300 kW)
RF 400 341 to 1365 MBH (100 to 400 kW)
RF 540 478 to 1843 MBH (140 to 540 kW)



Vitoflex 300-RF



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.

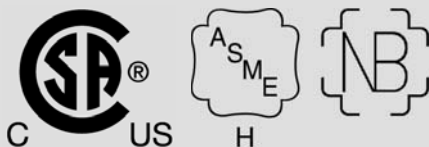
Take precautions in all instances to avoid accidental activation of power during service work.

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

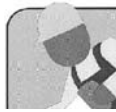
Information contained in this and related product documentation must be read and followed. Failure to do so renders the warranty null and void.



■ 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.

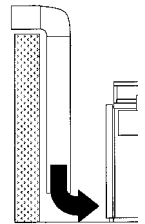
► *For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, refer to the "Safety" section.*



■ 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: B365-10, 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-RF 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 and standards

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-RF Rotating Combustion System (patent no: EP 0 905 442 B1) was developed for automatic combustion wood, pellets and wood chips to max. 35% moisture content, see section "Wood Fuel Requirements". The Vitoflex 300-RF Rotating Combustion System is characterized by high efficiencies and perfect combustion at all load levels.

The Vitoflex 300-RF 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 in-feed auger conveys the wood fuel diagonally from below into the combustion chamber. The holding devices for the back-burn sensor and the thermal extinguishing valve are situated on the in-feed auger. Above the in-feed auger, there is a metering container with a light barrier to ascertain the level of the fuel insulating layer required.
- The wood fuel is ignited automatically by an electric heat gun, at the time of the boiler start. The gasification of the fuel is carried out on a feed grate moved by a worm-gear motor. The ash falls in an ash bin below. An automatic de-ashing system is optional. The combustion chamber is heavily insulated and lined with fire clay refractory elements.
- The combustion gases rising from the combustion chamber are swept up by the rotary secondary airflow brought to bear from the rotary blower and burned out completely in the round heat exchanger. The thermal energy from the combustion gases is transmitted to the boiler water in horizontal heat exchanger tubes. The heat exchanger is heavily insulated and provided with excellent access through the boiler door in the front.
- A flue gas re-circulation system reduces the temperature in the combustion chamber while maintaining the highest possible degree of efficiency. This increases the service life of the un-cooled refractory elements in the gasification zone. With the basic setting, the ratio of re-circulated gas to fresh air is precisely adjusted according to the amount of wood fuel that is burned. A mechanical adjustable damper provides a constant ratio of the quantity of re-circulated gas to fresh air over the entire output range.
- The flue gas blower is specially designed for wood heating operation and is very quiet. The motor has a solid, heat resistant design with a heat dissipation hub and is spring supported. The blower casing has a round intake port and a round blowout nozzle. Installation is possible on the top, side or rear of the flue gas collector within 360° rotation.

Supplied with:

- Boiler with rotary heat exchanger including supply and return temperature sensors
- Combustion chamber with moving grate and light barriers for ember monitoring
- Automatic igniter
- In-feed auger including insulating layer, safety end switch for maintenance lid, back-burn temperature sensor, extinguisher valve with strainer, extinguisher water container with mounting bracket
- Set of displacement rods
- Flue gas re-circulation system
- Flue gas blower including flue gas temperature sensor and oxygen sensor
- Draft damper for installation in the flue gas pipe
- Boiler cleaning tools for the combustion chamber and heat exchanger
- Installation fittings including pressure relief valve, drain valve, low water cut off, fixed high limit, temperature and pressure gauges

Customer supplied:

- Counter flanges for the boiler supply and return
- Piping to the mixing valve, boiler pump and hot water storage tank
- Piping for the safety heat exchanger
- Wiring to the control panel
- Separate electrical circuit for pneumatic cleaning system air compressor, when used.

Accessories for Vitoflex 300-RF Rotating Combustion System:

- Flue gas cyclone 24 USG (90 L)
- Metal mesh filter
- Automatic de-ashing system in bin, 63 USG (240 L)
- Automatic de-ashing in bin, 211 USG (800 L)
- Automatic de-ashing in base container
- Pneumatic cleaning system
- Operating pressure 30 or 60 psi
- Two-stage in-feed auger
- Insulation for flue gas re-circulation line
- Thermal safety flush valve
- Slide valve / Rotary valve
- Boiler pump and boiler 3-way mixing valve
- Ecocontrol control system options:
 - 3 sensor hot water 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

A number of lifting lugs will be provided on each boiler and heat exchanger where lifting gear may be attached. A tie bar is required to lift the boiler by the boiler supply and boiler return flanges.

Minimum clearances to walls for installation and maintenance work must be observed. Anti-vibration boiler supports may be used if anti-vibration measures are required.

Vitoflex 300-RF 150 - 300:

Hoist by the lifting lug.

Vitoflex 300-RF 400 - 540:

Hoist by boiler supply and boiler return flanges using a lifting lug.

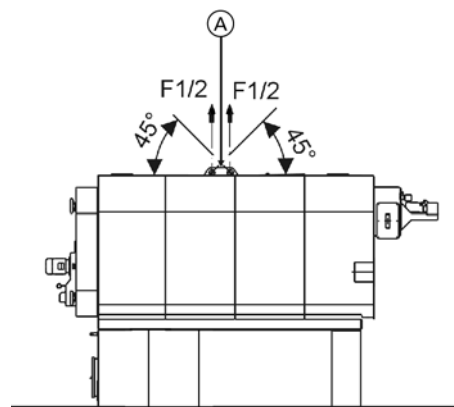
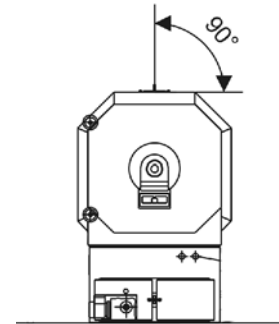


WARNING

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 B 365-10, Installation Code for Solid-Fuel Burning Appliances and Equipment.



Legend

Ⓐ Lifting lugs

Delivery Condition

Standard delivery condition

The standard delivery condition of the Vitoflex 300-RF 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:

- The heat exchanger is mounted to the combustion chamber
- Boiler is fully bricked
- Boiler door is mounted to the heat exchanger including secondary air rotating blower
- Primary air vents are attached to the combustion chamber
- Flue gas collector is attached to the heat exchanger
- Pneumatic cleaning system (optional) is attached to the flue gas collector

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

- Electrical components which include temperature sensors, oxygen sensor, light barriers for the combustion chamber, igniter, low water cut off, fixed high limit, 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 system (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
- Re-circulation system and insulation (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 fire box as standard delivery condition

Boiler model	RF 150	RF 220	RF 300	RF 400	RF 540
Minimum size door	47¼ in. x 78¾ in. (1200 mm x 2000 mm)	59 in. x 88½ in. (1500 mm x 2250 mm)	59 in. x 88½ in. (1500 mm x 2250 mm)	70¾ in. x 98½ in. (1800 mm x 2500 mm)	70¾ in. x 98½ in. (1800 mm x 2500 mm)
Minimum ceiling opening (W x H)	47¼ in. x 112¼ in. (1200 mm x 2850 mm)	59 in. x 112¼ in. (1500 mm x 2850 mm)	59 in. x 126 in. (1500 mm x 3200 mm)	70¾ in. x 130 in. (1800 mm x 3300 mm)	70¾ in. x 137¾ in. (1800 mm x 3500 mm)
Minimum ceiling opening including pneumatic cleaning system	47¼ in. x 128 in. (1200 mm x 3250 mm)	59 in. x 128 in. (1500 mm x 3250 mm)	59 in. x 141¾ in. (1500 mm x 3600 mm)	70¾ in. x 145¾ in. (1800 mm x 3700 mm)	70¾ in. x 153½ in. (1800 mm x 3900 mm)

Delivery Condition *(continued)*

Special delivery condition (partially disbanded)

For special circumstances like restricted space to bring the boiler into the heating room, the size of the boiler can be reduced by detaching additional components to the ones as described in section "Standard delivery condition". The assembly of these components require additional assembly time of approximately 6 hours.

The following additional objects will be delivered disbanded:

- The heat exchanger and the combustion chamber are separate
- No brickwork inside the heat exchanger and combustion chamber
- No insulation and panels are attached to the combustion chamber

Measurements of the largest part for reduced boiler size

Boiler model	RF 150	RF 220	RF 300	RF 400	RF 540
Minimum size door	35½ in. x 49¼ in. (900 mm x 1250 mm)	46 in. x 61 in. (1170 mm x 1550 mm)	46 in. x 61 in. (1170 mm x 1550 mm)	55 in. x 67 in. (1400 mm x 1700 mm)	55 in. x 67 in. (1400 mm x 1700 mm)
Minimum ceiling opening (W x H)	39¼ in. x 102¼ in. (1000 mm x 2600 mm)	49¼ in. x 103¼ in. (1250 mm x 2620 mm)	49¼ in. x 118 in. (1250 mm x 3000 mm)	59 in. x 122 in. (1500 mm x 3100 mm)	59 in. x 130 in. (1500 mm x 3300 mm)

Special delivery condition (fully disbanded)

For special circumstances like heavily restricted space to bring the boiler into the heating room, the size of the boiler can be reduced by detaching additional components to the ones as described in section "Standard delivery condition" and "Special delivery condition partially disbanded". The assembly of these components require welding and additional assembly time of approximately 20 hours.

The following additional objects will be delivered disbanded:

- The heat exchanger is a separate piece
- The flue gas collector is detached from the heat exchanger
- The boiler door is detached from the heat exchanger (welding required)

Measurements of the largest part for reduced boiler size

Boiler model	RF 150	RF 220	RF 300	RF 400	RF 540
Minimum size door	35½ in. x 49¼ in. (900 mm x 1250 mm)	46 in. x 59 in. (1170 mm x 1500 mm)	46 in. x 59 in. (1170 mm x 1500 mm)	55 in. x 67 in. (1400 mm x 1700 mm)	55 in. x 67 in. (1400 mm x 1700 mm)
Minimum ceiling opening (W x H)	39¼ in. x 85 in. (1000 mm x 2160 mm)	49¼ in. x 85¾ in. (1250 mm x 2180 mm)	49¼ in. x 98¾ in. (1250 mm x 2510 mm)	59 in. x 96½ in. (1500 mm x 2450 mm)	59 in. x 110 in. (1500 mm x 2800 mm)

Wood Fuel Requirements

The Vitoflex 300-RF 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)
	Max. length	in. (cm)	3 1/3 (8.5)
	Coarse sieve nominal mesh width	in. (mm)	5/8 (16)
Main percentage 60 to 100%	Medium sieve nominal mesh width	in. (mm)	1/4 (5.6)
	Fine sieve nominal mesh width	in. (mm)	1/25 (1)
Percentage of fines (incl. ultrafine content) max. 20%			



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 in² (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).

Consequence 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-RF systems is limited to 35%. 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 & dust [wood particles smaller than 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-RF 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-RF systems allow for a max. of 35% 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 3/4 in. (20 mm) to max. 2 in. (60 mm)
k1	S650 [40.6]	Less than W10	P1	untreated up to 3/8 in. (10 mm)
k2	S650 [40.6]	Less than W10	P2	untreated 3/8 in. to 3/4 in. (11 mm to 20 mm)

Note: For size of wood chips, see page 12.

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 lb/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, boiler 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 gage 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 Material

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.

Backup power supply or backup generator is highly recommended to ensure continuous operation in the event of power failure.

Venting Requirements

The Vitoflex 300-RF Rotating Combustion 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-RF rotating combustion 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, condensation and creosote formation.

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.

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-RF rotating combustion 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).

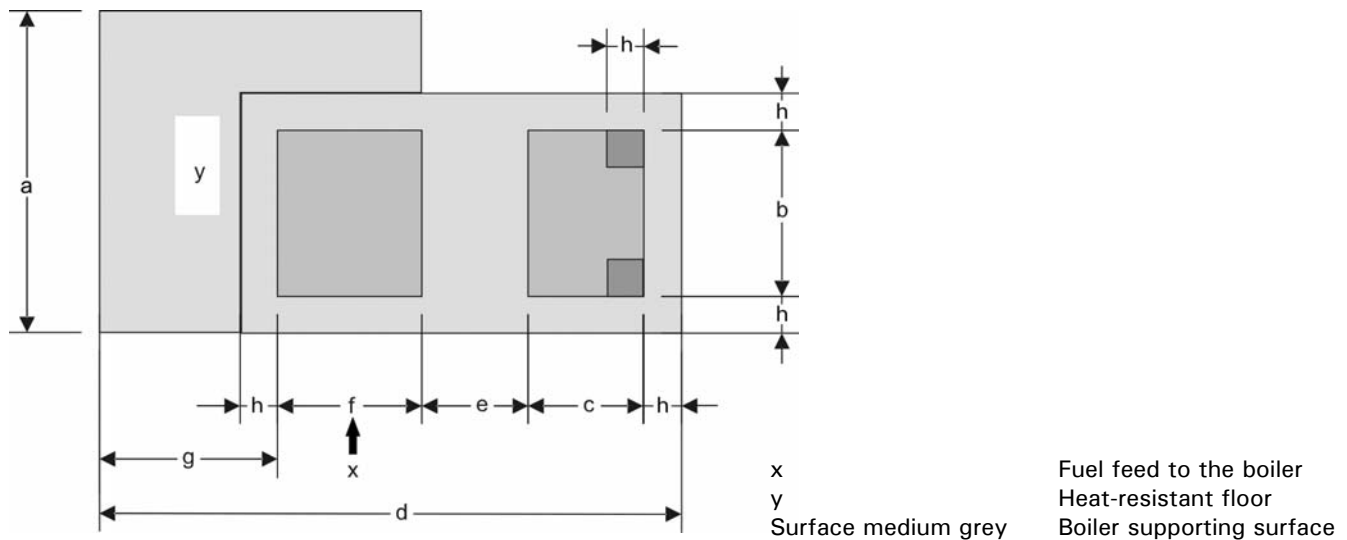
The load-bearing capacity of the heating room floor must be designed for the weight of the system plus filling with water and fuel. The load-bearing capacity of the floor in the area of the boiler bearing surface must be 512 lb/ft² (2500 kg/m²).

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.



Foundation dimensions

Boiler model	RF-		150	220	300	400	540
a	in. (mm)		61 ¹³ / ₁₆ (1570)	80 ¹¹ / ₁₆ (2050)	80 ¹¹ / ₁₆ (2050)	96 ⁷ / ₈ (2460)	96 ⁷ / ₈ (2460)
b	in. (mm)		34 ¹ / ₄ (870)	45 ¹ / ₄ (1150)	45 ¹ / ₄ (1150)	54 ³ / ₄ (1390)	54 ³ / ₄ (1390)
c	in. (mm)		24 ³ / ₈ (620)	26 ³ / ₄ (680)	26 ³ / ₄ (680)	31 ¹ / ₂ (800)	31 ¹ / ₂ (800)
d	in. (mm)		112 ³ / ₁₆ (2850)	123 ¹ / ₄ (3130)	142 ¹ / ₄ (3613)	147 ¹ / ₈ (3738)	161 ¹ / ₂ (4103)
e	in. (mm)		20 ¹ / ₂ (520)	20 ¹ / ₂ (520)	28 ¹ / ₂ (723)	17 ⁵ / ₈ (448)	21 ³ / ₈ (543)
f	in. (mm)		29 ¹ / ₈ (740)	29 ¹ / ₈ (740)	34 ⁵ / ₈ (880)	37 ¹³ / ₁₆ (960)	43 ¹¹ / ₁₆ (1095)
g	in. (mm)		34 ¹ / ₄ (870)	45 ¹ / ₄ (1150)	45 ¹ / ₄ (1150)	54 ³ / ₄ (1390)	54 ³ / ₄ (1390)
h	in. (mm)		9 ⁷ / ₈ (250)	9 ⁷ / ₈ (250)	9 ⁷ / ₈ (250)	9 ⁷ / ₈ (250)	9 ⁷ / ₈ (250)

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 (latest edition).

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. 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 grille 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.

