

Installation / Service Manual

for use by heating contractor

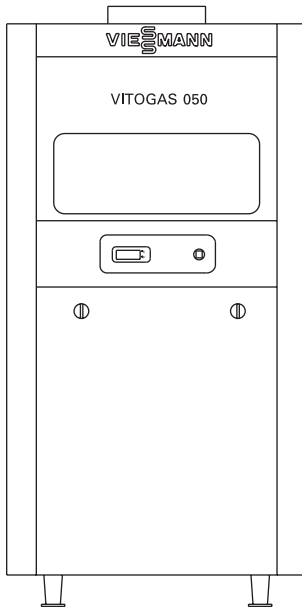


Vitogas 050, ECD Series

Gas-fired, atmospheric cast iron boiler

65 to 200 MBH / 19 to 59 kW

IMPORTANT: READ AND SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE



Warning: If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliances.
- Do not touch any electrical switches, do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

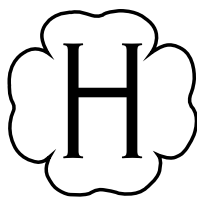
Installation and service must be performed by a qualified installer, service agency or the gas supplier.

WARNING

Should overheating occur or the gas supply fail to shut off, do not disconnect the electrical supply to the pump. Instead, shut off the gas supply at a location external to the appliance.


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DOE



 This “Attention” symbol is located beside all important safety recommendations. Please follow the instructions in detail to avoid property damage, severe personal injury, or loss of life.

 **Warning:**

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

If flame roll-out or blocked vent switch trips during start-up or normal operation, it indicates a hazardous condition to be corrected immediately. Do not attempt to put boiler in operation. Immediately contact a qualified service professional to locate source of problem and correct. Failure to heed this warning could result in property damage, severe personal injury, or loss of life.

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

Do not store chemicals containing chlorine or other corrosive materials near the boiler, such as bleach, cleaning solvents, detergents, acids, hair spray, spray cans, paint thinners, paint, water softener salt, refrigerants.

 **Warning:**

Installers must follow local regulations with respect to installation of carbon monoxide detectors. Follow manufacturer’s maintenance schedule of boiler.

 **Warning:**

Before each heating season begins, have the following service and maintenance done by a professional service technician:

- 1) Boiler heat exchanger inspected and cleaned.
- 2) Vent system inspected for deterioration, leaks, corrosion, proper draft, and proper operation. Check vent system for compliance with local and national code requirements. Repair or replace as required.
- 3) Burner inspected and if necessary cleaned to ensure proper combustion and operation. Check for adequate supply of fresh outside combustion and ventilation air.

Neglecting to perform necessary maintenance can cause unsafe operation.

 **Warning:**

Never operate the boiler without an installed venting system which safely vents all products of combustion to the outdoors. The vent system must comply with all applicable local and/or national codes.

Improper, incomplete, obstructed, or deteriorated vent systems can present a serious risk of flue gases leaking into living space which could cause carbon monoxide poisoning. Failure to heed this warning can cause severe personal injury or loss of life.

 **Warning:**

Never operate the boiler without an adequate supply of fresh combustion air. This boiler needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air. All combustion and ventilation air must be supplied from the outside. Failure to heed this warning can cause severe personal injury or loss of life.

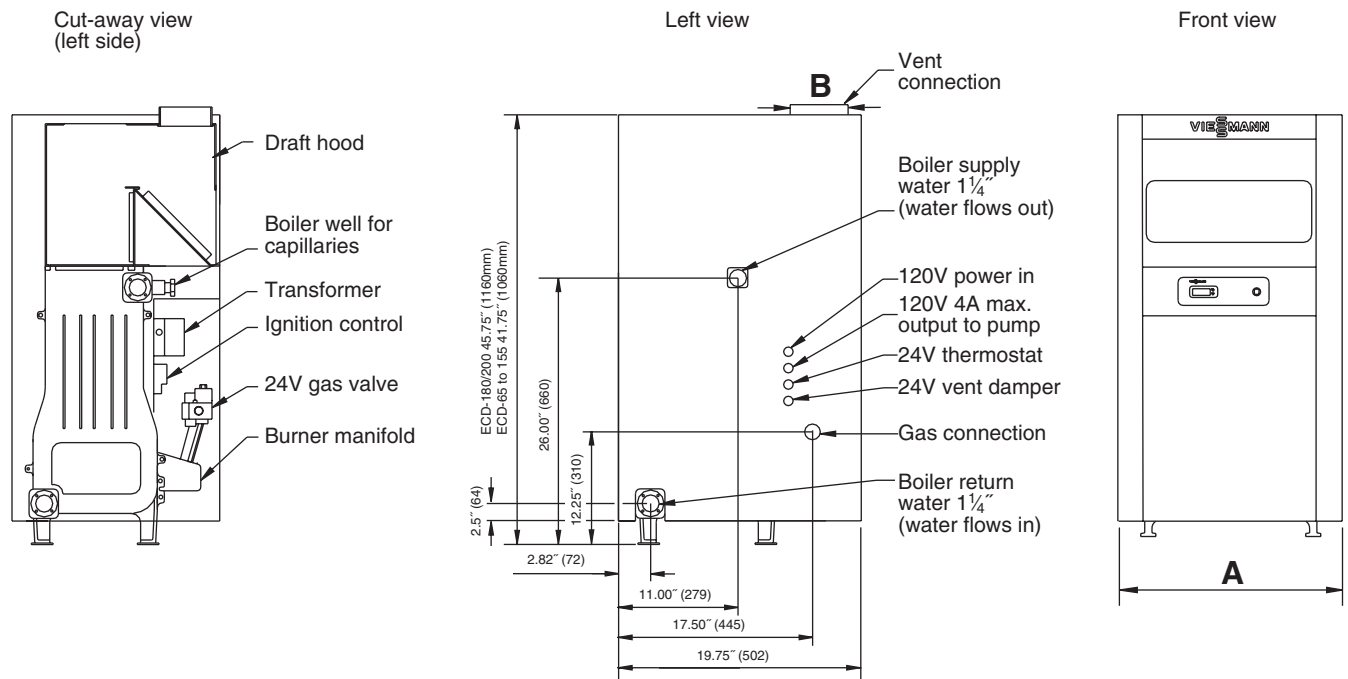
 **Warning:**

Shut off all electrical power and turn off gas or oil supply to boiler before performing any service or maintenance on the boiler, burner, or control. Failure to heed this warning could result in electrical shock, serious personal injury or loss of life.

 **Attention:**

The preferred and safest location for the ECD Series boiler is in a dedicated mechanical room with fresh combustion air intake and ventilation openings made directly to the outside.

Vitogas 050, ECD Series Technical Data



Boiler electrical requirements are 120V, 60 Hz, less than 12A
 Max. pump amperage is 4A. Use field supplied relay for pumps over 4A.

Model	CSA input	DOE heating capacity CGA output	Width "A"	Vent Conn. "BØ"	Gas Conn.	Water Conn.	Cast Iron Sections	Burners	Water Content	Weight	AFUE*	Steady State Efficiency
ECD-65	65,000 Btu/h 19 kW	53,950 Btu/h 16 kW	350 mm 14"	5"	1/2"	1/4"	3	2	9.9 ltr 2.6 USG	106 kg 233lbs	83.7%	83%
ECD-80	80,000 Btu/h 23 kW	66,400 Btu/h 19 kW	350 mm 14"	5"	1/2"	1/4"	3	2	9.9 ltr 2.6 USG	106 kg 233 lbs	83.5%	83%
ECD-100	100,000 Btu/h 29 kW	83,000 Btu/h 24 kW	450 mm 17 3/4"	6"	1/2"	1/4"	4	3	13.2 ltr 3.5 USG	130 kg 285 lbs	83.5%	83%
ECD-115	115,000 Btu/h 34 kW	95,450 Btu/h 28 kW	450 mm 17 3/4"	6"	1/2"	1/4"	4	3	13.2 ltr 3.5 USG	130 kg 285 lbs	83.5%	83%
ECD-140	140,000 Btu/h 41 kW	116,200 Btu/h 34 kW	550 mm 21 1/4"	7"	1/2"	1/4"	5	4	16.5 ltr 4.3 USG	157 kg 345 lbs	83.5%	83%
ECD-155	155,000 Btu/h 45 kW	128,500 Btu/h 38 kW	550 mm 21 3/4"	7"	1/2"	1/4"	5	4	16.5 ltr 4.3 USG	157 kg 345 lbs	83.4%	83%
ECD-180	180,000 Btu/h 52 kW	149,400 Btu/h 44 kW	654 mm 25 3/4"	7"	1/2"	1/4"	6	5	26.8 ltr 7.1 USG	192 kg 423 lbs	83.2%	83%
ECD-200	200,000 Btu/h 58 kW	166,000 Btu/h 48 kW	654 mm 25 3/4"	7"	1/2"	1/4"	6	5	26.8 ltr 7.1 USG	192 kg 423 lbs	83.0%	83%

* With vent damper and intermittent pilot ignition
 kW figures are approximate

All sizes available with propane gas.
 For net IBR rating divide output by 1.15.

Electrical requirement
 120V, 60Hz, less than 12A

Before operating this boiler/burner unit, make sure you fully understand its method of operation. Your heating contractor should always perform the initial start-up and explain the system and the need for regular inspection and maintenance.

The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the National Fuel Gas Code, ANSI Z223.1 (latest edition). In Canada follow CAN/CSA-B149.1 or .2 Installation Codes (latest edition).

These instructions must be placed in an envelope and affixed to the boiler.

Boiler handling

The boiler is shipped on a wooden pallet in a cardboard crate. Crate and wooden pallet must be removed. Vent damper is shipped separately.

Boiler location – Minimum clearances to combustibles (all measurements from boiler enclosure)

Left side: 150 mm (6")
 Right side: 25 mm (1")
 Front: 150 mm (6")
 Top: 450 mm (18")
 Rear: 25 mm (1")
 Floor: Non-combustible
 Flue: 150 mm (6").

Above clearances apply to all ECD boilers.

Recommended minimum service clearances:

Left side:	610 mm (24")
Right side:	610 mm (24")
Front:	1220 mm (48")
Top:	610 mm (24")
Rear:	610 mm (24")

Recommendation

If boiler is located in a confined space, install main gas shut-off valve (gas cock) and main power supply switch in easily accessible location outside the confined space.

The boiler model selected should be based on an accurate heat loss calculation of the building.

General information

Please read and observe the following instructions carefully before installing the boiler. Install boiler according to these instructions.

Installation, service and maintenance work must be done by qualified and experienced technicians only. Improper installation, service or maintenance could create a hazard, resulting in property damage, severe personal injury, or loss of life.

The ECD Series boiler is for use in closed-loop forced circulation hot water heating systems only. Boiler operation is limited by ASME Code to maximum water pressure of 50 psig and maximum water temperature of 248°F. The vast majority of applications operate below 30 psig and below 194°F. Standard equipment on the ECD boiler includes a 30 psig relief valve and adjustable aquastat with maximum setting of 194°F. An alternate construction is available for operation between 194°F and 248°F. Consult a Viessmann representative for alternate construction before ordering boiler.

Necessary permits from local authorities must be obtained before installing boiler. Installation must be made in accordance with local ordinances which may differ from the instructions in this manual.

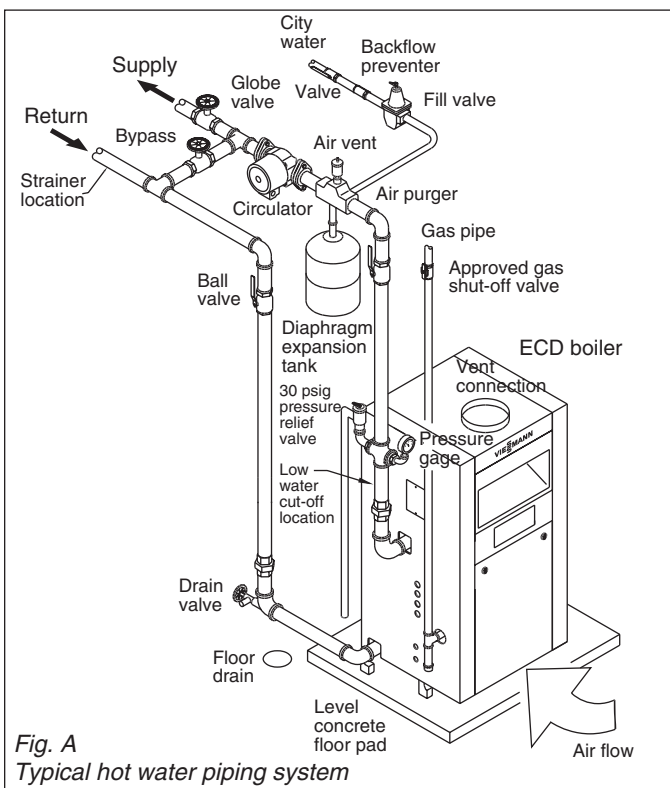


Fig. A
Typical hot water piping system

Flushing of existing piping

Before boiler is connected to a piping/heating system which has previously been in service (the ECD is a replacement boiler), the piping system should be flushed thoroughly with water in order to remove sludge or other contaminants, especially in large piping systems such as old gravity pipe systems. Flush from the top of the system with city water pressure. Failure to flush out system can lead to deposits in boiler resulting in boiler failure. This type of failure is not covered under warranty.

