Installation and Operating Instructions

for use by engineers and heating contractors

KOB

VIESMANN Group

KPT 390 to KPT 1250 Series
Wood-fired Boiler
Max. output: 390 to 1250 kW (1331 to 4266 MBH)
Min. output: 98 to 370 kW (334 to 1263 MBH)

Pyrotec®

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.

Please file in Service Binder

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".*

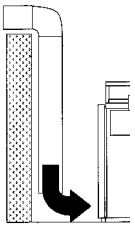
- **Advice to owner**
  Once the installation work is complete, the heating contractor must familiarize the system operator/ ultimate owner with all equipment, as well as safety precautions/requirements, shutdown procedure, and the need for professional service. Refer to the Service and Maintenance Instructions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

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About These Instructions

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

WARNING

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.

Mechanical *(continued)*

Electrical

Operation

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: B 365-01, 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 Pyrotec 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.

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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.

Note: "Pyrotec" is an alternate / interchangeable trade name with "Pyrtec".

Codes

CSA B366.1-M91
Solid Fuel Fired Central Heating Appliances

CSA C.22.2#3-M88 (R2004)
Electrical Features of Fuel Burning Equipment

UL2523
Solid Fuel-Fired Hydronic Heating Appliances, Water Heaters and Boilers

CSA B365-10
Installation Code for Solid Fuel Burning Appliances and Equipment

Boiler Description

Description

The PYROTEC Grate Firing System (patent no: EP 0 905 442 B1) was developed for automatic combustion of all dry to moist wood fuels (remnant wood, pellets and forest wood chips to max. W50, (see section "Wood Fuel Requirements") and combines the benefits of underfeed firing with the benefits of grate firing.
The PYROTEC Grate Firing System is characterized by highest efficiencies and perfect combustion in all load stages. The PYROTEC Boiler Plant has been built to ASME Sec. IV and has CRN for Canada. It is tested and approved to the applicable CSA / UL safety standards.

Function:

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

Supplied with:

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

Customer supplied:

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

Accessories for PYROTEC Grate Firing System:

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

Transport and Installation

IMPORTANT

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

Lifting

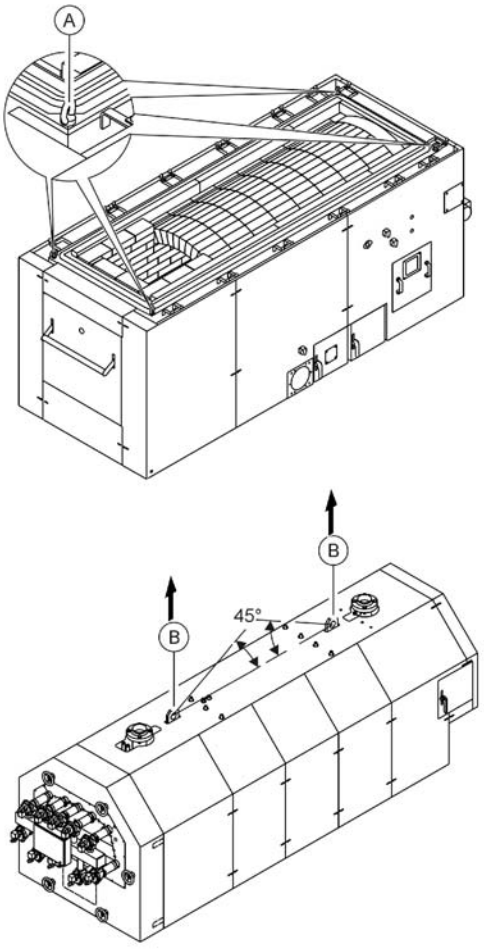
The combustion chamber has four lifting lugs that must be screwed in before lifting. Lifting gear can be attached to these lifting lugs.
The pressure vessel of the PYROTEC has two lifting lugs to which lifting gear may be attached.

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

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

⚠ WARNING

Follow instructions for proper installation.
For wood-fired installations:
This wood-fired boiler must be installed in accordance with local codes if any; if not, follow B365-10, Installation Code for Solid-Fuel Burning Appliances and Equipment.



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

Delivery Condition

Standard delivery condition

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

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

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

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

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

Measurements for the combustion chamber as standard delivery condition

Boiler model	KPT390	KPT530	KPT720	KPT950	KPT1250
Minimum size door (W x H)	59 in. x 59 in. (1500 mm x 1500 mm)	63 in. x 69 in. (1600 mm x 1750 mm)	63 in. x 69 in. (1600 mm x 1750 mm)	74¾ in. x 73¾ in. (1900 mm x 1850 mm)	74¾ in. x 78¾ in. (1900 mm x 2000 mm)
Minimum ceiling opening (W x H)	59 in. x 149 in. (1500 mm x 3800 mm)	63 in. x 157½ in. (1600 mm x 4000 mm)	63 in. x 196¾ in. (1600 mm x 5000 mm)	74¾ in. x 196¾ in. (1900 mm x 5000 mm)	74¾ in. x 216½ in. (1900 mm x 5500 mm)

Measurements for the pressure vessel as standard delivery condition

Boiler model	KPT390	KPT530	KPT720	KPT950	KPT1250
Minimum size door (W x H)	59 in. x 59 in. (1500 mm x 1500 mm)	63 in. x 69 in. (1600 mm x 1750 mm)	63 in. x 69 in. (1600 mm x 1750 mm)	74¾ in. x 73¾ in. (1900 mm x 1850 mm)	74¾ in. x 78¾ in. (1900 mm x 2000 mm)
Minimum ceiling opening (W x H)	59 in. x 112¼ in. (1500 mm x 2850 mm)	63 in. x 112¼ in. (1600 mm x 2850 mm)	63 in. x 126 in. (1600 mm x 3200 mm)	74¾ in. x 130 in. (1900 mm x 3300 mm)	74¾ in. x 137¾ in. (1900 mm x 3500 mm)

Wood Fuel Requirements

The Pyrotec 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	---	⅜ in. (10 mm)
P2 - Pellets Medium	⅜ in. (10 mm)	¾ in. (20 mm)
P4 - Briquettes (Pellets Large)	¾ in. (20 mm)	2½ 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 (cm²)	½ (3)	¾ (5)
	Max. length	in. (cm)	3⅓ (8.5)	4¾ (12)
	Coarse sieve nominal mesh width	in. (mm)	⅝ (16)	1¼ (31.5)
Main percentage 60 to 100%	Medium sieve nominal mesh width	in. (mm)	⅛ (2.8)	¼ (5.6)
Percentage of fines (incl. ultrafine content) max. 20%	Fine sieve nominal mesh width	in. (mm)	1/25 (1)	1/25 (1)

CAUTION

Chips have to pass through a 1 in. (25 mm) sieve, additionally, a fraction of max. 5% of the fuel with a cross-section of max. ¾ in.² (500 mm²) up to a length of max. 6¼ in. (160 mm) can be tolerated.

Size of briquettes:

- Fraction of one-offs. max. 5% with cross-section of max. ¾ in.² (500 mm²) up to a length of max. 6¼ in. (160 mm).
- Frayed surface by chopping tools (shredders) or slow-running choppers.
- Briquettes, diameter max. 2⅜ in. (60 mm).

Consequences of overstepping particle size:

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

Wood Fuel Requirements *(continued)*

Maximum water content

The maximum allowable water content of the fuel for Pyrotec systems is limited to 50%.
The water content impacts the maximum boiler output.

Non-wood fuels

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

Limitation super fines and dust [wood particles smaller than 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 Pyrotec 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 Pyrotec systems allow for a max. of 50% water content (**W**).

Saw dust

Fuel code	**Bulk Density** kg/m³ [lb/ft³]	Water content %	Fuel Size	Description
a	**S**130 [8.1]	**W**10 to **W**20	C1	Sawdust, untreated (planing shop)
b1	**S**200 [12.5]	**W**20 to **W**35	C1	Sawdust, untreated (sawmill)
c2	**S**250 [15.6]	**W**35 to **W**50	C1	Sawdust, untreated (sawmill)

Wood chips

Fuel code	**Bulk Density** kg/m³ [lb/ft³]	Water content %	Fuel Size	Description
b2	**S**200 [12.5]	**W**20	C7	Forest wood chips, soft, untreated
c1	**S**250 [15.6]	**W**20 to **W**35	C7	Forest wood chips, soft, untreated
d1	**S**300 [18.7]	**W**20 to **W**35	C7	Forest wood chips, soft/hard, untreated
d2	**S**300 [18.7]	**W**35 to **W**50	C7	Forest wood chips, soft, untreated
e1	**S**350 [21.8]	**W**20 to **W**35	C7	Forest wood chips, hard, untreated
e2	**S**350 [21.8]	**W**35 to **W**50	C7	Forest wood chips, soft/hard, untreated
f1	**S**400 [24.9]	**W**35 to **W**50	C7	Forest wood chips, hard, untreated

Shavings and chips

Fuel code	**Bulk Density** kg/m³ [lb/ft³]	Water content %	Fuel Size	Description
g	**S**130 [8.1]	Less than **W**15	C7	Shavings & chips from wood remnants, dry, mixed
h	**S**200 [12.5]	Less than **W**15	C7	Shavings & chips from wood remnants, dry, mixed
i	**S**250 [15.6]	Less than **W**15	C7	Shavings & chips from wood remnants, dry, mixed

Pellets and briquettes

Fuel code	**Bulk Density** kg/m³ [lb/ft³]	Water content %	Fuel Size	Description
j	**S**350 [21.8]	Less than **W**15	P4	Briquettes from wood remnants ¾ in. (20 mm) to max. 2 in. (60 mm)
k1	**S**650 [40.6]	Less than **W**10	P1	untreated up to ⅜ in. (10 mm)
k2	**S**650 [40.6]	Less than **W**10	P2	untreated ⅜ in. to ¾ in. (11 mm to 20 mm)

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

Wood Fuel Requirements *(continued)*

Content limits for non-combustible substances

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

The following limits (per 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 (K2O and Na2O)	max. 0.016 oz/lb (1.0 g/kg)	0.006 oz/lb (0.35 g/kg)
Sintering point of the ash	min. 1800° F (1000° C)	approx. 2200° F (1200° C)

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

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

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

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

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

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

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

Other information

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

Carbon Monoxide

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

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

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

For safe operation

We recommend that you frequently:

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

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

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

⚠ WARNING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ CAUTION

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

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Hazardous Materials

Fiberglass wool and ceramic fiber materials

⚠ WARNING

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

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

⚠ WARNING

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

First aid measures

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

Suppliers of ceramic fiber products recommend the following first aid measures

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

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

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

Power Failure Provision

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

Venting Requirements

The PYROTEC Grate Firing System is equipped with a flue gas exhaust blower.

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

This boiler shall be connected to:

a) a masonry chimney conforming to local regulations or, in the absence of such regulations, to the requirements of the National Building Code

b) a certified factory-built chimney (refer to the NFPA 211 standard).

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

IMPORTANT

Do not use galvanized steel

For installations in Canada:

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

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

An insulated chimney should be provided to prevent sooting.

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

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

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

Mechanical Room

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

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

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

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

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

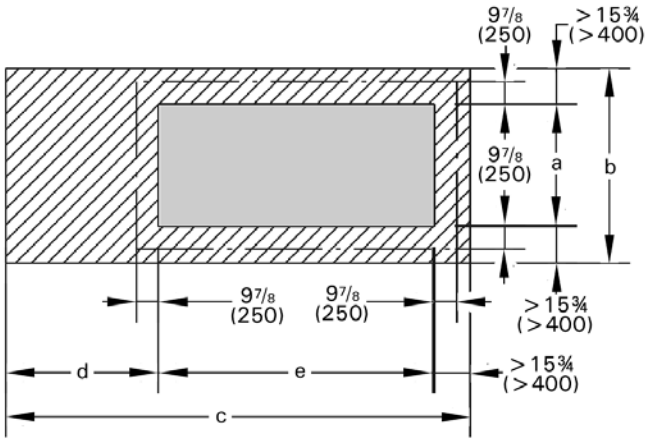
The temperature in the heating room must not fall below 50° F (10° C) while the system is in operation (measured at the inner side of exterior walls).

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

IMPORTANT

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

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



Dimensions shown in. (mm)

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

Foundation dimensions

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

Mechanical Room *(continued)*

⚠ WARNING

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

Mechanical room conditions

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

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

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

Never close existing ventilation openings.

⚠ WARNING

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

IMPORTANT

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

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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 B365-10, Installation Code for Solid Fuel Burning Appliances and Equipment.
Always use latest edition codes.

⚠ WARNING

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

⚠ WARNING

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

General

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

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

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

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

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

Confined spaces

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

a. have a permanent opening or openings for natural air circulation with a minimum net free area of 1.5 in² / 1000 Btu/h (3300 mm² / kW) input, and

b. connect to another space or spaces such that the total volume of air available for natural air circulation is at least 30% of the total volume to be heated by the appliance.

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

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

Unconfined spaces

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

Louvers and grilles

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

Technical Data

Boiler model KPT-		390	530	720	950	1250
Maximum output	MBH (kW)	1331 (390)	1808 (530)	2457 (720)	3242 (950)	4265 (1250)
Minimum output[1]	MBH (kW)	334 (98)	450 (132)	614 (180)	812 (238)	1065 (312)
Efficiency[2]		85%				
Fuel Moisture content[3]	%	W 50				
Size of wood chips[4]		G 30 / G 50 as per CAN/CSA-B366. 1-M91				
Flue gas figures						
Connection flue gas pipe ∅ A	in. mm	13½ (350)	13¾ (350)	13¾ (350)	15¾ (400)	17¾ (450)
Mass flow rate; W5; O_2 6%	lb/s (g/s)	0.48 (219)	0.65 (297)	0.89 (404)	1.17 (532)	1.54 (700)
Volume flow; W5; O_2 6%; 302°F (150°C)	ft³/s (m³/s)	9.18 (0.26)	12.71 (0.36)	17 (0.48)	22 (0.63)	29 (0.83)
Mass flow rate; W35; O_2 8%;	lb/s (g/s)	0.67 (303)	0.91 (412)	1.23 (560)	1.62 (736)	2.13 (968)
Volume flow;W35; O_2 8%; 302°F (150°C)	ft³/s (m³/s)	13 (0.37)	17.5 (0.50)	23.6 (0.67)	31 (0.88)	40.6 (1.15)
Average flue gas temperature at full load[5]	°F (°C)	320 (160)				
Average flue gas temperature at partial load[5]	°F (°C)	248 (120)				
Chimney draft required	Pa	±0				
Electrical connections						
Electrical connections, total	kW	6.42	8.28	8.28	9.51	11.31
Ignition device	kW	1.6	1.6	1.6	1.6	1.6
Flue gas exhaust blower	kW	1.5	2.2	2.2	2.2	4.0
In-feed auger	kW	1.1	1.5	1.5	2.2	2.2
Primary air blower [1]	kW	0.14	0.3	0.3	0.48	0.48
Primary air blower [2]	kW	1.0	1.0	1.0	1.0	1.0
Secondary air blower	kW	.9	1.5	1.5	1.85	1.85
Grate drive unit	kW	0.12	0.12	0.12	0.12	0.12
Electric power consumption at full load	kW	3.36	4.68	4.68	5.29	6.91
Electric power consumption at partial load	kW	2.75	3.83	3.83	4.28	5.6
Heating						
Water side resistance (diff. 27° F / 15 K)	"wc (mbar)	5.12 (13)	9.23 (23)	17.26 (43)	10.5 (26)	18 (45)
Boiler water volume	USG (L)	303 (1150)	383 (1450)	488 (1850)	515 (1950)	660 (2500)
Heating surface	ft² (m²)	291.8 (27.1)	457.5 (42.5)	597.4 (55.5)	805.2 (74.8)	979.6 (91.0)
Volume on heating gas side	USG (L)	407 (1540)	602 (2280)	774 (2830)	1070 (4050)	1367 (5210)
Volume of ash container for grate ash	USG (L)	63 (221) - 240 (800)				
Volume of ash container for flue gas cyclone	USG (L)	63 (221) - 240 (800)				
Test pressure[6]	psi (bar)	113 (7.8)				
Maximum allowable working pressure (water)[6]	psi (bar)	30 or 60 (2 or 4)				
Maximum water temperature	°F (°C)	250 (120)				
Minimum return temperature	°F (°C)	149 (65)				
Weight						
Weight of combustion chamber	lb (kg)	6570 (2970)	9343 (4238)	10919 (4953)	12740(5779)	14374(6520)
Weight of pressure vessel (30 psi)	lb (kg)	4993 (2265)	7094 (3218)	9275 (4207)	12965 (5881)	14643 (6642)
Weight of pressure vessel (60 psi)	lb (kg)	4993 (2265)	7094 (3218)	9936 (4507)	13627 (6181)	15525 (7042)
Weight of displacement rods	lb (kg)	644 (292)	721 (327)	869 (394)	1186 (538)	1186 (538)
Weight of flue gas exhaust blower	lb (kg)	132 (60)	172 (78)	178 (78)	181 (82)	236 (107)
Weight of in-feed auger	lb (kg)	337 (153)	337 (153)	3.37 (153)	419 (190)	419 (190)
Total weight without water (30psi) [7]	lb (kg)	12820(5815)	17780(8065)	21572(9785)	27492(12470)	30858(13997)
Total weight without water (60psi) [7]	lb (kg)	12820(5815)	17780(8065)	22234(10085)	28153(12770)	31740(14397)
Total weight with water (30psi) [7]	lb (kg)	15355(6965)	20964(9509)	25675(11646)	31775(14413)	36330(16479)
Total weight with water (60psi) [7]	lb (kg)	15355(6965)	20964(9509)	26336(11946)	32437(14713)	37212(16879)