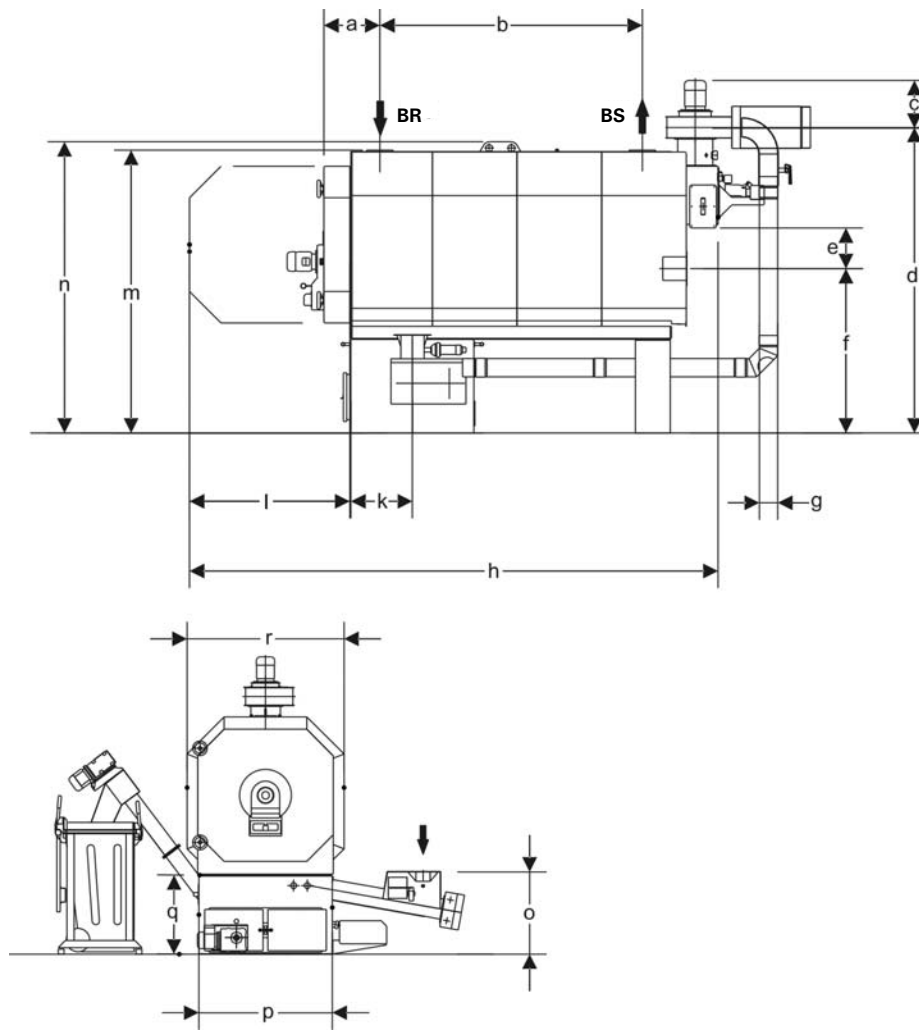
Technical Data

Boiler model		RF 150	RF 220	RF 300	RF 400	RF 540
Maximum output	MBH (kW)	512 (150)	751 (220)	1024 (300)	1365 (400)	1843 (540)
Minimum output¹	MBH (kW)	154 (45)	205 (60)	273 (80)	341 (100)	478 (140)
Efficiency	--	85%				
Fuel moisture content²	%	W 35				
Size of wood chips³	--	G 30 / G 50 as per CAN/CSA-B366. 1-M91				
Flue gas figures						
Connection flue gas pipe Ø A	in. (mm)	97/8 (250)	97/8 (250)	117/8 (300)	137/8 (350)	137/8 (350)
Mass flow rate; W5; O ₂ 6%	lb/s (g/s)	0.18 (80.4)	0.26 (117.9)	0.35 (160.8)	0.47 (214.4)	0.64 (289.44)
Volume flow; W5; O ₂ 6%; 150°C (302° F)	ft ³ /s (m ³ /s)	3.1 (0.09)	4.9 (0.14)	6.7 (0.19)	8.8 (0.25)	12.4 (0.35)
Mass flow rate; W35; O ₂ 8%;	lb/s (g/s)	0.24 (106.9)	0.35 (156.9)	0.47 (213.9)	0.63 (285.2)	0.85 (385.1)
Volume flow;W35; O ₂ 8%; 150°C (302° F)	ft ³ /s (m ³ /s)	4.2 (0.12)	6.7 (0.19)	8.8 (0.25)	12.0 (0.34)	16.2 (0.46)
Average flue gas temperature at full load ⁴	°F (°C)	320 (160)				
Average flue gas temperature at partial load ⁴	°F (°C)	266 (130)				
Chimney draft required	Pa	± 0				
Electrical connections						
Electrical connections, total	kW	2.67	2.85	3.6	3.98	3.63
Igniter	kW	1.6	1.6	1.6	1.6	1.6
Flue gas exhaust blower	kW	0.55	0.55	0.75	1.1	1.1
Rotary blower	kW	0.12	0.12	0.12	0.12	0.12
In-feed auger	kW	0.37	0.55	1.1	1.1	0.75
Grate drive unit	kW	0.03	0.03	0.03	0.06	0.06
Electric power consumption at full load	kW	1.032	1.108	1.521	1.868	1.753
Electric power consumption at partial load	kW	0.355	0.369	0.434	0.480	0.460
Heating						
Water side resistance (diff. 27°F/15 K)	"wc (mbar)	13 (38)	30 (76)	16 (42)	11 (29)	22 (56)
Boiler water volume	USG (L)	114 (430)	209 (790)	238 (900)	350 (1330)	399 (1510)
Heating surface	ft ² (m ²)	116.3 (10.8)	172.3 (16.0)	222.9 (20.7)	310.1 (28.8)	424.1 (39.4)
Volume on heating gas side	USG (L)	99 (374)	197 (744)	233 (883)	354 (1340)	426 (1613)
Volume of ash container for grate ash	USG (L)	8 (32)	12 (45)	15 (55)	20 (75)	24 (91)
Volume of ash container for flue gas cyclone	USG (L)	24 (90)				
Test pressure ⁵	psi (bar)	60 or 90 (4 or 6)				
Maximum allowable working pressure (water) ⁵	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)	1049 (477)	1278 (581)	1410 (641)	1712 (778)	2061 (937)
Weight of pressure vessel (30 psi) ⁶	lb. (kg)	4885 (2216)	6535 (2964)	7408 (3360)	9764 (4429)	11233 (5095)
Weight of pressure vessel (60 psi) ⁶	lb. (kg)	4974 (2256)	6667 (3024)	7452 (3380)	9875 (4479)	11453 (5195)
Weight of displacement rods	lb. (kg)	191 (87)	310 (141)	359 (163)	484 (220)	636 (289)
Weight of flue gas exhaust blower	lb. (kg)	88 (40)	88 (40)	99 (45)	136 (62)	136 (62)
Weight of in-feed auger	lb. (kg)	315 (143)	315 (143)	315 (143)	315 (143)	328 (149)
Total weight without water (30 psi) ⁷	lb. (kg)	6532 (2963)	8530 (3869)	9595 (4352)	12416 (5632)	14401 (6532)
Total weight without water (60 psi) ⁷	lb. (kg)	6620 (3003)	8662 (3929)	9639 (4372)	12527 (5682)	14621 (6632)
Total weight with water (30 psi) ⁷	lb. (kg)	7485 (3395)	10280 (4663)	11585 (5255)	15340 (6958)	17730 (8042)
Total weight with water (60 psi) ⁷	lb. (kg)	7573 (3435)	10412 (4723)	11629 (5275)	15450 (7008)	17950 (8142)

- ¹ Minimum load: Operation with modulated control (Infinitely variable power control)
Low load with ON Qmin / OFF (Stop-and-go mode)
- ² Moist fuels: > W35 further limitations regarding output, degree of efficiency and control behavior. > 35% MC will limit the output, decrease efficiency and introduce sub optimum control of combustion etc. In addition, the quote for Vitoflex 300 RF is insufficient to allow for complete combustion of fuels in excess of 35% moisture content.
- ³ Specification: See section on Wood Fuel Requirements
- ⁴ Flue gas temperature: An increase is possible by removing the displacement rods [Full load 86°F (30°C); Partial load 50°F (10°C)]
- ⁵ Pressure: Per ASME Sec. IV
- ⁶ Weight: Includes door and refractory concrete lining
- 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. 68°F (20°C)]

Boiler Dimensions

BR Boiler Return
BS Boiler Supply

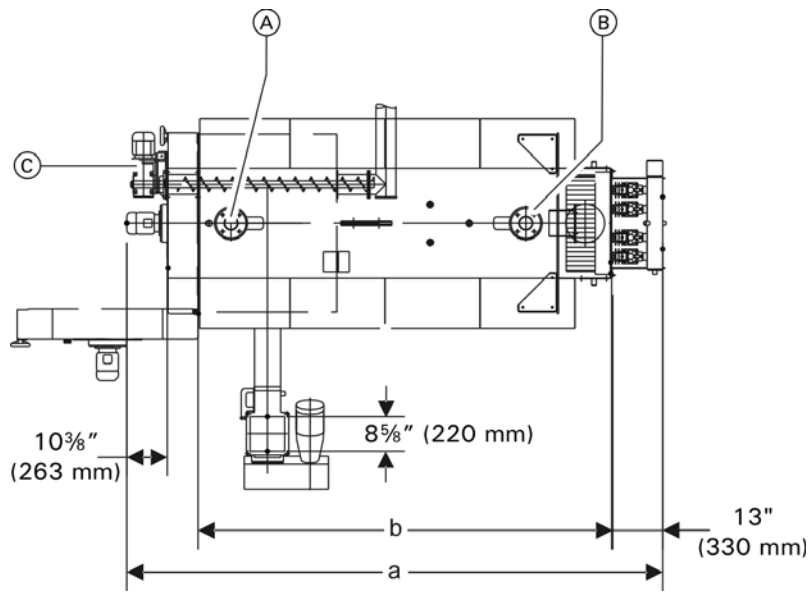


Dimensions

Boiler Model RF-		150	220	300	400	540
a	in. (mm)	15 ⁷ / ₁₆ (392)	16 (406)	16 (406)	18 ³ / ₈ (466)	18 ³ / ₈ (466)
b	in. (mm)	60 ⁵ / ₈ (1541)	60 (1525)	73 ¹³ / ₁₆ (1875)	70 ⁷ / ₈ (1800)	79 ¹⁵ / ₁₆ (2030)
c	in. (mm)	14 ¹ / ₁₆ (358)	14 ¹ / ₁₆ (358)	13 ⁷ / ₈ (352)	14 ³ / ₄ (375)	14 ³ / ₄ (375)
d	in. (mm)	75 ¹ / ₈ (1908)	85 ³ / ₈ (2168)	86 ¹ / ₈ (2182)	96 ³ / ₄ (2457)	99 ¹ / ₂ (2527)
e	in. (mm)	11 ¹⁵ / ₁₆ (303)	12 ⁷ / ₁₆ (316)	12 ⁷ / ₁₆ (316)	12 ⁹ / ₁₆ (319)	12 ⁹ / ₁₆ (319)
f	in. (mm)	43 (1093)	46 ⁷ / ₁₆ (1179)	46 ⁷ / ₁₆ (1179)	48 (1219)	50 ³ / ₈ (1279)
g	in. (mm)	3 (DN 80)	3 (DN 80)	5 (DN 125)	5 (DN 125)	5 (DN 125)
h	in. (mm)	122 ¹³ / ₁₆ (3120)	134 ¹³ / ₁₆ (3424)	148 ¹³ / ₁₆ (3780)	157 ⁵ / ₈ (4004)	166 ⁵ / ₈ (4232)
k	in. (mm)	14 ⁹ / ₁₆ (370)	14 ⁹ / ₁₆ (370)	17 ⁵ / ₁₆ (440)	17 ⁵ / ₁₆ (440)	24 ⁹ / ₁₆ (548)
l	in. (mm)	34 ¹ / ₄ (870)	45 ¹ / ₄ (1150)	45 ¹ / ₄ (1150)	54 ³ / ₄ (1390)	54 ³ / ₄ (1390)
m	in. (mm)	69 ¹ / ₂ (1765)	79 ¹¹ / ₁₆ (2024)	79 ¹¹ / ₁₆ (2024)	89 ¹ / ₁₆ (2262)	91 ¹³ / ₁₆ (2332)
n	in. (mm)	71 ⁷ / ₈ (1825)	82 ¹ / ₁₆ (2084)	82 ¹ / ₁₆ (2084)	95 ³ / ₈ (2422) *1	98 ¹ / ₈ (2492) *1
o	in. (mm)	27 ⁹ / ₁₆ (700)	27 ⁹ / ₁₆ (700)	27 ⁹ / ₁₆ (700)	27 ⁹ / ₁₆ (700)	29 ³ / ₁₆ (742)
p	in. (mm)	34 ¹ / ₄ (870)	45 ¹ / ₄ (1150)	45 ¹ / ₄ (1150)	54 ³ / ₄ (1390)	54 ³ / ₄ (1390)
q	in. (mm)	26 ¹ / ₂ (673)	26 ¹ / ₂ (673)	26 ¹ / ₂ (673)	26 ¹ / ₂ (673)	29 ¹ / ₂ (750)
r	in. (mm)	41 ³ / ₈ (1050)	52 ³ / ₈ (1330)	52 ³ / ₈ (1330)	61 ⁷ / ₈ (1570)	61 ⁷ / ₈ (1570)

*1 For Vitoflex 300-RF 400/540 - Suspension gear is detachable.

Boiler Dimensions *(continued)*



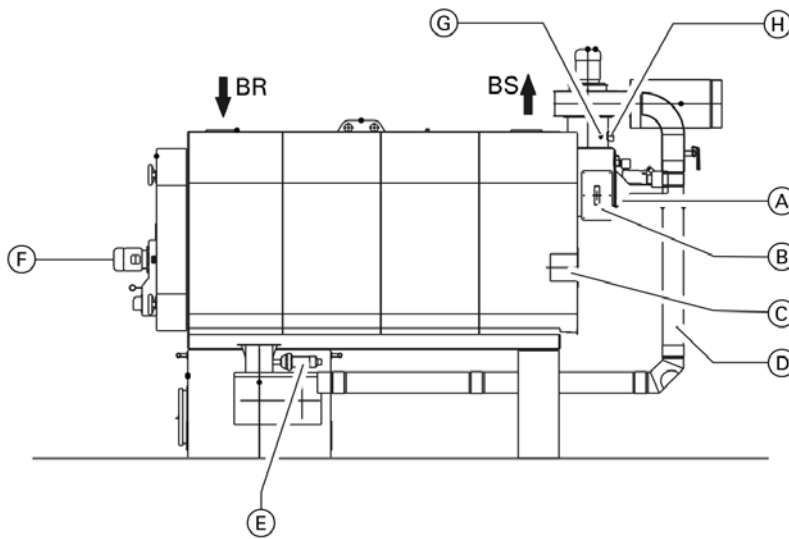
Legend

- Ⓐ Boiler Return
- Ⓑ Boiler Supply
- Ⓒ Automatic de-ashing system (optional)

Dimensions

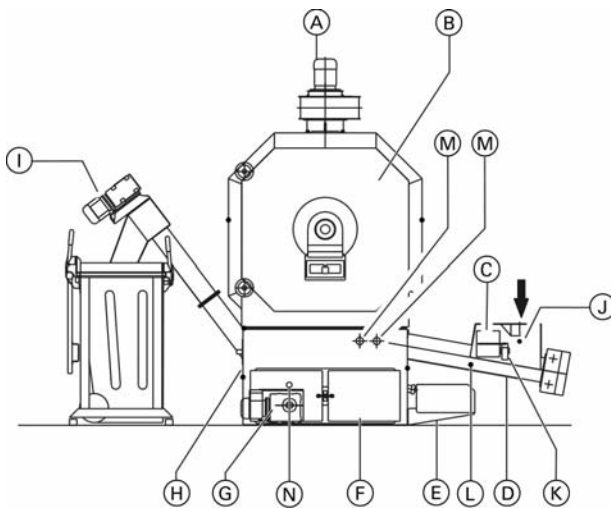
Boiler Model RF-		150	220	300	400	540
a	in. (mm)	119½ (3035)	120½ (3059)	134 ⁷ / ₁₆ (3415)	136 ¹ / ₈ (3457)	145 ¹ / ₁₆ (3685)
b	in. (mm)	88 ⁹ / ₁₆ (2250)	89½ (2274)	103 ⁹ / ₁₆ (2630)	102 ¹⁵ / ₁₆ (2614)	111 ⁷ / ₁₆ (2842)