Boiler foundation

Provide a solid, level foundation, capable of supporting the weight of the boiler filled with water, and extending at least 1" past the jacket on all sides. Pour a concrete foundation if necessary. The boiler must be installed in an indoor heated space.

The boiler should be located near a floor drain.

Do not install boilers on carpeting. Install on non-combustible floor.

If the boiler is to be installed on combustible floors or on a mezzanine, it should be equipped with a special base pan. Please reference the Viessmann Price List.

Typical boiler piping is shown in Fig. A.

Vent damper installation

Boilers are sold with a vent damper, packaged separately. The vent damper must be installed on the boiler to meet minimum federal efficiency standards. If possible, install vent damper at the top of the draft hood. Otherwise install vent damper as close to the boiler as possible.

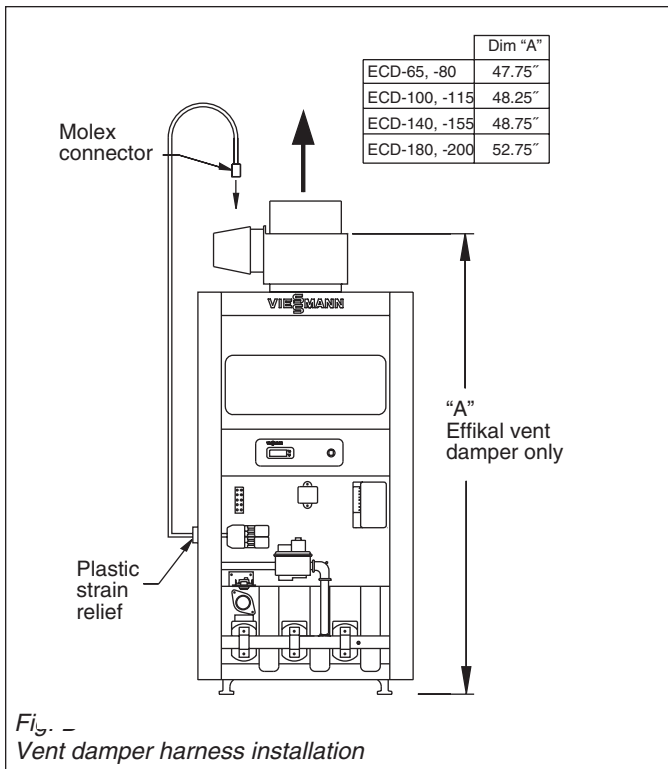
The vent damper must be field installed on the boiler. Read the vent damper manufacturer's instructions before installing the vent damper. Vent damper must be installed as close as possible to the boiler flue outlet.

The closing and opening action of the vent damper is driven by a motor. Spring action is not used to move the vent damper blade. Do not force vent damper blade by hand. Forcing the vent damper blade by hand will damage the motor. To observe the vent damper blade move, turn thermostat up and down after the vent damper has been installed. Vent damper blade must be in open position when burner is firing.

The vent damper must be installed according to Fig. B. The vent damper may be placed directly on top of the ECD boiler. Ensure that damper blade rotates freely and is not obstructed in any way. Read and save the vent damper manufacturer's instructions packaged with the vent damper.

After vent damper has been installed on boiler connect the vent damper cable using the following instructions.

1. Remove ECD front panel.
2. Route the end of the vent damper cable with the Molex connector through the plastic strain relief on the ECD left side panel.
3. Attach Molex connector to vent damper motor using the metallic strain relief on the vent damper motor to secure the cable.
4. Unplug the two 3-pole #41 plugs inside the boiler and attach them to the 6-pole plug from the vent damper (see Figs. B, C and D).



There are no serviceable parts on the vent damper. Defective vent dampers must be replaced.

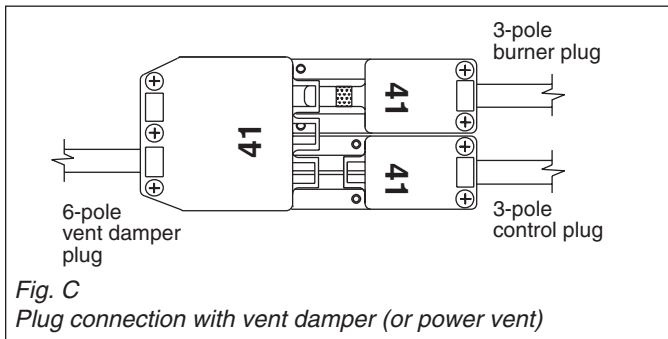
If the side wall vent system is used, the vent damper must not be installed. Refer to separate side wall vent system instructions for series boiler. The side wall vent system must be purchased separately from the ECD boiler.

Sequence of operation with vent damper:

1. Thermostat calls for heat.
2. Vent damper blade opens.
3. Pilot sparks and ignites.
4. Pilot is proven and main valve is energized.
5. Main burner and pilot will continue to operate until thermostat is satisfied. Burner may turn off and on in response to the adjustable high limit aquastat (SHL1) setting during a call for heat.

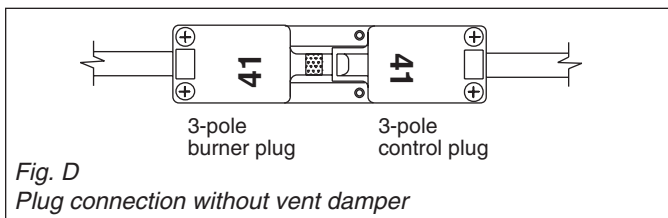
If the vent damper becomes defective:

1. Follow the vent damper manufacturer's instructions to leave the vent damper in the "Service" or "Hold Open Damper" (Effikal) mode by using the service switch on the damper motor. Vent damper blade should stay open and boiler should operate normally.
2. If the procedure in #1 does not work, remove vent damper, install transitional piece of vent pipe and disconnect 6-pole plug from 3-pole plugs. Connect the 3-pole plugs together as shown in Fig. D. Refer to wiring diagrams. Boiler will operate without vent damper.



Closest/alcove installation

Models ECD- (65-155) are approved for closet installation with the clearances shown in Fig.1. Models ECD- (180, 200) are approved for alcove installation with the clearances shown in Figs. E and F. Do not use Models ECD- (180, 200) in closet installations.

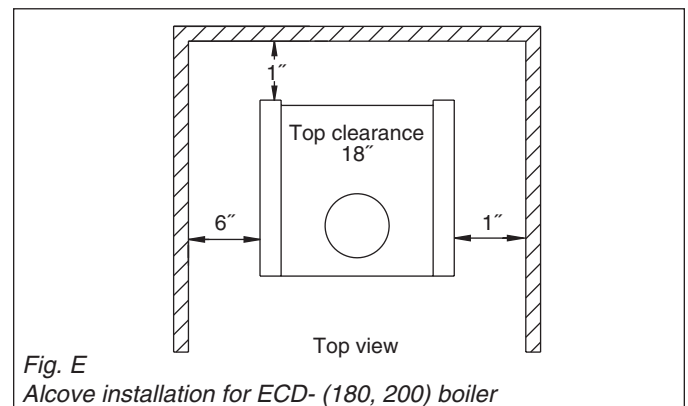


Please note that the minimum clearance to combustibles listed will apply when the boiler is located in a room large in comparison to the size of the equipment. Please see the Uniform Mechanical Code for definition. If the boiler is installed in a space that does not fit the definition of a "room large in comparison with the size of the equipment", then it is considered a closet or an alcove installation and the closet or alcove installation instructions apply.

The cable must not touch the vent pipe, and any excess cable must be suitably supported with cable clamps screwed to the side of the boiler if required. Refer to wiring diagrams. Do not attach vent damper cable to water or vent pipes.

Damper must be in the open position when main burners are operating. The damper position indicator (arrow) must be in a visible location following boiler installation.

The venting system must be arranged so that only the ECD boiler is served by the vent damper. Maintain a minimum clearance of 6" between the vent damper and combustible construction. There must be provision for service access to the vent damper after the installation. Use sheet metal screws (e.g. #8 x 1/2") to fasten vent damper to boiler and vent pipe. Thermostat anticipator should be set at 0.8A.



ATTENTION

Follow local regulations with respect to CO detectors. Follow all safety information from LP or gas supplier.

Combustion air supply (see Fig. 2)

This boiler needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air. Refer to requirements of local jurisdictions in addition to the information in this manual.

All combustion air must come from the outside.

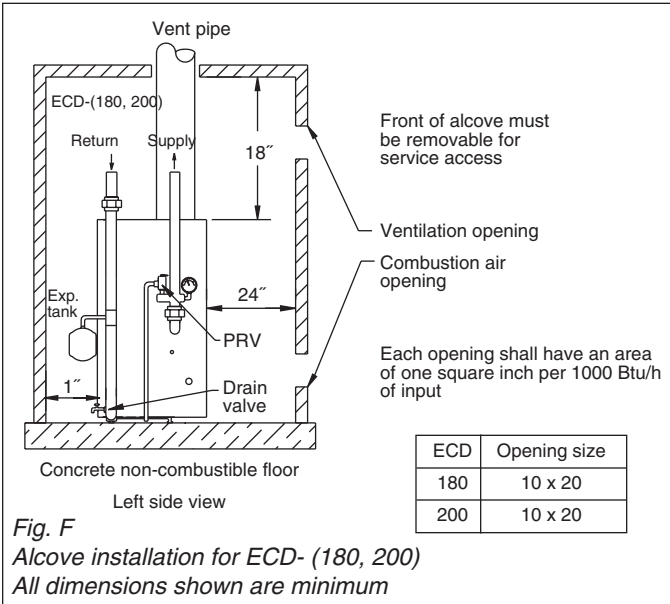


Fig. F
Alcove installation for ECD- (180, 200)
All dimensions shown are minimum

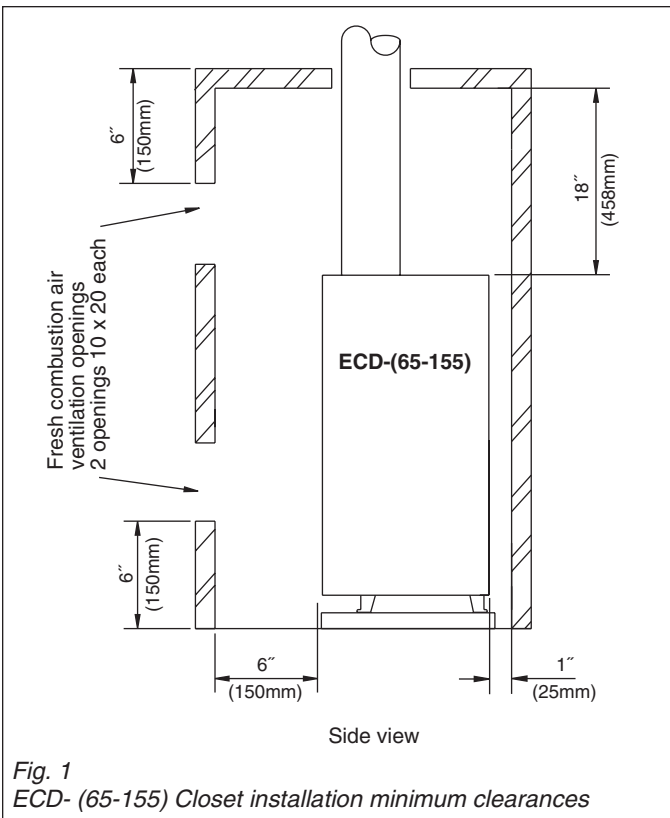


Fig. 1
ECD- (65-155) Closet installation minimum clearances

Provisions for combustion and ventilation air must be made in accordance with section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1

(latest edition) or applicable provisions of the local codes. In Canada follow CAN/CSA-B149.1 or .2 Natural Gas Installation Codes (latest edition) for combustion and ventilation air requirements.

Whenever possible install boiler near an outside wall so that it is easy to duct fresh air directly to the boiler area. See example in Fig. 2. Refer to national codes for duct sizing. Round ducts can be used.

