

**Warning**

This replacement kit shall be installed by a qualified service agent in accordance with these instructions and all applicable codes and requirements of the authority having jurisdiction. If the information in these instructions is not followed exactly a fire, an explosion or production of carbon monoxide may result causing property damage, personal injury or loss of life.

The qualified service agency is responsible for the proper installation of this kit. The installation is not proper and complete until the operation is checked as specified in these instructions.

**Warning**

Water quality has a significant impact on the lifetime and performance of a boiler's heat exchanger.

Improperly prepared water in a heating circuit may cause damage to the heat exchanger through fouling or corrosion. Repeated or uncontrolled water fills will increase the potential for damage.

High levels of dissolved solids or minerals may precipitate out of the fluid onto the hottest part of the heat exchanger, impairing heat transfer and resulting in overheating and premature failure. The amount of solids that may form on the heat exchanger will depend on the degree of hardness and the total water volume in the system. A high water volume system with a low hardness count may cause as much damage as a system with less volume and higher hardness, so it is recommended to treat water so as to reduce dissolved solids to the minimum 10 ppm, and to no more than 30 ppm. Water chemistry allowable limits are as follows:

- » TDS 0.6 to 1.75 grains/ gal (10 to 30 ppm)
- » Acidity pH is to be between 6.6 and 8.5
- » Chloride is to be less than 125 mg/l
- » Iron is to be less than 0.3 mg/l
- » Cu less than 0.1 mg/l
- » Conductivity is to be less than 400µS/cm at 77°F (25°C)

Important: Ensure that these limits are acceptable for the other water-side components in the system.



Warning

The IBC heat exchanger has a small amount of combustion chamber insulation (refractory), which contains ceramic fibers.

When exposed to extremely high temperatures, the ceramic fibers that contain crystalline silica can be converted into cristobalite, classified as a possible human carcinogen.

Avoid disturbing or damaging the refractory. If damage occurs, contact the factory for directions.

Avoid all contact with dust, including ingestion (breathing), skin and eyes. Follow these precautions:

1. For conditions of frequent use or heavy exposure, respirator protection is required. Refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators certified by NIOSH.

For the most current information, NIOSH can be contacted at 1-800-356-4676 or on the web at www.cdc.gov/niosh.

2. Wear long sleeved, loose fitting clothing, gloves and eyes protection.
3. Assure adequate ventilation.
4. Wash with soap and water after contact.
5. Wash potentially contaminated clothes separately from other laundry and rinse washing machine thoroughly.
6. Discard used insulation in an air tight plastic bag.

NIOSH stated first aid:







- » Eye contact - Irrigate and wash immediately.
- » Breathing - Provide fresh air.

Note

Many of the parts in this kit are shipped together as an assembly.

The P-1635 Heat Exchanger Replacement Kit does **not** include a replacement burner.

The burner from the original heat exchanger must be reinstalled with the new heat exchanger if a separate replacement burner ([P-1519](#)) was not purchased.

Heat Exchanger - CX 150				
		Part #	Description	Quantity
		150-012	Screw, SHC, S/S, M3x10	2
		150-260	Screw, 6 T/ Pan SS, M4-0.7x10mm	8
		170-126	Burner Lid, VC45	1
		170-128	VC45 Heat Exchanger + Pan (Hostalen)	1
		240-182	Ignitor, VC (Kanthal APM 3.0)	1
		250-050	Gasket, Ignitor	1
		250-057	Housing, Viewport	1
		250-059	Glass Insert, Viewport	1
		251-122	O-Ring, Water Pipe, VC	2
		255-023	Gasket- Sight Glass To Lid, SL	1
		255-025	Gasket- Viewport Upper	1
		255-141	Gasket, Burner VC45&60	1
		255-152	Refractory, VC150	1

When to Install the P-1635 Heat Exchanger Replacement Kit

Install the P-1635 kit if you need to replace a heat exchanger in the CX 150 because it is leaking.