Boiler Components



Legend

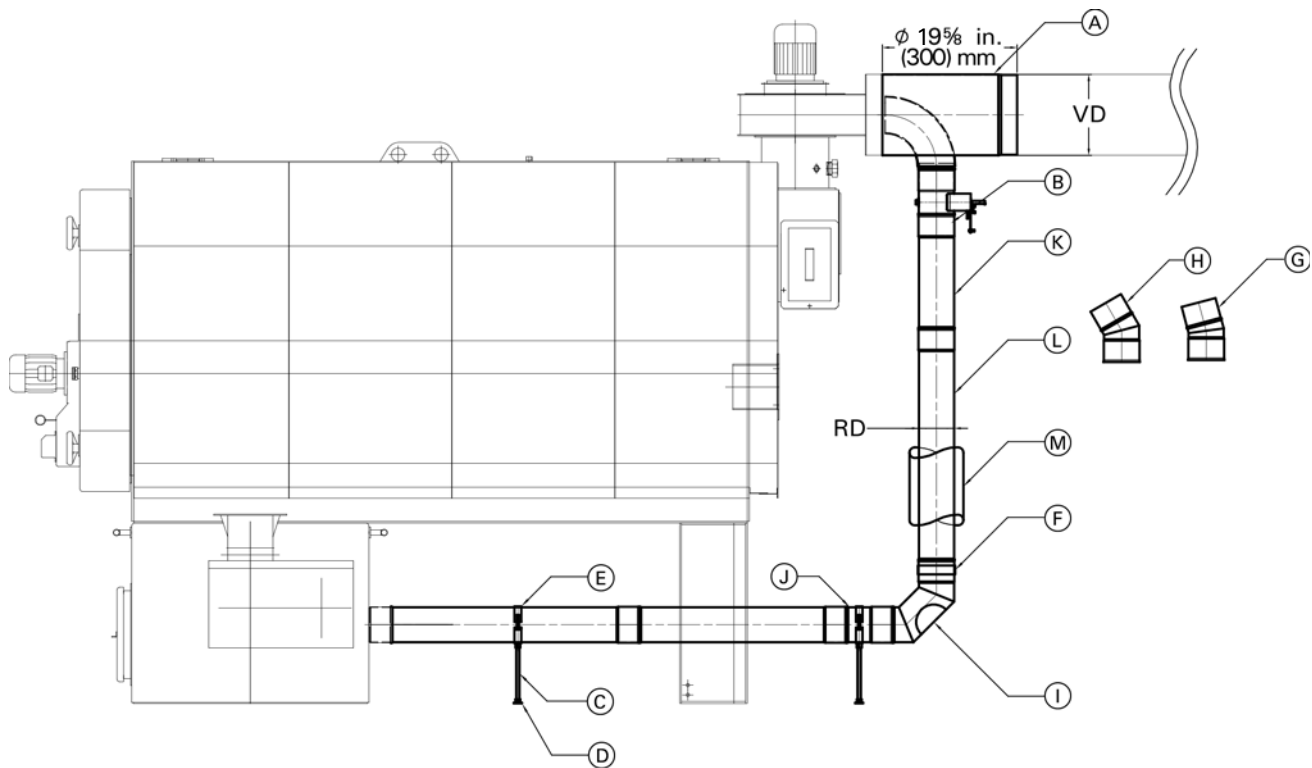
- (A) Pneumatic cleaning system (optional)
- (B) Cleaning cover, flue gas collector, alternate port for the flue gas exhaust blower
- (C) Cover with sight glass
- (D) Recirculation gas line, line routing variable
- (E) Igniter
- (F) Rotary blower
- (G) Flue gas temperature sensor
- (H) Oxygen sensor
- BS Boiler Supply
- BR Boiler Return



Legend

- (A) Flue gas exhaust blower
- (B) Boiler door with rotating blower
- (C) Extinguishing water connection 3/4 in.
- (D) In-feed auger
- (E) Grate motor
- (F) Ash doors of the grate ash container (2 units)
- (G) Motor for automatic de-ashing assembly
- (H) Fire box
- (I) Incline auger for automatic de-ashing assembly
- (J) Light barrier for in-feed auger
- (K) Limit switch for maintenance cover
- (L) Temperature sensor for in-feed auger
- (M) Light barrier for ember monitoring (2 locations)
- (N) Light barrier for automatic de-ashing system

Recirculation System



Legend

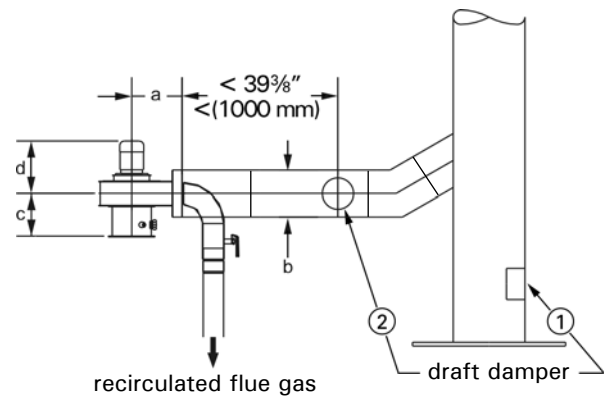
- (A) Vent piece with recirculation adaptor
 - (B) Recirculation system damper
 - (C) Threaded rod M12 39 $\frac{3}{8}$ in. (1000 mm)
 - (D) Base plate M12 (x4)
 - (E) Pipe clamp M12 (x4)
 - (F) Pipe clamp fitting (x16)
 - (G) Elbow 15° (x2)
 - (H) Elbow 30° (x2)
 - (I) Elbow 90° with cleanout (x3)
 - (J) Pipe 9 $\frac{7}{8}$ in. (250 mm) (x3)
 - (K) Pipe 19 $\frac{5}{8}$ in. (500 mm) (x3)
 - (L) Pipe 39 $\frac{3}{8}$ in. (1000 mm) (x3)
 - (M) Insulation (optional) (x5)
- RD Recirculation pipe diameter, for Vitoflex 300-RF 150 and 220 is 3 $\frac{1}{8}$ in. (80 mm), for Vitoflex 300-RF, 400 and 540 is 5 $\frac{1}{8}$ in. (130 mm).
- VD Vent pipe diameter, for Vitoflex 300-RF 150 and 220 is 9 $\frac{7}{8}$ in. (250 mm), for Vitoflex 300-RF is 11 $\frac{7}{8}$ in. (300 mm), for Vitoflex 300-RF 400 and 540 is 13 $\frac{7}{8}$ in. (350 mm).

Chimney Connection

It is recommended to install a draft damper in the chimney ①. The draft damper is field supplied.

The optional draft damper can be installed in the flue gas pipe of the biomass boiler ②.

The draft damper should be installed in the flue gas pipe as close as possible to the chimney not closer than 39³/₈ in. (1000 mm) to the outlet of the flue gas exhaust blower. The final position has to be arranged with the chimney supplier. The draft damper must be installed in the heating room together with the biomass boiler.



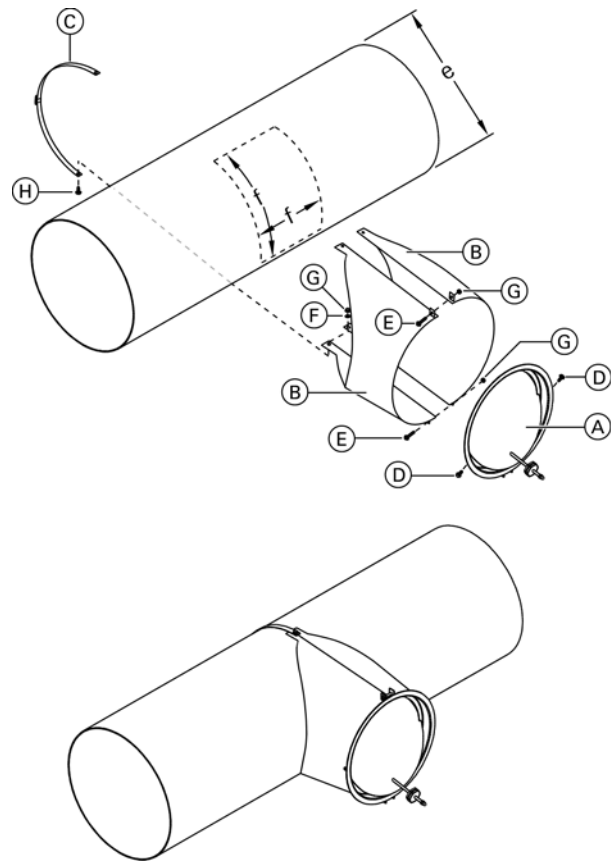
Dimensions

Boiler Model		RF 150	RF 220	RF 300	RF 400	RF 540
a	in. (mm)	11 ¹ / ₂ (292)	11 ¹ / ₂ (292)	12 ¹¹ / ₁₆ (323)	12 ¹¹ / ₁₆ (323)	17 ³ / ₈ (442)
b	in. (mm)	9 ⁷ / ₈ (250)	9 ⁷ / ₈ (250)	11 ⁷ / ₈ (300)	13 ⁷ / ₈ (350)	13 ⁷ / ₈ (350)
c	in. (mm)	9 ¹ / ₈ (232)	10 ¹ / ₈ (257)	10 ⁷ / ₈ (277)	14 (355)	14 (355)
d	in. (mm)	14 ¹ / ₁₆ (358)	14 ¹ / ₁₆ (358)	13 ⁷ / ₁₆ (352)	14 ³ / ₄ (375)	14 ³ / ₄ (375)
e	in. (mm)	9 ⁷ / ₈ (250)	9 ⁷ / ₈ (250)	11 ³ / ₄ (300)	13 ³ / ₄ (350)	13 ³ / ₄ (350)
f	in. (mm)	4 ⁷ / ₈ (125)	4 ⁷ / ₈ (125)	5 ⁷ / ₈ (150)	6 ⁷ / ₈ (175)	6 ⁷ / ₈ (175)

Assembly instructions for the draft damper:

Note: Before installing the draft damper, make sure to install the draft damper door in the right orientation, with the weight located at the bottom.

1. Cut an opening in the flue gas pipe (field supplied) according to the flue gas pipe size (see dimensions in the chart above).
2. Place the clamping band ③ over the flue gas pipe and place one of the draft damper adapters ② over the clamping band ③ and mark the mounting holes on the clamping band ③.
3. Cut the clamping band ③ to the outside of the marked holes and drill a ³/₁₆ in. (4 mm) hole in each of the marked areas of the clamping band ③. (refer to the chimney connection drawing above)
4. Assemble the two draft damper adapters ② with bolt ⑤ and nut ⑦.
5. Fasten the clamping band ③ and the draft damper adaptor assembly over the cut opening with bolt ④, washer ⑥ and nut ⑦.
6. Insert the draft damper door ① into the draft damper opening (with the weight to the bottom of the door) and fasten together with screws ⑧.
7. Tighten all fasteners and seal all gaps with heat resistant silicon [rated at 650°F (343°C)].
8. Adjust the balancing weight on the draft damper door ① to 10 Pa or 2 in. (50 mm) from the damper door.



Legend

- | | |
|-----------------------------|-------------------|
| ① Draft damper door | ⑤ Bolt M4x30 (x2) |
| ② Draft damper adapter (x2) | ⑥ Washer (x2) |
| ③ Clamping band | ⑦ Nut M4 (x4) |
| ④ Screw ST3.9x13 (x2) | ⑧ Bolt M4x12 (x2) |

Flue Gas Cyclone

The flue gas cyclone minimizes dust emissions and is designed as a multi cyclone with axial function. The de-duster is fully insulated and has three covers for cleaning. The flue gas cyclone for 300 RF is an option, and is not generally required when burning pellets but is recommended when burning chips.

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).

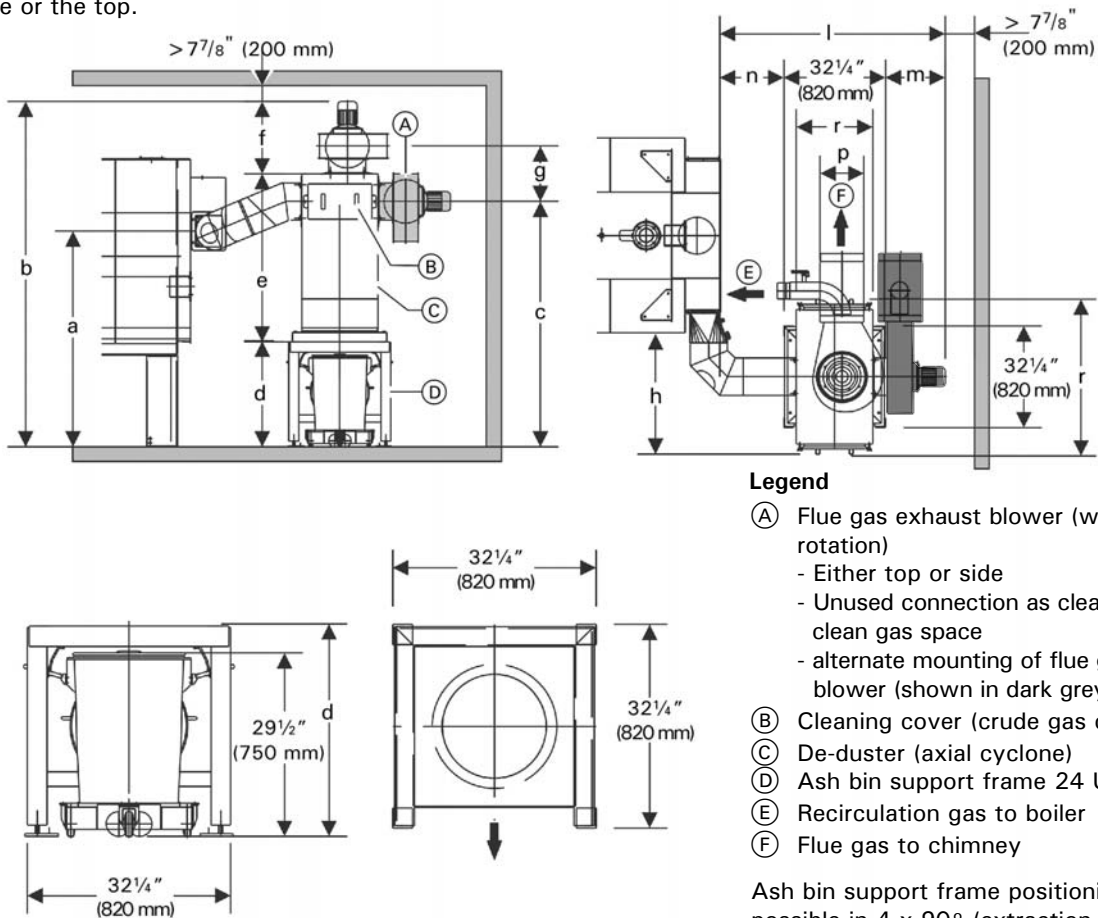
The ash box has a carriage and is connected to the de-duster with quick-action fasteners. It can easily be pulled out for emptying. The blower can be installed either on the side or the top.

Supplied with:

- 1 flue gas cyclone
- 1 ash container 24 USG (90 L)

CAUTION

The effects of heat can create dangerous conditions.



Legend

- Ⓐ Flue gas exhaust blower (with variable rotation)
 - Either top or side
 - Unused connection as cleaning cover, clean gas space
 - alternate mounting of flue gas exhaust blower (shown in dark grey)
- Ⓑ Cleaning cover (crude gas chamber)
- Ⓒ De-duster (axial cyclone)
- Ⓓ Ash bin support frame 24 USG (90 L)
- Ⓔ Recirculation gas to boiler
- Ⓕ Flue gas to chimney

Ash bin support frame positioning is possible in 4 x 90° (extraction, ash bin)

Boiler Model		RF 150	RF 220/300	RF 400	RF 540
a	in. (mm)	59 ⁷ / ₈ (1521)	64 ¹ / ₈ (1628)	65 ³ / ₄ (1671)	68 ⁹ / ₁₆ (1741)
b	in. (mm)	90 (2285)	100 ¹ / ₂ (2552)	106 ³ / ₈ (2702)	109 ⁵ / ₁₆ (2776)
c	in. (mm)	59 ³ / ₄ (1518)	69 ⁷ / ₈ (1775)	73 ¹³ / ₁₆ (1875)	76 ³ / ₄ (1949)
d	in. (mm)	33 ⁵ / ₁₆ (846)	33 ⁵ / ₁₆ (846)	33 ⁵ / ₁₆ (846)	36 ¹ / ₄ (920)
e	in. (mm)	35 ⁷ / ₁₆ (899)	45 ¹ / ₂ (1156)	49 ⁷ / ₁₆ (1256)	49 ⁷ / ₁₆ (1256)
f	in. (mm)	21 ¹ / ₄ (540)	21 ⁵ / ₈ (550)	23 ⁵ / ₈ (600)	23 ⁵ / ₈ (600)
g	in. (mm)	16 ¹⁵ / ₁₆ (430)	16 ¹¹ / ₁₆ (424)	17 ⁵ / ₈ (447)	17 ⁵ / ₈ (447)
h	in. (mm)	21 ⁷ / ₁₆ (545)	20 ⁷ / ₈ (530)	38 ¹ / ₂ (977)	38 ¹ / ₂ (977)
l	in. (mm)	64 ⁹ / ₁₆ (1640)	56 ¹¹ / ₁₆ (1440)	70 ¹ / ₂ (1790)	70 ¹ / ₂ (1790)
m	in. (mm)	16 ⁵ / ₁₆ (414)	16 ⁵ / ₁₆ (414)	18 ⁷ / ₈ (480)	18 ⁷ / ₈ (480)
n	in. (mm)	11 (280)	14 ⁹ / ₁₆ (370)	14 ⁹ / ₁₆ (370)	14 ⁹ / ₁₆ (370)
p	in. (mm)	7 ⁷ / ₈ (200)	9 ⁷ / ₈ (250)	11 ¹³ / ₁₆ (300)	11 ¹³ / ₁₆ (300)
r	in. (mm)	30 ¹¹ / ₁₆ (780)	30 ¹¹ / ₁₆ (780)	49 ⁵ / ₈ (1260)	49 ⁵ / ₈ (1260)

Metal Mesh Filter

The metal mesh filter removes dust and fine dust from the flue gas. It is characterized by a particularly high degree of separation. This ensures a fine dust content of less than 20 mg/Nm³ in the clean gas. The flue gas cyclone is not required when using the metal mesh filter.