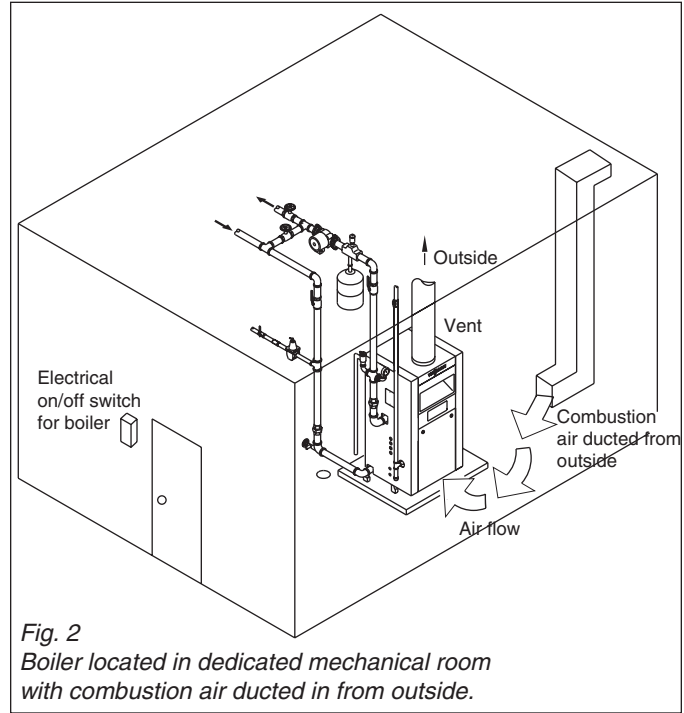


Fig. 2
Boiler located in dedicated mechanical room with combustion air ducted in from outside.

Warning:

Failure to provide an adequate supply of fresh combustion air can cause poisonous flue gases to enter living space which can cause severe personal injury or loss of life.

Outside air must enter the house to replace the air used by the boiler. When the boiler operates, the burner needs a continuous supply of oxygen which is supplied by the air entering the structure. Without a continuous supply of oxygen the flames will incompletely burn and can allow poisonous carbon monoxide gas to circulate into the living space.

Any home with bathroom or kitchen exhaust fans or heat recovery ventilator units should have outside air intake.

You must check with local authorities (municipal building department, gas utility) for combustion air requirements particular to your area.

Caution:

Whenever your boiler is installed in a structure with airtight features such as vapor barrier or tight insulation, there must be a combustion air duct installed to supply air from the outside even though the boiler may be installed in a space with a volume large relative to the boiler.

The following guidelines are from the CSA B149 Code for combustion air supply in buildings with airtight construction:

1. When the boiler is installed in buildings with airtight construction, air supply openings or ducts connected directly to the outside must be installed.
2. For boilers installed above grade and within 2 ft. of an outside wall, openings may be used in lieu of a duct. The openings shall be located within 1 ft. above and 2 ft. horizontally from the burner level of the appliance with the largest Btu/h input.
3. For boilers installed below grade, the combustion air duct must terminate within 1 ft. above, and within 2 ft. horizontally, from the burner level of the appliance having the largest Btu/h input.

According to the CSA-B149 Code the following diameters can be used for round corrosion resistant air supply ducts with smooth internal surfaces. Use equivalent lengths of 10 ft. per 90° elbow and 5 ft. per 45° elbow and 15 ft. for a grill or louver. See Table 1.

Model	Dia. for up to 20 ft. of equivalent length air duct	Dia. for up to 50 ft. of equivalent length air duct
ECD-65, -80	4"	5"
ECD-100, -115	5"	6"
ECD-140, -155	5"	6"
ECD-180, -200	6"	7"

Table 1. Combustion air duct sizes

4. The outside inlet of the combustion air duct must not permit the entry of rain or wind and must not reduce the free area of the air supply opening. It must not be blocked by snow.
5. Corrosion resistant screens must not have individual grids less than ¼" x ¼". Screens may not reduce the free area required for combustion air.
6. Manually operated combustion air dampers are not allowed. The air opening must be not of a type that could lead to situations where the air supply may be closed off while the burner is running.
7. A combustion air supply inlet opening from the outdoors shall be located not less than 12 inches above the outside grade.
8. Certified combustion air supply equipment may be used in lieu of a duct to provide outside combustion air.

Viessmann recommends above items 1-8 for all installations, even in buildings without airtight construction.

For structures that do not have tight construction and adequate air can infiltrate through cracks and openings in doors and windows refer to ANSI Z223.1 and CSA-B149.1 and .2 guidelines for combustion air supply.

Buildings without airtight construction

1. Always have air openings or ducts supplying air directly from the outside. If there is any doubt about the combustion air supply, install ducts directly to the outside for fresh air.
 2. If the boiler is installed in a confined space within the building (a space with a volume less than 50 ft³ per 1,000 Btu/h of input for all gas burning equipment) then adequate air for combustion must be provided by two permanent openings: one located 6" below the ceiling, the other 6" above the floor. Each opening shall have a minimum free area of 1 in² per 1,000 Btu/h of input for all gas burning equipment, but not less than 100 in². Two openings each with a minimum free area of 200 in² will be sufficient for the installation of one ECD-200. Larger openings can be used. The volume of the boiler space and the space connected by the air openings must have a volume greater than 50 ft³ per 1,000 Btu/h of input for all gas burning equipment.
 - a) When the boiler is in a confined space and the openings can be made directly on an outside wall to allow outside air into the boiler room, each opening shall have a minimum area of 1 in² per 4,000 Btu/h for all gas burning equipment. Two openings each with a free area of 50 in² will be sufficient for the installation of one ECD-200.
 - b) When the boiler is in a confined space and horizontal ducts are connected to crawl spaces or attics which can freely communicate to the outdoors, the openings shall be a minimum of 1 in² per 2,000 Btu/h of input for all gas burning equipment.
 - c) When the boiler is in a confined space and vertical ducts are connected to crawl spaces or attics which can freely communicate to the outside, the openings shall be a minimum of 1 in² per 4,000 Btu/h of input for all gas burning equipment.
- When ducts are used they shall be of the same cross sectional area as the free area of the openings to which they connect. The minimum dimension of rectangular air ducts shall be not less than 3 inches.
3. Wherever possible, it is recommended to supply air directly from the outdoors through wall openings or ducts even if previous experience with fuel burning equipment was satisfactory.
 4. Any change to the construction of the building such as weather-stripping, caulking around cracks, installation of exhaust fans, adding insulation, etc. can prevent adequate air supply and can make the building airtight. When required by construction changes, air supply ducts must be installed for safe boiler operation.
 5. If windows or doors are used for combustion air openings, they must be locked open.

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

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 duct.

Excerpt from our warranty terms

Boiler is not covered under any warranty terms for damages resulting from the following:

Improper application and installation, installation by unqualified personnel, ignorance of instructions, improper service and maintenance work, incorrect replacement component selection or application, incorrect field wiring. Full warranty applies only when boiler is installed and operated according to instructions and used only with the proper gas and the applicable gas pressures.

Please read boiler warranty card.

Standard equipment

- Wet base sectional cast iron heat exchanger with stainless steel burners
- Boiler completely assembled with vertical draft diverter
- Electronic ignition
- 24 VAC redundant seat gas valve
- Boiler fully insulated with 1½" fiberglass wrap-around blanket
- Boiler control panel with fixed high limit and temperature gage
- Pump aquastat to turn pump on
- One 120/24 VAC transformer
- 30 psig pressure relief valve, pressure gage and fittings
- One cleaning brush
- Adjustable high limit

Installation on combustible floor

Placement of boiler

1. Verify that base size and material are in conformity with local codes.
2. Locate the base so that the minimum clearances of boiler to combustible materials are maintained as outlined on page 3.
3. Base must be constructed of hollow concrete blocks, minimum height 100 mm (4"), covered with sheet metal at least 24 ga. thick.
4. The base must extend beyond the boiler enclosure by at least 150 mm (6") on all sides.
5. The blocks must be placed to provide an unbroken concrete surface under the boiler, with the hollows running continuously and horizontally to allow air circulation.

Boiler water piping

Install pressure relief valve and pressure gage directly to boiler supply. No isolation valve must be installed between boiler supply and pressure relief valve. Install pressure relief valve as shown in Fig. 4.

Water piping must be supported by pipe hangers. Boiler must not support weight of water piping.

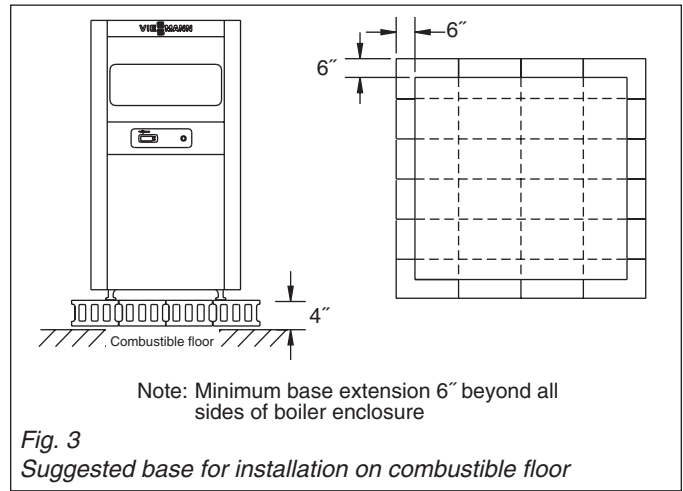


Fig. 3
Suggested base for installation on combustible floor

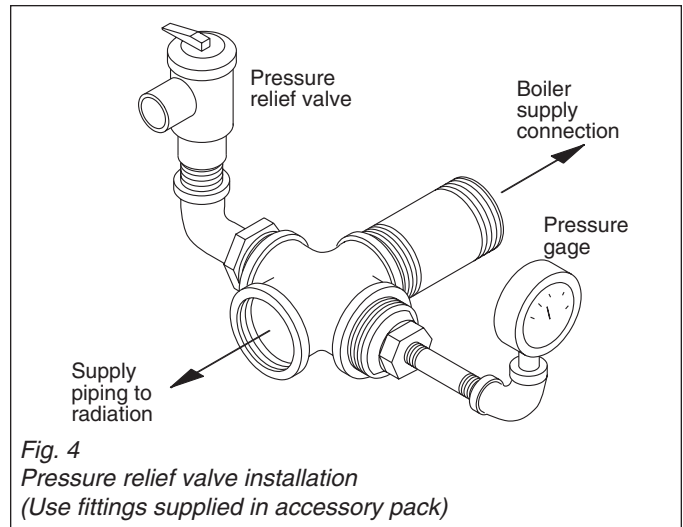


Fig. 4
Pressure relief valve installation
(Use fittings supplied in accessory pack)

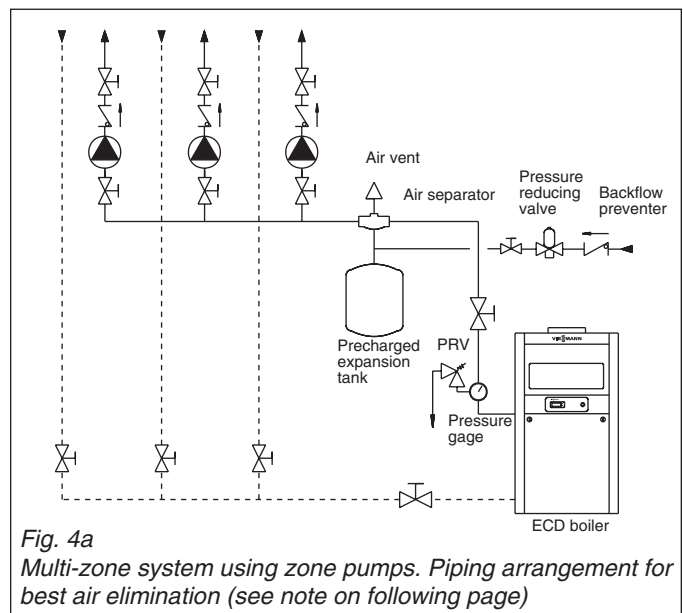


Fig. 4a
Multi-zone system using zone pumps. Piping arrangement for best air elimination (see note on following page)

Before boiler is connected to a piping/heating system which has previously been in service (boiler is a replacement boiler), the piping system should be flushed thoroughly with water in order to remove sludge or other contaminants, especially in large piping systems such as old gravity pipe systems.

Check system for pipe leaks, defective valves etc. and make required corrections immediately.

Be aware that best overall system performance is achieved when all components are properly sized. Sizing of the required circulation pump according to the pipe layout and calculation of a proper volume expansion tank is vital to obtain the system's peak performance. See Fig. 4a for multi-zone system using pumps.

Caution:

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

Caution:

This boiler is not for use in systems where water is constantly or frequently replenished. Minerals such as calcium in make-up water can deposit on heat exchanger causing overheating, and eventually the boiler will leak. This type of failure is not covered by warranty. Water must not be drained from system for use by cleaning personnel.