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

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

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

[4] *Specification:* See Section Wood Fuel Requirements

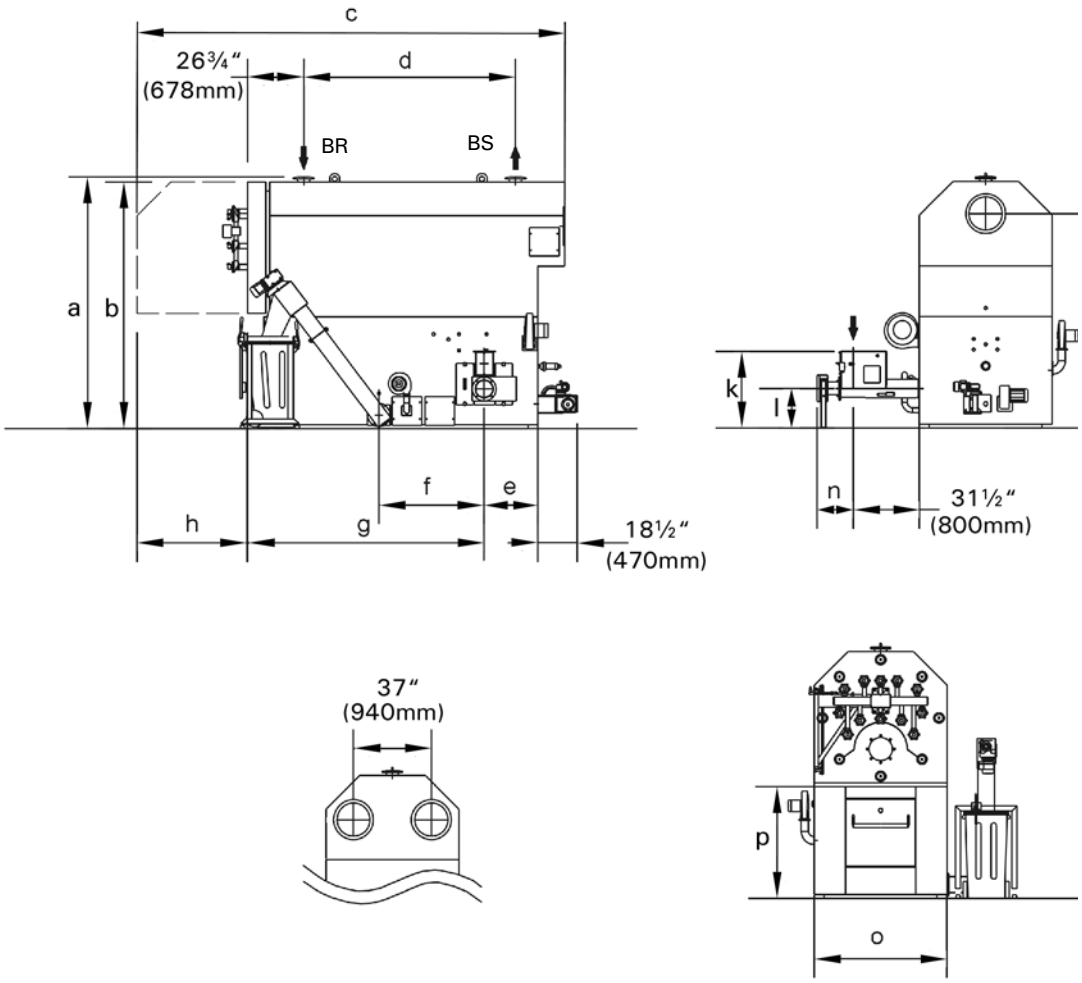
[5] *Flue gas temperature:* An increase is possible by removing the displacement rods [Full load 86° F (30° C); Partial load 50° F (10° C)]

[6] *Pressure:* Per ASME Sec. IV

[7] *Overall weight:* Includes displacement rods

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

Boiler Dimensions

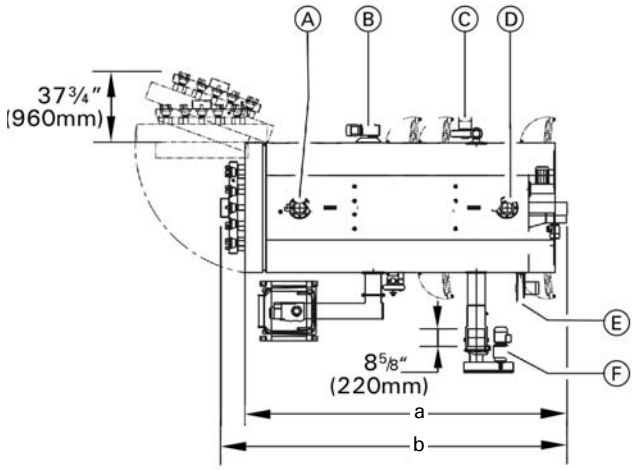


BR Boiler Return
BS Boiler Supply

Dimensions

Boiler Model KPT-		**390**	**530**	**720**	**950**	**1250**
a	in. (mm)	93 5/8 (2378)	99 7/8 (2536)	111 5/8 (2834)	119½ (3035)	127 1/8 (3230)
b	in. (mm)	91 5/8 (2328)	97 7/8 (2486)	109 5/8 (2784)	117 3/8 (2981)	125 (3176)
c	in. (mm)	172 (4370)	191¾ (4870)	207 (5257)	214½ (5447)	235 7/8 (5992)
d	in. (mm)	87 1/8 (2060)	100¾ (2560)	100 7/8 (2562)	100 7/8 (2562)	122 3/8 (3107)
e	in. (mm)	22¾ (577)	22¾ (577)	22¾ (577)	25 7/8 (657)	25 7/8 (657)
f	in. (mm)	47¼ (1200)	47¼ (1200)	47¼ (1200)	50¼ (1275)	50¼ (1275)
g	in. (mm)	94¾ (2405)	114 3/8 (2905)	117 7/8 (2993)	112 5/8 (2861)	134 1/8 (3406)
h	in. (mm)	42¾ (1086)	42¾ (1086)	54 3/8 (1380)	63½ (1612)	63½ (1612)
k	in. (mm)	31 5/8 (803)	31 5/8 (803)	31 5/8 (803)	36 5/8 (929)	36 5/8 (929)
l	in. (mm)	17 7/8 (453)	17 7/8 (453)	17 7/8 (453)	18 7/8 (479)	18 7/8 (479)
m	in. (mm)	81¾ (2077)	91¾ (2331)	98 1/8 (2491)	96¼ (2444)	103 7/8 (2639)
n	in. (mm)	12 1/8 (308)	12 1/8 (308)	12 1/8 (308)	17 3/8 (440)	17 3/8 (440)
o	in. (mm)	50 1/8 (1274)	50 1/8 (1274)	54 3/8 (1380)	63½ (1612)	63½ (1612)
p	in. (mm)	49¾ (1263)	55¾ (1417)	55 5/8 (1413)	51 7/8 (1317)	61 5/8 (1566)

Boiler Dimensions *(continued)*



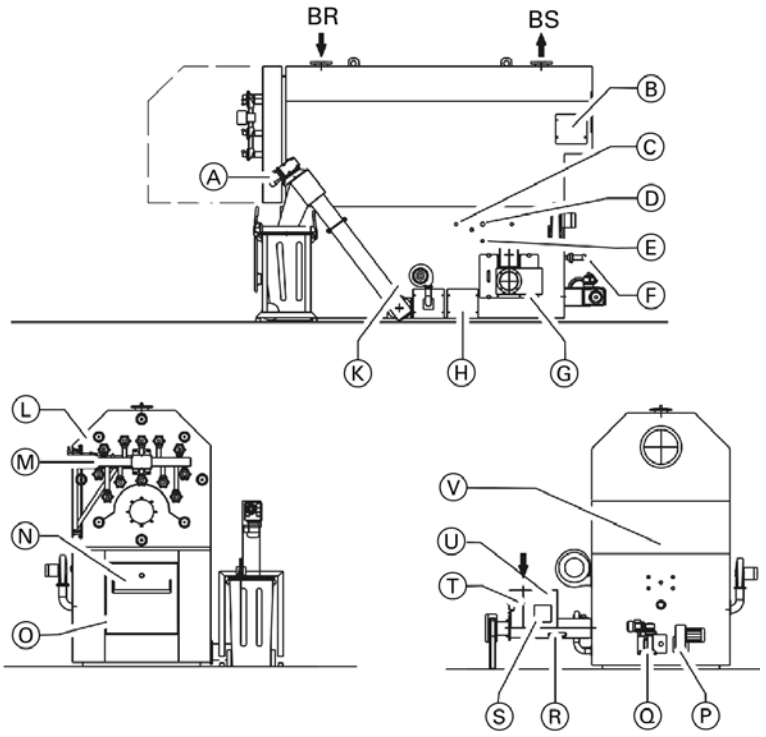
Legend

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

Dimensions

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

Boiler Components

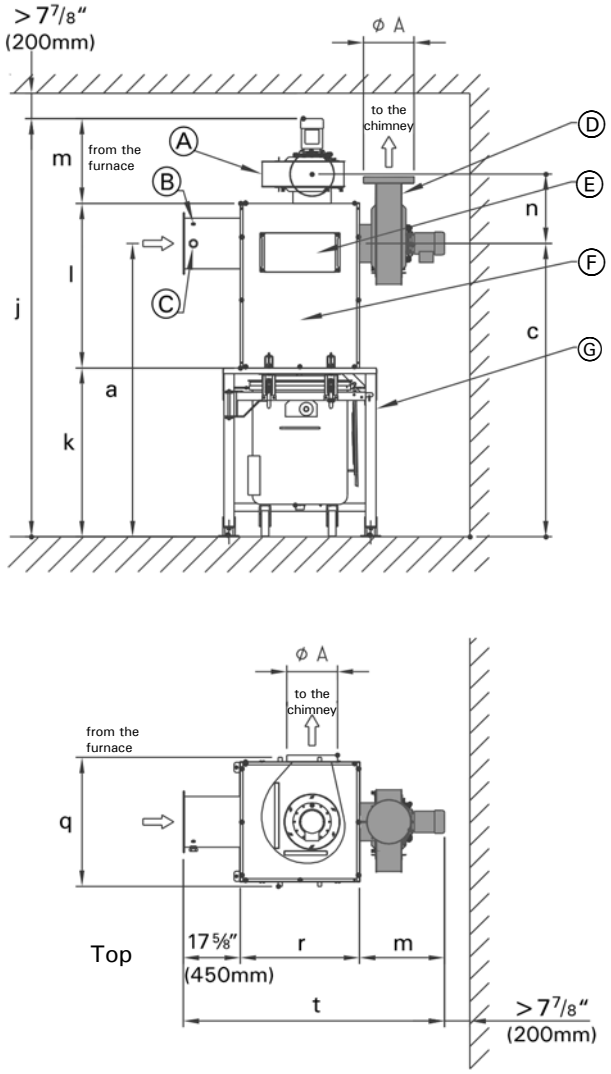


Legend

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

Flue Gas Cyclone

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



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

CAUTION

The effects of heat can create dangerous conditions.

Legend

Ⓐ Flue gas exhaust blower (with variable rotation)
- Either top or side
- Unused connection as cleaning cover
- Alternate mounting of the flue gas exhaust blower (shown in dark grey)

Ⓑ Flue gas temperature sensor

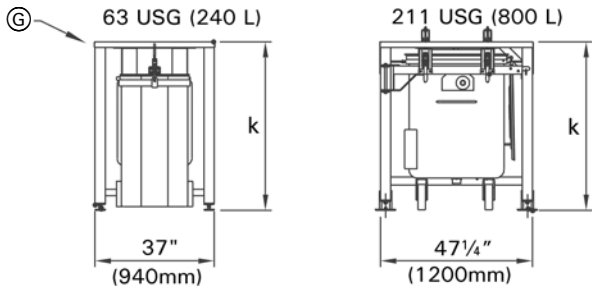
Ⓒ Oxygen sensor

Ⓓ Flue gas exhaust blower - choice of top or side - unused connection as cleaning lid, variable rotation, clean gas chamber

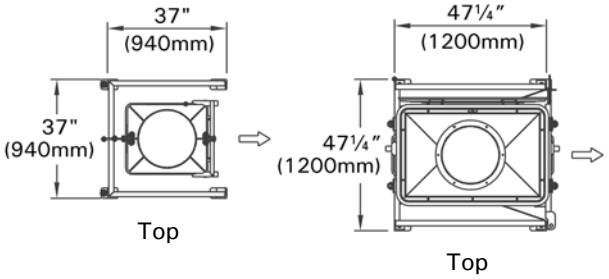
Ⓔ Cleaning lid crude gas chamber

Ⓕ Cyclone (axial cyclone)

Ⓖ Ash bin support frame 63 USG (240 L) or 211 USG (800 L)

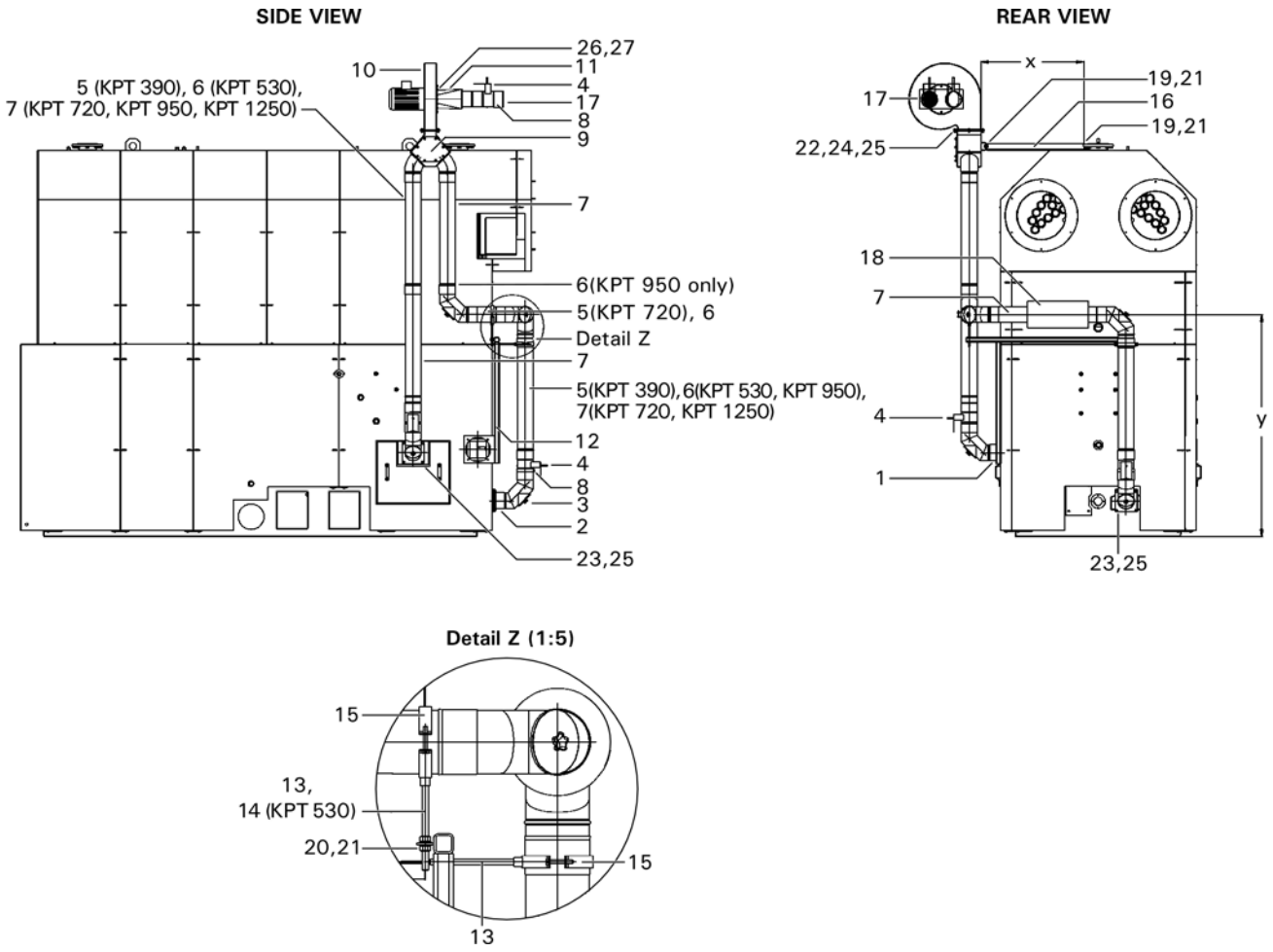


Ash bin support frame: positioning is possible in 4 x 90° (extraction, ash container) Drawn with extraction to the right



Boiler Model KPT-		390	530	720	950	1250
A	in. (mm)	13¾ (350)	13¾ (350)	13¾ (350)	15¾ (400)	17 11/16 (450)
a	in. (mm)	81 7/8 (2080)	92 7/8 (2359)	98 1/16 (2491)	96¼ (2444)	103 7/8 (2639)
c	in. (mm)	92 7/8 (2359)	92 7/8 (2359)	98 1/16 (2491)	96¼ (2444)	103 7/8 (2639)
j	in. (mm)	125½ (3186)	125½ (3186)	133 (3378)	135 7/8 (3452)	146 3/8 (3717)
k	in. (mm)	52 3/8 (1330)	52 3/8 (1330)	57 9/16 (1462)	57 9/16 (1462)	65¼ (1657)
l	in. (mm)	49½ (1256)	49½ (1256)	49½ (1256)	51 3/16 (1300)	51 3/16 (1300)
m	in. (mm)	23 5/8 (600)	23 5/8 (600)	26 (660)	27 1/8 (690)	30 (760)
n	in. (mm)	17 5/8 (447)	17 5/8 (447)	18 1/8 (461)	22 7/8 (579)	22 7/8 (579)
q	in. (mm)	49 5/8 (1260)	49 5/8 (1260)	49 5/8 (1260)	40 1/8 (1020)	40 1/8 (1020)
r	in. (mm)	24½ (620)	24½ (620)	24½ (620)	37½ (950)	37½ (950)
t	in. (mm)	65¾ (1670)	65¾ (1670)	68 (1730)	82 (2083)	84¾ (2153)