The metal mesh filter compresses two block shaped units joined together. The compact design enables it to also be used in low level boiler rooms. The filter cartridges are robust and resistant to a shower of sparks.

Function:

The filter is operated under negative pressure. With the cylindrical filter cartridges, the flow is from outside in. The filter cartridges are protected against condensation by means of a heating system and are therefore protected against corrosion.

In the case of boiler demand, the filter cartridges are preheated. If the set filter temperature is reached, boiler start-up operation is enabled. If the temperature falls below the filter temperature set point, the filter heating system starts in heating mode.

The filters are cleaned automatically in the counter current. This means that the dust layer on the mesh is regularly discarded into the ash box.

Filter operation is controlled via the boiler control unit. Operation is carried out via the control unit programming module.

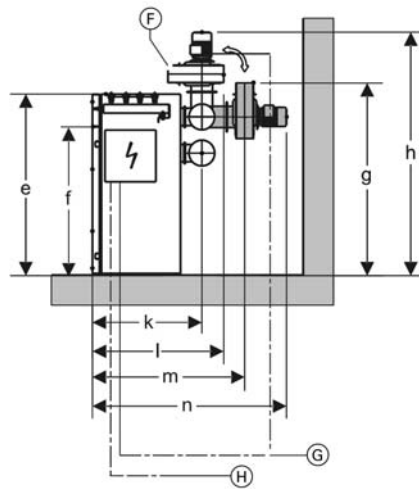
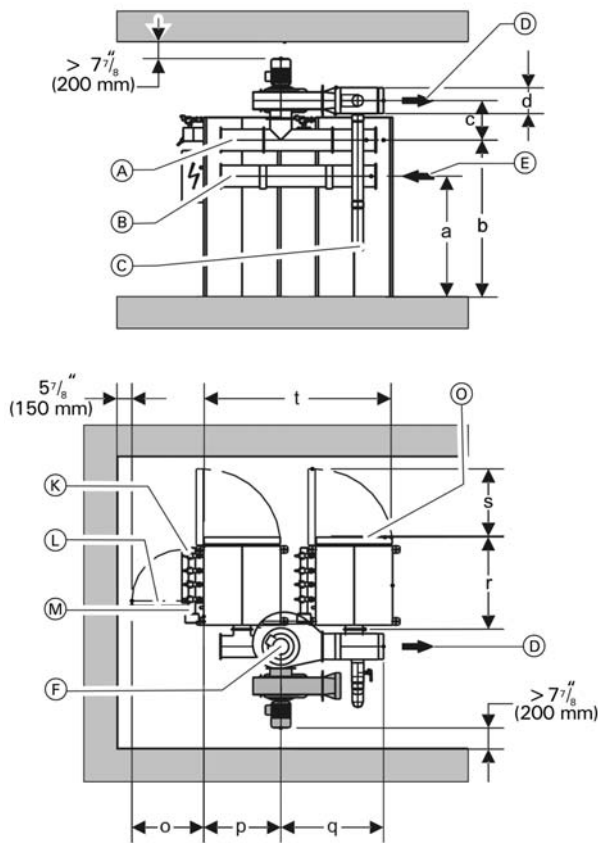
Supplied with:

- Two-part, insulated filter casing with:
 - Hinged doors, lockable by means of a quick-action fastener and lock
 - Maintenance cover for clean gas space
 - Filter cartridges
 - Ash box
- Electric heater
- Pneumatic cleaning
- Flue gas exhaust blower for boiler and filter
- Control panel fully wired.

On-site tasks:

Provision of a compressor or a connection to a compressed air line system [adjustable pressure level 4-6 bar (60-90 psi)] and a power supply of 208/3/60.

Metal Mesh Filter *(continued)*



Legend

- (A) Clean gas collector
- (B) Crude gas distributor (connection possible on both sides)
- (C) Recirculation gas connection
- (D) Clean gas to chimney
- (E) Crude gas from boiler (connection possible on both sides)
- (F) Flue gas exhaust blower (with variable rotation)
(alternate mounting of flue gas blower shown in dark grey)
- (G) Control panel Ecocontrol
- (H) Power supply 208/3/60
- (K) Pneumatic cleaning system
- (L) Control panel door
- (M) Compressed air connection
- (O) Filter door

Dimensions

Boiler Model RF-		220	300	400
a	in. (mm)	55 ⁵ / ₈ (1413)	55 ⁵ / ₈ (1413)	55 ⁵ / ₈ (1413)
b	in. (mm)	72 ³ / ₁₆ (1833)	72 ³ / ₁₆ (1833)	72 ³ / ₁₆ (1833)
c	in. (mm)	18 ¹ / ₈ (460)	18 ¹ / ₈ (460)	18 ¹ / ₈ (460)
d	in. (mm)	11 ¹³ / ₁₆ (300)	11 ¹³ / ₁₆ (300)	13 ³ / ₄ (350)
e	in. (mm)	82 ⁹ / ₁₆ (2096)	82 ⁹ / ₁₆ (2096)	82 ⁹ / ₁₆ (2096)
f	in. (mm)	67 ³ / ₄ (1720)	67 ³ / ₄ (1720)	67 ³ / ₄ (1720)
g	in. (mm)	87 ¹³ / ₁₆ (2230)	87 ¹³ / ₁₆ (2230)	87 ¹³ / ₁₆ (2230)
h	in. (mm)	111 (2820)	111 (2820)	111 ¹ / ₄ (2827)
k	in. (mm)	50 (1270)	50 (1270)	55 ¹ / ₈ (1400)
l	in. (mm)	65 ³ / ₄ (1670)	65 ³ / ₄ (1670)	67 ⁵ / ₈ (1717)
m	in. (mm)	68 ¹ / ₈ (1730)	68 ¹ / ₈ (1730)	69 ¹¹ / ₁₆ (1770)
n	in. (mm)	88 ³ / ₄ (2255)	88 ³ / ₄ (2255)	94 ¹ / ₂ (2400)
o	in. (mm)	33 ¹ / ₁₆ (840)	33 ¹ / ₁₆ (840)	33 ¹ / ₁₆ (840)
p	in. (mm)	35 ⁷ / ₁₆ (900)	35 ⁷ / ₁₆ (900)	35 ⁷ / ₁₆ (900)
q	in. (mm)	46 ¹⁵ / ₁₆ (1192)	46 ¹⁵ / ₁₆ (1192)	47 (1040)
r	in. (mm)	42 ¹⁵ / ₁₆ (1069)	42 ¹⁵ / ₁₆ (1069)	42 ¹⁵ / ₁₆ (1069)
s	in. (mm)	31 ¹ / ₂ (800)	31 ¹ / ₂ (800)	31 ¹ / ₂ (800)
t	in. (mm)	86 ⁵ / ₈ (2200)	86 ⁵ / ₈ (2200)	86 ⁵ / ₈ (2200)

Weight

Transport weight	lb. (kg)	1036 + 1036 (470 + 470)	1081 + 1081 (490 + 490)	1081 + 1081 (470 + 470)
Total weight	lb. (kg)	2073 (940)	2117 (960)	2161 (980)

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Safety Devices

1. Install the pressure relief valve, discharge pipe, air vent and pressure gage 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).
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 used 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.

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).

Boiler system with return 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-RF rotating combustion chamber 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).

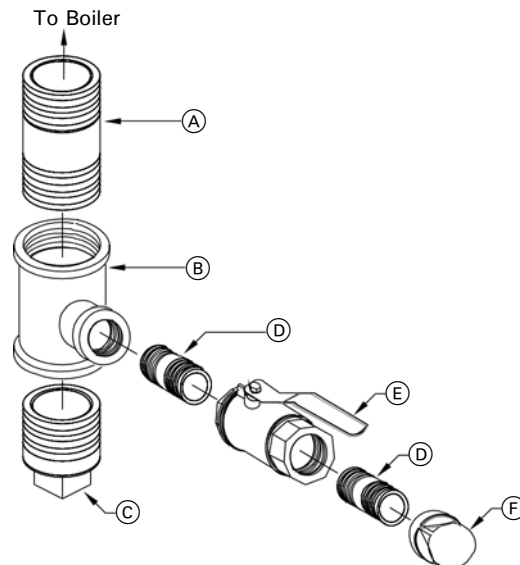
The activation of the boiler pump and boiler mixing valve is integrated in the custom control panel.

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).

Drain inspection port



Legend

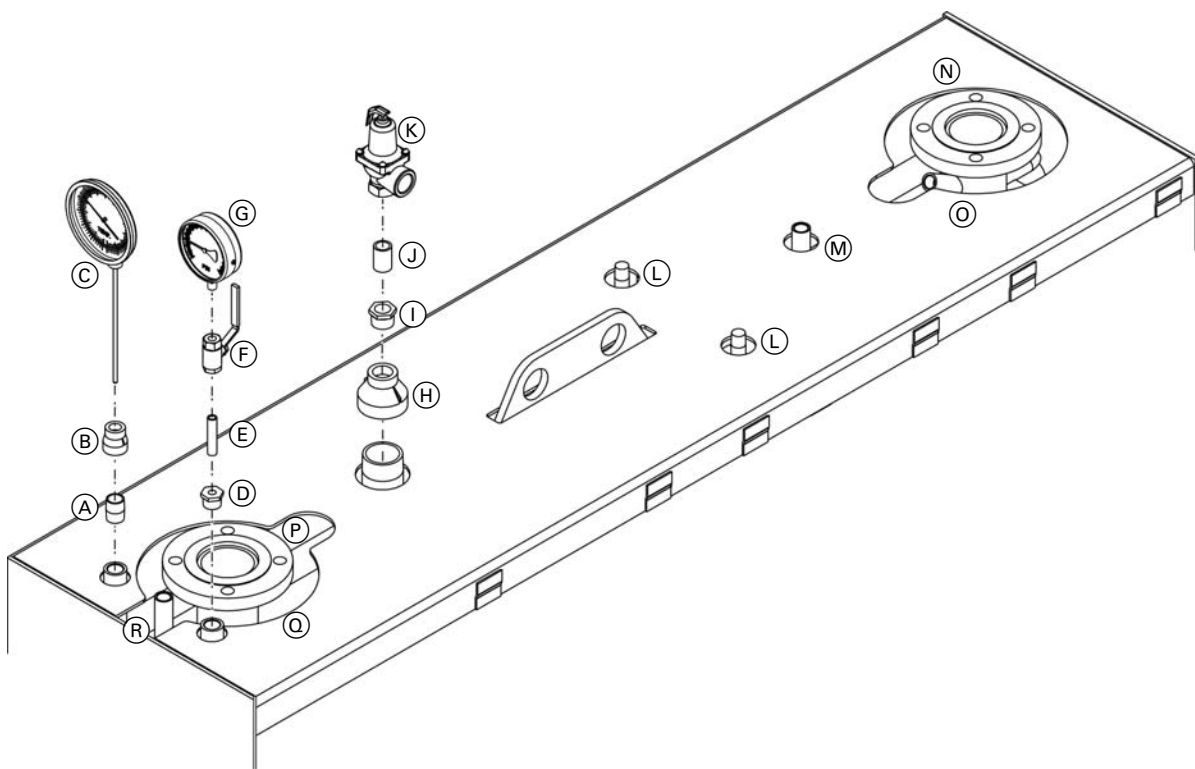
- (A) Nipple, 3 in. x 5 in.
- (B) Reducing Tee 3 x 3 x 1 1/2 in.
- (C) Plug 3 in.
- (D) Nipple 1 1/2 in. x 2 in.
- (E) Ball valve 1 1/2 in.
- (F) Cap 1 1/2 in.

Safety Devices *(continued)*

The safety equipment for the heating installation must be installed by the 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) Reducing coupling
- (I) Reducing bushing
- (J) Nipple
- (K) Pressure relief valve, 30 psi or 60 psi
- (L) Safety heat exchanger connections, NPTM 1/2 in. ¹
- (M) Sensor well - fixed high limit
- (N) 3 in. or 4 in. Boiler supply flange ²
- (O) Supply sensor well (sensor supplied)
- (P) Return sensor well (sensor supplied)
- (Q) 3 in. or 4 in. Boiler return flange ²
- (R) Sensor well for thermal safety flush valve (R1/2 in.) (sensor supplied)

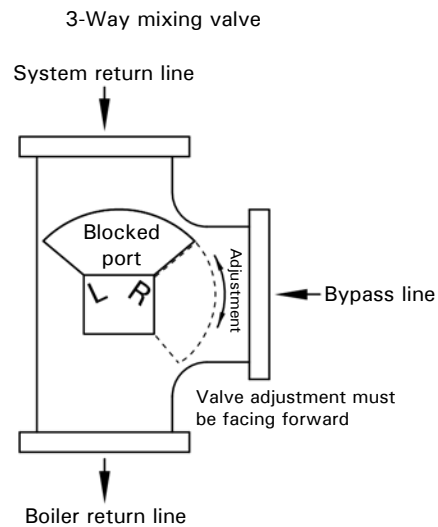
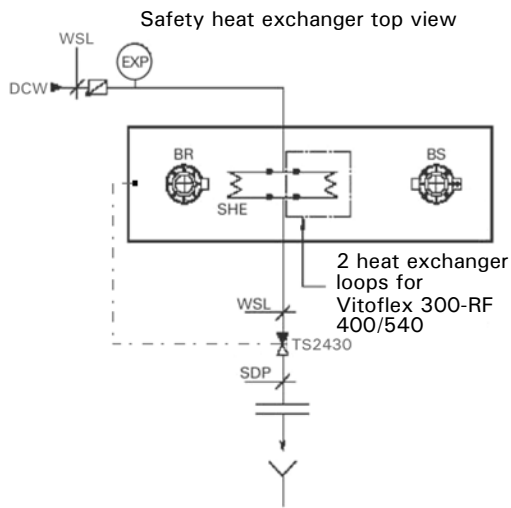
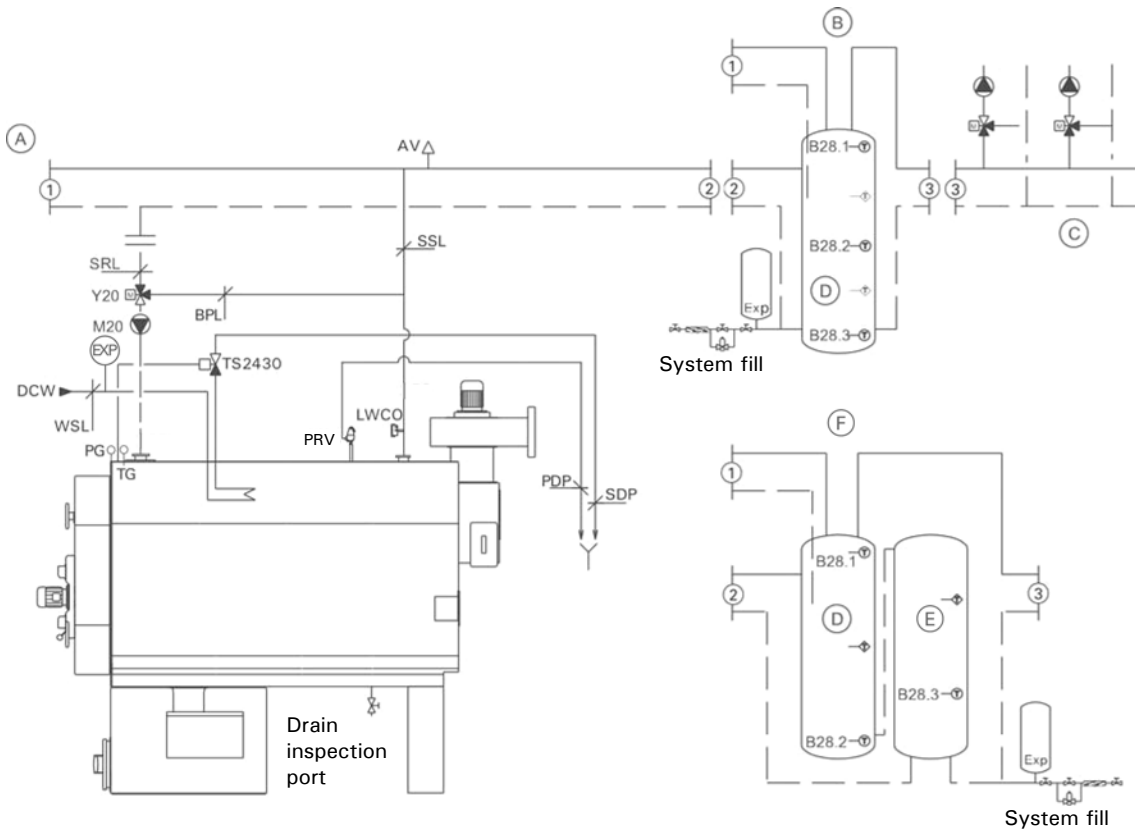


¹ See section piping and installation of safety devices

² 3 in. boiler flange for Vitoflex 300-RF 150-300, 4 in. boiler flange for Vitoflex 300-RF 400-540

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



Legend

- (A) Additional heat source
- (B) Thermal storage tank as low loss header (option A) (3 sensors, optionally 5 sensors)
- (C) Distributor, heat consumer
- (D) Thermal storage tank #1
- (E) Thermal storage tank #2
- (F) Two thermal storage tanks as low loss header (option B)(3 sensors, optionally 5 sensors)

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 3-way mixing valve are provided according to the tables below. The boiler circuit should be designed that the temperature difference between the supply and the return temperature is equal to or less than Δt 27°F (15°C).
 The expansion tank has to be connected to the boiler without any shut-offs.