Do not use this boiler to directly heat swimming pool water. Use a heat exchanger to separate the boiler water from the pool water.

Caution:

For underfloor heating applications, an additional immersion or strap-on aquastat must be installed in the low temperature underfloor loop (ahead of the mixing valve) to de-energize the pump and/or boiler to prevent overheating. High water temperatures can damage concrete slabs.

Adjustable high limit aquastat (see Fig. 4c)

The adjustable high limit aquastat limits the boiler water temperature during a call for heat from the room thermostat or other operating control. It is located behind the front access panel. Honeywell L4008A aquastat or equivalent may be used. Ensure sensing bulb is fully inserted in well, see Fig. 4c. Set to a minimum of 140°F. Never permanently bypass high limit aquastats.

Circulating pump

The pump aquastat is located behind the control panel. Connect the circulating pump wires to the boiler terminal strip.

Circulating pump supplied by others. Failure to connect pump aquastat will significantly shorten life expectancy of boiler heat exchanger. Pump aquastat is factory set at 116°F. Alternate aquastat is available at 104°F.

Note to Fig. 4a

For multi-zone systems using zone pumps, one pump (usually the one serving the main living area) should be dedicated to operate with the pump aquastat located on the boiler (see wiring diagram). For multi-zone systems a bypass pipe must be installed. See page 10 for bypass piping details.

Do not wire more than one thermostat end switch from the zone valves into the boiler thermostat T-T connection. Wiring more than one thermostat into the boiler thermostat T-T connection will lead to burner short cycling, which can cause reduction in life span of the boiler due to probable flue gas condensation. This type of failure is not covered under the boiler warranty.

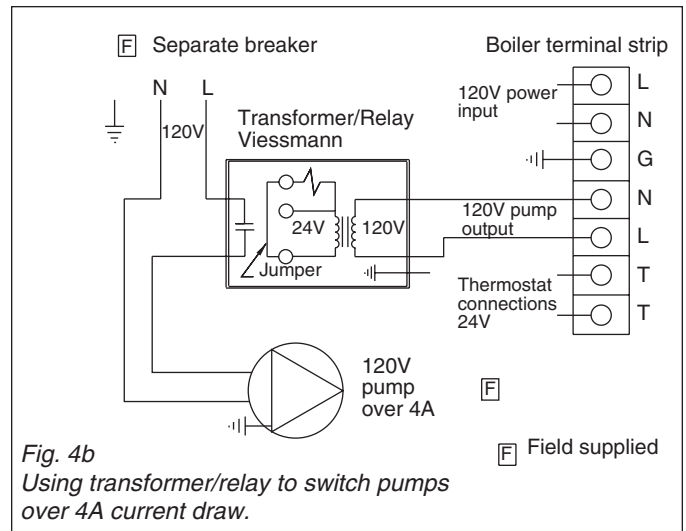


Fig. 4b
Using transformer/relay to switch pumps over 4A current draw.

The following lists typical water flow rates for the Atola-ECD boiler series:

Model	Flow rate (GPM) for 20°F rise	Flow rate (GPM) for 30°F rise
ECD-65	5.3	3.5
ECD-80	6.6	4.4
ECD-100	8.3	5.5
ECD-115	9.5	6.3
ECD-140	11.6	7.7
ECD-155	12.8	8.5
ECD-180	14.9	9.9
ECD-200	16.6	11.0

The water pressure drop for ECD-(65, 200) is:

GPM	Pressure drop (ft. of water)
10	.33
15	.60
20	1.20

Refer to wiring diagrams on pages 19, 20 for wiring a pump (less than 4A) to the ECD boiler terminal strip. For pumps greater than 4A use a **field supplied switching device** to switch separate 120V power to the pump, see Fig 4b. 120V (4A) is switched from the boiler terminal strip when the boiler pump aquastat exceeds its setting.

Caution:

Do not connect pumps with continuous or inrush currents greater than 4A. For pumps over 4A add a field supplied switching relay. See Fig. 4b for an example.

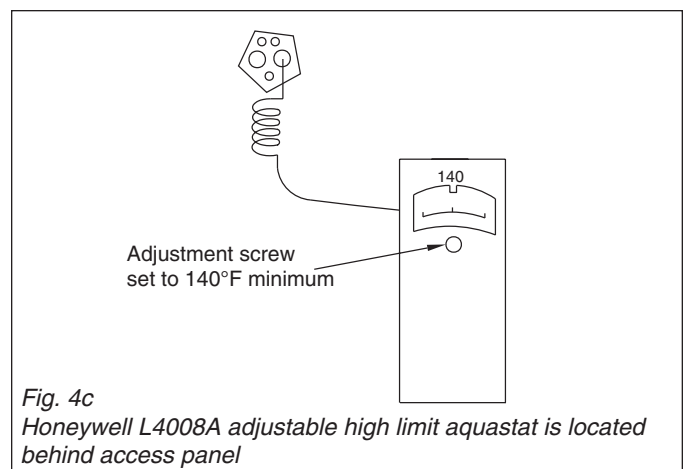


Fig. 4c
Honeywell L4008A adjustable high limit aquastat is located behind access panel

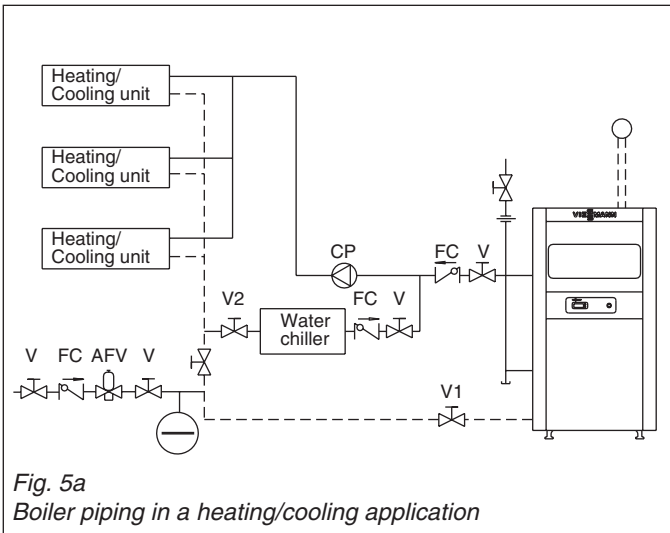


Fig. 5a
Boiler piping in a heating/cooling application

Boiler piping in heating/cooling application

The boiler, when used in connection with a refrigeration system, must be installed so the chilled medium is piped in parallel to the boiler with appropriate valves to prevent the chilled medium from entering the boiler (Fig. 5a).

The boiler piping system of a hot water heating boiler connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation must be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

Check installation instructions of chiller manufacturer carefully for additional requirements.

Cooling season starts: Close valve V1 and open valve V2.
Heating season starts: Close valve V2 and open valve V1.

A metal tag should be attached to these valves as to purpose.

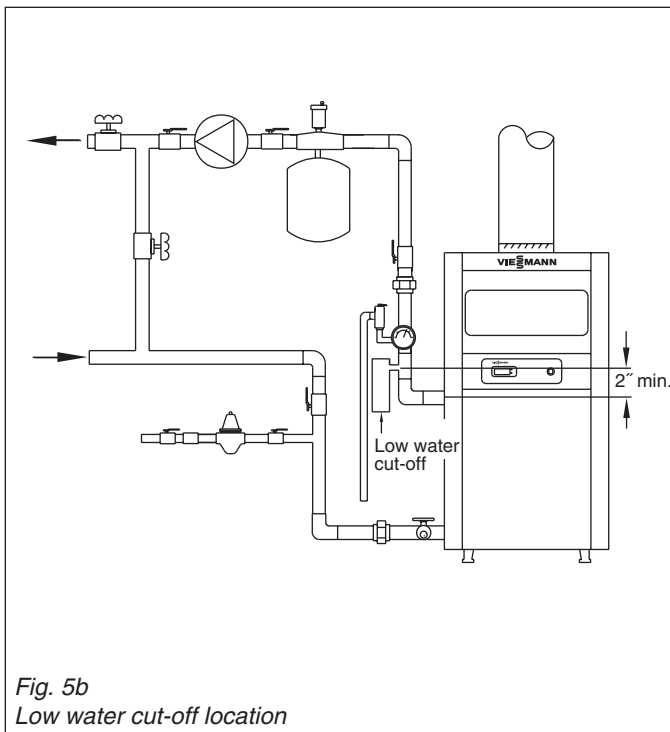


Fig. 5b
Low water cut-off location

Low water cut-off

If the ECD boiler is installed above radiation level then a low water cut-off device must be installed. See Fig. 5b for location of low water cut-off device. Note: Flow direction must be as shown in Fig. 5b. Low water cut-off is field supplied. Follow instructions provided with low water cut-off.

When required by the authority having jurisdiction, the installation must conform to the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1, latest edition.

Bypass piping (see Fig. 5a and Fig. 5b)

In some cases it is necessary to install a bypass. If you find the bypass is not needed, then simply close the bypass valve.

Install a bypass in order to prevent flue gas condensation from occurring in the heat exchanger casting and vent system when installing the boiler in a large water volume system (i.e. converted gravity system with tube type cast iron radiators).

A bypass is not a substitute for a mixing valve driven by an indoor/outdoor control for proper weather responsive control of an underfloor heating system.

1. Install full size bypass as shown below.
2. Use valve in bypass and valve in supply line to balance flow so that boiler water temperature quickly reaches 140°F or higher. Use globe valve or ball valve.
3. Bypass line should be minimum 12" long.
4. Bypass will lower flow rate through boiler to allow higher average water temperature rise. Water flow will bypass boiler depending on setting of bypass valve.
5. If the bypass is not needed, simply close the bypass valve.
6. The water flow direction must be as shown. Water flows in at bottom and out at top.

Initial system fill

Treatment for boiler feed water should be considered in areas of known problems, such as high mineral content and hardness. In areas where freezing might occur, an antifreeze may be added to the system water to protect the system. Please adhere to the specifications given by the antifreeze manufacturer. Do not use silicate based automotive antifreeze solutions.

Install a strainer on return pipe when necessary.

Wait for fill water to warm up to room temperature (70°F) before firing boiler. Firing boiler with cold water will stress the casting and could cause failure.

Please observe that an antifreeze/water mixture may require a backflow preventer within the automatic water feed and influence components such as diaphragm expansion tanks, radiation and pumps selection. A 40% antifreeze content will give freeze-up protection to approximately -10°F (-23.3°C). Do not use antifreeze other than specific brands made for hot water heating systems. System also may contain components which might be negatively affected by antifreeze. Check total system frequently when filled with antifreeze.

A field supplied pressure reducing valve (or "fill" valve) is required to reduce the incoming water pressure to between 12 and 15 psig.

Boiler venting (Category I)

The mounted boiler draft hood must not be altered or modified in the field.

The boiler should be located as close to the chimney as possible. The vent connection must be made in the shortest possible way with a minimum quantity of elbows.

The ECD boiler draft hood must not support the weight of the chimney. The chimney and vent connectors must be suitably supported to prevent the draft hood from supporting the weight of the chimney.



Warning:

Improper sizing, maintenance, termination of vent or chimney can cause flue gases to enter living space. Any blockage of vent or chimney by birds' nests, ice, snow, debris, or other materials can cause 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.

Avoid long horizontal runs of vent pipe. Horizontal runs must be supported by appropriate means to prevent sagging, and should have not less than $\frac{1}{4}$ " rise per ft. from the boiler to the vertical vent connection.

Metal strapping must be used to support horizontal runs every 3 ft.

Use approved vent materials only. For venting purposes, a B-vent may be used.

With this boiler installation, it is recommended to install a corrosion resistant approved liner within a masonry or unlined chimney. Observe and follow local rules and regulations.

The vent connector of this boiler must not be connected into any portion of mechanical draft systems operating under positive pressure.

Based upon proper chimney and breeching size, the boiler may be vented into a chimney/breeching with a direct-fired (atmospheric-fired) gas water heater. Observe national codes, local rules and regulations. In Canada follow CSA B149.1 or .2, in USA follow National Fuel Gas Code ANSI Z223.1. Always use latest edition of national codes for all venting installation requirements.

Before connecting boiler to existing chimney, inspect chimney for inside and outside conditions. Deteriorated chimneys are unsafe.

Terminate venting system outside with approved termination at least 6 ft. above the boiler. Vent pipe must extend at least 3 ft. above the point where it passes through the roof. Vent termination must be at least 2 ft. higher than any portion of building within 10 ft. horizontal and vent termination must be at least 2 ft. higher than roof peaks within 10 ft. horizontal.

Downdraft problems due to negative building pressure must be corrected. Chimney condensation problems must be corrected.

Removal of existing boiler

When an existing boiler is removed from a common venting system, the common venting is likely to be too large for proper venting of the appliances remaining connected to it.