Recirculation System



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Recirculation System *(continued)*

Item	Boiler Model KPT-	390	530	720	950	1250
no.	Description	Quantity	Quantity	Quantity	Quantity	Quantity
1	Pipe adaptor primary air 1	1	1	1	1	1
2	Pipe adaptor primary air 2	1	1	1	1	1
3	Elbow 130 x 0.9/90° with PD	5	5	5	5	5
4	Flue damper blade D = 5⅛ in. (130 mm)	4	4	4	4	4
5	Pipe 130 x 0.6 L = 9⅞ in. (250 mm)	2	--	1	--	--
6	Pipe 130 x 0.6 L = 19⅝ in. (500 mm)	1[1x L = 8⅞ in. (225 mm)]	3[1x L = 8⅞ in. (225 mm)]	1[1x L = 9 in. (228 mm)]	3[1x L = 12⅛ in. (308 mm)], 1[1x L = 16⅛ in. (409 mm)]	1[1x L = 12⅛ in. (308 mm)]
7	Pipe 130 x 0.6 L = 39⅛ in. (1000 mm)	3[1x L = 31¾ in. (805 mm)], 1[1x L = 36 in. (914 mm)]	3[1x L = 31¾ in. (805 mm)], 1[1x L = 32⅝ in. (830 mm)], 1[1x L = 36 in. (915 mm)]	5[1x L = 18⅛ in. (460 mm)], 1[1x L = 28⅜ in. (720 mm)], 1[1x L = 33¼ in. (845 mm)]	4[1x L = 36 in. (915 mm)]	5[1x L = 36 in. (915 mm)]
8	Clamping band 130 with gasket	18	18	18	19	20
9	Distributor	1	1	1	1	1
10	Fan DMVL	1	1	1	1	1
11	Intake cone	1	1	1	1	1
12	Recirculation bracket	1	1	1	1	1
13	Threaded rod M12 L = 7½ in. (190 mm)	2	1	2	2	2
14	Threaded rod M12 L = 9⅞ in. (250 mm)	--	1	--	--	--
15	Pipe clamp 125-130 M12	2	2	2	2	2
16	Fan bracket	1	1	1	1	1
17	Mesh 8 x 8	1	1	1	1	1
18	Pipe insulation L = 39⅜ in (1000 mm)	4	5	5	6	6
19	Bolt M12 x 1 in. (25 mm)	4	4	4	4	4
20	Nut M12	4	4	4	4	4
21	Lock washer M12	8	8	8	8	8
22	Bolt M8 x 1 in. (25 mm)	6	6	6	6	6
23	Bolt M8 x ¾ in. (20 mm)	8	8	8	8	8
24	Nut M8	6	6	6	6	6
25	Lock washer M8	14	14	14	14	14
26	Bolt M5 x ¾ in. (20 mm)	4	4	8	8	8
27	Lock washer M5	4	4	8	8	8
x	Distance between the recirculation fan and the supply flange.	27⅜ in. (695 mm)	27⅜ in. (695 mm)	28⅞ in. (735 mm)	33¼ in. (845 mm)	33¼ in. (845 mm)
y	Height of the horizontal recirculation section.	41½ in. (1055 mm)	51¼ in.(1303 mm)	49½ in.(1258 mm)	51⅛ in. (1299 mm)	71⅞ in.(1825 mm)

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

Safety Devices

1. Install the pressure relief valve, discharge pipe, air vent and pressure gauge as illustrated in section piping and installation of safety devices.

   A 30 or 60 psi pressure relief valve is supplied with the boiler (standard equipment).

   The KPT 1250, 30 psi will have 2 PRVs.
2. Install a discharge pipe on the pressure relief valve. The end of the pipe must not be threaded. The pressure relief discharge pipe should extend to a floor drain and end approximately 6 in. (150 mm) above the drain.

IMPORTANT

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

IMPORTANT

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

⚠ WARNING

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

IMPORTANT

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

Fire extinguishing water tank

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

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

Expansion

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

The boiler system with 3-way mixing valve

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

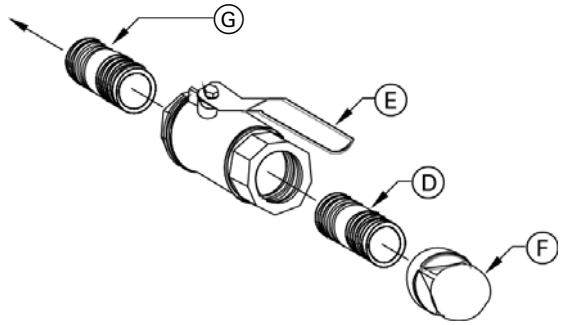
The stepless control of the PYROTEC Grate Firing System output requires a constant flow through the boiler of the water to be heated. The boiler circuit, the boiler pump and boiler-mixing valve must therefore be installed according to section piping and installation of safety devices.

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

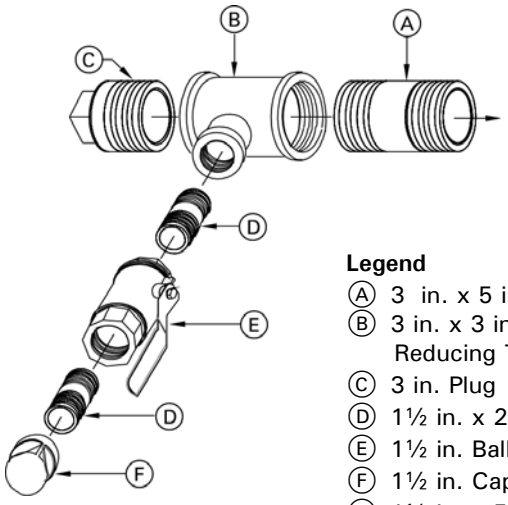
The activation of the boiler pump and boiler mixing valve is integrated in the custom control panel.

Drain inspection port

KPT 390 - 720



KPT 950 - 1250



Legend

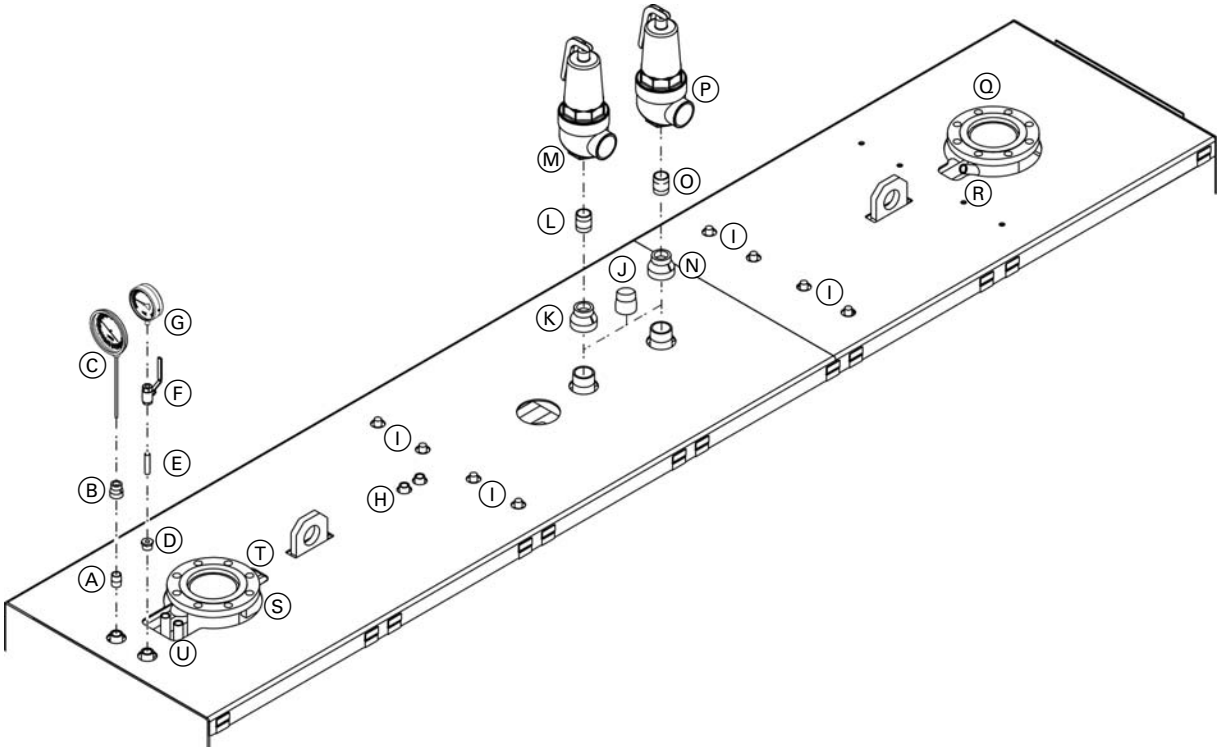
Ⓐ 3 in. x 5 in. Nipple
Ⓑ 3 in. x 3 in. x 1½ in. Reducing Tee
Ⓒ 3 in. Plug
Ⓓ 1½ in. x 2 in. Nipple
Ⓔ 1½ in. Ball Valve
Ⓕ 1½ in. Cap
Ⓖ 1½ in. x 5 in. Nipple

Safety Devices *(continued)*

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

Legend

Ⓐ Nipple, ¾ in. x 1½ in.
Ⓑ Reducing coupling, ¾ in. x ½ in.
Ⓒ Boiler water temperature gauge
Ⓓ Bushing ¾ in. x ¼ in.
Ⓔ Nipple ¼ in. x 2½ in.
Ⓕ Ball valve ¼ in.
Ⓖ Pressure gauge
Ⓗ Sensor well - fixed high limit (sensor supplied)
Ⓘ Safety heat exchanger connections, NPTM ½ in. *1*
Ⓙ PRV Pressure Relief Valve connection cap *2*
Ⓚ Reducing bushing
Ⓛ Nipple
Ⓜ Pressure relief valve, 30 psi or 60 psi
Ⓝ Reducing bushing (KPT 1250, 30 psi only)
Ⓞ Nipple (KPT 1250, 30 psi only)
Ⓟ Pressure relief valve, 30 psi or 60 psi (KPT 1250, 30 psi only)
Ⓠ 4 in. or 6 in. Boiler supply flange *3*
Ⓡ Supply sensor well (sensor supplied)
Ⓢ 4 in. or 6 in. Boiler return flange *3*
Ⓣ Return sensor well (sensor supplied)
Ⓤ Sensor wells for thermal safety flush valve (R½ in.) (sensor supplied)



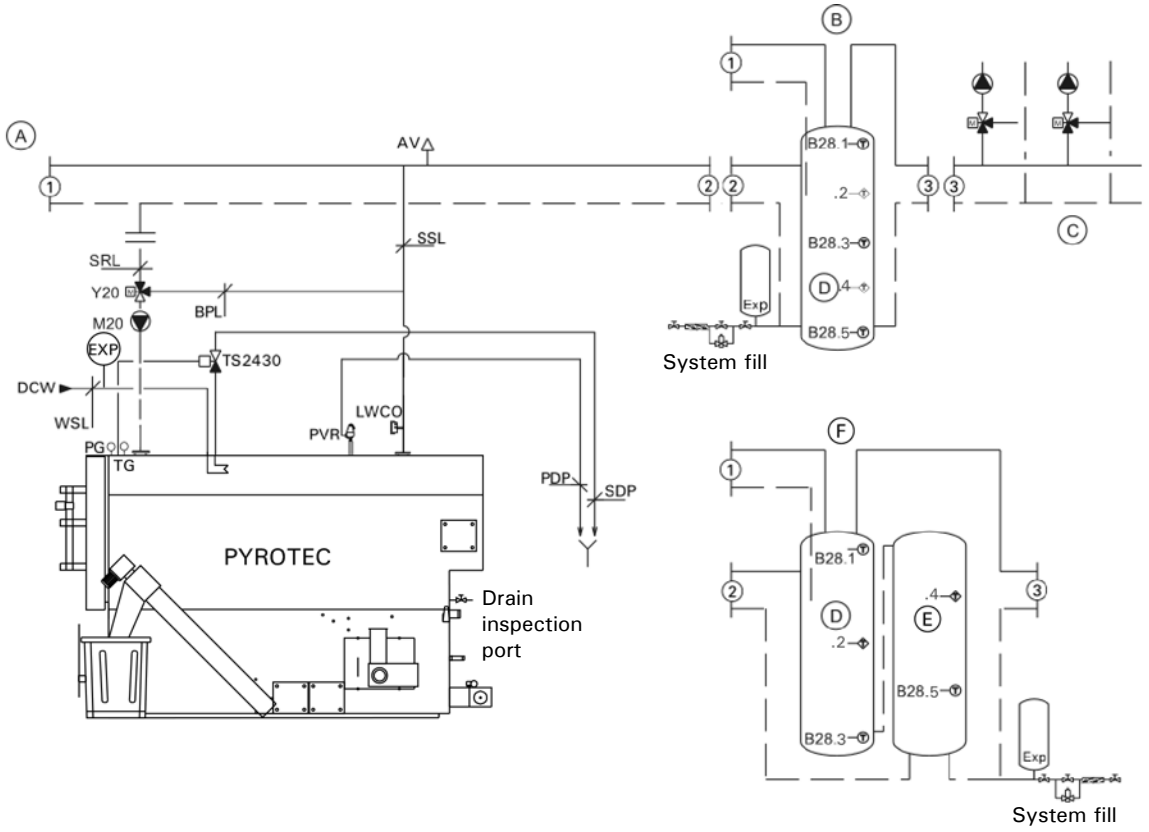
1 See section Piping and Installation of Safety Devices

2 Two PRVs must be installed on the KPT 1250 - 30 psi boiler. One PRV must be installed and the other PRV connection must be capped on the KPT 1250 - 60 psi boiler. All other models have only one PRV connection.

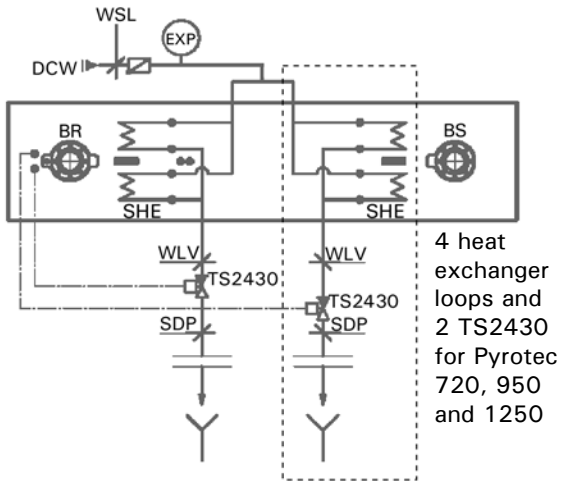
3 4 in. boiler flange for Pyrotec 390-720, 6 in. boiler flange for Pyrotec 950-1250

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

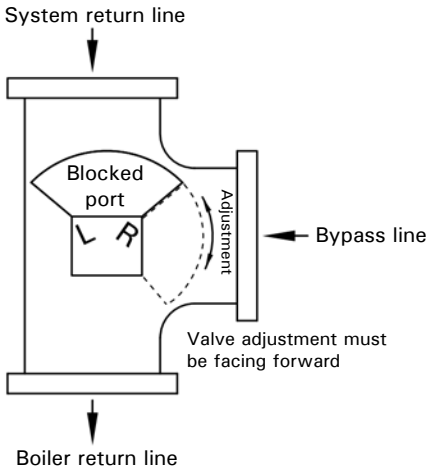
Piping and Installation of Safety Devices



Safety heat exchanger top view



3-Way mixing valve



Legend

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

①, ② and ③ indicates system connections

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Piping and Installation of Safety Devices *(continued)*

Note: To reliably prevent boiler corrosion caused by condensation of flue gases, the boiler return flow temperature must not under any circumstances be below 150° F (65° C).
A Viessmann sized boiler pump with a boiler mixing valve are provided according to the tables below.
The boiler circuit should be designed such that the temperature difference between the supply and the return temperature is equal to or less than Δt 27° F (15° C).
The expansion tank has to be connected to the boiler without any shut-offs.

Safety equipment supplied by Viessmann:

- **M 20** Boiler pump
- **Y 20** Boiler mixing valve
- **PRV** Pressure relief valve, pressure set to 30 or 60 psi
- **TS2430** Thermal safety flush valve R ¾ in., approved component; special-purpose, designed for opening at a temperature of 122°- 248° F (50°- 120° C), (safety heat exchanger loop built into boiler). The Pyrotec 390 and Pyrotec 530 have two safety heat exchanger loops and require one thermal run-off safety valve.
  The Pyrotec 720 to Pyrotec 1250 have four safety heat exchanger loops and require two thermal run-off safety valves.
- **LWCO** Low water cut-off
- **PG** Pressure gauge
- **TG** Temperature gauge (thermometer)
- **SHE** Safety heat exchanger, water volume 1.1 USG (4.2L) per loop, NPTM ½ in.

Design Recommendation:

Customer supplied:

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

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

Thermal safety flush valve

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

Pressure relief valve

Boiler model KPT-	Pressure relief valve Conbraco [1]		Drain pipe PDP [2]	
	30 psi	60 psi	30 psi	60 psi
390	1¼ in.	1 in.	1½ in.	1¼ in.
530	1½ in.	1¼ in.	2 in.	1½ in.
720	2 in.	1¼ in.	2½ in.	1½ in.
950	2 in.	1½ in.	2½ in.	2 in.
1250	2 in.	2 in.	2½ in.	2 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 KPT-	Pump	Frequency	Voltage and phase
390	UPS 50-80/4 F	60 Hz	3 x 208-230 V
530	UPS 50-80/4 F	60 Hz	3 x 208-230 V
720	UPS 80-160 F	60 Hz	3 x 208-230 V
950	UPS 80-160 F	60 Hz	3 x 208-230 V
1250	TP 100-80/4	60 Hz	3 x 208-230 / 460 V

Mixing valve

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

Viessmann ASME recommended tank sizes (U-stamped)

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

Fire Protection

Follow local regulations for wood-fired heating systems.