Safety equipment included in the scope of supply provided by Viessmann:

- **M 20** Boiler pump
- **Y 20** Boiler 3-way 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 the boiler).
 The Vitoflex 300-RF 150 to Vitoflex 300-RF 300 have one safety heat exchanger loop and require one thermal safety flush valve. The Vitoflex 300-RF 400 and Vitoflex 300-RF 540, have two safety heat exchanger loops and require one thermal safety flush valve.
- **LWCO** Low water cut-off
- **PG** Pressure gauge
- **TG** Temperature gauge (thermometer)
- **SHE** Safety heat exchanger, water volume 1.1 USG (4.2 L) per loop, NPTM ½ in.

Equipment to be supplied by the installing heating contractor:

- 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
- 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

Design recommendation:

Thermal safety flush valve

Boiler Model RF-	Thermal safety flush valve TS-2430 (Quantity)	Water through-put required at 36 psi (2.5 bar)		Supply line WSL	Drain pipe SDP ²
		L/h	GPM		
150	1	915	4	R ¾ in.	R 1 in.
220	1	1230	5.4	R ¾ in.	R 1 in.
300	1	1500	6.6	R ¾ in.	R 1 in.
400	1	1880	8.3	R ¾ in.	R 1 in.
540	1	2226	10	R ¾ in.	R 1 in.

Pressure relief valve

Boiler Model RF-	Pressure relief valve Conbraco ¹ 30 psi or 60 psi		Pressure relief valve drain pipe PDP ² 30 psi or 60 psi	
	1 in.	¾ in.	1 ¼ in.	1 in.
150	1 in.	¾ in.	1 ¼ in.	1 in.
220	1 in.	¾ in.	1 ¼ in.	1 in.
300	1 ¼ in.	1 in.	1 ½ in.	1 ¼ in.
400	1 ¼ in.	1 ¼ in.	1 ½ in.	1 ½ in.
540	1 ½ in.	1 ¼ in.	2 in.	1 ½ in.

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	Freq.	Voltage and phase	Speed
RF 150	UPS 32-80 F	60 Hz	3 ph 208VAC	3
RF 220	UPS 40-80/4 F	60 Hz	3 ph 208VAC	1
RF 300	UPS 50-80/4 F	60 Hz	3 ph 208VAC	2
RF 400	UPS 80-80/4 F	60 Hz	3 ph 208VAC	2
RF 540	UPS 80-80/4 F	60 Hz	3 ph 208VAC	3

Mixing valve

Boiler model	Nominal pipe size	Valve
RF 150	2½ in.	3-way mixing valve
RF 220	2½ in.	3-way mixing valve
RF 300	3 in.	3-way mixing valve
RF 400	3 in.	3-way mixing valve
RF 540	4 in.	3-way mixing valve

Viessmann ASME recommended tank sizes (U-stamped)

Boiler model	Tank size	
	L	USG
RF 150	1514	400
RF 220	2006	530
RF 300	2650	700
RF 400	3785	1000
RF 540	5678	1500

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 safety flush valve.

Protection against back-burn for the boiler plant

The following safeguards are part of the scope of supply for the Vitoflex 300-RF Rotating Combustion System:

- **Preventing overfilling of the combustion chamber**
A level monitor must be installed to prevent overfilling of the combustion chamber. The Vitoflex 300-RF Rotating Combustion 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
- **Back flash safeguard**
The Vitoflex 300-RF Rotating Combustion System is operated with continuous negative pressure and is equipped with a backflash prevention device. This device prevents backflashes 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-RF Rotating Combustion 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-RF Rotating Combustion 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. over pressure allowed in fuel storage unit:
+ 500 Pa / + 2.00"wc.

Max. negative pressure allowed in fuel storage unit:
+ 0 Pa / + 0"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. over pressure allowed in fuel storage unit:
+ 3000 Pa / + 12"wc.

Max. negative pressure allowed in fuel storage unit:
-3000 Pa / -12"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.

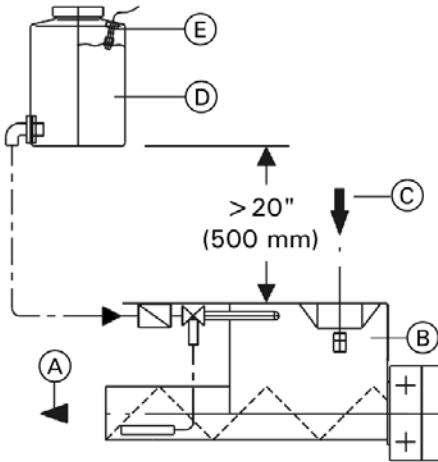
Fire Extinguishing Systems

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 a back-burn. The activation temperature is approx. 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 1/2 in. valve (as short as possible).
- Valve thermostatic, Danfoss AVTA 15 122-194°F (50- 90°C) position 3 equals approximately 176°F (80°C).
- The lines must be executed as hard piping in metal (1/2 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.

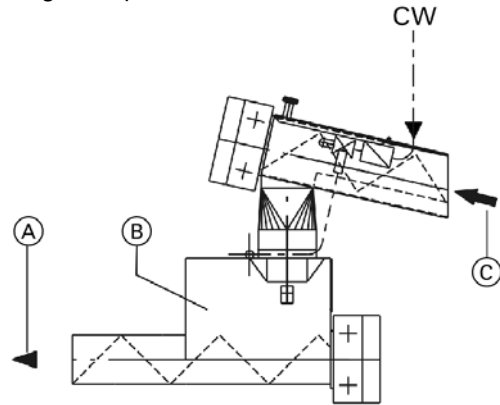


Legend

- (A) Combustion
 - (B) Metering Container
 - (C) Fuel supply
 - (D) Extinguishing water container 6.6 USG (25 L)
 - (E) N1 Floater switch
- CW Cold water supply 1/2 in. min. 30 psi (2.0 bar), max. 45 psi (3.0 bar)

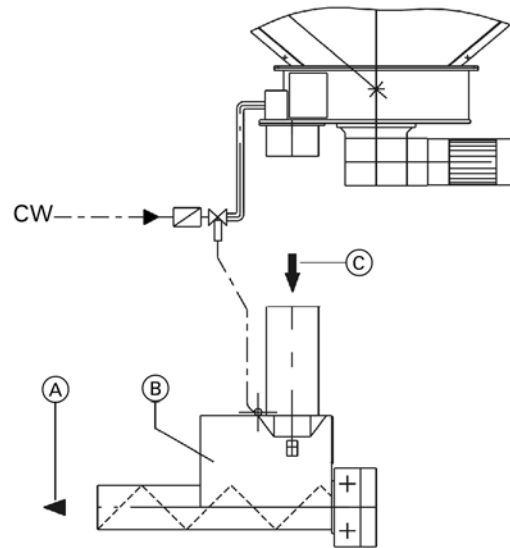
Fire extinguishing system for the conveyor auger

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



Fire extinguishing system for the down pipe

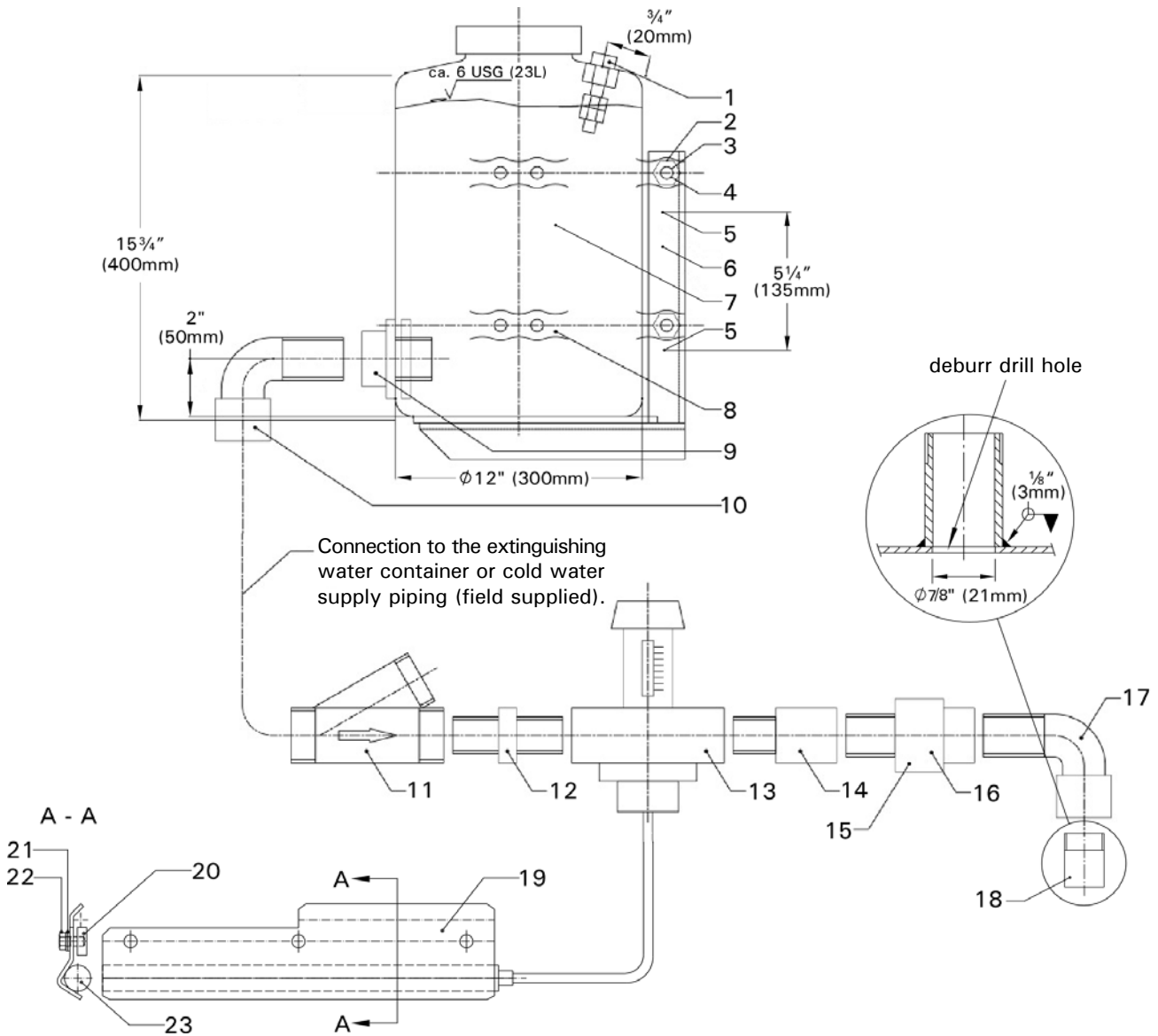
Note: The fire extinguishing system for the down pipe is optional.



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

- The lines must be executed as hard piping in metal (1/2 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 (N1)
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 (25L)
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 as shown in section Assembly of the Fire Extinguishing System.

- 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, that the bending radius of the capillary tube does not exceed 2 in. (50 mm).

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 fuseable 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.

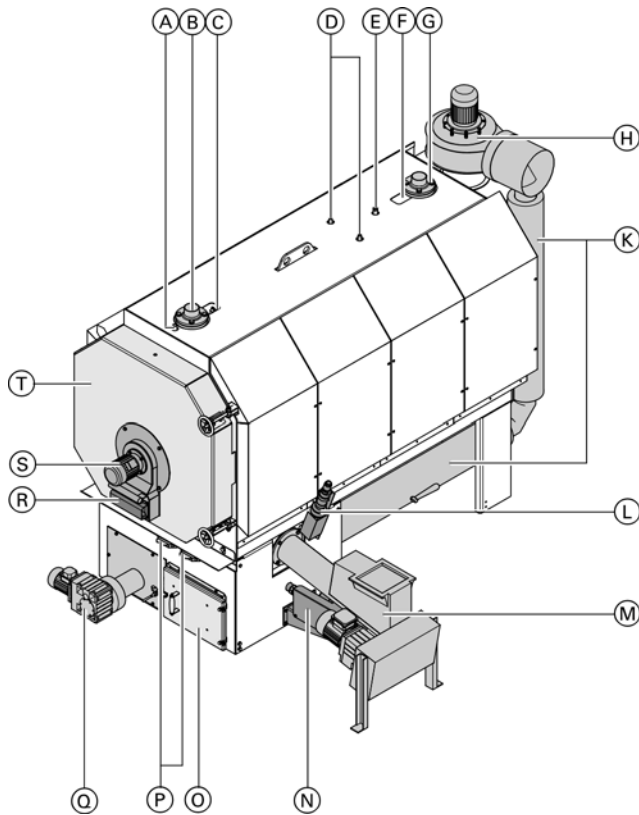
CAUTION

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.

Appliance Description



The Vitoflex 300-RF is an automatic solid fuel boiler with rotation combustion.

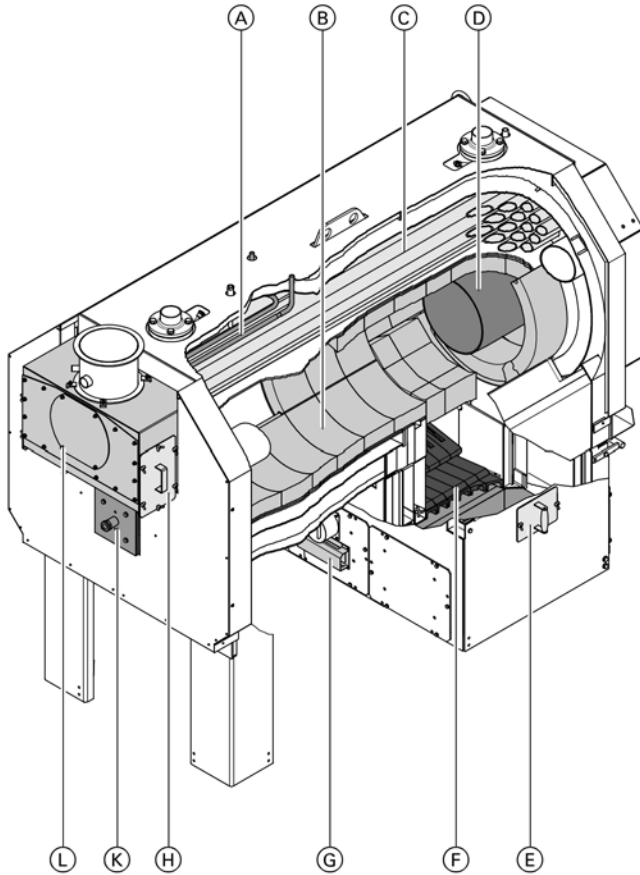
The boiler is made of steel. The lower section contains the infeed grate. The rotation combustion takes place in the combustion chamber above.