At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation.

1. Seal any unused openings in the common venting system.
2. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion or other deficiency which would cause an unsafe condition.
3. Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on any exhaust fans such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
4. Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.
5. Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or a candle.
6. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas burning appliance to their previous condition of use.
7. Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1 – latest edition. When resizing, any portion of the common venting system should be resized to approach the minimum size as determined using the appropriate tables in Appendix G in the National Fuel Gas Code Z223.1 – latest edition.

The above steps 1–7 must be followed for new installations involving single or multiple ECD boilers.

Side wall vent system

A side wall power vent system can be ordered for the ECD boiler. This package includes the appropriate power venter, vent terminal and adaptor fittings for each ECD boiler model, as well as installation instructions. **The vent damper must not be installed when the side wall vent system is used.**

For boilers for connection to gas vents or chimneys, vent installations shall be in accordance with Part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1, or applicable provisions of the local building codes.

Ignition system

Safe lighting and other performance criteria were met with the gas manifold and control assembly provided on the boiler when the boiler underwent tests specified in the ANSI Z21.13/CSA 4.9 boiler standard.

The gas ignition system and components must be protected from water (dripping, spraying, rain etc.) during appliance operation and service (circulator replacement, control replacement, etc.). If boiler has been underwater, all electrical parts must be replaced.

Pressure relief valve

The pressure valve supplied with this boiler must be installed. Install a pressure relief valve according to Figs. A, 4, 5b.

A discharge pipe of the same diameter or larger as the pressure relief discharge opening must be rigidly installed directly onto the pressure relief valve. The discharge should extend to the floor drain and end approximately 6" above the floor. The discharge pipe end must not be threaded. Do not pipe discharge outdoors.

Warning:

Never cap or plug pressure relief valve opening or discharge pipe. Never install shut-off valve between boiler and pressure relief valve. Failure to heed this warning can cause explosion resulting in property damage, severe personal injury, or loss of life.

If pressure relief valve is discharging frequently, locate source of problem and correct. Significant amounts of make-up water will cause mineral deposits in boiler which may lead to failure. This type of failure is not covered under warranty.

Follow instructions supplied with pressure relief valve.

Caution:

Discharge piping of pressure relief valve must be installed so there will be no danger of scalding personnel.

Boiler is standard equipped with 30 psig ASME-rated pressure relief valve. This 30 psig pressure relief valve may be exchanged at the job site with a 50 psig ASME-rated pressure relief valve only by strictly observing the minimum relief valve capacity in lb/h marked on the nameplate. The maximum allowable working pressure is 50 psig.

Gas piping

Before connecting gas boiler to gas line, install main gas shut-off valve, union, and capped drip leg (see Fig. 6).

Size gas supply piping to boiler according to local utility requirements.

Identify the main shut-off valve as such with a tag and familiarize owner of boiler with this valve.

Support piping by proper suspension method. Piping must not rest on or be supported by boiler.

Testing – gas pipe

The boiler and its gas connection must be leak-tested before placing the boiler in operation. Use only the gas stated on the boiler rating plate.

The boiler and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at pressures in excess of 1/2 psig (3.5 kPa).

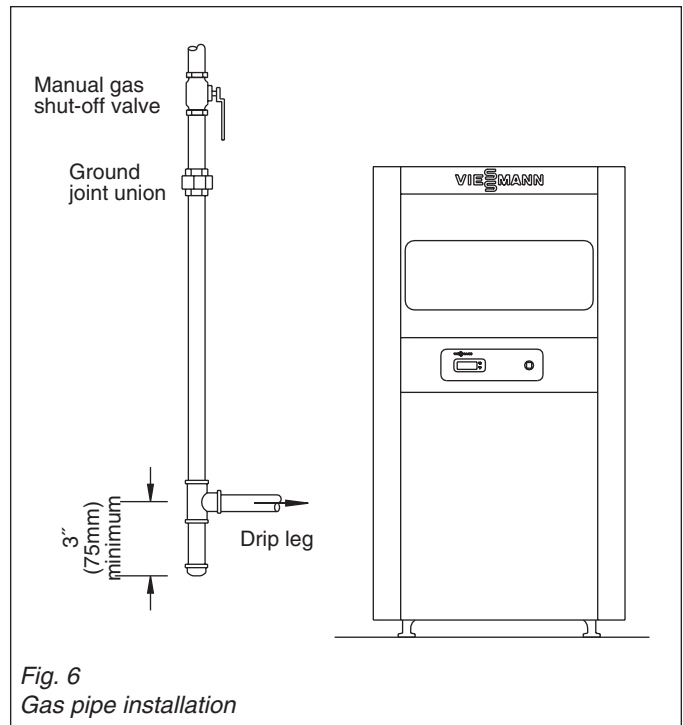


Fig. 6 Gas pipe installation

The boiler must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at a test pressure equal to or less than 1/2 psig (3.5 kPa).

Unions and manifold have been factory-tested. Leak test must be repeated during initial trial operation of burner by mechanical contractor.

Never check for gas leaks with an open flame. Use approved spray liquid or soap water solution for bubble test.

Gas pressure – Orifice sizes

Natural Gas

Minimum gas valve inlet pressure	4.5" w.c.
Maximum gas valve inlet pressure	14" w.c.

Propane Gas

Minimum gas valve inlet pressure	12" w.c.
Maximum gas valve inlet pressure	14" w.c.

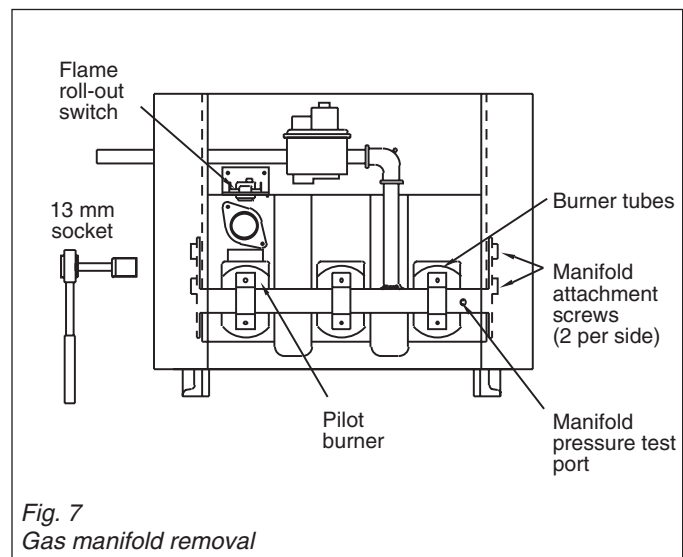


Fig. 7 Gas manifold removal

Manifold orifices – natural gas (1,000 Btu/cu. ft.)

Boiler size ECD	Orifices required	Low Altitude 0-610m 0-2000ft. Orifice size Ø	High Altitude 610-1370m 2000-4500ft. Orifice size Ø	Gas valve/manifold pressure "w.c.
65	2	2.65	2.55	3.5
80	2	2.95	2.80	3.5
100	3	2.70	2.60	3.5
115	3	2.85	2.75	3.5
140	4	2.75	2.65	3.5
155	4	2.85	2.80	3.5
180	5	2.80	2.65	3.5
200	5	2.95	2.80	3.5

Manifold orifices – propane (2,500 Btu/cu. ft.)

Boiler size ECD	Orifices required	Orifice size	Low Altitude 0-610m 0-2000ft. Gas valve/manifold pressure "w.c.	High Altitude 610-1370m 2000-4500ft. Gas valve/manifold pressure "w.c.
65	2	1.60	10"	9"
80	2	1.80	10"	8"
100	3	1.65	10"	8"
115	3	1.75	10"	8"
140	4	1.70	10"	8"
155	4	1.75	10"	8"
180	5	1.70	10"	8"
200	5	1.80	10"	8"

All orifice sizes given in mm! Orifice size is stamped onto each orifice for identification. When ordering orifices, state boiler size, type of gas, number of orifices required and orifice size.

Gas burner removal (see Fig. 7)

The main gas burner manifold with the individual stainless steel burners mounted may be easily removed from the boiler by:

1. Closing the main gas shut-off valve external to boiler.
2. Disconnecting all power to boiler.
3. Removing front cover panel from boiler.
4. Breaking ground joint union before gas valve, remove gas pipe.
5. Disconnecting wiring to gas valve. Disconnect wiring from igniter sensor and ground connection.
6. Loosening manifold bolts. (Do not remove, only loosen). Use socket with extension to access bolts through holes in side panel.
7. Removing burners once manifold is loose.
8. Slide out on an upper angle to remove manifold.

Gas input – CAUTION

Do not exceed input rating stamped on rating plate of boiler.

1. Close main gas shut-off valve.
2. Disconnect main power supply to boiler.
3. Remove plug (1/8") on manifold. Install test plug and connect U-tube manometer or equivalent.
4. Place boiler/burner in operation.
5. Read manifold gas pressure and compare with stamped rating on rating plate. If necessary, adjust pressure on gas valve.

If using meter clocking method: Ensure there is no gas flow through the meter other than to the boiler being checked. Other appliances must remain off, including their pilot burners.

6. Deactivate boiler, reinstall 1/8" plug, place boiler in operation again.
7. Repeat gas leak test at plug (1/8") and ensure tightness.

Main burner (see Fig. 8)

Proper flame: Upper main flame cone with light orange coloring, sharply defined individual flames (Fig. 8).

Underfired: Lazy-burning main flame cone, mushy flame appearance throughout, smaller flame sizes than in Fig. 8.

Overfired: Increased burner noise, higher flame sizes than in Fig. 8.