Power failure provision

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

Protection against back-burn for the boiler plant

The following safeguards are part of the scope of delivery for the PYROTEC Grate Firing System:

- **Preventing overfilling of the combustion chamber door**
  A level monitor must be installed to prevent overfilling of the combustion chamber door. The PYROTEC Grate Firing System has a light barrier to monitor the embers.
- **Preventing back-burn**
  With a temperature sensor directly on the in-feed auger, any danger of back-burn initiation will be detected and quickly counteracted at an early stage by increasing the fuel conveyance speed into the combustion chamber door.
- **Back flash safeguard**
  The PYROTEC Grate Firing System is operated with continuous negative pressure and is equipped with a back flash prevention device. This device prevents back flashes caused by flying embers or combustible gases that may ignite the fuel system.
- **Automatic in-feed auger extinguishing system**
  The supplied fire extinguishing system is necessary on the in-feed auger. This system should reliably prevent back- burn in case of a malfunction (such as a power failure). For safety reasons and to prevent damage by flooding, connecting the extinguishing system directly to the water network is not advisable.
  This extinguishing system must be equipped with a 6.6 USG (25 L) extinguishing water tank with a float-type switch and an adjustable Danfoss extinguisher valve. The tank for the extinguishing system must be equipped with a level monitoring system.
  If there is a shortage of water, the PYROTEC Grate Firing System will switch off automatically.
  In case of excess temperature, the in-feed auger will be flooded reliably but in a limited fashion.

IMPORTANT

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

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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 PYROTEC Grate Firing System. In addition to being a safeguard against back-burn, this will also prevent any penetration by air leaking in via the in-feed auger.

Rotary valve

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

Max. overpressure allowed in fuel storage unit:
+500 Pa / +2.00"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. overpressure 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.

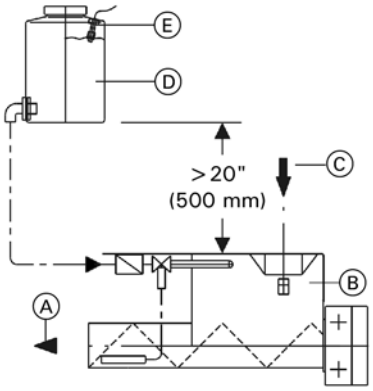
Fire Extinguishing System

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

Fire extinguishing system for the in-feed auger

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

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

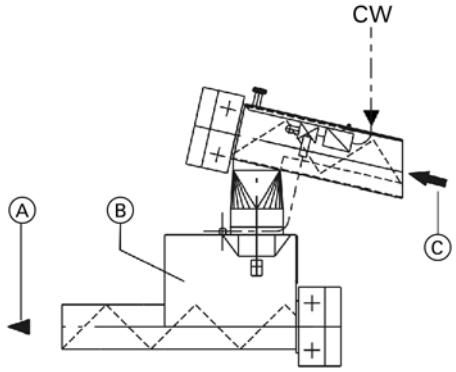


Legend

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

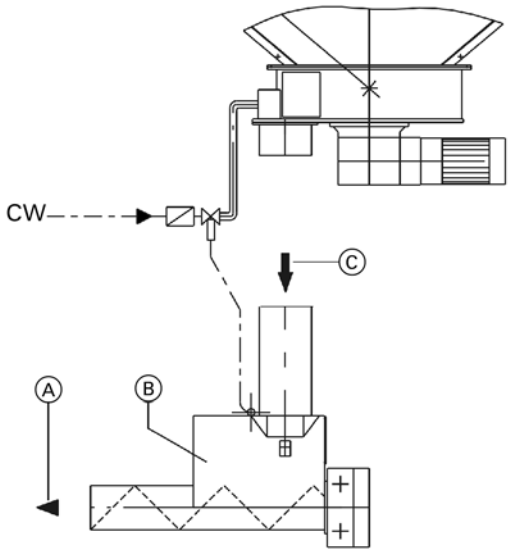
Fire extinguishing system for the conveyor auger

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



Fire extinguishing system for the down pipe

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



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

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

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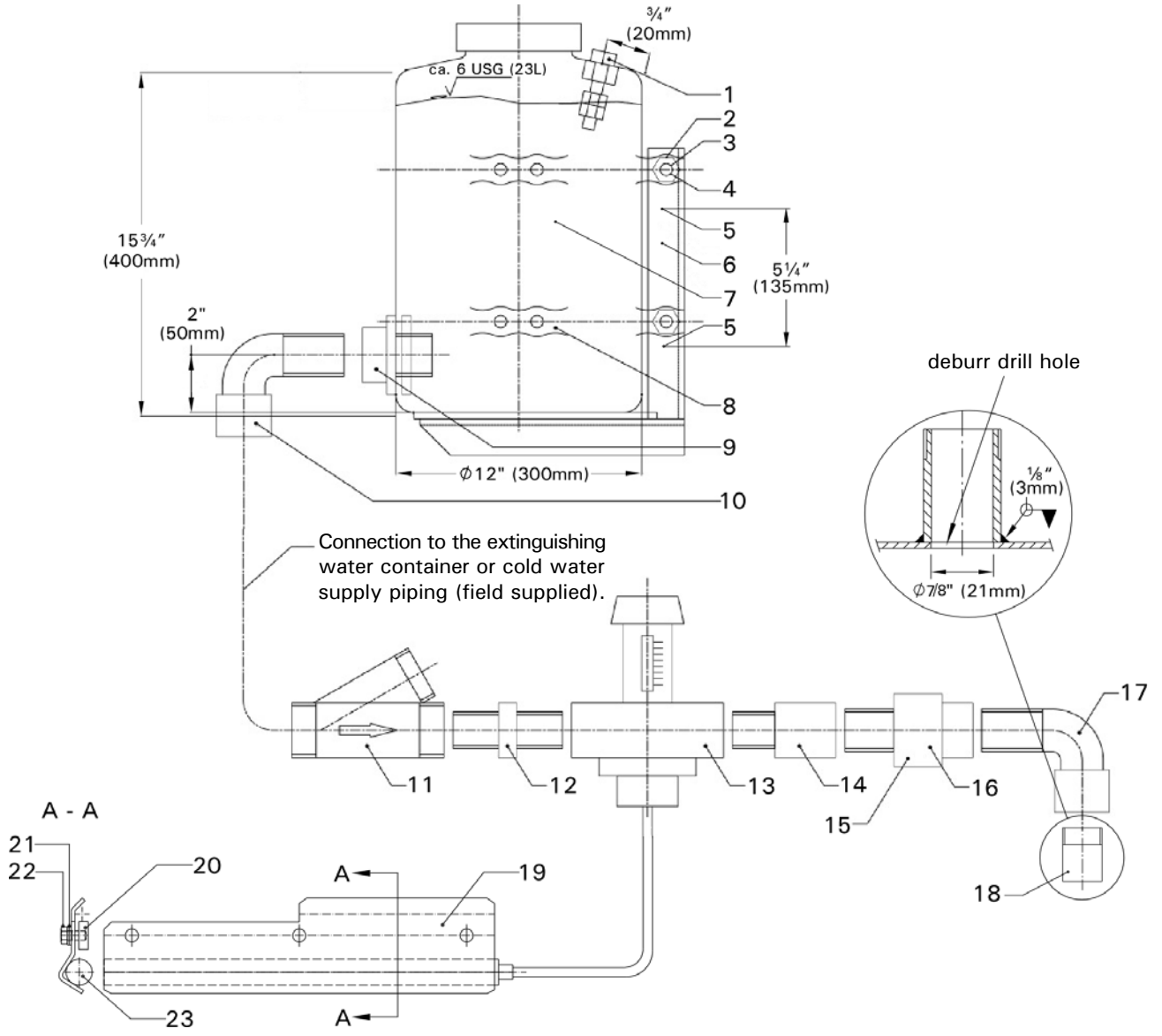
Assembly of the Fire Extinguishing System



Item No.	Quantity	Description
1	1	Floater switch (N25)
2	4	Washer
3	2	Hex nut M6
4	2	Threaded rod M6
5	2	Stud anchor ⅜ in. x 4¼ in. (10 mm x 108 mm)
6	1	Mounting bracket
7	1	Plastic container 6.6 USG (25 L)
8	2	Clamping band
9	1	Duct ½ in.
10	1	90° street elbow ½ in.
11	1	Strainer ½ in.

Item No.	Quantity	Description
12	1	Connector ½ in.
13	1	Danfoss AVTA
14	1	Reducer ¾ in. - ½ in.
15	1	Union ¾ in.
16	1	Gasket ¾ in.
17	1	90° street elbow ¾ in.
18	1	Weld on nipple ¾ in.
19	1	Clamp
20	3	Bracket
21	3	Strain washer
22	3	Hex nut
23	1	Sensor

Assembly of the Fire Extinguishing System *(continued)*

The following assembly instructions for the fire extinguishing system are to be used with the layout and description shown on page 31.

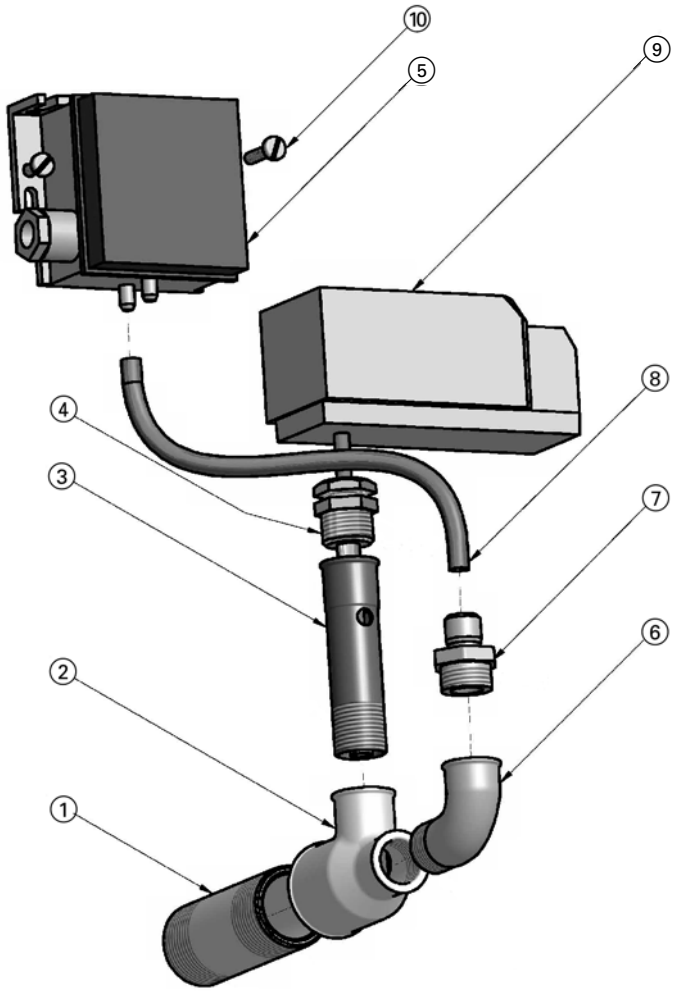
- Install the mounting bracket (6) near the in-feed auger at a minimum height of 20 in. (500 mm) with the stud anchors (5) for wall mount.
- Install the plastic container (7) to the mounting bracket (6) with the clamping bands (8), the threaded rods (4), washers (2) and the hex nuts (3).
- Attach the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

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

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

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

Negative Pressure Monitoring Assembly



Legend

1. Nipple 1 in. x 1 in.
2. Tee 1 in. x ½ in. x ½ in.
3. Extension with hole
4. Sensor well ½ in.
5. Differential pressure transducer
6. 90° street elbow ½ in.
7. Adapter ½ in.
8. Pressure hose
9. STB-RAK
10. Screw

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Control Panel

Mounting of the control panel

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

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

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

Electrical connection

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

General safety instructions

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

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

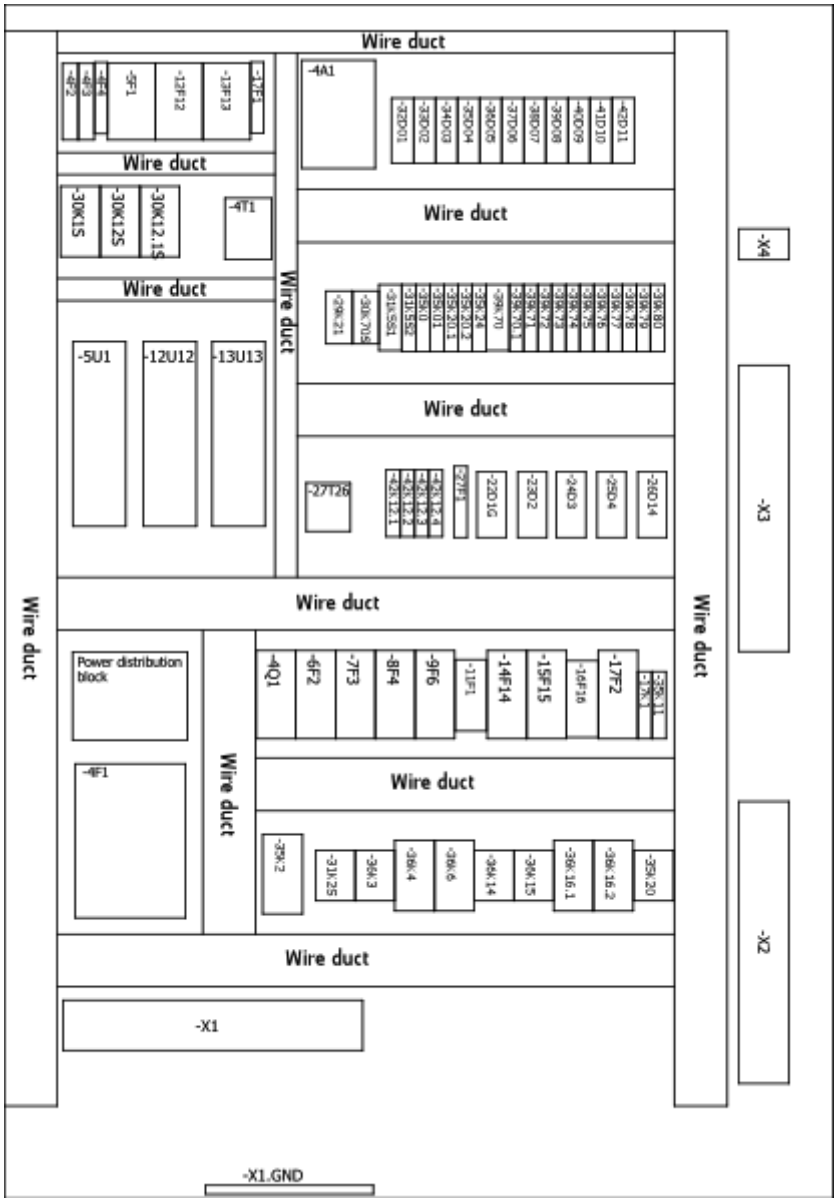
The information about wire type, wire number and wire gauge made in the wiring diagrams is not obligatory. The final decision of these settings has to be made by the executing installation company taking into consideration the local codes and regulations.

CAUTION

Any alteration of the control cabinet will void the warranty.

Control Panel *(continued)*

Vitocontrol - C, Pyrocontrol KPT



Mains supply 208V, 3 phase, 60 Hz, see field wiring diagram for details.

Customer terminal tag	Description
-X1	Line voltage connections
-X2	24V connections
-X3	Dry contact outputs
-X4	Alarm outputs

Control Panel *(continued)*

Device tags and designations may vary from project to project. Please refer to the field wiring diagram for details. The wiring diagram will be supplied after the control panel is built or with the receipt of the control panel.

