



13. FLUE GAS CONDENSER

1. The condenser you have just purchased is a product of unparalleled engineering and superb quality, expressly designed with the purposes of consumer in mind. Our considerable experience in the building of boilers and flue gas condensers serves as a guarantee of excellence and long life assurance. We wish to point out that careful maintenance considerably extends the lifespan of your condenser.

We also wish to draw your attention to the fact that not merely the assembly instructions but also the Nuisance Act, the law concerning Public Safety and Security, the Steam Act and the provincial and local regulations must be taken into account to the extent they are applicable.

2. Various safety measures should be considered upon installation of the flue gas condenser. The following devices should be connected:

- A gas pressure switch in the case of blockage of the condenser or the flue gas pressure exceeding a fixed limit. The switch must be fitted horizontally in front of the condenser and adjusted at approximately 10 mm/wk overpressure.
- A thermostat to prevent the water temperature exceeding a fixed level. The thermostat needs to be fitted to the lowest water connection pipe of the condenser.
- An overflow valve in the event of the water pressure reaching an excessive height.

3. In addition, we have a number of thermometers supplied with your condenser to measure the inlet/outlet flue gas temperatures and the water inlet/outlet temperatures. The water inlet/outlet are positioned at the top and bottom respectively.

4. The above safety devices should be electrically connected to the 'startconditions' circuit of the burner.

5. The condensation water from the condenser must be transported in a manner such that no flue gases escape. A water seal must be positioned underneath the condenser as a preventative measure. The seal can easily be removed and is to be inspected fortnightly to ensure a free flow of condensation water.



MANUAL FLUE GAS CONDENSER

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1. OPERATION

1.1 General

The flue gas condenser is assembled following a gas-fuelled BBK/WND-LD installation. All flue gases are lead through the condenser, expediting the cooling process, which in turn generates heat which can be used to warm water. Prior to delivery, the flue gas condenser is checked with cold water and examined for evidence of leakages.

1.2 Operation

Flue gases are directed via the by-pass to the flue gas condenser. The burnerfan must surmount the subsequent pressure loss, thus rendering the ventilator capacity of extreme importance on selection of your flue gas condenser. The occurring pressure drop in the condenser is protected by a pressure switch. In case of emergency, oil may be used for a maximum period of 3 days. Heavy oils are not to be used !

The circulation pump transports the water through the condenser. Insufficient water transport can cause overheating. The temperature is safeguarded by means of a maximum-thermostat. The safety devices are incorporated into the 'start-conditions' circuit of the BBK/WND-LD-burner. An overflow valve needs to be fitted onto the condenser in the water unit to limit overpressure.

The flue gas condenser contains no mobile components. The machine is a closed mechanism with a hatch for inspection and cleaning in the gas unit. To ensure the sound working of machine, the recommended amount of water must be employed. The flanges on the water tanks are adjusted to correspond.



2. INSTALLATION

2.1 Delivery

The flue gas condenser is delivered standard with flue gas intake duct, counter flange, and a waste receptacle with siphon for the condensate discharge. The following accessories can also be delivered:

- Flue
- Roof feedthrough
- Safeguard devices

2.2 Guidelines

The equipment should be installed by a recognised heating installation expert in conformity with the valid VISA regulation SECTION B-6 and SECTION E of November 1989. The electrical installation regulation is NEN1010. All local regulations must be adhered to. Discharge of condensate and flue gas should meet the stipulations outlined in NEN 3028.

2.3 Set-up

The condenser should be set-up in a manner conducive to inspection and maintenance activities. Space between operating and inspection side should be at least 80 cm. The counter flange must be welded to the heat exchanger horizontally. The BBK or WND-LD manufacturer will carry out this process. The inlet must be affixed at the precise level of the counter flange. The condenser is a self-supporting construction enabling mobility by forklift or crane. The condenser can remain suspended in the incidence of insufficient assembly space.

2.4 Assembly of Safety Devices

Fit the limit-switch(es), pressure switch, thermostat, overflow valve and thermometers into position as indicated.



2.5 Assembly of Flue Gas Outlet

- Assembly of Adapter

The adapter (reducing coupling piece) must be positioned so that the flue is precisely centred above the heat exchanger. The bolt holes are fixed in a manner facilitating a single possible mode of assembly. Supply the inside of the bolt holes from the adapter's flange with a layer of silicon paste. Place the adaptor on the condenser and proceed to fit the bolts.

- Assembly of Flue

Position the flue in a location conducive to the reading of the flue gasthermometer (preferably on the water connection side) simultaneously allowing for a possible CO₂ connection on the desired side. Assemble the supplied guy rope at the preferred level and fit the necessary guy wires or rods either above or below the roof.