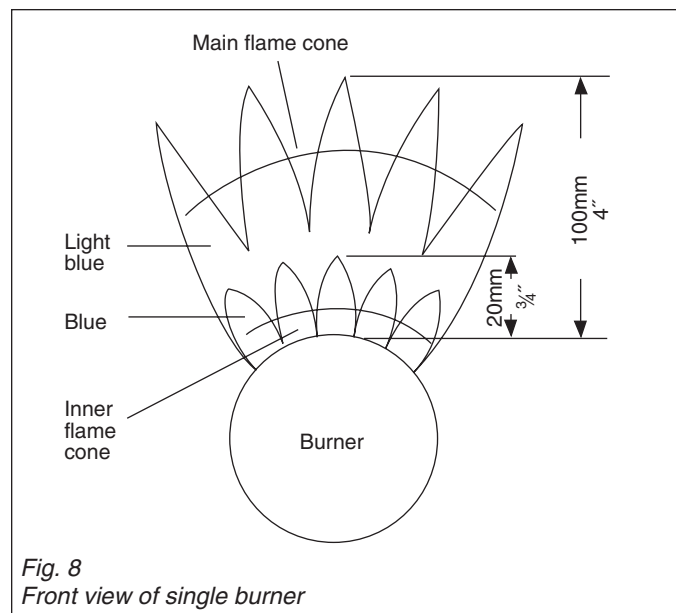


Fig. 8
Front view of single burner

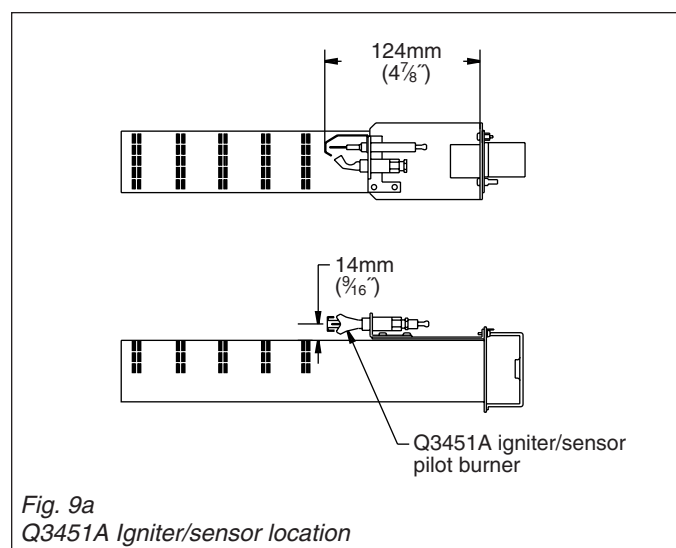
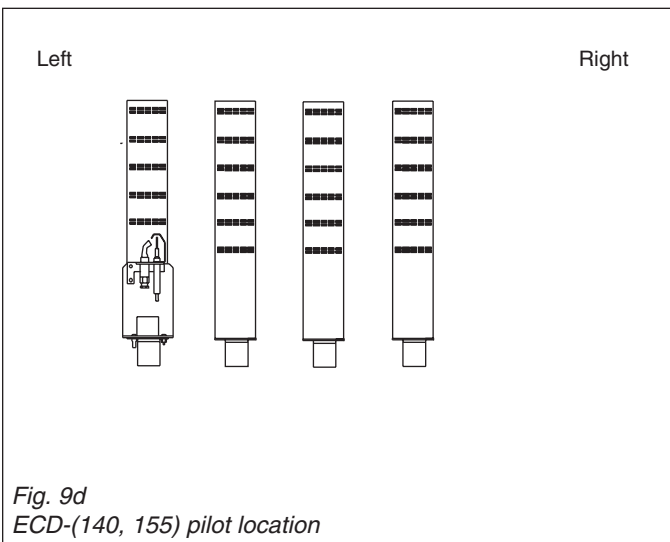
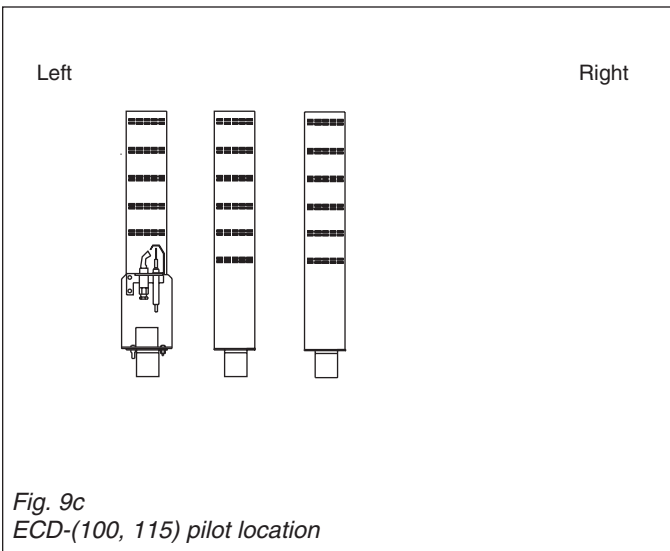
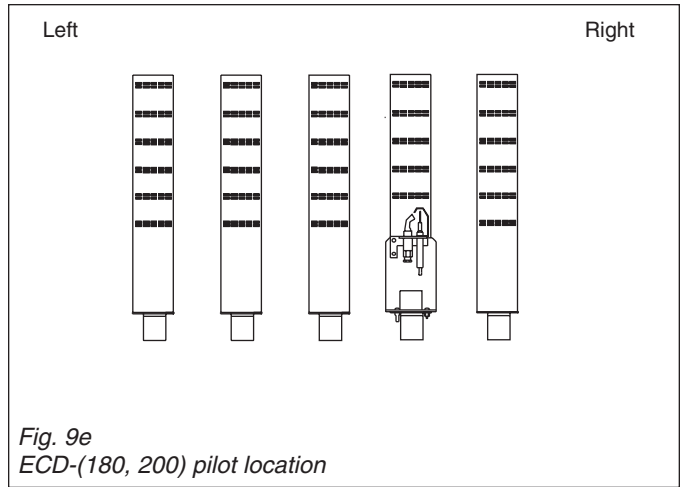
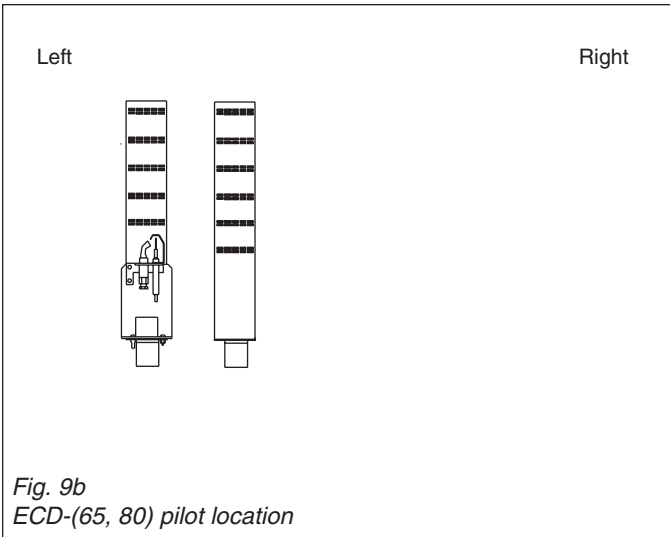


Fig. 9a
Q3451A Igniter/sensor location

Caution:

Gas burner positioning

For ECD boiler with Honeywell intermittent pilot (spark) ignition the main burner for mounting the Q3451A pilot assembly contains one less group of main burner ports (5). If the burners are disassembled or replaced for any reason they must be reassembled as shown in Figs. 9a, b, c, d, e. If the Q3451A pilot assembly is accidentally assembled into a 6 port burner it will be exposed to the flames from the first row of ports and will overheat and become defective. Defective pilot will prevent boiler from operating which could cause property damage from freezing.



Blocked vent and flame roll-out switches

Flame Roll-Out Switch Model 60T14 (140°F)	Blocked Vent Switch Model 60T14 (235°F)
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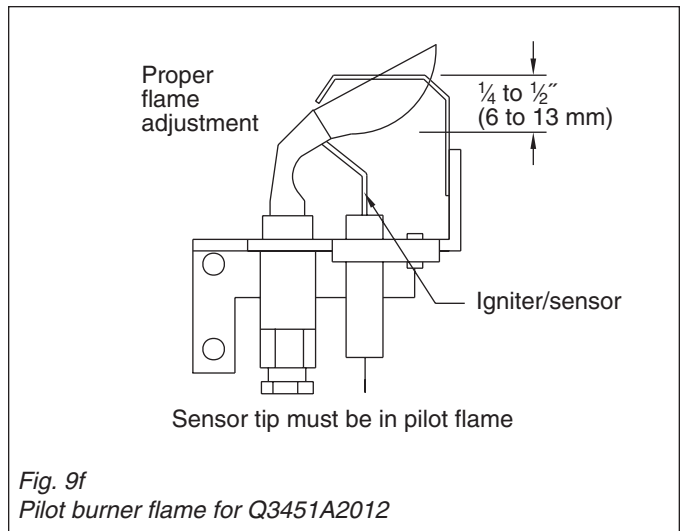
Note:

Fig. 9f shows pilot burner flame with proper flame adjustment.

Boiler wiring

Refer to wiring diagrams on pages 19, 20. All wiring must be properly grounded! Before attempting to wire unit, disconnect power supply at main service panel first.

In the United States all electrical wiring must be in accordance with the National Electrical Code ANSI/NFPA 70 (latest edition.) In Canada all electrical connections must be in accordance with Canadian Electrical Code C22.1 Part 1 (latest edition.)



PILOT PRESSURE FOR Q345A PILOT	
Natural Gas	5 - 7" w.c.
Propane Gas	8 - 10" w.c.

If an external electrical source is utilized, the boiler, when installed, must be electrically grounded in accordance with the requirements of the authority having jurisdiction or, in the absence of such requirements, with the National Electrical Code, ANSI/NFPA 70.

Boiler electrical requirements are 120V, 60 Hz, less than 12A. The thermostat connections on the boiler must be connected to a potential-free (or “dry”) contact such as a room thermostat, end switch of a zone valve or dry contact of an indoor/outdoor control.

See wiring diagram in rear of manual and wiring label on boiler. Viessmann reserves the right to substitute electrical components as necessary. The boiler wiring label takes precedence.

Caution

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

Electronic thermostat connection

For those installations where an electronic set-back thermostat is used, an isolation relay may be necessary (see Fig. 9g). Any electronic thermostat that constantly requires current from the boiler transformer will require an isolation relay. For example when installing a Honeywell Chronotherm, use an isolation transformer relay (as shown in Fig. 10) to provide current for the electronic thermostat.

System start-up procedure

If the system was shut down for an extended period of time, have a qualified service technician restart and recondition your system. Refer to lighting instructions on page 18.

1. Check if all national and/or local rules and regulations have been adhered to on this installation. Do not attempt to start the boiler if you smell gas. If you smell gas, open windows. Do not touch electrical switches, extinguish any open flame, close all gas valves immediately. Call your gas supplier immediately from a neighbor’s phone.
2. Check system for proper water fill (cold fill pressure). Make sure that complete system is properly vented of air. Adjust automatic feed valve to proper desired fill pressure between 12-15 psig.
Do not tamper with the unit or controls.
Never burn garbage or paper in the unit or leave combustible materials around it.

Additional attention must be given to the following paragraphs

1. Once system water is heated, deactivate circulating pump/boiler and vent system of any remaining air within piping, radiation and boiler.
2. Check for proper boiler circulation, pump, zone valve, thermostat or operating control functions.
3. Check high limit aquastat by dialing it to a setting below the water temperature in the boiler. The gas burner must be deactivated. Turning the dial back to a setting higher than the present boiler water temperature must result in reactivation of gas burner.
4. Cycle boiler on and off with the room thermostat (or other operating control) to verify that the burner shuts down when the room thermostat is adjusted below room temperature.

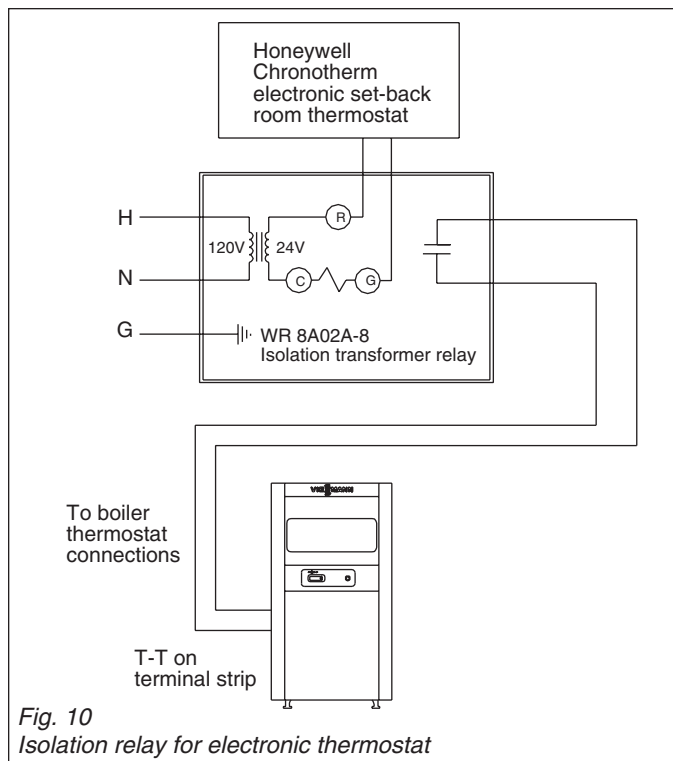


Fig. 10
Isolation relay for electronic thermostat

Annual shut-down

If boiler is used for comfort heating only and not used with an indirect-fired domestic hot water storage tank, the boiler/heating system should be shut down during the summer time.

1. Turn down operating control (thermostat).
2. Disconnect main power switch.
3. Close main gas shut-off valve and turn knob on gas valve to “off” (see Figs. 6 and 7).

ATTENTION

If system is shut down during the heating season and subject to freezing temperatures and is not filled with antifreeze for protection, the system including the boiler must be drained of water. Valve before automatic feed valve (if installed) must be closed; any other valves, air vents and drain valves must stay open.

Advise the operator/ultimate owner

1. Of the proper system operation sequence.
2. Explain the equipment as well as the need for combustion air.
3. Demonstrate an emergency shut-down, what to do and what not. Refer to lighting instructions on page 18.
4. Explain that there is no substitute for proper maintenance to help ensure safe operation.

Before leaving jobsite

Fill in and sign warranty card for boiler and hand over to owner for record keeping.

Maintenance

Inspections during heating season

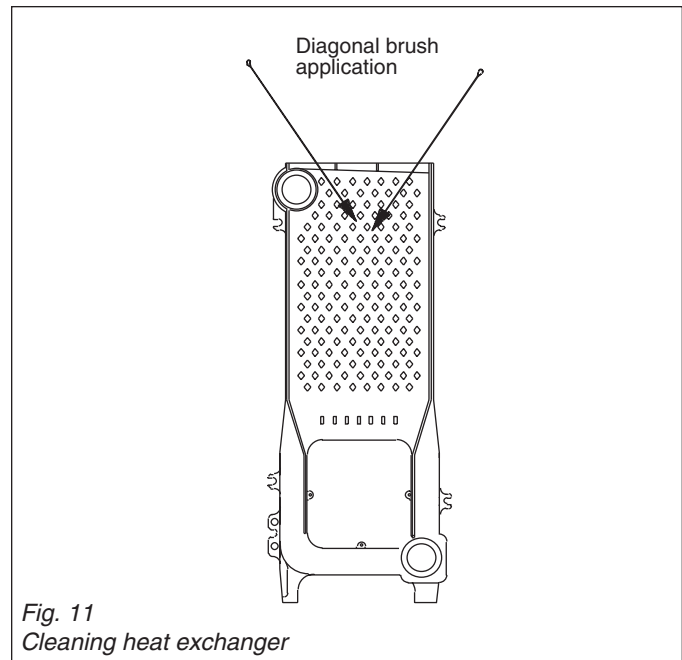
Boiler servicing – heat exchanger cleaning

A service/inspection of the boiler and the system is mandatory once a year.