Components Installed in the Control Panel

Device tag	Description
-4F2	Circuit breaker
-4F3	Circuit breaker
-4F4	Fuse
-5F1	Circuit breaker
-12F12	Circuit breaker
-13F13	Circuit breaker
-16F1	Fuse
-17F1	Fuse
-4A1	Power supply 24 VDC
-32D01	CAN Gateway
-33D02	Digital input module
-34D03	Digital input module
-35D04	Digital input module
-36D05	Digital input module
-37D06	Analog input module
-39D07	Analog input module
-39D08	Digital input module
-40D09	Analog input module
-41D10	Analog input module
-42D11	Digital input module
-30K1S	Contactor
-30K12S	Contactor
-30K12.1S	Contactor
-4T1	Transformer
-29K21	Relay
-30K70S	Relay
-31K5S1	Relay
-31L5S2	Relay
-35K0	Relay
-35K01	Relay
-35K20.1	Relay
-35K20.2	Relay
-35K24	Relay
-39K70	Relay
-39K70.1	Relay
-39K71	Relay
-39K72	Relay
-39K73	Relay
-39K74	Relay
-39K75	Relay
-39K76	Relay
-39K77	Relay
-39K78	Relay
-39K79	Relay
-39K80	Relay

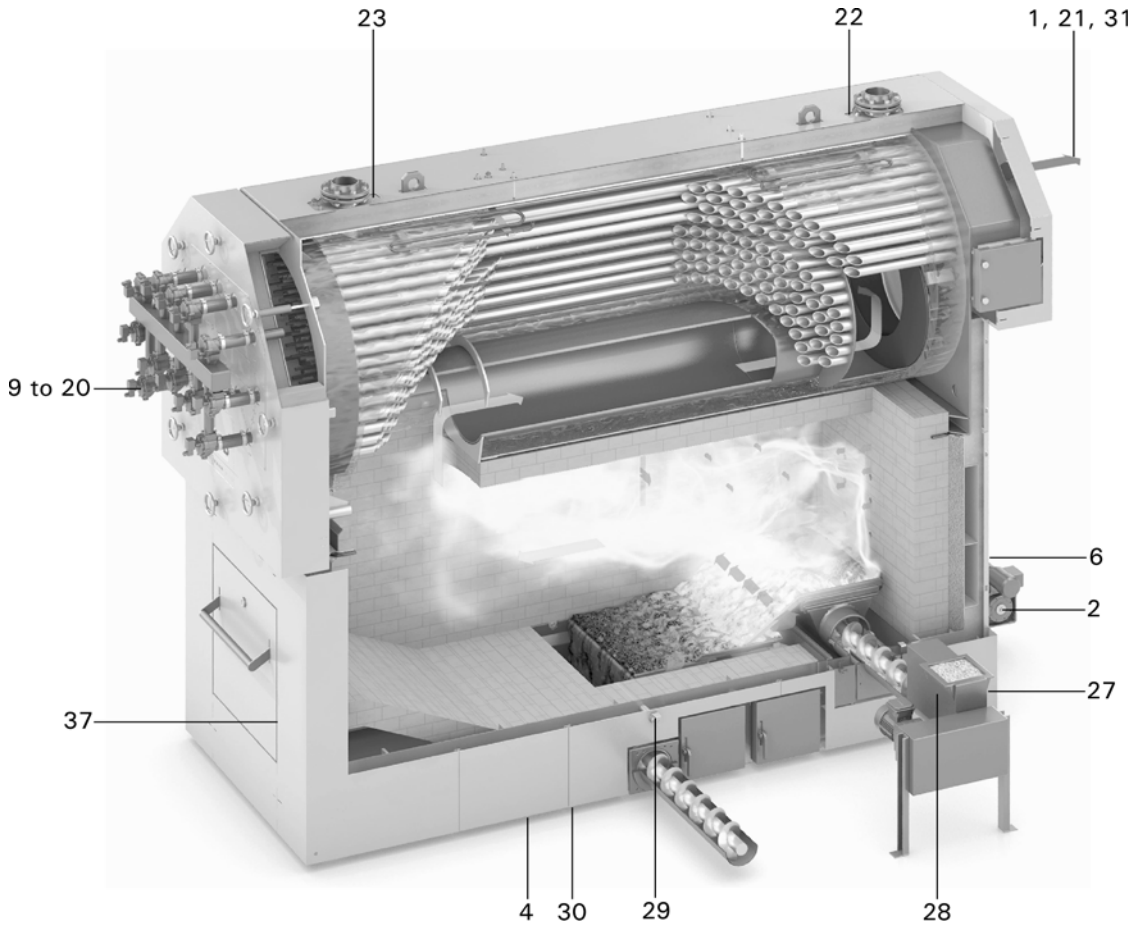
Components Installed in the Control Panel

Device tag	Description
-5U1	Variable frequency drive
-12U12	Variable frequency drive
-13U13	Variable frequency drive
-27T26	Transformer
-43K12.1	Relay
-43K12.2	Relay
-43K12.3	Relay
-43K12.4	Relay
-27F1	Fuse
-22D1G	Timer
-23D2	Timer
-24D3	Timer
-25D4	Timer
-26D14	Timer
-4Q1	Motor circuit controller
-6F2	Motor circuit controller
-7F3	Motor circuit controller
-8F4	Motor circuit controller
-9F6	Motor circuit controller
-11F1	Fuse
-14F14	Motor circuit controller
-15F15	Motor circuit controller
-16F16	Circuit breaker
-17F20	Motor circuit controller
-17K1	Relay
-35K11	Relay
-4F1	Fuse
-35K2	Solid state relay
-31K2S	Contactor
-36K3	Contactor
-36K4	Contactor
-36K6	Contactor
-36K14	Contactor
-36K15	Contactor
-36K16.1	Contactor
-36K16.2	Contactor
-35K20	Contactor

Components Installed in the Control Panel Door

Device tag	Description
-32BK	Touch screen
-4H1	Panel light
-4M1	Filter blower
-4Q0	Disconnect
-4S1	Door switch
-4U1	Temperature Regulator

Electrical Components



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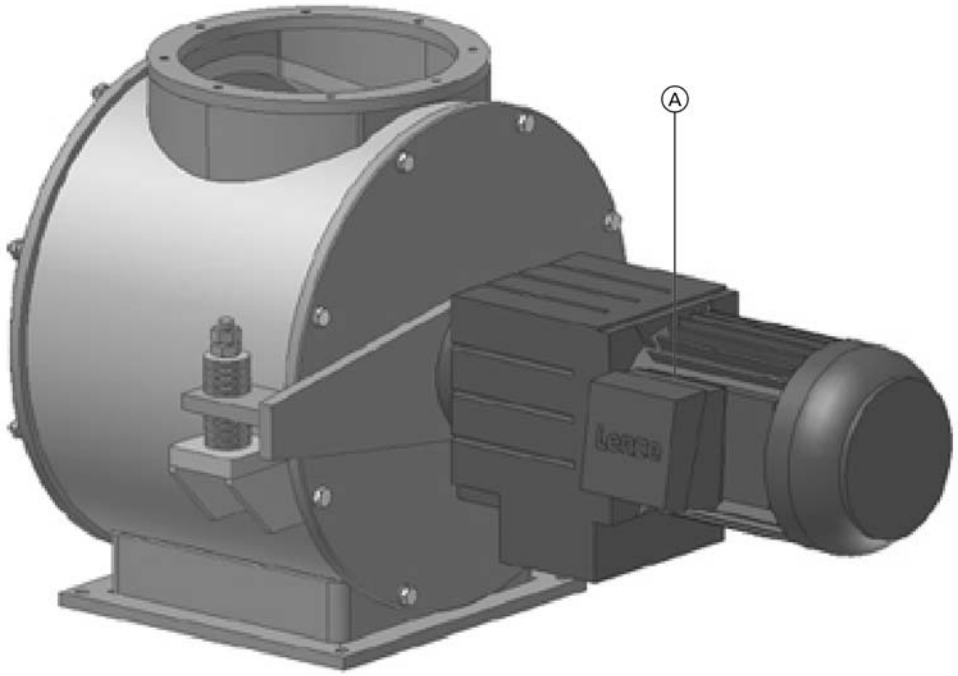
Electrical Components *(continued)*

M High voltage
Y Low voltage
B sensors
S Switches
N Sensors

Number	Designation	Device tag	Description
High Voltage			
1	M1	-3M1	Flue gas exhaust blower (not shown)
2	M11	-9M11	Grate drive
3	M13	-13M13	Secondary air blower (not shown)
4	M14	-14M14	De-ashing auger
5	M15	-15M15	De-ashing ascending conveyor auger (not shown)
6	M16	-16M16	Igniter (not shown)
7	M20	-17M20	Boiler pump (not shown)
Low Voltage			
8	Y20	-18Y20	Mixing valve actuator (not shown)
9	Y71	-20Y71	Solenoid valve 1
10	Y72	-20Y72	Solenoid valve 2
11	Y73	-20Y73	Solenoid valve 3
12	Y74	-20Y74	Solenoid valve 4
13	Y75	-20Y75	Solenoid valve 5
14	Y76	-20Y76	Solenoid valve 6
15	Y77	-20Y77	Solenoid valve 7
16	Y78	-20Y78	Solenoid valve 8
17	Y79	-20Y79	Solenoid valve 9
18	Y80	-20Y80	Solenoid valve 10
19	Y81	-20Y81	Solenoid valve 11
20	Y82	-20Y82	Solenoid valve 12
Temperature sensors			
21	B1	-107B1	Flue gas temperature sensor (not shown)
22	B20	-107B20	Boiler supply temperature sensor
23	B20.1	-107B20.1	Boiler return temperature sensor
24	B27	-73B27	Combustion chamber temperature sensor (not shown)
Light barriers			
25	B1G/1	-61B1G/1	Light barrier embers (Transmitter) (not shown)
26	B1G/2	-61B1G/2	Light barrier embers (Receiver) (not shown)
27	B2/1	-61B2/1	Light barrier in-feed auger (Transmitter)
28	B2/2	-61B2/2	Light barrier in-feed auger (Receiver)
29	B14/1	-61B14/1	Light barrier de-ashing auger (Transmitter)
30	B14/2	-61B14/2	Light barrier de-ashing auger (Receiver)
Sensors			
31	B26	-91B26	Oxygen sensor (not shown)
32	U26	-91U26	Oxygen sensor transducer (not shown)
33	N25	-69N25	Floater switch for fire extinguishing water container (not shown)
34	N21	-72N21	Fixed high limit (not shown)
35	U1	-17U1	Low water cut-off (not shown)
36	N23	-72N23	Water safety pressure switch (not shown)
37	S1	-60S1	Limit switch for the combustion chamber door
38	B70	-67B70	Differential pressure transmitter for the combustion chamber (not shown)
39	N70	-72N70	Pressure switch for the combustion chamber RAK (not shown)

Fuel Transport and Extraction Systems

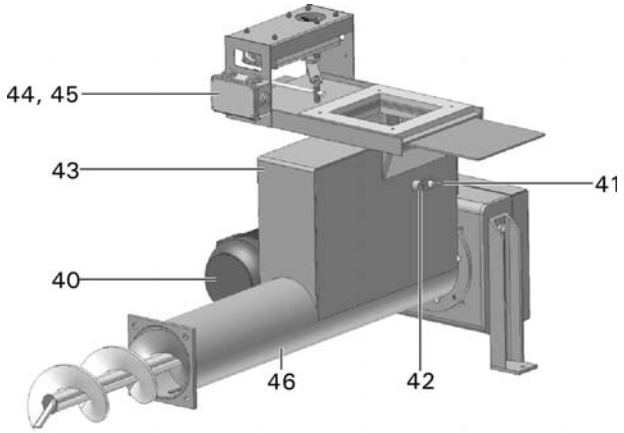
Rotary Valve



Number	Designation	Device tag	Description
Ⓐ	M9	-9 M9	Motor for rotary valve

Fuel Transport and Extraction Systems *(continued)*

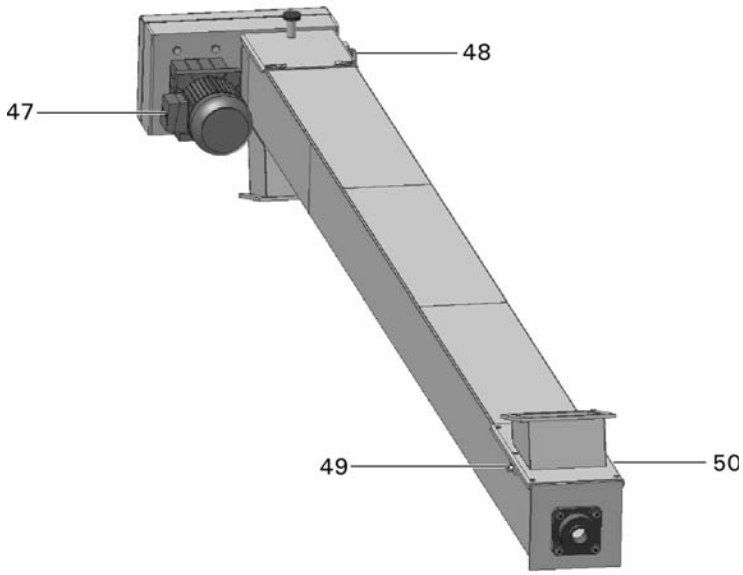
In-feed auger



Number	Designation	Device tag	Description
40	M2	-4M2	Motor for in-feed auger
41	S2	-68S2	Limit switch for maintenance lid
42	B31.1	-11B31.1	Light barrier metering container (Transmitter)
43	B31.2	-11B31.2	Light barrier metering container (Receiver)
44	M10.1	-8M10.1	Slide valve T30
45	M10.2	-8M10.2	Slide valve T30
46	B02	-107B02	In-feed auger temperature sensor

Note: For details on designation see field wiring diagram.

Pipe/trough conveyor auger

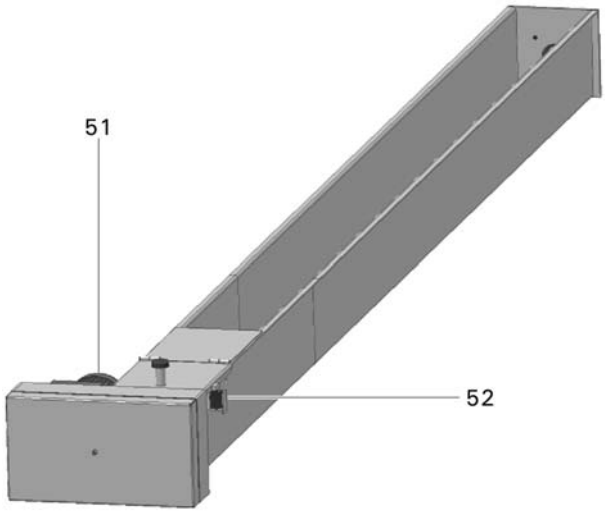


Number	Designation	Device tag	Description
47	M4.1	-5M4.1	Motor for pipe/trough conveyor auger
48	S4.1	-68S4.1	Limit switch for maintenance lid
49	B4.1/1	-61B4.1/1	Light barrier conveyor auger (Transmitter)
50	B4.1/2	-61B4.1/2	Light barrier conveyor auger (Receiver)

Note: For details on designation see field wiring diagram.

Fuel Transport and Extraction Systems *(continued)*

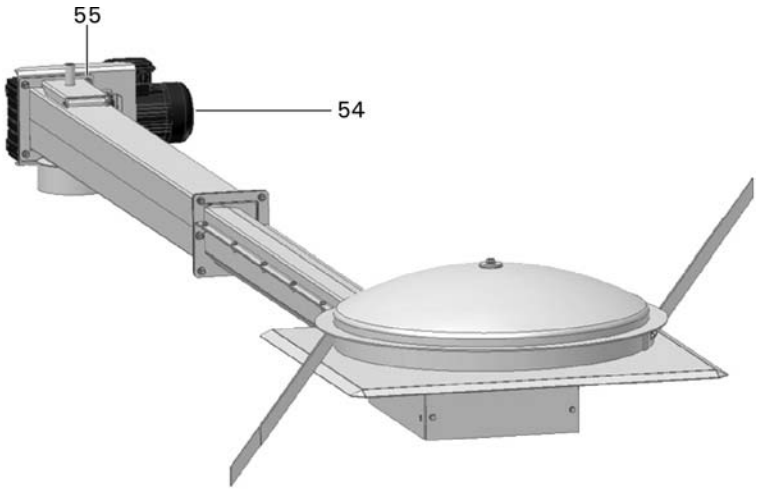
Pellet extraction auger



Number	Designation	Device tag	Description
51	M32	-12M32	Motor for pellet extraction auger
52	S32.1	-12S32.1	Limit switch for maintenance lid
53	S32.2	-12S32.2	Limit switch for silo door (not shown)

Note: For details on designation see field wiring diagram.

Spring extraction system

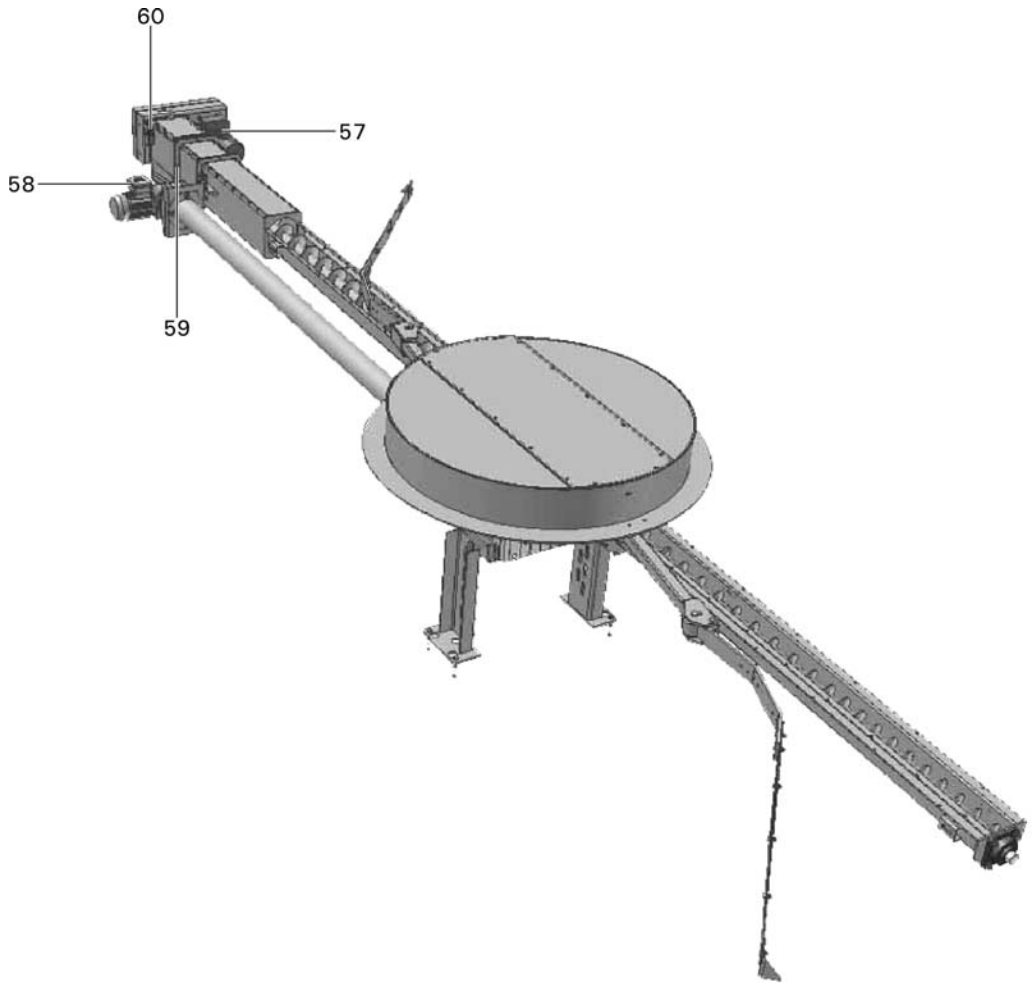


Number	Designation	Device tag	Description
54	M32	-12M32	Motor for spring extraction system
55	S32.1	-12S32.1	Limit switch for maintenance lid
56	S32.2	-12S32.2	Limit switch for silo door (not shown)

Note: For details on designation see field wiring diagram.