Note

A ladder or step may be required to have a clear vertical view of the work area.

Do not attempt to remove the assemblies without a clear view, as damage to the connectors, screws or refractory may occur.

CX Heat Exchanger Replacement

Preparing the Unit for Servicing

1. Remove call(s) for heat.
2. Remove power to the unit at a wall switch or a breaker.
3. Shut off gas supply to the boiler.
4. Allow the boiler to cool down.
5. Remove the front cover, and then remove the four Torx 20 head screws on the top panel of the combi boiler.
6. Drain the boiler. Open the manual air vent to break a potential airlock.

Accessing Service Area

A. Removing the Gas Line and Gas Valve:

Refer to [Figure 1](#)

- a. Unplug the electrical connection to the gas valve.
- b. Undo the union nut (A) at the gas inlet (B).
- c. Undo the union nut (C) connecting the gas valve outlet pipe to the mixer (D).
- d. Carefully remove the gas line and valve assembly and set aside for re-installation.

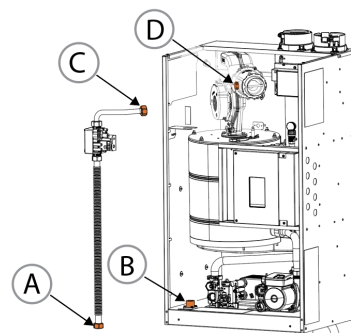


Figure 1 CX Gas Line Assembly Removal

B. Removing the Return and Supply Pipe:

Refer to [Figure 2](#)

- a. Remove the return pipe by unclipping the bracket (E) of the return water temperature sensor from the pipe and set aside.
 - » Loosen the union nut at the combi block (F).
 - » Loosen the union nut (G) from the heat exchanger and set the return pipe aside.
- b. Remove the supply pipe by removing the retaining clip (H) from the base of the supply pipe and combi block.
 - » Disconnect the supply pipe from the heat exchanger by loosening the union nut (I), and remove the supply pipe. Set aside for reassembly.

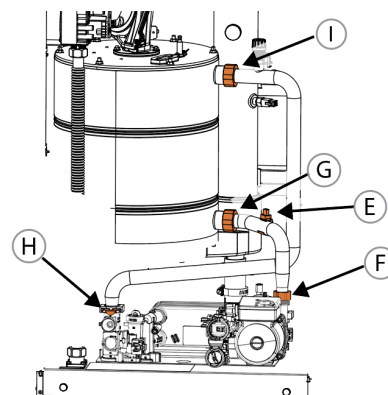


Figure 2 CX Return and Supply Pipes

C. Relocating the Exhaust Vent:



Caution

The exhaust venting may be extremely heavy. Ensure that adequate support is in place.

- a. Unplug the temperature sensor (L) on the exhaust duct (K) (see [Figure 3](#)).
- b. Loosen the gear clamp (J) to disconnect the exhaust venting from the exhaust duct. Clear a few inches above the duct, either by:
 - » using slack to swing the venting aside,
 - » disassembling nearby venting joint(s), or
 - » cutting the venting where future repair with a coupling will be possible.
- c. Slide the exhaust duct up and out of the way of the heat exchanger pan.

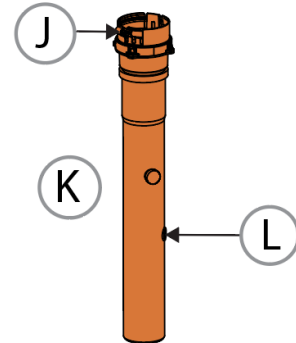


Figure 3 CX Exhaust Duct Removal

D. Removing the Fan/ Mixer assembly:

- a. Remove the electrical connection to the fan.
- b. Unscrew the two nuts at the base of the fan, and retain for re-installation.
- c. Carefully lift and tilt the fan/ mixer assembly backwards to safely remove it from the heat exchanger lid.
- d. Remove and **retain** the fan gasket

Removing the Condensate Trap

1. Pull back the clip to release the trap, and pull the trap downwards to remove.
2. Unscrew the condensate union cap at the base of the trap, empty the water and flush the trap with water.