Before heating season starts, boiler/burner should be serviced by a qualified service agency. The owner should establish a service contract with a **qualified service agency**.

Cleaning heat exchanger (flue gas passageways, see Fig. 11)

1. Disconnect power supply to boiler and all heating related components.
2. Close main gas shut-off valve. Allow boiler to cool if necessary.
3. Remove front panel.
4. Remove gas burner assembly from boiler (refer to gas burner removal procedure, page 12).
5. Refer to Fig. 13 for draft hood removal. Disconnect vent pipe from draft hood outlet.
6. Remove top panel from boiler (4 screws).
7. Remove rear panel (6 screws).
8. Remove screws securing mid panel, upper front panel and control panel to side panels (4 screws per side).
9. Remove side panels (3 screws per side).
10. Remove top insulation and loosen insulation jacket to reveal screws securing draft hood to cast iron heat exchanger (4 screws). Remove screws.
11. Carefully pry draft hood from heat exchanger.
12. Clean fins by brushing diagonally through sections. See Fig. 11.
13. Inspect combustion chamber by using flashlight between front section legs.
14. Before reinserting burner manifold, clean stainless steel burners with soft brush.
15. Inspect ignition system. Check igniter for cracks or other deterioration. Replace if necessary.
16. Reverse steps 4 through 11 to reassemble boiler. Seal draft hood to casting using a high temperature RTV type sealant.



Additional check points of annual service inspection

Check flue pipe condition, chimney connection, and chimney itself, both inside and outside, for rust, deterioration, blockage, or leakage. Repair or replace as necessary.

Check pressure relief valve and system pressure, and verify proper operation of automatic feed if installed.

Check heating pipe joints, valves, air vents, etc. System leaks must be corrected immediately to avoid damages. The cause of any system defect must be determined and corrected in order to prevent property damage, personal injury, or loss of life.

Check for proper combustion air supply and ventilation for the boiler.

Check to ensure that combustible material or chemicals are not stored close to the boiler. Operate high limits by dialing lower settings, switching burner on/off to verify function of same. If low water cut-off is installed, check and verify proper function according to manufacturer's instructions. If oil lubricated circulating pump is used, check for proper lubrication.

Check for gas-tight connection of gas piping, unions, gas valve and manifold.

Check proper ignition and gas burner operation.

Combustion test must be performed by a competent service technician.

Do not tamper with boiler or controls.

INTERMITTENT PILOT IGNITION – TROUBLE SHOOTING GUIDE*

Trouble	Cause	Cure
Pilot will not light	Air in gas line	Purge air from gas line
	Boiler temperature too high (adjustable high limit aquastat activated)	Wait for boiler to cool down below aquastat setting
	Room thermostat setting too low	Increase setting
	No power	Check power supply
	Manual reset aquastat activated	Wait for boiler to cool down. Reset aquastat
	Pilot burner defective	Replace
	Pilot orifice clogged or defective	Replace pilot orifice
	Faulty ground connection from burner to module	Replace ground wire
	Gas valve knob in "off" position	Turn knob to "on"
	No gas, or gas supply has been temporarily interrupted	Check position of main gas shut-off valve or purge gas line of air
	Ignition module defective	Replace
	Gas valve defective	Replace
	Blocked vent switch activated	Chimney or vent obstruction needs to be removed
Flame roll-out switch activated	Clean heat exchanger	
Main burner will light and turn off again within safety timing of module	Defective igniter/sensor	Replace
	Defective module	Replace
	Faulty ground wire	Replace

* Never leave a safety control bypassed. Only qualified service technicians shall perform troubleshooting procedures.

Parts List for Honeywell Intermittent Pilot Ignition System

	NATURAL GAS	PROPANE GAS
GAS CONTROL LIST	HONEYWELL PART NO.	HONEYWELL PART NO.
Gas Valve ECD	VR8204P1007 (ECD-65 - 180) VR8304P3308 (ECD-200)	VR8204P1049
Ignition Control	S8600H1006	S8600H1006
Pilot Burner *1	Q3451A2012	Q3451A2012
Pilot Orifice	.018 inches dia. 390686-4 BCR 18	.014 inches dia. 390696-24 BBR 14

*1 Pilot burner has ignition cable permanently attached.
Consult your Viessmann representative for parts replacement.

Lighting Instructions for Intermittent Pilot (Spark to Pilot)

FOR YOUR SAFETY READ BEFORE OPERATING

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
- B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

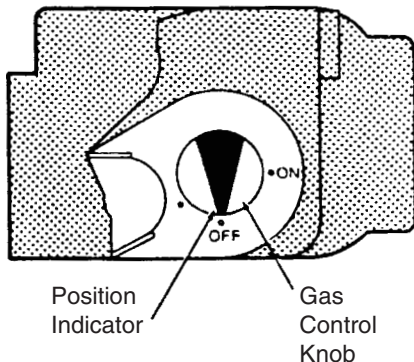
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.



- If you cannot reach your gas supplier, call the fire department.

- C. Use only your hand to turn the gas control knob. Never use tools. If the knob will not turn by hand, don't try to repair it; call a qualified service technician. Force or attempted repair may result in fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.


OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this page.
2. Set the thermostat to the lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.



5. Remove control access panel.
6. Turn gas control knob clockwise  to "OFF".
7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas, go to the next step.
8. Turn gas control knob counterclockwise  to "ON".
9. Replace control access panel.
10. Turn on all electric power to the appliance.
11. Set thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

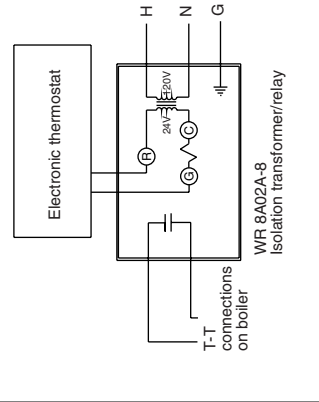
TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control access panel.
4. Turn gas control knob clockwise  to "OFF". Do not force.
5. Replace control access panel.

Vitogas 050, ECD Series with Honeywell intermittent pilot ignition (spark to pilot) with #41 plugs

Warning! Disconnect power before servicing boiler
Do not bypass aquastats. Do not alter wiring of this boiler.

NOTE: If electronic room thermostat is used, i.e. Honeywell Chronotherm, then use isolation relay/transformer. Follow instructions supplied with electronic thermostat. Thermostat supplied by others.



Safety aquastats

SHL1 Adjustable high limit aquastat 90°C (194°F) maximum setting

SHL2 Fixed manual reset high limit aquastat set at 120°C (248°F)

H Hot
N Neutral
G Ground

[F] Field supplied

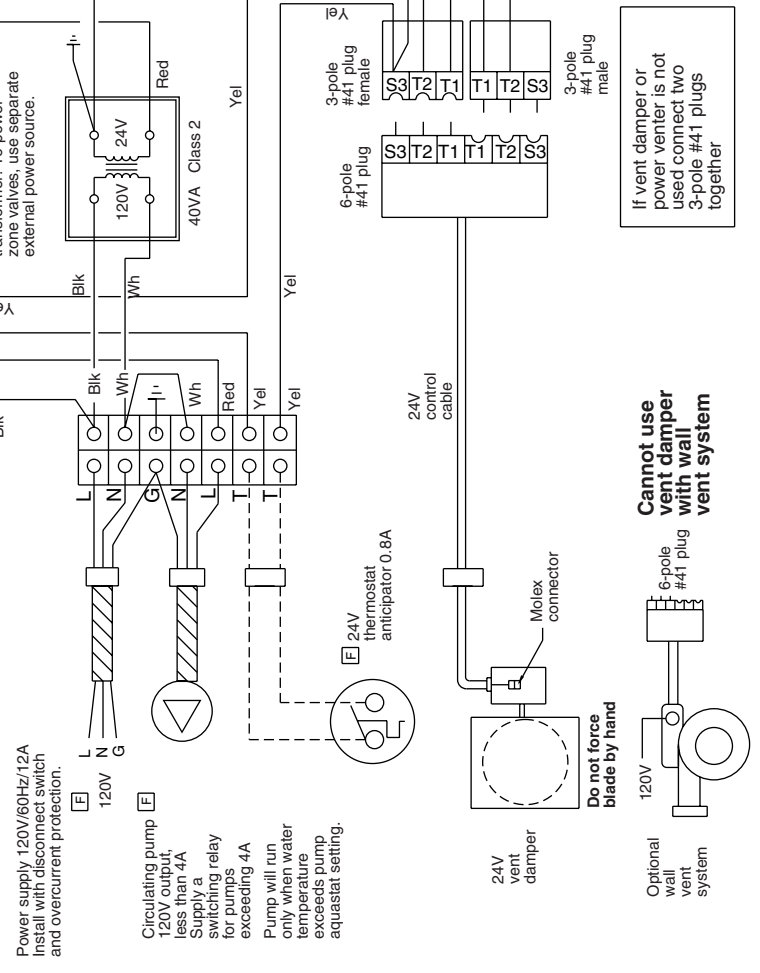
PA Pump aquastat control with fixed settings
Pump on at 40°C (104°F)
Pump off at 33°C (91°F)



Caution:
Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

If any of the original wires supplied with the appliance must be replaced, replace with 105°C rated wire or its equivalent.

Do not use multiple trial S8600M control on propane fired boilers



If vent damper or power venter is not used connect two 3-pole #41 plugs together

Cannot use vent damper with wall vent system

Do NOT install a flow switch when pump aquastat is used

Fig. 12

Vitogas 050, ECD Series with Honeywell intermittent pilot and vent damper – Ladder diagram

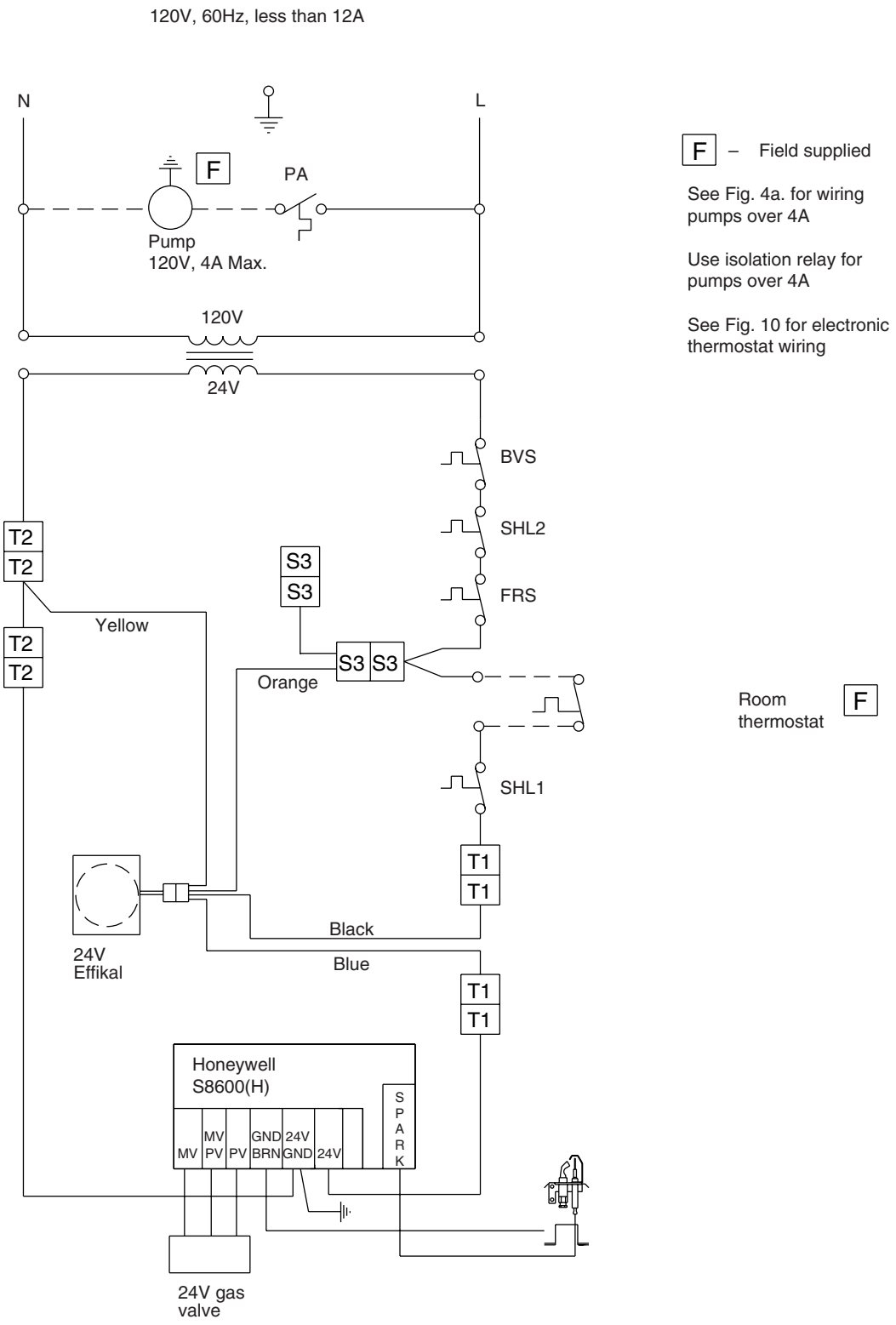


Fig. 12a

Legend

- | | |
|---|-------------------------------------|
| PA – Pump aquastat (104°F) | BVS – Blocked vent switch (235°F) |
| SHL1 – Adjustable high limit aquastat (194°F) | FRS – Flame roll-out switch (140°F) |
| SHL1 – Fixed manual reset (248°F) aquastat | |