Fuel Transport and Extraction Systems *(continued)*

Horizontal extraction system

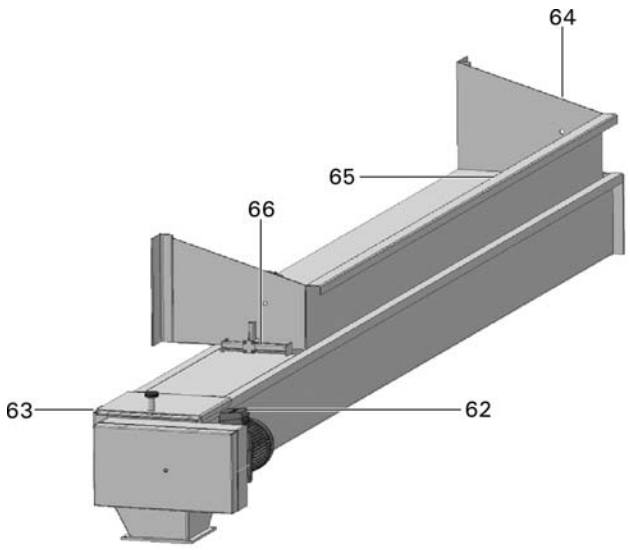


Number	Designation	Device tag	Description
57	M32	-12M32	Motor for extraction auger
58	M33	-12M33	Motor for agitator
59	B32	-12B32	Light barrier for extraction auger
60	S32.1	-12S32.1	Safety switch for maintenance lid
61	S32.2	-12S32.2	Safety switch for silo door (not shown)

Note: For details on designation see field wiring diagram.

Fuel Transport and Extraction Systems *(continued)*

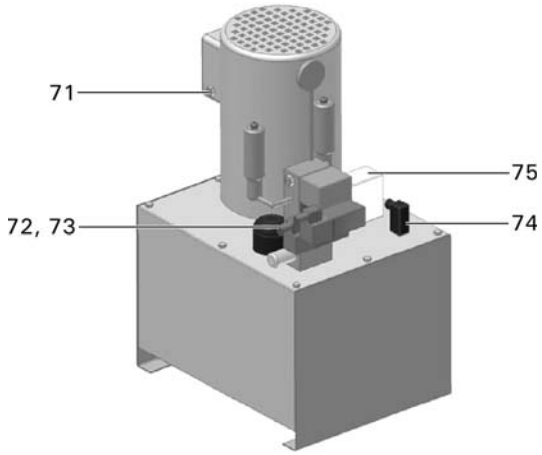
Walking floor auger



Number	Designation	Device tag	Description
62	M2	-4M2	Motor for walking floor auger
63	S3	-68S3	Safety switch for maintenance lid
64	S3.1	-68S3.1	Safety switch for auger cover
65	B3/1	-61B3/1	Light barrier walking floor auger (Transmitter)
66	B3/2	-61B3/2	Light barrier walking floor auger (Receiver)
67	B6.1/1	-61B6.1/1	Light barrier silo distribution top (Transmitter)
68	B6.1/2	-61B6.1/2	Light barrier silo distribution top (Receiver)
69	B6.2/1	-61B6.2/1	Light barrier silo distribution bottom (Transmitter)
70	B6.2/2	-61B6.2/2	Light barrier silo distribution bottom (Receiver)

Note: For details on designation see field wiring diagram.
Note: Items 67 to 70 only apply to the walking floor with filling function.

Hydraulic unit



Number	Designation	Device tag	Description
71	M6	-7M6	Motor for hydraulic unit
72	Y6.1	-25Y6.1	Solenoid valve to change between silo lid and walking floor
73	Y6.9	-7Y6.9	Change silo distribution
74	N6.1	-7N6.1	Hydraulic temperature
75	N6.2	-7N6.2	Hydraulic level

Note: For details on designation see field wiring diagram.
Note: Items 72 and 73 are optional.

Fuel Transport and Extraction Systems *(continued)*

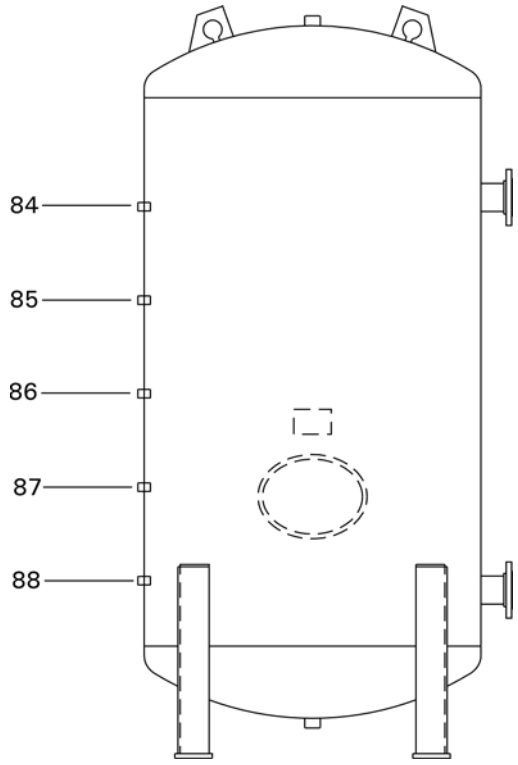
Silo Lid

Number	Designation	Device tag	Description
76	Y6.3	-22Y6.3	Solenoid valve silo lid open
77	Y6.4	-22Y6.4	Solenoid valve silo lid close
78	S6.1	-22S6.1	Key operated switch for silo lid
79	M901	-24M901	Vibration motor 1
80	M902	-24M902	Vibration motor 2
81	M903	-24M903	Vibration motor 3
82	S901	-24S901	Key operated switch for vibration motor
83	S5.1	-68S5.1	Safety switch for silo lid

Note: For details on designation see field wiring diagram.
Note: The quantity of items 79 to 81 will depend on the size of the silo lid.

Thermal Storage Tank

Thermal storage tank



Number	Designation	Device tag	Description
84	B28.1	-109B28.1	Thermal storage tank sensor (top)
85	B28.2	-109B28.2	Thermal storage tank sensor (top/middle)
86	B28.3	-109B28.3	Thermal storage tank sensor (middle)
87	B28.4	-109B28.4	Thermal storage tank sensor (middle/bottom)
88	B28.5	-110B28.5	Thermal storage tank sensor (bottom)
89	B60	-110B60	Outdoor temperature sensor (not shown)

Note: For details on designation see field wiring diagram.

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.

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

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.

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Commissioning

Initial startup

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

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

IMPORTANT

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

First check:

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

Filling the heating system

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

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

Fuel for the commissioning

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

PYROTEC	390	approx.	5100 lb.
PYROTEC	530	approx.	6600 lb.
PYROTEC	720	approx.	8800 lb.
PYROTEC	950	approx.	11660 lb.
PYROTEC	1250	approx.	14960 lb.

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

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

CAUTION

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

Commissioning and hand over

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

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

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

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

IMPORTANT

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

Filling the Fuel Storage Unit

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

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 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 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 combustion chamber.

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 feed auger. Fill the silo evenly to approximately 12 in. (300 mm) above the articulated arm or over the spring-mounted blades, switch on the facility using the function button on the control panel and wait until the articulated arms or the spring-mounted blades go under the cup washer.

⚠ CAUTION

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

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

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

IMPORTANT

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

⚠ WARNING

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

Excess Conditions

Excess temperature/power failure

CAUTION

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

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

IMPORTANT

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

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

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

Possible causes for excess temperature:

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

Low water/excess water pressure

Possible causes:

Low water: Leakage in the heating system.

Excess water pressure: The expansion tank is not functioning.

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

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

Pyrocontrol Control System

The control system for the Pyrotec boiler firing process (Pyrocontrol) is controlled by a Programmable Logic Controller (PLC), which visualizes the system on a touch screen and provides an interface for navigation and entering settings.

Export of operational data via Mod-bus Pyrocontrol

As an option, the Pyrocontrol boiler control unit can be extended with the Mod-bus (PYR-SED) extension module. This extension module enables the exchange of operating data between the higher control unit (Modbus master) and the Pyrocontrol control unit (Modbus slave) via a serial interface (RS232).

Note: This module is optional and must be ordered separately. Please refer to the export of Operational data via Mod-bus Pyro control for details.

The soft touch keys in Screen 1

Soft touch key 1

Switch on boiler
When touched, the color changes (from light to dark)

Soft touch key 2

Switch off boiler
When touched, a confirmation is requested, and then the color changes (from light to dark).

Soft touch key 3

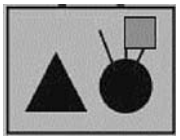
Lock screen / Unlock screen
When touched, a confirmation is requested.

Soft touch key 4

Open settings
Touching it opens Screen 4 to enter settings.

Soft touch key 7
Screen for Kob boiler

Overview, wood-fired boiler
Touching it opens Screen 7.



Soft touch key 8
Symbol

Overview, additional boilers
Touching it opens Screen 8.
Important: Screen 8 is only available with optional multiple-boiler systems.

An additional boiler can be manually switched on or off, and automatic operation can be selected. The operating hours counter is located in the centre left of the screen.

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Pyrocontrol Control System *(continued)*

Touch screen, Screen 1-8

The touch screen is 6¼ in. (160 mm) wide, 4¾ in. (120 mm) high and has a resolution of 640 x 480 pixels. The screen is a color display monitor. After switching "ON" the main switch, the PLC starts up, and the Overview appears (Screen 1).

Navigation: The navigation program "Pyrocontrol" is a product of KÖB Viessmann Manufacturing Company Inc. It is operated following the same patterns like MS Windows programs. Select a soft touch key with the fingertip or fingernail.

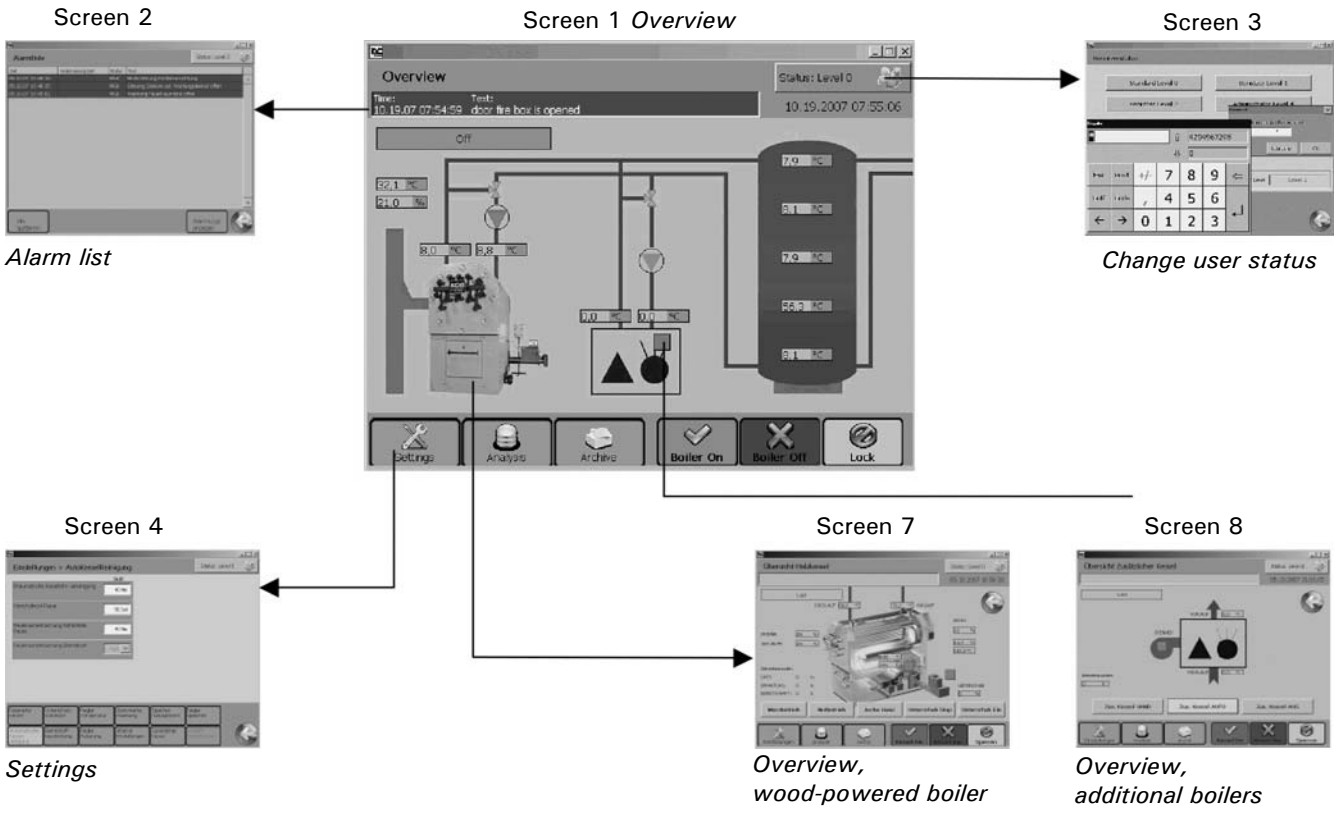
The arrangement of the soft touch keys is always the same throughout, i.e. once a keypad occurs; it is located in the same position in all screens, with the exception of the BACK key (arrow in blue circle) in Screens 7 and 8.

The hierarchy of Screens 1-7 (optional 8) ranges over the following levels:

In Screen 1 you can choose between 7 or 8 different Screens (8 being for an optional additional boiler).

When choosing by tapping one of the two boilers soft touch key (photo and optional symbol), either 7 "Overview of wood-powered boiler" or, optionally, 8 "Overview of additional boilers" appears (optional only with multiple-boiler systems) in the Screen title.

Settings can be changed in screen 1-8 by touching the respective soft touch key. This opens new windows with new input fields or soft touch keys.



Pyrocontrol Control System *(continued)*

The following applies to all screens. The screen title and user status are shown at the top. The screen title indicates which Screen (1-8) is active. The areas for display and call-up for entering settings are always located in the centre of the screen. The soft touch keys for navigation and input are located at the bottom, with the exception of the combined user status display and the call for input.

Changeable soft touch keys for input are white (light). Display windows are grey (dark). Soft touch keys for navigation are in color.

Screen 1, Object indicator light

Displays operational status of boiler pump and additional boilers. If the object indicator lights up green, the component is active.

Example: The pump is running and an additional boiler is in operation. If the object indicator light is grey, the respective object (pump or additional boiler) is shut down.

IMPORTANT

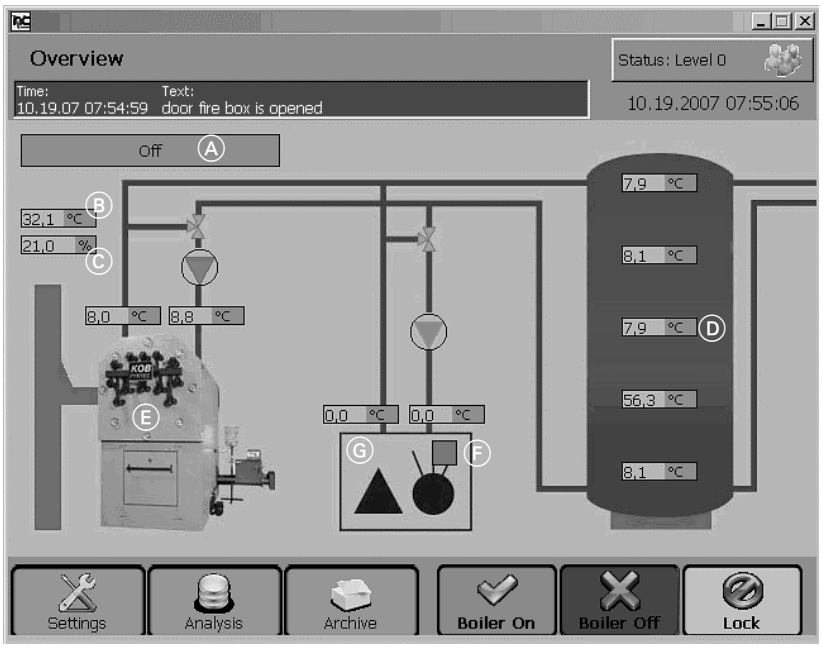
The object indicator light does not provide information about the operating mode of the system.

Area of Screen

Screen 1 Overview

Description

Top



Screen title, e.g. “Overview”
User status (top right)
Alarm line (bottom left, red)
Date/Time (bottom right)

Centre

Ⓐ Display of operating status of KÖB boiler (top left, grey), e.g. “OFF” (no heating operation)
Display of actual data of boiler (grey)
Ⓑ Flue gas temperature (top left)
Ⓒ Residual O_2 (bottom left)
Ⓓ Displays of accumulator charge status (grey)
Ⓔ Button for KÖB boiler (photo)
Ⓕ Object indicator light (green/grey)
Ⓖ Button for additional boilers (option)

Bottom

Sets of buttons, bottom left:
Navigation (orange) for Screens 4, 5 & 6: Settings, Analysis, Archive

Sets of buttons, bottom right:
Boiler ON (green)
Boiler OFF (red)
Lock screen (yellow)

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Pyrocontrol Control System *(continued)*

Screen 2, Alarm list

Touching the red Alarm line soft touch key (in Screen 1) opens Screen 2 (Alarm List with alarm logs, red). All error messages which have been registered but not yet acknowledged are listed here.