The Vitoflex 300-RF is designed for automatic fuel combustion. For fuel specifications, see from page 13.

Legend

- (A) Sensor well for thermally activated safety valve
- (B) Boiler return
- (C) Return temperature sensor
- (D) Connections, safety heat exchanger
- (E) Temperature sensor, high limit safety cut-out
- (F) Boiler water temperature sensor
- (G) Boiler supply
- (H) Flue gas fan
- (K) Flue gas recirculation line
- (L) Ignition fan
- (M) Feed
- (N) Grate drive
- (O) Cleaning hatch, ash box
- (P) Light barriers, firebed
- (Q) Automatic ash removal
- (R) Secondary air damper
- (S) Drive, rotation mechanism
- (T) Boiler door

Appliance Description *(continued)*



Legend

- Ⓐ Safety heat exchanger
- Ⓑ Combustion chamber
- Ⓒ Heat exchanger
- Ⓓ Guide pipe
- Ⓔ Inspection port
- Ⓕ Infeed grate
- Ⓖ Primary air damper
- Ⓗ Cleaning cover, flue gas collector
- Ⓚ Sight glass and connection for oil or gas burner
- Ⓛ Flue gas collector

Controller

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

Fuel supply

The fuel is transported via the feed on to the infeed grate. A feed screw conveyor is installed at the side for this purpose.

Infeed grate

On the infeed grate, the fuel is gasified under lack of oxygen. The movement of the infeed grate causes the ash to fall into the ash removal compartment.

Combustion chamber

Secondary air is supplied in rotation to the combustion chamber. Here, the combustion of the combustion gases takes place under rotary movement.

Flue gas recirculation

Part of the flue gas is re-supplied to the combustion on the infeed grate.

Ash removal

An optional ash removal screw automatically transports the ash out of the boiler. Without automatic ash removal the ash is collected in ash pans.

Boiler safety equipment

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

The safety heat exchanger must be connected via a thermally activated safety valve. 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

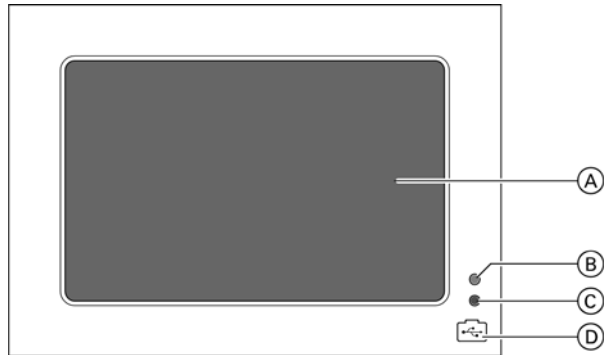
The Vitoflex 300-RF is part of an overall system. The boiler's sensors and drive units are connected with the control panel via the electrical installation. The heating system installation links the boiler to the heating system circuit. The energy generated is supplied to the consumers.

Operating States

In automatic mode, the boiler assumes various operating states as listed in the following table. The relevant current operating state is displayed on the programming unit. The order of the operating states normally follows the sequence detailed in the table, from "OFF" to "Burnout". The "Oil/gas operation" operating state is only intended for operation with an alternative heat generator.

Operating state	Description
"OFF"	The system is switched off.
"Zero air dampers"	The zero position of the air dampers (primary air, secondary air) is set anew for each normal cycle.
"Flush comb. chamber"	With each normal cycle, the combustion chamber is purged with ambient air.
"Fill hopper"	The hopper is filled up.
"Fill screw conveyor"	Warm start: The feed screw conveyor is filled with fuel. During this process, the feed screw conveyor operates with the "Screw conveyor fill time" parameter.
"Combustion chamber filling"	Cold start: Fuel is delivered via the feed on to the infeed grate. During this process, the feed screw conveyor operates with the "Combustion chamber fill time" parameter.
"Ignition"	The ignition system is in operation. The controller monitors the ignition process, see page 47.
"Load"	The system is in heating mode.
"Run screw conveyor until empty"	The feed screw conveyor is run to empty. The controller then switches to the "Burnout" operating state.
"Burnout"	Operating state after the system has been switched off via the programming unit or due to a fault, or when no more heat is needed (cylinder fully charged). A controlled system shutdown is performed. After burnout, the controller switches to the "OFF" operating state or to "Standby ON - OFF".
"Standby ON - OFF"	The system is switched on and the cylinder is charged. No additional heat is needed.
"Oil/gas operation"	Requirements: An alternative heat generator (oil or gas burner) has been fitted. The burner is in operation. With an oil or gas burner, only the "OFF" and "Oil/gas operation" operating states are possible.

Programming Unit



The programming unit is equipped with a touchscreen. To input settings and call up information, tap the on-screen buttons.

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



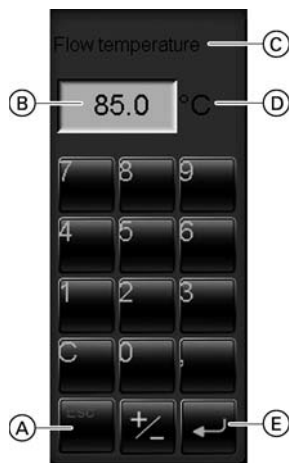
Assistance with touchscreen input

On some of the controller screens you can 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 tapping in the box by means of the keyboard.
- (C) Enter key
Saves the entered data and closes the keyboard.

Programming Unit *(continued)*



Number pad


Legend

- Ⓐ ESC key
The number pad is closed and no data is saved.
- Ⓑ Entry field
Contents can be changed by tapping in the box by means of the number pad.
- Ⓒ 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 detailed view and overview are accessed via the button in the footer.

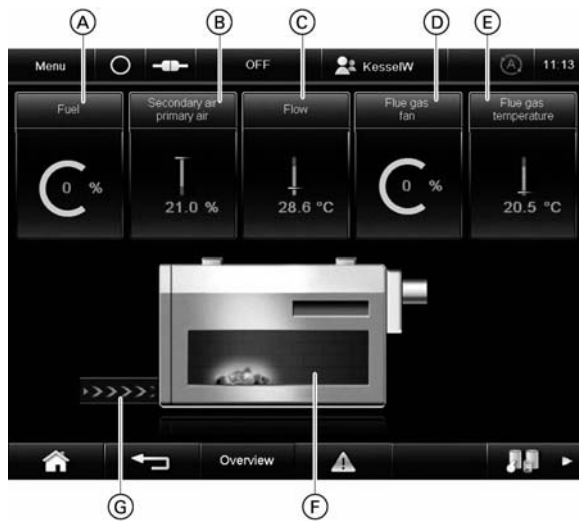
The "Fuel", "Secondary air", "Flow" and "Flue gas fan" buttons provide access to the relevant sub-area screen. If a component is in manual mode, this is indicated by the  symbol on the associated button.

The headers and footers of the default display follow the same structure in all user interfaces of the controller, see page 44.

Detailed view

In the detailed view, the most important actual value for each sub-area of the boiler is shown on large buttons Ⓐ to Ⓔ.

Default Display *(continued)*



Legend

- (A) "Fuel"
Displays fuel supply in %
- (B) "Secondary air"
Displays flue gas oxygen content in %
- (C) "Flow"
Displays flow temperature in °C
- (D) "Flue gas fan"
Displays flue gas fan utilisation level in %
- (E) "Flue gas temperature" (no button)
Displays flue gas temperature in °C
- (F) Boiler, animated flame
The flame is depicted in 3 sizes to indicate the current output.
- (G) Fuel supply, animated
Green arrows indicate that fuel is currently being supplied.














Legend

- (A) Header
- (B) Operating and display area
- (C) Footer

Overview display

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

Default Display *(continued)*

Header and footer on the programming unit	
Header	
"Menu"	This takes you to the menu screen, see page 46.
	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
	System fault
"Load" etc.	Shows the current operating state, see page 41.
"Boiler technician"	As Boiler technician, you can switch the heating system on and off and change system parameters. You can switch to the "Observer" user group.
"Observer"	As 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 on manual mode. When you do so, all components which are in manual mode are switched back to automatic mode.
	System is currently in automatic mode. Colour of symbol: Green
Time (e.g. 10:39)	Set the date and time via a window.
Footer	
	Returns you to the default display.
	Takes you back one level. 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
	Takes you to the auxiliary system screen, see page 71, 72.
	Takes you to the heat distribution screen, see page 73, 74.


Manual Mode and Calling up Further Information

The “Boiler”, “Auxiliary systems” and “Heat distribution” sub-area screens show the set values and actual values, as well as status information for the selected sub-area. The Manual mode and Automatic mode buttons enable you to operate components manually or automatically.

Sub-area screens for the boiler


The sub-area screens are accessed from the default display, via buttons “Fuel”, “Secondary air”, “Flow” and “Flue gas fan”. See page 70.

Sub-area screens for auxiliary systems

The screen for the auxiliary system can be accessed from the default display via the following button:  See page 71.


The sub-area screens for the auxiliary systems are accessed via buttons “Buffer cylinder”, “Default set value”, “Boiler 2”.

Sub-area screens for heat distribution

The screen for heat distribution can be accessed from the default display via the following button:  See page 73.

The sub-area screens for heat distribution are accessed via buttons “DHW circulation 1”, “DHW cylinder 2” and “Heating circuit 3”.

Parameters

On each sub-area screen, the sub-area’s parameter level can be accessed via the following button: 

The parameters may be assigned to several tabs. See page 48.

Menu



The “Menu” screen provides access to further screens with a variety of functions.

Tapping the button opens the associated screen. The functions are described in various sections of these instructions.

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

Function	Description
“Panel”	See page 63
“Operating data”	See the Service Instructions
“Diagrams”	See page 66
“Service”	Only for user group “Engineer”
“I/O modules”	See the Service Instructions
“Special functions”	See page 64 and page 65
“User administration”	See page 66
“Settings”	Only for user group “Engineer”

Information on Starting Up/Shutting Down

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

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.

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.

Starting Up

Switch on the system at the programming unit using the  button.

The combustion chamber is automatically filled with fuel. The controller switches to the "Ignition" operating state. The ignition fan is started.

The amount of fuel can be set on the programming unit, via parameters in the "Fuel" sub-area. Manual adjustment of the fuel amount is carried out via "Fuel supply", see page 70.

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. Also check the amount of fuel. If necessary increase the amount of fuel supplied. Acknowledge the fault message.


Shutting Down

Switch off the system via the  button.

The controller switches the system off automatically.

Parameter Level



On each sub-area screen, the  button 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.

Charging



“Feed” tab

Parameters	Description	Setting in	Setting range	Default value
“Combustion chamber fill time”	Feed screw conveyor runtime for supplying fuel. Only applies for cold starts, i.e. if the system has been switched off for longer than 6 hours. In the “Filling” operating state: If the hopper is empty, it is filled first until the light barrier triggers the feed. Note: For successful ignition there must be an adequate amount of fuel at the ignition system level after the combustion chamber fill time has elapsed.	seconds	10 to 1200	300
“Screw conveyor fill time”	Feed screw conveyor runtime for supplying fuel. Applies only to warm starts, i.e. when the combustion chamber temperature is sufficiently high.	seconds	10 to “Combustion chamber fill time” -10	60
“Dosing hopper, idle runtime”	Runtime of the feed screw conveyor until hopper is refilled	seconds	0 to 100	25
“Cycle after heatup” Left entry field	Cycle time in “Ignition” operating state	%	1 to 800	10
“Delay” Right entry field	Length of time after which the feed is enabled again	seconds	10 to 900	20

Charging *(continued)*

Parameters	Description	Setting in	Setting range	Default value
"Delay, O ₂ , heatup"	Length of time for which ignition is monitored in the "Ignition" operating state If the O ₂ value falls below 15 % for the set time, the boiler switches to the "Load" operating state.	seconds	50 to 300	90
"Min cycle, feed screw" 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.	seconds	1 to "Max cycle, feed screw" - 1	20
"Max cycle, feed screw" Right entry field	Upper cycle time limit in the "Load" and "Burnout" operating states	%	"Min cycle, feed screw" + 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.	%	20 to 90	70
"Firebed"/delay/ cycle ramp	Required size of firebed The size of the firebed is monitored with a light barrier, see "Fill levels" tab.	Via selection	"Small"/ "Large"	
Firebed/"delay"/ cycle ramp	Switching delay for firebed monitoring Once the firebed light barrier has been triggered, the fuel supply to the combustion chamber is stopped after the indicated time.	seconds	10 to 600	100
Firebed delay / "cycle ramp"	Once the firebed light barrier has been triggered, the feed cycle is reduced in 0.5 % steps. The cycle time is reduced until it equals half the current cycle time. "Cycle ramp" is used to set the interval between each step.	seconds	10 to 600	20

Charging *(continued)*



“Charging” tab

Parameters /column	Description	Setting in
“Delay ON”	Start delay for the component	seconds
“Delay OFF”	Shutdown delay	seconds
“Pulse”	On/off times for the component’s operation:	seconds
“Pause”	- Pulse = Component is on - Pause = Component is off Tip: Pause = 0 means continuous operation	seconds

Parameters	Description	Setting in	Setting range	Default value
“Conveyor system”				
“Delay ON”	For definition of “Delay ON” see above	seconds	0 to 50	2
“Delay OFF”	For definition of “Delay OFF” see above	seconds	0 to 50	2
“Pulse”	For definition of “Pulse” see above	seconds	0 to 100	1
“Pause”	For definition of “Pause” see above	seconds	0 to 100	0
“Transverse screw conveyor”				
“Delay ON”	For definition of “Delay ON” see above	seconds	0 to 100	2
“Delay OFF”	For definition of “Delay OFF” see above	seconds	0 to 100	2.5
“Container” or “Hydraulics”				
“Delay ON”	For definition of “Delay ON” see above	seconds	0 to 100	2
“Delay OFF”	For definition of “Delay OFF” see above	seconds	0 to 500	2

Charging *(continued)*

Parameters	Description	Setting in	Setting range	Default value
"Emergency mode"				
"Pulse"	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 or the light barrier is clear again. For definition of "Pulse/Pause" see above	seconds	0 to 100	5
"Pause"			0 to 500	5
"Runtime, transverse screw conveyor, maximum"				
"Delay ON"	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". For definition of "Delay ON" see page	seconds	0 to 1000	80
Auto and Manual selection fields	- Auto (Automatic): If there is more than one container, the system changes over to the next container if a fault occurs or the container is empty. - Manual 1, 2 or 3: Container 1, 2 or 3 is in manual mode. The relevant container is used.			
"Delay, empty message"	Delay due to 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.	seconds	0 to 800	300
"Cycle control"				
"Delay ON"	For definition of "Delay ON" see above	seconds	0 to 50	2
"Pulse"	For definition of "Pulse" see above	seconds	0 to 100	5
"Pause"	For definition of "Pause" see above	seconds	0 to 500	5
"Pendulum screw conveyor"				
"Delay ON"	For definition of "Delay ON" see above	seconds	0 to 20	5
"Pulse"	For definition of "Pulse" see above	seconds	0 to 100	5
"Pause"	For definition of "Pause" see above	seconds	0 to 500	5
"Preferred direction"				
"Preferred direction ON"	If "Preferred direction" is ON, the discharge runs to the right by preference (without reversing). For definition of "Delay ON/OFF" see above	seconds	"ON"/"OFF"	"OFF"
"Preferred direction OFF"				
"Reversing interval"				
"Delay ON"	If "Preferred direction" is OFF, the pendulum screw conveyor changes rotational direction after this time has elapsed. For definition of "Delay ON" see above	seconds	0 to 1000	240

Charging *(continued)*



“Fill levels” tab

Display	Description
“Interrupted”	If the light barrier is triggered, the message “Interrupted” or “Full” is displayed for all parameters and the status indicator is not illuminated.
“full”	
Parameters	Description
“Firebed 1”	The light barriers are evaluated differently, depending on the set firebed size, “Small” or “Large”. The light barrier, firebed 1 is positioned closer to the feed than the light barrier, firebed 2.
“Firebed 1”	
“Feed”	Fill level indicator for the feed screw conveyor
“Ash removal”	Displays the ash level in the ash chamber below the infeed grate
“Conveyor system”	Fill level indication for the fuel supply screw conveyors In the case of several conveyor devices, the smallest number is the closest to the boiler.
“Horizontal discharge”	Fill level indication for the screw conveyor in the horizontal discharge
“LB, silo, top”	Fill level indication for upper fuel store
“LB, silo, bottom”	Fill level indication for lower fuel store

Charging *(continued)*






“Ash removal” tab

Parameters	Description	Setting in	Setting range	Default value
“Infeed grate, pause”	Pause time of the infeed grate under full load	seconds	0 to 500	40
“Infeed grate pause, partial load”	Pause time of the infeed grate under partial load	seconds	0 to 500	40
“Pause, pneumatic cleaning”	Pause time between the cleaning cycles of the pneumatic cleaning system	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	hours/ minutes	00:00 to 23:59	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.	seconds	10 to 60	20

Cleaning function

The “Cleaning” button activates and deactivates the cleaning function. The function is required before cleaning the boiler interior.