Vitogas 050, ECD Series

Cast Iron Atmospheric Gas-Fired

(exploded view example of ECD-140 / ECD-155)

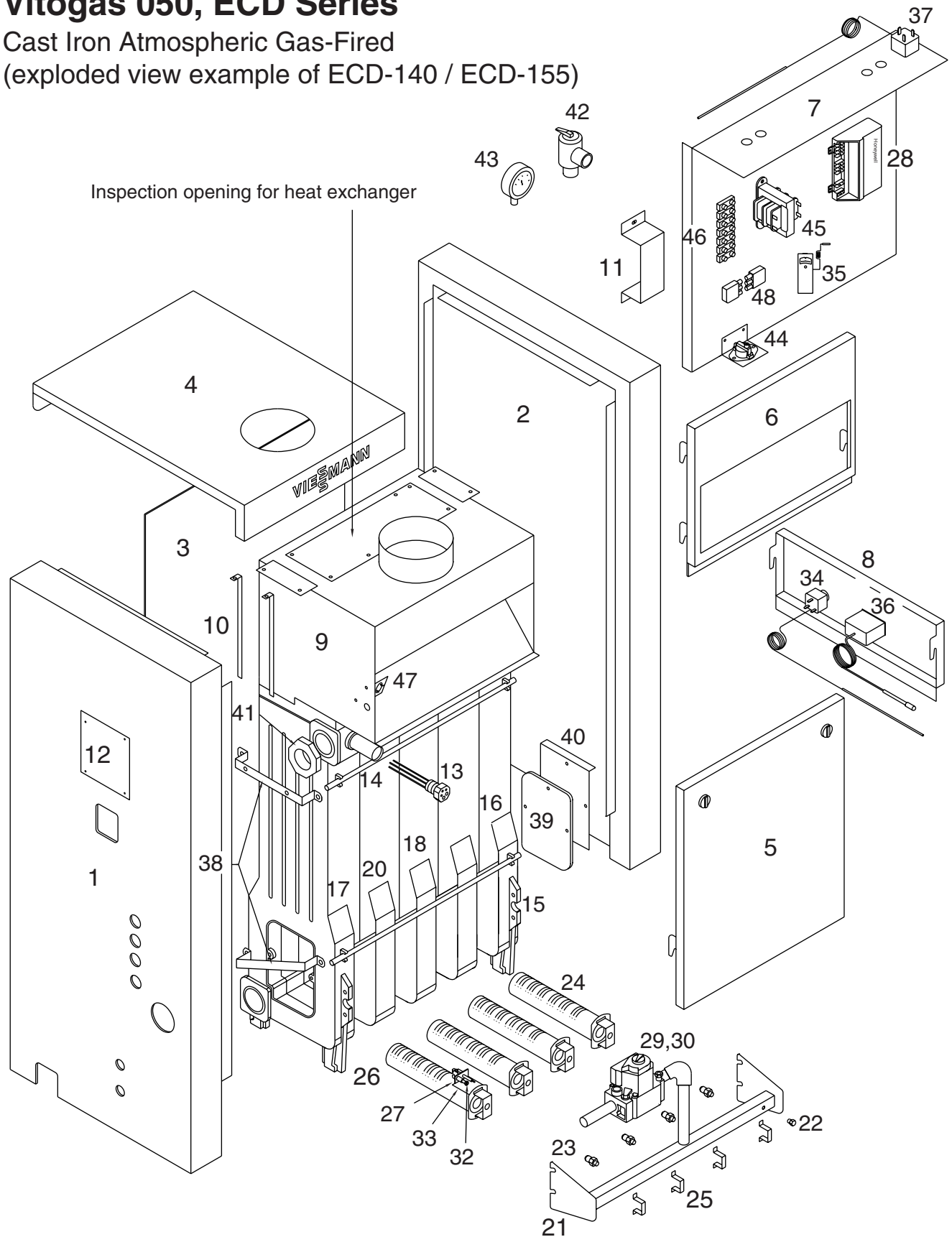


Fig. 13

Note: Ref. No. 19 not shown, as only applicable to ECD-180 / ECD-200.

Note: Ref. No. 35 is at a different location for the ECD-180 / ECD-200.

Ref No.	Name of Part	Part No.		ECD -65	ECD -80	ECD -100	ECD -115	ECD -140	ECD -155	ECD -180	ECD -200
		Silver	Orange								
1	Left panel	9544 200 9544 201	9543 897 9544 189	1	1	1	1	1	1	1	1
2	Right panel	9544 202 9544 203	9543 893 9543 892	1	1	1	1	1	1	1	1
3	Back panel	9544 204 9544 205 9544 206 9544 207	9543 909 9543 910 9543 911 9543 913	1	1	1	1	1	1	1	1
4	Top panel	9544 208 9544 209 9544 210 9544 211	9543 918 9543 919 9543 920 9543 921	1	1	1	1	1	1	1	1
5	Front access panel	9544 212 9544 213 9544 214 9544 215	9543 902 9543 903 9543 904 9543 905	1	1	1	1	1	1	1	1
6	Front upper panel	9544 216 9544 217 9544 218 9544 219	9543 922 9543 923 9543 924 9543 925	1	1	1	1	1	1	1	1
7	Mid panel	9544 220 9544 221 9544 222 9544 223	9543 887 9543 888 9543 889 9543 890	1	1	1	1	1	1	1	1
8	Control panel	9544 224 9544 225 9544 226 9544 227	9543 877 9543 906 9543 907 9543 908	1	1	1	1	1	1	1	1
9	Drafthood assembly	9544 228 9544 229 9544 230 9544 231	9543 926 9543 927 9543 928 9543 929	1	1	1	1	1	1	1	1
10	Drafthood strap	9544 735 9544 841	9543 735 9543 841	1	1	1	1	1	1	1	1
11	Terminal strip cover	9544 232	9543 930	1	1	1	1	1	1	1	1
12	Vent cover plate	9544 233	9543 744	1	1	1	1	1	1		
13	Thermowell	7255 283	7255 283	1	1	1	1	1	1	1	1
14	Thermowell nipple	7250 121	7250 121	1	1	1	1	1	1	1	1
15	Assembled cast iron heat exchanger	9543 931 9543 932 9543 933 9543 934	9543 931 9543 932 9543 933 9543 934	1	1	1	1	1	1	1	1

Ref No.	Name of Part	Part No.		ECD -65	ECD -80	ECD -100	ECD -115	ECD -140	ECD -155	ECD -180	ECD -200
		Silver	Orange								
16	Section – right side*	9507 593	9507 593	1	1	1	1	1	1	1	1
17	Section – left side*	9507 592	9507 592	1	1	1	1	1	1	1	1
18	Section intermediate*	9507 596	9507 596			1	1	1	1	2	2
19	Section int. with pilot opening on right*	9507 595	9507 595							1	1
20	Section int. with pilot opening on left*	9507 594	9507 594	1	1	1	1	1	1	1	1
21	Manifold	7255 277 7255 278 7255 279 7255 280	7255 277 7255 278 7255 279 7255 280	1	1	1	1	1	1	1	1
22	Pipe plug 1/8"	9543 412	9543 412	1	1	1	1	1	1	1	1
23	Manifold orifices Natural Gas 0-2000 ft. 2000-4500 ft. 4500-7000 ft. LP 0-2000 ft. 2000-4500 ft. 4500-7000 ft.			9507 072 9507 071 9507 070	9507 327 9507 075 9507 073	9507 073 9507 614 9507 071	9507 615 9507 074 9507 073	9507 074 9507 072 9507 071	9507 615 9507 075 9507 072	9507 075 9507 072 9507 614	9507 327 9507 075 9507 073
24	Stainless steel burner tube	9507 642	9507 642	1	1	2	2	3	3	4	4
25	Burner mounting saddle	9507 051	9507 051	2	2	3	3	4	4	5	5
26	Burner tube for pilot mounting	9543 939	9543 939	1	1	1	1	1	1	1	1
27	Pilot igniter assembly Q3451A2012	9543 722	9543 722	1	1	1	1	1	1	1	1
28	Ignition control module S8600H	9543 876	9543 876	1	1	1	1	1	1	1	1
30	Gas valve (NG) VR8204P1007 Gas valve (NG) VR8304P3308 Gas valve (LP) VR8204P1049	9549 246 9544 199 9543 716		1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1
32	Pilot orifice NG .020" LP .014"	9543 391 9543 392	9543 391 9543 392	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Note:

*When ordering replacement boiler sections, order 4 push nipples per intermediate section and 2 push nipples per side section.

Ref No.	Name of Part	Part No.		ECD -65	ECD -80	ECD -100	ECD -115	ECD -140	ECD -155	ECD -180	ECD -200
		Silver	Orange								
33	Pilot bracket for Q3451A	9543 384	9543 384	1	1	1	1	1	1	1	1
34	Manual reset safety high limit control	9509 899	9509 899	1	1	1	1	1	1	1	1
35	Adjustable aquastat	9543 875	9543 875	1	1	1	1	1	1	1	1
36	Thermometer	9506 884	9506 884	1	1	1	1	1	1	1	1
37	Pump aquastat	9519 214	9519 214	1	1	1	1	1	1	1	1
38	Support bracket upper	9543 731	9543 731	2	2	2	2	2	2	2	2
	lower	9543 732	9543 732	2	2	2	2	2	2	2	2
39	Insulation steel cover Left side	5130 822	5130 822	1	1	1	1	1	1	1	1
	Right side	5130 825	5130 825	1	1	1	1	1	1	1	1
40	Insulation fiber plate Left side	7205 515	7205 515	1	1	1	1	1	1	1	1
	Right side	7205 514	7205 514	1	1	1	1	1	1	1	1
41	Hex bushing 1½" x 1¼"	9543 718	9543 718	2	2	2	2	2	2	2	2
42	Pressure relief valve ¾" 30 psig	9542 940	9542 940	1	1	1	1	1	1	1	1
43	Pressure gage 0-100 psig	9542 939	9542 939	1	1	1	1	1	1	1	1
44	Flame roll-out switch 60T14 140F (140°F)	9543 878	9543 878	1	1	1	1	1	1	1	1
45	Transformer 120/24V 40VA	9543 945	9543 945	1	1	1	1	1	1	1	1
46	Terminal strip	9543 458	9543 458	1	1	1	1	1	1	1	1
47	Blocked vent switch 60T15 235F (235°F)	9543 729	9543 729	1	1	1	1	1	1	1	1
48	3-pole 41 plug Female	7037 464	7037 464	1	1	1	1	1	1	1	1
	Male	7270 385	7270 385	1	1	1	1	1	1	1	1

Replacement parts are available from your Viessmann dealer. Installation of incorrect replacement parts can cause unsafe operation.

Maintenance record

Year	Service contractor (name, phone number)	Clean boiler heat exchanger	Check for proper supply of combustion air	Vent system inspected for soot, leaks, deterioration, proper draft, adherence to codes, blockage*	Burner serviced and combustion test performed
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

*Any defects, blockages, etc. in vent system must be corrected to ensure safe operation. Inspect draft hood for corrosion, replace if necessary. Cast iron heat exchanger must be kept clean for safe operation.

Viessmann Manufacturing Company (U.S.) Inc.
45 Access Road
Warwick, Rhode Island • 02886 • USA
Tel. (401) 732-0667 • Fax (401) 732-0590
www.viessmann-us.com • mail@viessmann-us.com

Viessmann Manufacturing Company Inc.
750 McMurray Road
Waterloo, Ontario • N2V 2G5 • Canada
Tel. (519) 885-6300 • Fax (519) 885-0887
www.viessmann.ca • mail@viessmann.ca