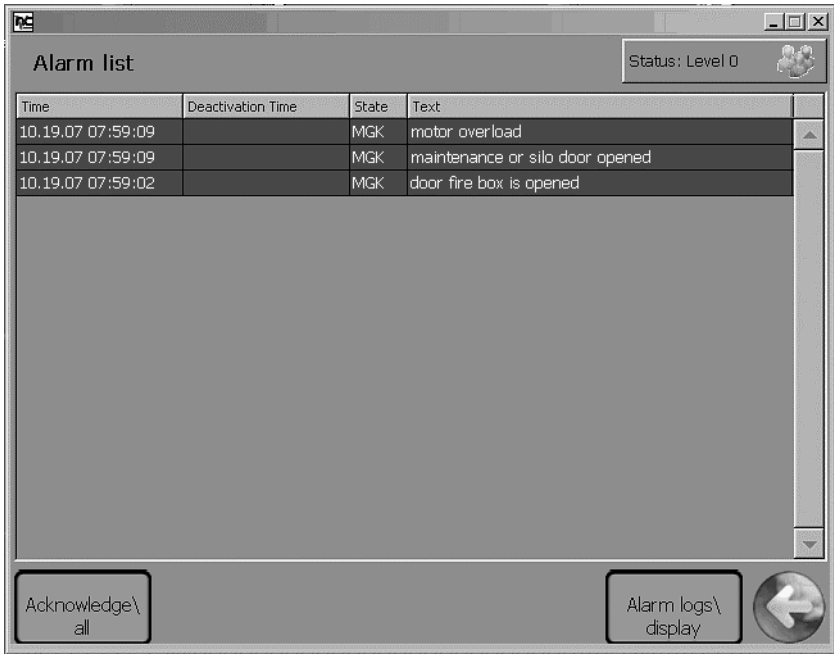
Touching an alarm log line allows the respective error message to be displayed in detail or acknowledged. A history of acknowledged error messages can be called up in Screen 2.

Area of Screen | **Screen 2** | **Description**

Top

Centre

Bottom



Screen title, e.g. “Alarm List”
User status (top right)

Alarm logs (red) in rows according to time

Back button (back to Screen 1)
Display alarm logs
Acknowledge all

The “Acknowledge all” soft touch key (bottom left) acknowledges error messages listed in the centre of the Screen. The cause of the error should be remedied before acknowledging the error message. Otherwise the error message will continue to be maintained. (It will be shown again in the Alarm List after a short period of time).

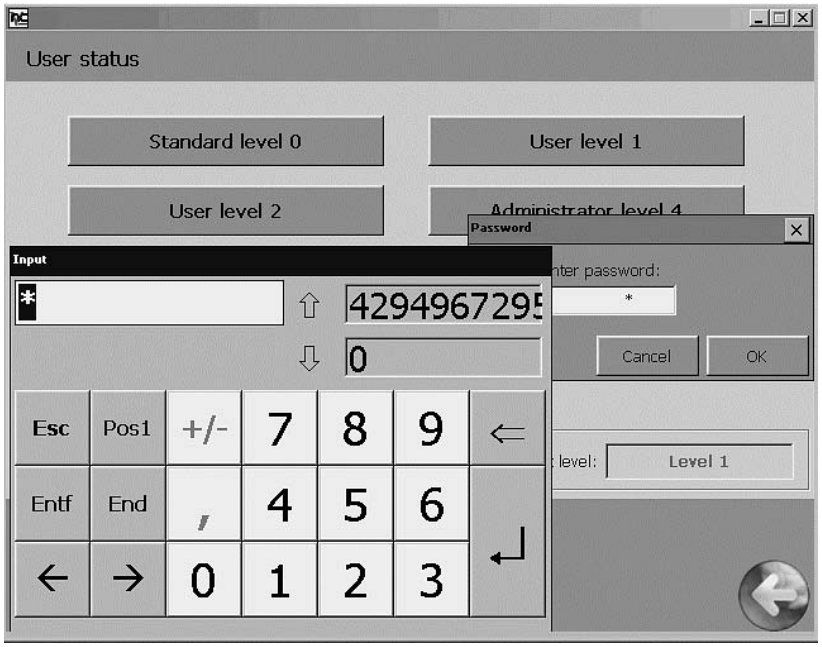
Touching the soft touch key “Display alarm log” (bottom right) will list all past error messages. The soft touch key “Ascertain alarms in history” is displayed in the lower left of this new page. By touching this soft touch key, the period for which the alarms to be displayed can be specified.

Pyrocontrol Control System *(continued)*

Screen 3, Managing the user status

Touching the soft touch key "Status Level 0", ...1, 2 or 4 (at the top right of the Screen), the user level can be changed and thus the access rights for entering settings stipulated. To change the user level, no user name needs to be entered, but all four possible levels are provided as buttons.

When the user level desired (0-4) is selected, a password in the form of a 4-digit code will be asked for, which has to be entered and confirmed with ENTER by touching the white input cell using the pop-up number keypad. The password will then appear in four asterisks (****) and has to be confirmed again with OK.

Area of Screen	Screen 3	Description
Top		Screen title "User Status"
Centre		Soft touch key for selecting the user level desired
		Password query window: Always confirm with OK.
		Input number keypad: Enter the 4-digit code here and confirm with ↵.
		Display: current level
Bottom		Back button (back to Screen1)

After making these entries, the newly selected status applies with the following user rights associated with it:

User level	Password	Rights
Standard Level 0	No password (→automatic jump back to standard after standstill period > 5 minutes).	No rights, no changing (only display)
Customer Level 1	1111	No selection of parameters with the trend display (Point 5.1)
Customer Level 2	2222	Parameter selection is possible
Administrator Level 4	No specification	Administrator, access to Win CE Desktop as well as software updating possible

By introducing these user levels, Viessmann is making an effort to maintain the parameters essential for quality-assured businesses. This guarantees good operational practice, as certain parameter changes are reserved only for Viessmann technicians. This gives the user greater certainty that one cannot accidentally make any changes that would be technically less favorable.

Pyrocontrol Control System *(continued)*

Screen 4, Adjusting settings and process parameters

In the Settings menu, adjustable categories can be chosen and their parameters changed.

In the centre the parameters to be set are listed with their current values.

If an attempt is made to change a parameter that is not cleared for change in the current user status, Screen 3 will be called up automatically. By changing the user status, the authorisation required can be cleared (see "Screen 3, managing the user status").

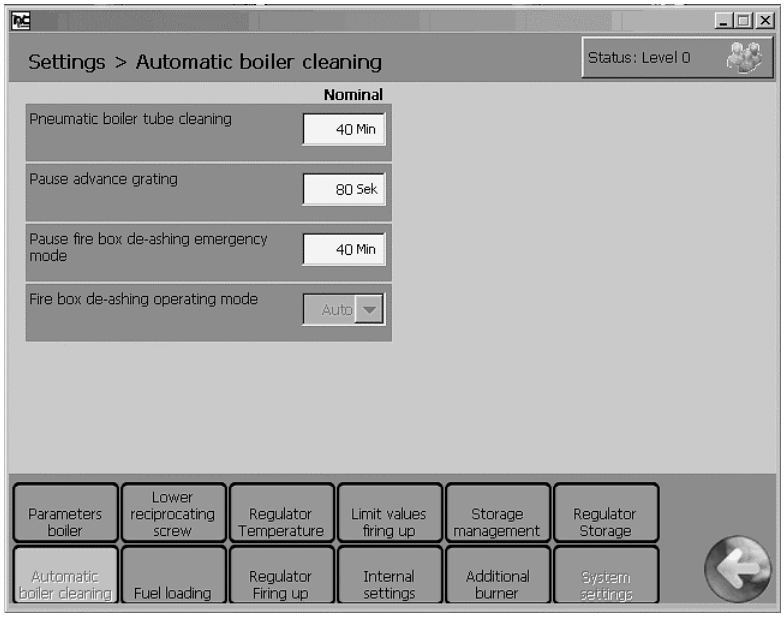
The value changes when the white "Setting input cell" is touched, which opens a pop-up number keypad. Enter the value desired and confirm with ↵ .

The new value is immediately valid in the furnace firing and/or heat recovery process. If the value selected is outside the setting range, then the maximum or minimum value possible will be automatically accepted.

Factory setting (default setting):

All the parameters in the Pyrocontrol, such as set point values and switching times, are already pre-set and can be produced in Screen 4 as "Set-point values".

The values of the factory setting can be restored in User Level 2 or higher in the internal settings.

Area of Screen	**Screen 4, settings**	**Description**
Top		**Screen title** "Settings > Auto Boiler Cleaning" (left) User status (right)
Centre		**Display** Parameters set White fields can be changed by touching, a valid user status is required.
Bottom		**Soft touch key categories (orange)** The active category is yellow. Parameters can then be changed. **Back button** (back to Screen 1)

Pyrocontrol Control System *(continued)*

Screen 7, Overview, wood-powered boiler

Touching the KÖB Boiler soft touch key (photo in Screen 1) opens Screen 7 (sectional view of the boiler).

Here the most important process parameters, activity modes and operating hours are displayed. The operating mode display is located in the centre upper left of the screen. (For explanation on the text display, see “Operating modes”).

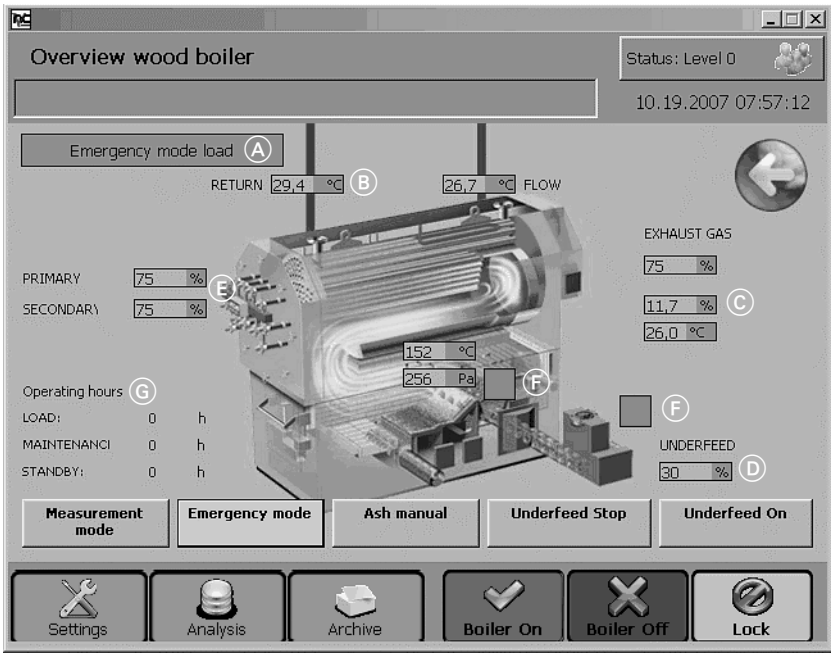
Measurement operation, emergency operation and the activity of the de-ashing assembly with ash container as well as that of the underfeed auger can all be operated manually here.

Area of Screen | **Screen 7, overview, wood-powered boiler** | **Description**

Top

Centre

Bottom



Screen title, e.g. “Overview, Wood-powered Boiler”
Alarm line (bottom left, red)
User status (top right)
Date/Time (bottom right)

Back button (back to Screen 1)

Ⓐ Display of operating mode (top left, grey), e.g. “Load” (heating operation)

Ⓑ Display of supply/return flow temperature (grey)

Ⓒ Display of flue gas parameters (right, grey)

Ⓓ Display of furnace-firing parameters (grey)

Ⓔ Display of supply air blower (left, grey)

Ⓕ Object indicator light (green/grey)

Ⓖ Displays of operational statistics

Soft touch key, left bottom:
Navigation (orange) for Screens 2, 3 & 4:
Settings, Analysis, Archive

Soft touch key, bottom right:
Boiler ON (green)
Boiler OFF (red)
Lock screen (yellow)

Flue gas parameters, centre of screen:

Flue gas exhaust blower power (top), residual oxygen (centre),
flue gas temperature (bottom).

Object indicator light (centre of screen, green or grey squares):

Light barriers for embers and metering container:

If the object indicator light, lights up green, then there is no blockage of the light barrier. If the object indicator light is grey, the light barrier has been blocked (maximum height of embers reached or metering container full). The object indicator light gives no information about the presence of any malfunction.

Operational statistics:

Here the respective sum of operating periods are listed for load, maintenance and standby.

Soft touch key (Screen 7, centre):

- Measurement operation (see ‘Operating Mode’ section)
- Emergency operation (see ‘Operating Mode’ section)
- *Ash, manual:* When the soft touch key is touched, the color of the field changes (dark/light). The de-ashing auger runs until the soft touch key is touched again or until a change is made to another screen.
- *Underfeed Stop:* When the soft touch key is touched, the color of the field changes (dark/light). The supply of material into the combustion chamber door is interrupted until the soft touch key is touched again or until a change is made to another screen.
- *Underfeed ON:* When the soft touch key is touched and held, the color of the field changes (dark/light). Material is supplied into the combustion chamber door until the soft touch key is released again.

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Pyrocontrol Control System *(continued)*

Screen 8, Additional boilers

When the soft touch key for additional boilers is touched (symbol in Screen 1), Screen 8 opens (symbol for oil or gas boiler, enlarged).

Here the supply flow and return flow temperature of the additional boiler is displayed. The KÖB Boiler operating mode display is located in the centre upper left of the screen.

(For explanation on the text displays, see “Operating modes”).

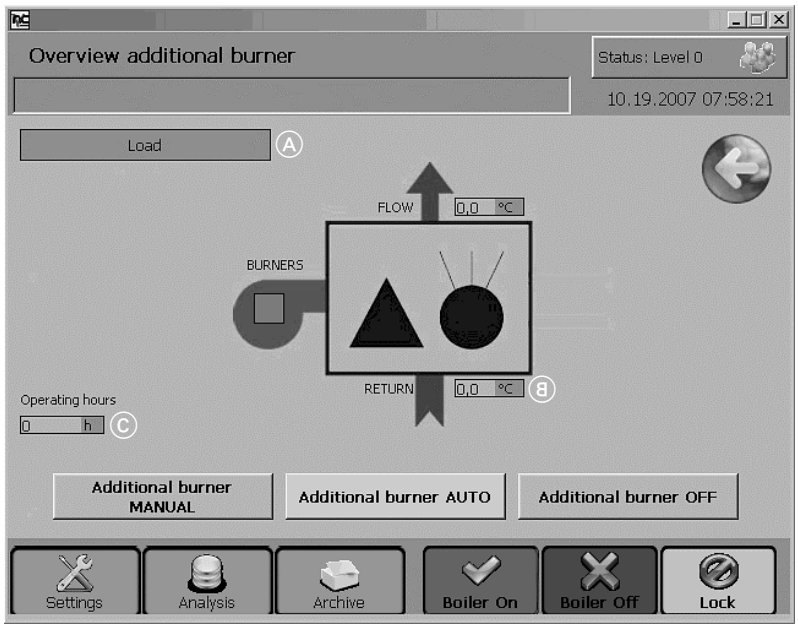
Here the additional boiler can be manually switched on or off, and automatic operation can be selected. The operating hours counter is located in the centre left of the screen.

Area of Screen | **Screen 8, overview of additional boilers** | **Description**

Top

Centre

Bottom



Screen title, “Overview of Additional Boilers”
Alarm line (bottom right, red)
User status (top right)
Date/Time (bottom right)
BACK key (back to Screen 1)

Ⓐ Display of operating mode for KÖB Boiler (top left, grey)
Ⓑ Displays of supply/return flow temperature (grey)
Ⓒ Display for operating hours

Soft touch key for additional boilers:
Additional boiler, manual (dark/light)
Additional boiler, automatic (dark/light)
Additional boiler, OFF (dark/light)

Soft touch key, left bottom:
Navigation (orange) for Screens 4, 5 & 6: Settings, Analysis, Archive, Display of operational statistics

Soft touch key for KÖB boiler:
Boiler ON (green)
Boiler OFF (red)
Lock screen (yellow)

Object Indicator Light (Screen 8, centre):

Status indication for burner: If the object indicator light lights up green, then the burner is in operation; if the object indicator light is grey, the burner is inactive. The object indicator light gives no information about the presence of any malfunction.

IMPORTANT

The additional boiler can only be switched on, off or to automatic operation in screen 8. The soft touch key selected will turn light. The operation selected is displayed in the operating mode display.

IMPORTANT

In Screen 7 and 8 (optional for additional boilers), the BACK keys are positioned in the centre of the screen.