- Assembly of Roof Feedthrough

Fit the roof feedthrough with rain ledge. Secure the connection between roof, feedthrough, guys, flue and rain ledge with silicon paste. In the case of a corrugated roof, cut the top of the roofing sheet, fold in line with corrugated patterns, and fasten with pop rivets.

- Regulations

The flue height is contingent on local regulations.

2.6 Assembly of Condensation Outlet

A siphon has been supplied for condensate discharge. Screw the cast iron coupling (2") in the socket (2") at the bottom of the condenser. Screw the supplied pipe nipple (2") in the coupling. Extend the pipe nipple with the supplied tube piece into the siphon tank. Place the siphon tank precisely in the centre of the flue gas condenser. Connect the condensation outlet. Place a 40 mm PVC socket over the outlet and connect the outlet tube.



2.7 Assembly of Water Connections

Ensure a solid connection of the overflow valve to either the sewer or condensation outlet via an "open" connection. Connect the conduit-pipes to the condenser. Use M12*50 or M16*60 bolts whereby the nut is tightened on the condenser side.

The condenser should be connected to the water system in a fashion supporting the invariable prevailment of continuous overpressure in the condenser installation. The suction side of the pump can therefore only be directly connected to the condenser on condition the minimum overpressure of the installation is higher than 1.5 bar.

2.8 Safety Devices

The condenser must be safeguarded in accordance with VISA requirements SECTION B-6. The safeguard workings are outlined in chapter 2.

2.8.1 Safeguarding against overheating

The installation is safeguarded with a maximum thermostat. Overheating occurs during pump defects or insufficient flow through the condenser.

2.8.2 Safeguarding against dirt build-up

Flue gas connections may experience a build-up of resistance as a result of dirt, which may influence the burner's operation. A maximum pressure switch safeguards against this build-up. The switch must be set 100 Pa. above the maximum operating pressure.

2.8.3 Overpressure

The condenser must be supplied with an overflow valve adjusted to 3 bar (maximum operating pressure is 3 bar). The necessary power depends on the condenser's capacity.



3. INSTALLATION

3.1 Connecting the Installation

Please verify the following prior to switching on the installation :

- Has the installation been filled with water ?
- Has the installation been deaerated ?
- Are the pressure and temperature safety devices functioning ?
- Has the waste receptacle been filled with water ?
- Is water flowing through the water section of the condenser and are valves correctly positioned ?
- Solve problem and reset safety device(s) following electrical malfunctioning.
- Measure the pressure near the maximum pressure switch in the gassection and adjust the pressure switch to the measured pressure + 100 Pa.

3.2 Disconnecting the Installation

The flue gas condenser forms part of the flue gas discharger and cannot be shut down (only by switching off the entire installation).



4. MALFUNCTIONINGS

4.1 General

Malfunctionings may be detected on the safety device switchboard. In the case of malfunctioning, one or more red light(s) will illuminate. Solutions need to be sought for malfunctioning causes and, following repair, the reset button pressed for re-activation of the installation.

4.2 Failure Report

Malfunctioning	Possible Cause	Action to be taken
T-max	Pump failure	Reinstate
	Water connections closed	Open
	By-pass valves (water circuit) open	Close
	Thermostat defect	Replace
	Loose contact or snapped wire	Repair
	Thermostat set too low	Adjust setting
P-max	Soiled heat exchanger	Clean
	Pressure switch defect	Replace
	Water in pressure switch	Change assembly setting
	Loose contact or snapped wire	Repair
	Pressure switch set too low	Adjust setting
ES	Limit-switch defect	Replace
	Loose contact or snapped wire	Repair
Condensation	Excessively soiled waste receptacle	Sanitise discharger
	Clogged discharger	Clean out condenser via inspection hatch



5. MAINTENANCE

5.1 General

The self-cleaning action of precipitated condensate works to prevent dirt build-up. The flue gas condenser is largely comprised of Corten steel. During operation, a limited amount of iron oxides fall to the condenser bottom to be partially transported to the waste receptacle.

5.2 Sanitization

- The waste receptacle should be emptied regularly (approximately 4 times per annum).
- Once a year, dirt and iron oxides should be removed from the bottom of the condenser.
- The heat exchanger does experience dirt build-up, notable by an increase in resistance. The condenser is supplied with an inspection hatch that may be easily disconnected and re-positioned. This same hatch can be employed in the cleaning of the heat exchanger.

5.3 Safety Devices

Safety devices need to be