1. Switch off the system via the  button.
2. Start the cleaning function via the  button.
3. Following cleaning: Switch the cleaning function off again via the  button.

Cleaning function enabled:

- Flue gas fan operates at 50%
- Infeed grate is moving

Secondary Air



“Settings” 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 via the door. If the set value for the amount of secondary air is exceeded, the amount of fuel supplied is reduced.

Parameters	Description	Setting in	Setting range	Default value
“Residual O2, set”	Set value for the residual oxygen content, control variable for secondary air control	%	4 to 15	7
“Resid. O2, part. load, offset”	Sliding increase in the residual oxygen content at partial load Full load: 0% increase, minimum partial load: Up to 4% increase	%	0 to 5.0	2
“Set resid. O2, calculated”	Displays the current set value for the residual oxygen content (modulating set value) Minimum value: “Residual O2, set” (at full load) Maximum value: “Residual O2, set” plus “Resid. O2, part. load, offset” (at partial load)			
“Residual O2, minimum”	Minimum residual oxygen content If the residual oxygen content falls below this value, the feed system is stopped.	%	3 to 10	4
“Sec. air damper position, partial load”	Set value of damper position at partial load Actual: Current open position of the secondary air damper	%	20 to “Sec. air damper position, full load” -1	20
“Sec. air damper position, full load”	Set value of damper position at full load Actual: Current open position of the secondary air damper	%	“Sec. air damper position, partial load” +1 to 180	50
“Secondary set, calculated”	Displays the current set value for the open position of the secondary air damper (modulating set value)			

Flow



“Settings” tab

Parameters	Description	Setting in	Setting range	Default value
“Flow temperature”	Supply temperature	(°F) °C	(167 to 203) 75 to 95	(185) 85
“Return temperature, minimum”	Minimum return temperature	(°F) °C °C (°F)	Min. setting 65°C (149°F) Note: max. setting ‘flow temp.’ less 5°C (9°F)	70 (158)
“Return temperature, calculated”	Displays the sliding set value for the return temperature Only if flow control is activated, see page 56.			
“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.	(°F) °C	Max. setting 105°C (221°F) Note: min. setting ‘flow temp.’ less 2°C (4°F)	(203) 95
“Runtime, boiler valve”	Runtime of boiler valve Actual: Displays the valve position in % of greatest opening	seconds	80 to 500	140
“Runtime, boiler circuit pump, minimum”	Minimum boiler circuit pump runtime	minutes	1 to 30	10
“Minimum system temperature, actual”	Selection of whether a minimum system temperature is specified If the parameter is set to “Yes”, input the required minimum set value for the system temperature. Actual: Set minimum system temperature	Via selection	“Yes”/“No”	“No”
“Minimum system temperature”	If the “Minimum system temperature, actual” parameter was set to “Yes”, a minimum set value can be entered for the system temperature.	(°F) °C	(122 to 194) 50 to 90	(158) 70
“Flow temperature max”	Maximum supply temperature	(°F) °C	Max. setting 96°C (205°F) Note: min. setting ‘flow temp.’ plus 1°C (2°F)	(194) 90
“Flow temperature, delay”	Switching delay for shutting down	minutes	1 to 60	1

Flow *(continued)*



“Controller” tab

“Flow controller”

Parameters	Setting range	Default value
“P factor”	1 to 100	50
“D factor”	1 to 100	50
“Cycle time”	1000 to 15000	5000

“Return controller”

Parameters	Setting range	Default value
“P factor”	1 to 100	15
“D factor”	1 to 100	15
“Cycle time”	5 to 20	10

Flue Gas Fan



“Settings” tab

Parameters	Description	Setting in	Setting range	Default value
“Start speed, flue gas fan”	Speed of the flue gas fan when the system is switched on	%	“Minimum speed, flue gas fan” to “Maximum speed, flue gas fan”	50
“Minimum speed, flue gas fan”	Minimum speed of flue gas fan	%	25 to “Maximum speed, flue gas fan” -1	30
“Maximum speed, flue gas fan”	Maximum speed of flue gas fan	%	“Minimum speed, flue gas fan” + 1 to 100	100
“Flue gas temperature, burnout – OFF”	A low flue gas temperature is a clear sign that there are no embers left in the combustion chamber. If the flue gas temperature drops below this value, the controller switches from the “Burnout” operating state to “Off” or “Standby ON - OFF”.	(°F) °C	(122 to 302) 50 to 150	(194) 90
“Delay, burnout – OFF”	Delay before changeover of operating state when “Flue gas temperature, burnout - OFF” is reached	minutes	2 to 60	10
“Flue gas temperature limit”	If the flue gas temperature rises above this value, the speed of the flue gas fan is reduced down to the “Minimum speed, flue gas fan” parameter.	(°F) °C	(302 to 482) 150 to 250	(392) 200
“Flue gas temperature, heat-up – operation”	If the flue gas temperature reaches the set value, the controller switches from the “Heat up” operating state to “Load”.	(°F) °C	(176 to 266) 80 to 130	(194) 90

Buffer Tank



“Temperatures” tab

Parameters	Description	Setting in	Setting range	Default value
“Operating mode”	Set operating mode of buffer tank	--	“ Köb”	“ Köb”
“Boiler start at sensor”	Setting specifies which sensor the boiler should start at	--	“ B28.2”	“ B28.2”
“Tank temperature at +5 °C”	Set tank temperature at plus 5 °C (9 °F) outside temperature	(°F) °C	(86 to 201) 30 to 94	(167) 75
“Tank temperature at -15 °C”	Set tank temperature at less 15 °C (27 °F) outside temperature	(°F) °C	(88 to 203) 31 to 95	(185) 85
“Tank temperature, minimum”	Minimum set tank temperature	(°F) °C	(122 to 201) 50 to 94	(167) 75
“Tank temperature, maximum”	Maximum set tank temperature	(°F) °C	(124 to 203) 51 to 95	(194) 90
“Outside temperature”	Displays the current outside temperature	(°F) °C	-- --	-- --
“Tank charging, to sensor”	Setting specifies to which sensor the boiler should charge the heating water buffer tank	--	“ B28.4”	“ B28.4”
“Tank charging, to temperature”	Setting specifies the temperature to which the boiler should charge the heating water buffer tank	(°F) °C	(167 to 194) 75 to 90	(176) 80

Boiler 2



“Temperatures” tab

Parameters	Description	Setting in	Setting range	Default value
“Operating status”	Displays the current operating state of additional boiler	--	--	--
“Start at temperature undershooting”	Start temperature of Boiler 2	(°F) °C	(122 to 203) 50 to 95	(158) 70
“Start delay”	Start delay after set temperature has been undershot	minutes	0 to 600	60
“Temperature drop”	If the temperature at the set sensor falls below the start temperature by this value, the boiler starts without start delay.	(°F) °C	(50 to 122) 10 to 50	(68) 20
“Minimum runtime”	Minimum runtime of Boiler 2 after starting up	minutes	0 to 600	10
“Boiler start at sensor”	Setting specifies which sensor Boiler 2 should start at	--	“ B28.2”	“ B28.2”
“Tank charging, to sensor”	Setting specifies to which sensor Boiler 2 should charge the heating water buffer tank	--	“ B28.4”	“ B28.4”
“Tank charging, temperature”	Setting specifies the temperature to which the boiler should charge the heating water buffer tank	(°F) °C	(122 to 194) 50 to 90	(176) 80

DHW Circulation 1



“Temperatures” tab

Parameters	Description
“Operating mode”	Displays the set operating mode for DHW circulation
“Operating status”	Displays the current operating state for DHW circulation



“Heating periods” tab

Column	Description
Parameters	Heating period 1 to Heating period 7
Start	Start of heating phase
End	End of heating phase

Set heating times

1. In the “Heating period 1” line, tap on the “Start” column.
2. Using the numeric keypad, enter the time. Confirm with “Enter” or terminate the entry with “Esc”.
3. In the “Heating period 1” line, tap on the “End” column and enter the time. Confirm with “Enter” or terminate the entry with “Esc”.
4. Activate the set heating periods by selecting the weekdays. The display color for the selected weekdays changes to “green”.
5. Repeat steps 1 to 4 to input further heating periods.

DHW Tank 2



“Temperatures” tab

Parameters	Description	Setting in	Setting range	Default value
“Operating mode”	Displays the set operating mode of the DHW tank	--	--	--
“Set DHW temperature”	Set temperature for DHW	(°F) °C	(104 to 176) 40 to 80	(140) 60
“Offset, set return temperature”	Setting specifies how much above the actual DHW temperature the return set temperature is	(°F) °C	(41 to 86) 5 to 30	(86) 30
“Start hysteresis”	Setting specifies how much below the set DHW temperature the DHW heating starts	(°F) °C	(34 to 50) 1 to 10	(41) 5
“Set valve runtime”	Valve runtime from 0% to 100% in seconds	seconds	20 to 500	140

Note: For “Heating periods” tab, see page 60

Heating Circuit 3



“Temperatures” tab

Parameters	Description	Setting in	Setting range	Default value
“Operating mode”	Displays the set operating mode for heating	--	--	--
“Operating status”	Displays the current operating state for heating	--	--	--
“Set flow at +10°C”	Set supply temperature at plus 10°C (18°F) outside temperature	(°F) °C	(68 to 194) 20 to 90	(104) 40
“Set flow at -10°C”	Set supply temperature at less 10°C (18°F) (outside temperature)	(°F) °C	(68 to 194) 20 to 90	(122) 50
“Set value, heating curve”	Displays the current set temperature	--	--	--
“Minimum flow”	Minimum set supply temperature	(°F) °C	(68 to 201) (20 to 94)	(86) (30)
“Maximum flow”	Maximum set supply temperature	(°F) °C	(70 to 203) 21 to 95	(158) 70
“Night setback”	Temperature value by which the set supply temperature is reduced outside the heating periods	(°F) °C	(32 to 68) 0 to 20	(45) 7
“Set valve runtime”	Valve runtime from 0% to 100%	seconds	200 to 500	140

Note: For “Heating periods” tab, see page 60

Cleaning the Touchscreen



Tap the following on-screen buttons:

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

Setting the Language



Tap the following on-screen buttons:

1. "Menu"
2. "Panel"
3. "Flag" (symbol for the available languages)
The selected language is switched over in the touchscreen.

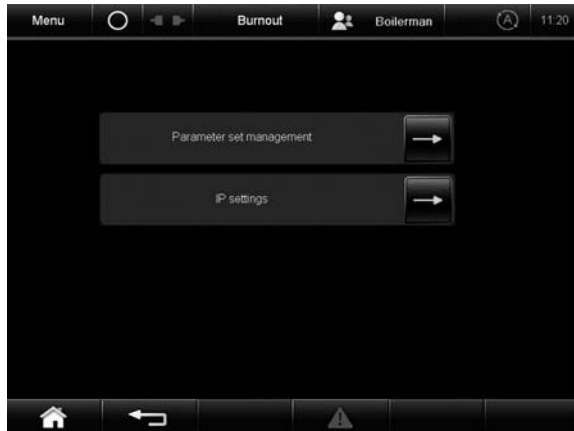
Designating Heating Circuits



Tap the following on-screen buttons:

1. "Menu"
2. "Panel"
3. "Heating circuit, designation"
4. "Heating zone"
The selected heating assembly can be renamed using the keypad.
Confirm with "Enter" or terminate the entry with "Esc".

Parameter Set Management



Managing the parameter sets

Parameter sets allow you to save parameters specific to a particular fuel and load them again at a later date.

Tap the following on-screen buttons:

1. "Menu"
2. "Special functions"
3. "Parameter set management"
The "Parameter set management" window opens.

Legend

- (A) Entry field for parameter name
Here, the name of a new parameter set can be specified. The names of existing parameter sets cannot be changed.
- (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 settings"
Resets the controller to its factory settings.



"Copy parameter set" screen

Saving/importing parameter sets

Parameter sets can be saved or imported, provided an external data carrier has been connected to the USB connection of the programming unit.

1. Connect a data carrier to the USB connection.
The "Copy parameter set" screen is displayed on the programming unit.
2. Mark a parameter set in a list by tapping on it.
The selected parameter set is highlighted against a grey background.
3. Tap on the "Copy" button.
The selected parameter set is copied. The parameter set will then also appear in the other list respectively.

Legend

- (A) Control list
Parameter sets saved in the controller.
- (B) External list
Parameter sets saved on an external data carrier.
- (C) "Copy"
The marked parameter set is copied.

IP Settings



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

Tap the following on-screen buttons:

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

The following screen opens:

Displaying your own network settings

Most networks have an integral DHCP server. This automatically assigns an IP address to all appliances connected to 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 key combination WINDOWS and R.
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 adaptor LAN connection".
6. Note down the IP address, subnet mask and default gateway for subsequent configuration.



Legend

- Ⓐ Entry field "IP address"
- Ⓑ Entry field "Subnet mask"
- Ⓒ Entry field "Gateway"
- Ⓓ Entry field "Remote access"

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 on-screen buttons:

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

Column	Description
Name	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:

- Boiler technician
- Engineer

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

Creating users

1. Tap an empty "Name" field.
The "Enter password" window is displayed.
2. Using the numeric keypad, enter the password "0".
Confirm with "Enter" or terminate the entry with "Esc".
The "Change user" window is displayed.
3. Enter the name via the keypad and the password via the numeric keypad.
Confirm with "Enter" or terminate the entry with "Esc".
4. Save the changes with "OK" or terminate the entry with "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. Save the changes with "OK" or terminate the entry with "Cancel".

Diagrams



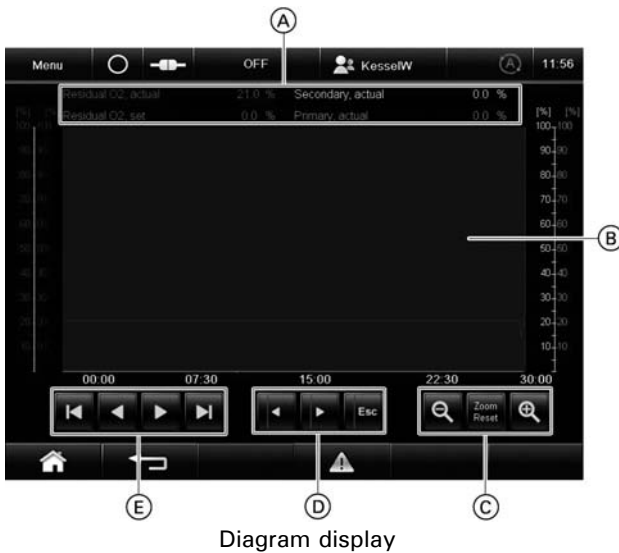
You can have up to 4 parameters (actual and set values) displayed in a diagram. The values are stored in a 30 min ring buffer. For this, values are recorded every 10 sec.

Opening diagrams

Tap the following on-screen buttons:

1. "Menu"
2. "Diagrams"
3. Select a diagram display. For this, tap a diagram symbol.

Legend



- (A) Overview of displayed variables
Gives the values for the current cursor position. Tap in this area to display the diagram settings screen, see page 68.
- (B) Diagram with the selected variables
Tap the diagram to zoom into the time axis.
- (C) Zoom
 - Shows the time axis in a higher resolution in the diagram.
 - 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.
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.