Pyrocontrol Control System *(continued)*

Pyrotec control system parameter

Parameters boiler		Unit	Min.	Max.	Default	Detailed definition
1	Boiler temperature, forward(out) flow	ºC	70	110	85.0	Set point for supply temperature, system design temperature
2	Boiler temperature, return(in) flow	ºC	65	95	70.0	Set point for return temperature
3	Residual oxygen, boiler	%	4.0	15.0	8.0	Oxygen setting, 7-9 for pellets, 8-11 for chips
4	Boiler temperature, combustion chamber	ºC	400	999	750	Set point for combustion chamber temperature sensor
5	Negative pressure, boiler, combustion chamber	Pa	20	250	100	Set point for negative pressure in combustion chamber
6	Underfeed auger cycle, maintain	%	1	30	1	Auger speed for maintain mode
7	Underfeed auger cycle, emergency operation	%	5	100	30	Auger speed for emergency mode
8	Boiler output for emergency operation	%	25	100	100	Boiler output for emergency mode

Lower reciprocating screw		Unit	Min.	Max.	Default	Detailed definition
1	Underfeed pipe temperature	ºC	50.0	120.0	70.0	Set point for in-feed auger temperature to prevent back-burn
2	Underfeed auger filling time	Sec.	50	999	60	In-feed auger fill time
3	Combustion chamber filling time	Sec.	50	999	90	Combustion chamber fill time
4	Empty running time, metering container, underfeed auger	Sec.	1	90	25	In-feed auger metering bin, delay on time if sensor is free
5	Underfeed auger starting cycle after maintain is reached	%	1	100	10	In-feed auger speed to fill, warm start
6	Underfeed auger starting cycle after ignition	%	1	100	5	In-feed auger speed to fill, cold start
7	Underfeed auger, pellet operation	On/ Off			Off	On for pellet operation

Regulator temperature		Unit	Min.	Max.	Default	Detailed definition
1	Boiler forward flow controller, P(proportional)-factor		0	99.9	3.0	Factor for supply, only active when boiler supply flow temperature is being used. Value 1-3 *DO NOT CHANGE SETTING*
2	Boiler forward flow controller, D(derivative)-factor		0	99.9	3.0	*DO NOT CHANGE SETTING*
3	Boiler forward flow controller, I(integral)-factor		0	99.0	0	*DO NOT CHANGE SETTING*
4	Boiler forward flow controller, P-factor		0	99.0	5.0	Factor for return *DO NOT CHANGE SETTING*
5	Boiler forward flow controller, D-factor		0	99.0	3.0	*DO NOT CHANGE SETTING*
6	Boiler forward flow controller, I-factor		0	99.9	0	*DO NOT CHANGE SETTING*
7	Hysteresis(lagging behind) preservation (warm start) ON	ºC	4	20	6.0	A call for heat will start the boiler from maintain mode, *DO NOT CHANGE SETTING*
8	Hysteresis(lagging behind) preservation (warm start) OFF	ºC	0	20	2.0	Shut off the boiler from maintain mode. *DO NOT CHANGE SETTING*

Pyrocontrol Control System *(continued)*

Pyrotec controller parameter reference guide for the technician

Regulator temperature		Unit	Min.	Max.	Default	Detailed definition
9	Hysteresis(lagging behind) standby (boiler off) ON	ºC	4	20	10.0	Value is calculated by value in 7 + value in 9, puts boiler in standby mode, when boiler is On. *DO NOT CHANGE SETTING*
10	Hysteresis(lagging behind) standby (boiler off) OFF	ºC	0	20	2.0	Value is calculated by value in 8 + value in 10, puts boiler in standby mode, when boiler is Off. *DO NOT CHANGE SETTING*
11	Minimum time for standby	Min.	0	999	10	Minimum time the boiler will be in standby before turning off, Initiated by value in 9
12	Temp. for carrying off excess heat (outflow thermometer)	ºC	50	120	100.0	Controls a contact in the control panel. Connect to an alarm or value to dissipate additional heat.

Limit values firing up		Unit	Min.	Max.	Default	Detailed definition
1	Combustion chamber temp. for heat up, cold start	ºC	150	500	180	From cold start, will go to full load after reaching this set point, works with 3
2	Combustion chamber temp. for burnout, off mode	ºC	250	500	350	Shut down at this temp when in burn out.
3	Flue gas temperature for heat up, cold start	ºC	50	150	90	When set point is reached, the boiler will go to full load, controls ID blower speed, works with 1
4	Flue gas temperature for burn-out, off mode	ºC	50	150	110	Switch off ID blower when set point is reached at burn out
5	Combustion chamber temperature, maximum	ºC	600	1200	900	Set point for the combustion chamber temperature
6	Residual oxygen, after-running, full load	%	10.0	20.0	13.5	Set point for oxygen at full load
7	Speed of flue gas exhaust blower, maintain	%	0.0	50	18	Normal operation of flue gas exhaust blower
8	Light barrier delay off, combustion chamber sensor	Sec.	0	999	90	In-feed auger turn off delay
9	Residual oxygen, minimum	%	3.0	10.0	4.0	Minimum value of oxygen, if below this value the in-feed auger will stop
10	Igniter switch off delay, cold start	Sec.	10	500	30	Delay to switch off igniter to cool down, minimum should be 60 seconds.
11	Boiler output at min. load	%	10.0	90	20	Set point for output at minimum load
12	Negative pressure in combustion chamber, at maintain	Pa	5	200	5	Set point for under pressure in the combustion chamber

Automatic boiler cleaning		Unit	Min.	Max.	Default	Detailed definition
1	Pneumatic boiler tubing cleaning system	Min.	0	999	40	Real time value for cleaning cycle
2	Moving grate pause	Sec.	0	999	80	Pause time after grate movement
3	Combustion chamber de-ashing assemlby with ash container, emergency operation, pause	Min.	6	999	40	Not used in current control system
4	Combustion chamber de-ashing assembly with ash container, operating mode					Not used in current control system

Fuel loading		Unit	Min.	Max.	Default	Detailed definition
1	Switch-on delay, auger after in-feed auger 1	Sec.	0	50	2	Switch on delay time of in-feed auger 1
2	Switch-on delay, auger after in-feed auger 2	Sec.	0	50	2	Switch on delay time of in-feed auger 2
3	Extraction/silo system run time	Sec.	2	30	5	Pulse time of silo auger, initiated by auger 1
4	Extraction/silo system pause time	Sec.	0	30	0	Pause time of silo auger, initiated by auger 1
5	Extraction system reversing interval	Sec.	0	999	240	Reverse jog to prevent binding of material in the silo auger

Pyrocontrol Control System *(continued)*

Pyrotec controller parameter reference guide for the technician *(continued)*

Fuel loading		Unit	Min.	Max.	Default	Detailed definition
6	Extraction system direction of advance	On/Off			Off	Changes direction of extraction system
7	Switch-on delay for hydraulic system	Sec.	0	20	5	Walking floor switch on delay
8	Light barrier delay for hydraulic system	Sec.	0	9.9	2.0	Walking floor switch off delay
9	Hydraulic system auger run time max.	Sec.	20	999	80	Walking floor on time
10	Hydraulic drive emergency operation jog	Sec.	10	999	90	Walking floor pulse time
11	Light barrier delay for auger after in-feed auger 1	Sec.	0	9.9	0.5	Feed auger sensor off delay of walking floor
12	Light barrier delay for auger after in-feed auger 2	Sec.	0	9.9	0.5	Feed auger sensor off delay of walking floor

Regulator firing up		Unit	Min.	Max.	Default	Detailed definition
1	Output controller, P-factor		0	99.9	5.0	Factor for how fast the boiler heats up (output power), *DO NOT CHANGE SETTING*
2	Output controller, D-factor		0	99.9	5.0	*DO NOT CHANGE SETTING*
3	Output controller, I-factor		0	99.9	0	*DO NOT CHANGE SETTING*
4	Fuel controller, P-factor		0	99.9	7.0	Factor for how fast material is fed into the system (underfeed auger) *DO NOT CHANGE SETTING*
5	Fuel controller, D-factor		0	99.9	5.0	*DO NOT CHANGE SETTING*
6	Fuel controller, I-factor		0	99.9	0	*DO NOT CHANGE SETTING*
7	Combustion chamber negative pressure controller, P-factor (under pressure of the combustion chamber		0	99.9	2.0	PID ramp up factor for how fast negative pressure is controlled or adjusted. (flue gas exhaust blower speed). *DO NOT CHANGE SETTING*
8	Combustion chamber negative pressure controller, D-factor		0	99.9	1.0	*DO NOT CHANGE SETTING*
9	Combustion chamber negative pressure controller, I-factor		0	99.9	0	*DO NOT CHANGE SETTING*

Internal settings		Unit	Min.	Max.	Default	Detailed definition
1	External request from other system such as primary boiler or outdoor reset	On/Off			Off	External start/stop input ONLY, to turn boiler On or Off
2	External output specification from external control system	On/Off			Off	External load regulation 0-10V DC input, outdoor reset, controls output of boiler
3	Controller address, serial interface		0	999	110	Controller address, Not used only if addition visualization is used
4	Enter permanent code		0	9999		Not used
5	Load Factory setting	On/Off			Off	*DO NOT CHANGE SETTING*
6	Adjust oxygen sensor (lambda)	On/Off			Off	Calibrate oxygen sensor if set to On *
7	Boiler forward flow temperature	On/Off			Off	If set to Off uses return temperature If set to On uses supply temperature

Accumulator management system		Unit	Min.	Max.	Default	Detailed definition
1	Accumulator management system operating mode	Auto/ Manual /Off			Auto	Controlled by accumulator system with 5 sensors
2	Accumulator management system model	Kob/QM			Kob	Kob or other system
3	Accumulator monitoring in accumulator sensor, selected sensor	B28.1 B28.5			B28.5	Sensor to be monitored in the thermal storage tank for design temperature
4	Accumulator monitoring in accumulator sensor, selected temp.	°C	30	120	85	Design temperature for the thermal storage tank

* Auto reset, after calibration is complete.

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Pyrocontrol Control System *(continued)*

Pyrotec controller parameter reference guide for the technician *(continued)*

Accumulator management system		Unit	Min.	Max.	Default	Detailed definition
5	Starts boiler when temperature falls below selected sensor in acc	B28.1 B28.5			B28.1	Sensor used to start boiler when below value in 4
6	Accumulator set-point for atmospheric temp. of +5 °C	°C	10	110	80	Outdoor reset, at 41° F (5° C)
7	Accumulator set-point for atmospheric temp. of -15 °C	°C	10	110	85	Outdoor reset, at 5° F (-15° C)
8	Accumulator temperature set-point maximum	°C	10	110	80	Monitored by 3
9	Accumulator temperature set-point minimum	°C	10	110	75	Monitored by 5
10	Light barrier delay for auger after in-feed auger 1	°C	10	110	75	Monitored by 1

Accumulator management system		Unit	Min.	Max.	Default	Detailed definition
1	Accumulator controller, P-factor		0	99.9	3.0	Factor for thermal storage tank management system. *DO NOT CHANGE SETTING*
2	Accumulator controller, D-factor		0	99.9	10.0	*DO NOT CHANGE SETTING*
3	Accumulator controller, I-factor		0	99.9	0	*DO NOT CHANGE SETTING*

Additional boiler		Unit	Min.	Max.	Default	Detailed definition
1	Additional boiler operating mode	Auto/ Manual /Off			Auto	Used with multiple boiler systems
2	Return flow temperature	°C	30	120	65	Used with multiple boiler systems
3	Accumulator loading to accumulator sensor	B28.1 B28.5			B28.1	Used with multiple boiler systems
4	Accumulator loading to sensor	°C	30	120	80	Used with multiple boiler systems
5	Temperature for connecting additional boiler, delayed	°C	50	95	80	Used with multiple boiler systems
6	Switch-on delay for additional boiler	Min.	0	90	10	Used with multiple boiler systems
7	Temperature for connecting additional boiler, without delay	°C	5	50	120	Used with multiple boiler systems
8	Minimum running time for additional boiler	Min.	0	90	10	Used with multiple boiler systems
9	After-running of pump for additional boiler	Min.	0	20	2	Used with multiple boiler systems
10	Return flow controller, P-factor		0	99.0	5.0	Factor for supply of additional boiler if controlled by Pyrotec controller. *DO NOT CHANGE SETTING*
11	Return flow controller, D-factor		0	99.9	3.0	*DO NOT CHANGE SETTING*
12	Return flow controller, I-factor		0	99.9	0	*DO NOT CHANGE SETTING*

Operating Modes

The following terms are displayed in the operating mode line depending on the situation.

Off	The boiler is switched off.
Filling	Cold start. The combustion chamber trough is being filled by the underfeed auger.
Auger filling	Direct or hot start with combustion chamber still warm. The auger module is being filled.
Igniting	The igniter is running. The system is being started.
Heating up	The system is being slowly started.
Full load	The boiler is running in regular operation.
Sustain	Embers being sustained. Boiler set-point temperature and the switching threshold "Sustain on" have been exceeded.
Standby	The boiler temperature is above the switching threshold for standby and no prompt.
Auger idling	The isolating valve closes, the boiler switches to standby. Example: After malfunctions or the boiler set-point temperature being exceeded. Upon a prompt for heat there will be an automatic new start.
Burn-out	There is a malfunction or Soft touch key 2 "Boiler OFF" has been touched. The combustion chamber is cooling down.
Emergency operation	Non-optimized operation with adjustable operational set-point values. *Example:* If a sensory mechanism necessary for optimized operation is defective, the switchover is being carried out automatically. *Required sensory mechanisms:* lambda-sensor, combustion chamber temperature sensor and negative pressure measuring system.
Measurement operation	The output control is blocked to guarantee constant full load operation during the measurement.

Operating Modes *(continued)*

Full load operation

As soon as a combustion chamber temperature of approximately 356° F (180° C) is reached (adjustable value), the system switches, depending on the boiler temperature, to operating mode "FULL LOAD" or "SUSTAIN", which is shown in the upper left of the display.

Output control

The heat output to be produced is adapted to the heat consumption in a range from 25% to 100% of the boiler's nominal output. Depending on the deviation of the boiler temperature from the boiler set-point temperature of 167° F to 203° F (75° C to 95° C), the airflow rate is set by means of a blower with variable speed. The combustion chamber and residual oxygen control then re-supplies the optimum amount of fuel for lowest emissions.

If, through a corresponding rise in the boiler temperature, the heat consumption drops below 25% of the rated output, the system switches to "SUSTAIN", which is shown in the upper left of the display.

Sustain

In the operating mode "SUSTAIN", the flue gas exhaust blower only runs at a minimum speed. The supply air blowers does not run.
Supplying material via the underfeed auger has to be greater than the speed of back-burn and can be set as a set-point value by touching Soft touch key 4 "Settings" in Screen 4 (CYCLE for underfeed auger SUSTAIN). This depends on the material (light shavings require more supply of material than wood chips).

"Cycle for underfeed auger sustain" too high

Too much material is pushed into the burner trough so that the embers are too large for the sustain load operation. The further consequence of this might cause the malfunction back burn, excess temperature or overfilling of the combustion chamber.

"Cycle for underfeed auger sustain" too low

Not enough material is pushed into the burner trough so that there are too less embers to sustain the load. This can cause back burn or the fire will go out.

Standby

If too much heat is generated in sustain load operation, the control system automatically goes into standby operation. When this threshold value is reached, first the isolating valve shuts, and the auger module is slowly idled in the sustain mode.

For the standby mode, all the drive activities (blowers and auger modules) are stopped. Only then "Standby" appears in the operating mode display.

When the boiler temperature drops or a minimum standby period lapses, in the case of a call for heat an automatic new start is carried out.

Transition in output

To obtain a good structure of the fire and thus low emissions of harmful substances, the switchover from "SUSTAIN" to "FULL LOAD" is not carried out suddenly but rather gently.

Switching off

Touching Soft touch key 2 "Boiler OFF" shuts down the furnace firing process properly. "Burn-out" is indicated on the display. The firing control system continues to run until there is no more fuel in the underfeed auger or the combustion chamber temperature is below the set-point value and then it switches off.

⚠ CAUTION

DO NOT use the main switch to switch off - DANGER OF BACK BURN!

Emergency operation

The firing optimization function can be switched off in Screen 7 by touching the "Emergency operation" soft touch key. If a sensory mechanism is defective, the switching off takes place automatically. Text shown on display: "SYSTEM PRESENTLY RUNNING WITHOUT OPTIMIZATION". The quantities of material and air are then manually set as set-point values under "Emergency operation output" and "Emergency operation cycle of underfeed auger". The negative pressure is no longer corrected automatically. For this reason the blower settings must be checked. No positive pressure must develop in the burner. In case positive pressure should develop, adjust the mechanical means of throttling on the supply air blowers.

Measurement operation

It is possible to switch the boiler control system into "MEASUREMENT OPERATION" in Screen 7 by touching the soft touch key "Measurement operation" while the indicator in the upper left of the display is indicating "FULL LOAD". In "MEASUREMENT OPERATION" the output control is blocked to guarantee constant full load operation during the measurement.

IMPORTANT

In measurement operation the system does not switch to "SUSTAIN". Ensure heat consumption ⇨ Danger of excess temperature!

Heating Up Manually

Filling the burner trough

When the system has been switched off properly, there is no more fuel in the burner trough or in the underfeed auger.

With the fire block cooled down (combustion chamber temperature below 482° F (250° C), touching soft touch key 1 “Boiler ON” will automatically fill the burner trough with fuel.

Heating up

Light a fire with paper and kindling wood in the combustion chamber. After this, use a shovel to push the fire back to the filled burner trough. Then press Soft touch key 1 “Boiler ON” again (Soft touch key 1 “Boiler ON” is then dark green). Operating mode “HEAT UP” shows in the upper left of
the display.

Fuel >W 40

- With fuel that has water content greater than W40, preheat the boiler with a chopped wood fire. To do so, manually light chopped wood in the combustion chamber and use a shovel to push it into the burner trough. If necessary, add more chopped wood. Heat up the fireclay brick lining like this for approx. one hour.
- Starting up the facility: Soft touch key 1 “Boiler ON”

  The soft touch key “Underfeed ON” is for manually activating the underfeed auger in automatic operation (= manual prompt for material). As long as this soft touch key is touched, the underfeed auger conveys fuel into the burner trough. With the underfeed auger stopped (soft touch key “Stop underfeed” light-grey), the manual prompt for material cannot be activated.

Check heat up successful

The combustion chamber temperature should be over 356° F (180° C) in 30 minutes (adjustable value). Otherwise the system will automatically shut down. In such case press Soft touch key 1 “Boiler ON”.

Heating up with automatic ignition

The boiler is simple to switch on:

- Press Soft touch key 1 “Boiler ON”. The loader modules will be switched on in the appropriate order. When the auger filling time or combustion chamber filling time has lapsed and there is enough fuel in the combustion chamber, the loader system switches off.
- The automatic ignition then takes place. The ignition process stops as soon as the fire is started.

  The boiler then automatically switches to full load operation. (If the material should be too moist, it might be necessary to proceed following section “Heating Up” above.)

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