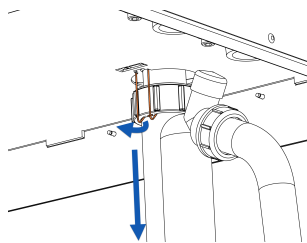


Figure 4 CX Condensate Trap Removal

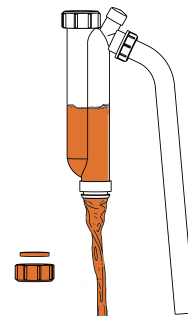


Figure 5 CX Condensate Trap Drain

3. Release tension on both hose clamps.
 - » One hose clamp (M) secures the EPDM tube (O) to the heat exchanger condensate pan drain and one hose clamp (N) secures the EPDM tube to the PP-R pipe (P).
 - a. Pull the PP-R pipe out from the condensate trap opening and set aside for reassembly.
 - b. Remove the EPDM tube and clamps and set aside for reassembly.

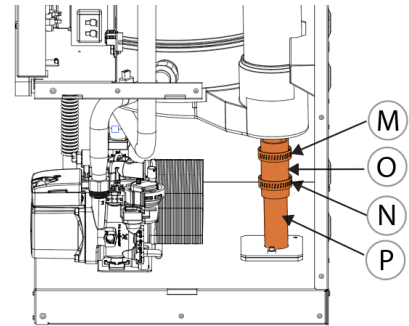


Figure 6 CX Condensate Pipe Clamp

Removing the Heat Exchanger Lid



Warning

Wear a suitable protective mask to avoid ingesting particles from the refractory.

Refer to [Figure 7](#)

1. Disconnect the ignitor wires.
2. Remove the ignitor (R), including the screws (Q) and gasket(S).
3. Remove the five nuts (T) securing the lid to the heat exchanger.
 - » The burner (W) is attached to the underside of the heat exchanger lid (U).
4. Carefully lift the lid upwards away from the studs.
 - » The refractory and burner (V and W) should stay with the lid as it is removed.
5. Turn the lid over and carefully place the original refractory into a garbage bag and seal. (See warning above regarding the refractory).
6. Remove the six screws (X) securing the burner to the original heat exchanger lid and remove the burner.
7. Discard the burner gasket (Y).
8. Remove the refractory, fasteners, ignitor (including screws and gasket) and lid gasket from the replacement lid and set aside in a clean and dry area.

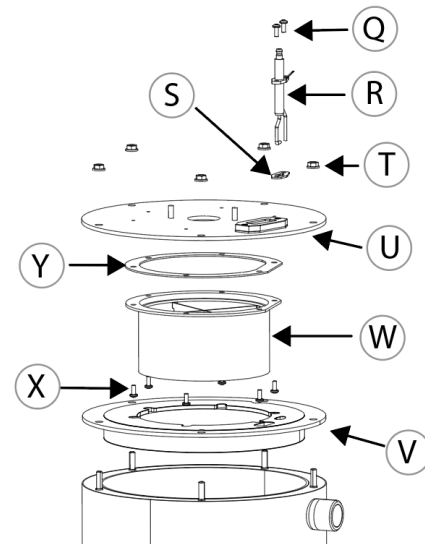


Figure 7 CX 150 Heat Exchanger

Exchanging the Burner

1. Clean the original burner using water and compressed air before re-installation.
2. Install the cleaned burner and replacement gasket onto the supplied lid, ensuring that all screws are tightened evenly by repeating the tightening sequence a few times as shown in [Figure 8](#).
3. Carefully slide the refractory over the burner all the way to the lid, ensuring that the openings for the ignitor, view port and heat exchanger studs are aligned correctly.

Removing the Heat Exchanger

1. Remove the two nuts that are connecting the temperature switch bracket to the top mounting bracket of the heat exchanger, and retain for reassembly.