Diagrams *(continued)*



Diagram settings

Legend

- (A) List of parameters
Overview of all parameters which can be shown in the diagrams.
Tap on "Overview" or to open or close the list of parameters.
Tap on a parameter. The parameter is highlighted with a blue background and is selected.
Add the selected parameter to the parameters of the current diagram with "Trend +".
- (B) Parameters in the current diagram
A maximum of 4 parameters can be displayed in a diagram.
Tap on a parameter.
The parameter is highlighted with a blue background and is selected. Configure the selected parameter in the diagram with "Color", "Limit max" and "Limit min".
Delete the selected parameter from the current diagram with "Trend-".
- (C) Time axis of the current diagram
The display of the selected parameter in the diagram can be set for 30 minutes or 1 hour.
- (D) "Limit max"
Set the upper scale value of the selected parameter on the Y axis.
- (E) "Limit min"
Set the lower scale value of the selected parameter on the Y axis.
- (F) "Color:", dropdown menu
Set the color of the selected parameter in the diagram.
- (G) "Trend-"
Removes the selected parameter from the current diagram.
- (H) "Trend +"
Adds the selected parameter to the current diagram.

Shutting Down the Heating System for an Extended Period

1. Switch off the system via the button.
The controller switches the system off automatically.
2. Allow the existing firebed to burn out completely.

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.

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. Check the ash removal zones under the grate through the maintenance cover. Remove all ash.
2. Clean the grate elements and check for damage.
3. Have damaged grate elements replaced by the Technical Service department.
4. Check the flanged connections of the fuel supply system.
5. Tighten any slack screws.
6. Replace damaged gaskets.

Restarting the system

1. Switch ON the mains isolator on the control panel.
2. Switch ON the system, see page 47.

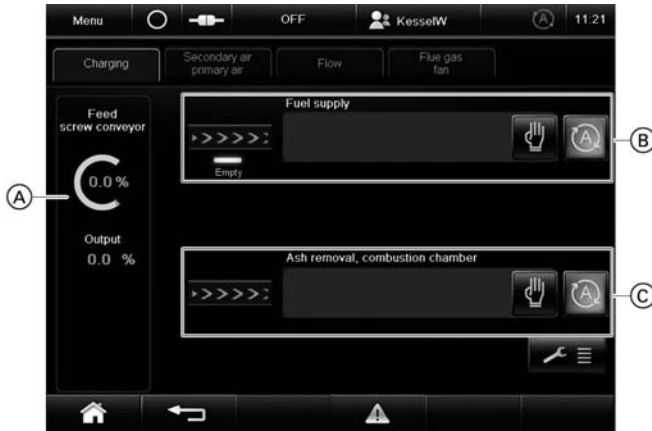
Sub-area Screens for the Boiler

The sub-area screens are accessed from the default display, via buttons "Fuel", "Secondary air", "Flow" and "Flue gas fan".

Fuel

Legend

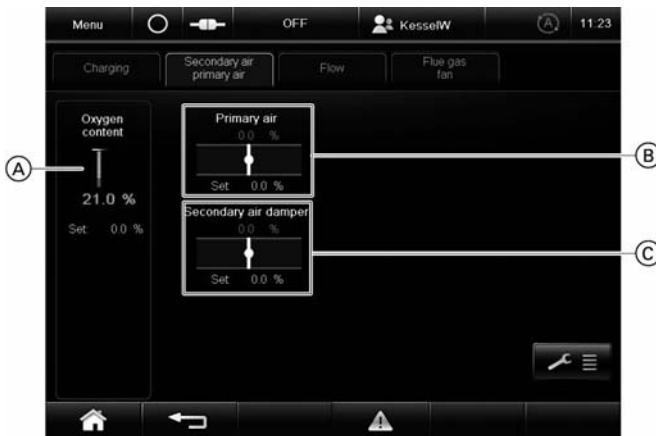
- (A) Displays boiler output in %
- (B) "Fuel supply"
 - Green arrow is animated: Fuel supply active
 - ___/"empty": Light barrier for firebed is clear
 - ___/"full": Light barrier for firebed is interrupted
 - 👉 button: Activate manual supply
 - (A) button: Activate automatic supply
- (C) "Combustion chamber ash removal"
 - Green arrow is animated: Ash removal active
 - ___/"Free": Light barrier for ash removal is clear
 - ___/"interrupted": Light barrier for ash removal is interrupted
 - 👉 button: Activate manual ash removal
 - (A) button: Activate automatic ash removal



Secondary air

Legend

- (A) Displays actual and set oxygen content in the flue gas in %
- (B) Displays actual and set opening of the primary air damper in %
 - The position of the damper shows the current opening: [↑↓]
- (C) Displays actual and set opening of the secondary air damper in %
 - The position of the damper shows the current opening: [↑↓]



Flow

Legend

- (A) Displays actual and set return temperature in °C
- (B) Displays actual and set supply temperature in °C
- (C) "Flow control"
 - 👉 button: Activate manual flow control
 - (A) button: Activate automatic flow control
- (D) "Return mixer"
 - 👉 button: Activate manual mode for return mixer
 - (A) button: Activate automatic mode for return mixer



Sub-area Screens for the Boiler *(continued)*

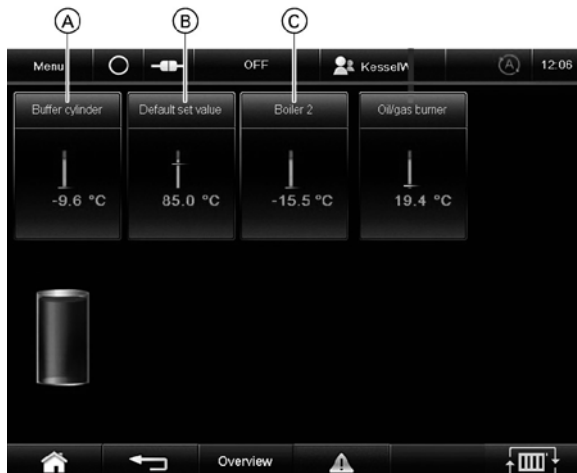



Flue gas fan

Legend

- (A) Displays flue gas fan utilisation level in %
- (B) "Flue gas fan"
Fan is animated: Flue gas fan active

Sub-area Screens for the Auxiliary Systems



The screen for the auxiliary system can be accessed from the default display via the  button.

Legend

- (A) Buffer tank
Displays the average buffer temperature in °C
- (B) Default set value
Displays the default set temperature in °C
- (C) Boiler 2
Displays the actual system temperature at the start sensor in °C

The sub-area screens for the auxiliary systems are accessed via buttons buffer tank, default set value, boiler 2.

Sub-area Screens for the Auxiliary Systems *(continued)*



Buffer tank
Legend

- (A) Displays actual and set return temperature in °C
- (B) Displays actual and set fill level temperature in °C
- (C) "Return mixer"
Displays return mixer setting
 🖐 button: Activate manual mode for return mixer
 ⌛ button: Activate automatic mode for return mixer



Default set value
Legend


- (A) Displays actual and set supply temperature in °C
- (B) "Default flow temperature"
- (C) "External demand"
 | button: Activate default supply temperature
 ○ button: Deactivate default supply temperature

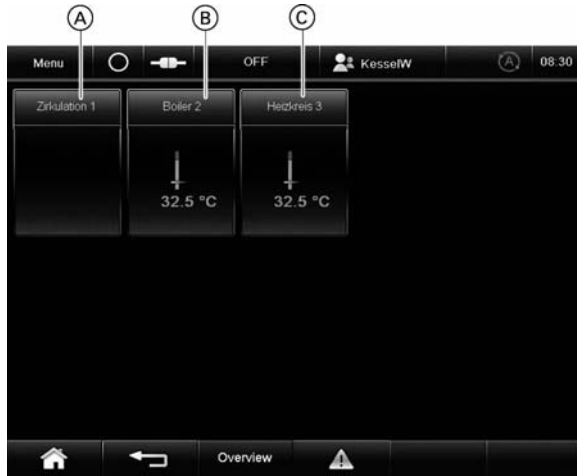


Boiler 2
Legend

- (A) Displays actual and set cylinder temperature in °C
- (B) Displays status or operating mode for boiler 2
 🖐 button: Activate manual mode
 ⌛ button: Activate automatic mode

Sub-area Screens for the Heat Distribution

The screen for heat distribution can be accessed from the default display via the  button.





Legend

- Ⓐ "DHW circulation 1"
Displays actual temperature in °C
 - Ⓑ "DHW cylinder 2"
Displays actual temperature in °C
 - Ⓒ "Heating circuit 3"
Displays actual temperature in °C
- The sub-area screens for heat distribution are accessed via buttons "DHW circulation 1", "DHW tank 2" and "Heating circuit 3".



DHW circulation 1

Legend

- Ⓐ Displays operating mode setting
-  button: Activate manual mode
-  button: Activate automatic mode

Sub-area Screens for Heat Distribution



DHW cylinder 2

Legend

- (A) Displays valve setting in %
- (B) Displays actual and set temperature in °C
- (C) Displays operating mode setting
- Hand icon button: Activate manual mode
- (A) button: Activate automatic mode



Heating circuit 3

Legend

- (A) Displays valve setting in %
- (B) Displays actual and set temperature in °C
- (C) Displays operating mode setting
- Hand icon button: Activate manual mode
- (A) button: Activate automatic mode

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

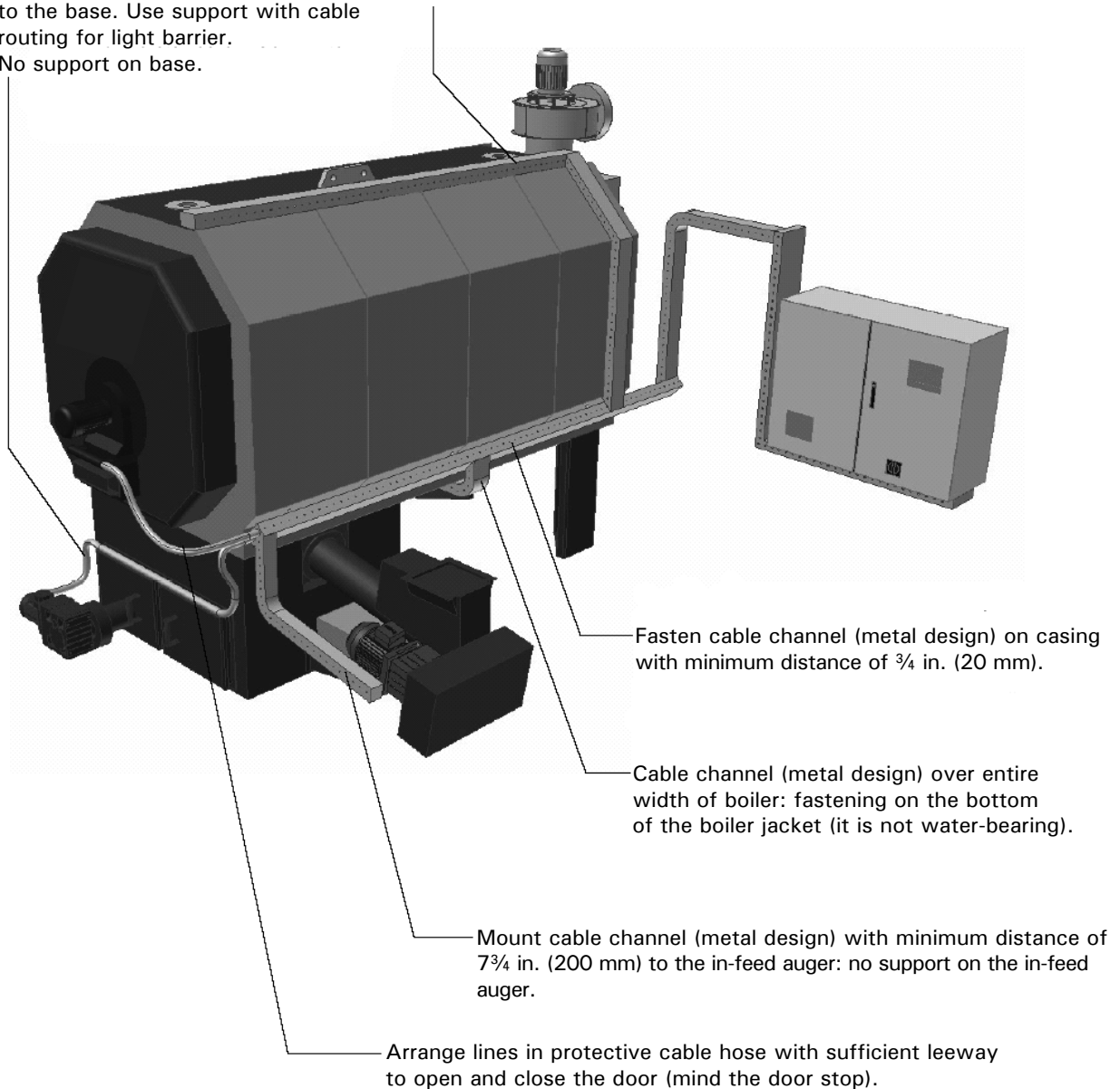
Any alteration of the control cabinet will void the warranty.

! 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 footplate on top of the boiler with minimum distance of 1/2 in. (10 mm).



Commissioning

Initial start up

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 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, firing and ashpit doors keep 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.

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-RF 150	approx. 2640 lb. (1197 kg)
Vitoflex 300-RF 220	approx. 3300 lb. (1497 kg)
Vitoflex 300-RF 300	approx. 4400 lb. (1996 kg)
Vitoflex 300-RF 400	approx. 5500 lb. (2495 kg)
Vitoflex 300-RF 500	approx. 6600 lb. (2994 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.

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.

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 handover

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

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.

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

Pellet extraction auger:

Switch off the facility using the function button on the control panel and wait until there is no more fuel in the in-feed auger.

Slowly and evenly fill the silo until the extraction auger is covered approx. 10 in. to 12 in. (250 mm to 300 mm) high over the entire open area. Level out any mounds that form from pouring.

Switch on the facility using the function button on the control panel and wait until the metering container on the in-feed auger has filled. If any excess or negative pressure develops in the silo during the filling, the facility has to be switched off again using the function button on the control panel.

After doing so, complete filling the silo slowly and evenly. The facility can then be turned back on using the function button on the control panel. Carry out refilling in the same manner.

By dumping

Horizontal extraction system and spring extraction system.

Heating system in operation:

- If the articulated arms or spring-mounted plates are still covered by fuel, refilling can be carried out immediately.
- If the articulated arms or spring-mounted plates are no longer covered by fuel, fill the silo evenly to approx. 12 in. (300 mm) above the articulated arm or over the spring-mounted plates. As soon as the articulated arms or spring-mounted plates have retracted through a request for material, the refilling can be continued.

Heating system not in operation:

- If the articulated arms or spring-mounted plates are still covered by fuel, refilling can be carried out immediately.
- If the articulated arms or spring-mounted plates are no longer covered by fuel, fill the silo evenly to approx. 12 in. (300 mm) above the articulated arm or over the spring-mounted plates. Then activate the "SILO FILLING" function. To do so, press the LOADER SYSTEM button (F4) and then the left arrow button (<). Select "YES" and confirm with "OK". Wait until the articulated arms or the spring-mounted blades move under the cup washer, complete by evenly filling the silo. The "SILO FILLING" function enables the filling of the fire box.

Note: The "SILO FILLING" function cannot be activated until the heating system has been shut off for one hour.

Walking floor: fuel can be refilled at any time.

Funnel extraction system: it is mandatory that the heating system is in operation!

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 in-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

IMPORTANT

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 approximately 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!

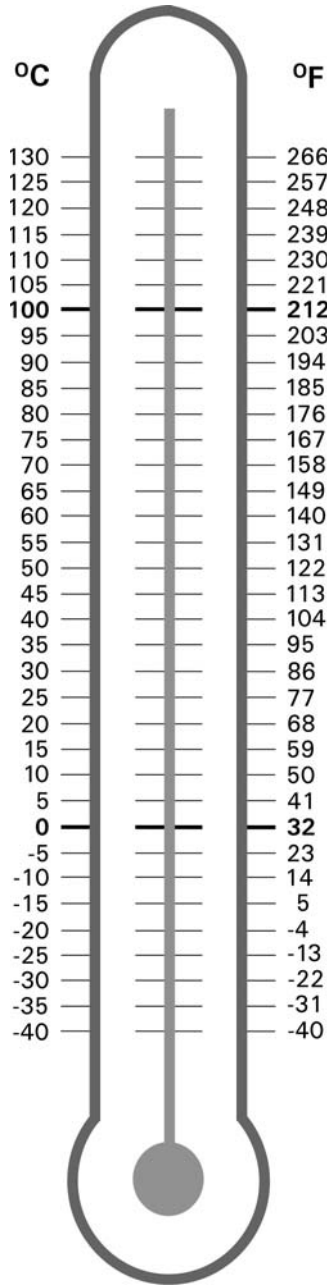
Low water/excess water pressure

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 overpressure monitor, and by pressing the OK button on the control panel.



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