Caution

The heat exchanger is heavy. Do not attempt removal without help if needed.

2. Carefully remove the heat exchanger from the front of the cabinet by lifting it up and out of the slots.
 - » Place a pallet in front of the boiler.
 - » Tilt and lift the heat exchanger onto the pallet from the front of the cabinet.

Reassembly and Start-Up

Installing the New Heat Exchanger and Lid

1. Carefully tilt and lower the replacement heat exchanger into the cabinet:
 - a. slide the hooks of the exchanger into the appropriate slots in the cabinet
 - b. connect the nuts for the temperature switch bracket to the heat exchanger bracket
2. Carefully lower the heat exchanger lid assembly onto the heat exchanger, without damaging the refractory.
4. Tighten each nut evenly by following the order indicated in the pattern below.

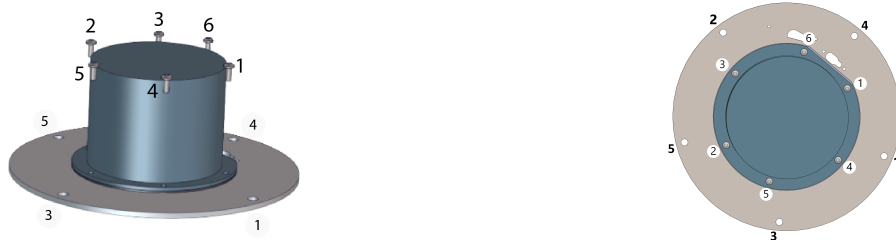


Figure 8 Order for tightening screws on burner and nuts on the lid

Reassembly

Refer to [Figure 9](#)

1. Using the condensate trap drain assembly from the old heat exchanger perform the following:
 - a. insert the condensate pipe from the underside of the cabinet and slide through the EPDM tube and hose clamps
 - b. tighten the hose clamps that secures the EPDM tube to the heat exchanger condensate pan drain and to the condensate pipe; ensure to not overtighten the clamps
 - c. fill the condensate trap with water, and ensure that the bottom union cap is hand-tightened to prevent leakage
 - d. slide the trap over the heat exchanger drain outlet, making sure it is secured by the clip, and tighten the upper union nut to ensure an airtight seal.
2. Reinstall the ignitor gasket and ignitor with two screws.
3. Position the fan gasket onto the fan, so that the holes align.
4. Follow the above [Accessing Service area on page 4](#) steps in reverse starting with installing the fan. Ensure that all replacement gaskets and o-rings are installed correctly.

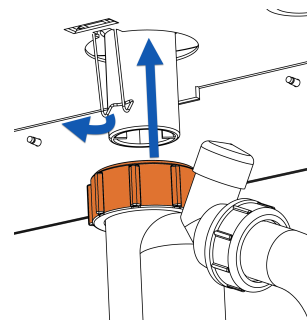


Figure 9 CX Condensate Trap Installation

Note

- » Ensure that all replacement gaskets and o-rings are installed correctly.
- » Loose fit the fan and gas line and valve connections first.
- » Hand-tighten the union nut connecting the outlet gas pipe to the mixer, ensuring that the o-ring is in place.
- » Insert the union nut of the flex gas line onto the gas inlet, hand-tighten the nut, then complete with $\frac{1}{4}$ to $\frac{1}{2}$ turn more.
- » It may be necessary to place a bead of silicone grease on the pan gasket to aid in placing the exhaust duct back into place.

Start-up Procedure



Caution

Before restoring the combi boiler to normal operation, check for leaks at the gas valve outlet and the gas valve pipe to mixer union.

1. Fill the boiler. Ensure that air is purged from the unit.
2. Check for leaks at the gas valve outlet and at the connection point between the fan and the heat exchanger lid.
3. Turn on the gas to the boiler.
4. Turn on power to the boiler.

5. Turn on call(s) for heat.
6. Check connections for leaks during operation.
7. Perform a combustion analysis, and test for proper operation.
8. Reinstall the top panel and front cover.