

Installation/Service Instruction Supplement

use in conjunction with the original technical literature supplied by Riello

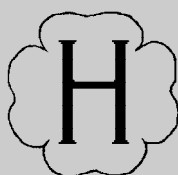
VIESSMANN

Riello Burner

Oil-Fired Burner
for use with Vitorond boiler

Heating input 77 to 245 MBH
 23 to 72 kW

Riello Burner



IMPORTANT

Read and save these instructions
for future reference.

Safety, Installation and Warranty Requirements

Please ensure that this manual is read and understood before commencing installation. Failure to comply with the issues listed below and details printed in this manual can cause **product/property damage, severe personal injury, and/or loss of life**. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

Each of the following issues is very important and is discussed in detail in the boiler technical literature. Ensure that the installation complies fully and completely with all requirements set out in the boiler technical literature.

■ Licensed professional heating contractor

The installation, adjustment, service, and maintenance of this equipment *must be* performed by a licensed professional heating contractor.

► Please see section entitled "Important Regulatory and Installation Requirements."



■ Contaminated air

Air contaminated by chemicals can cause by-products in the combustion process which are *poisonous* to inhabitants and destructive to Viessmann equipment.



WARNING

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, etc.

■ Fresh air

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



WARNING

Never operate the burner without an adequate supply of fresh combustion air. All the combustion and ventilation air must be supplied from the outside. Failure to heed this warning can cause severe personal injury or loss of life.

■ Product documentation

Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

► For a listing of applicable literature, please see section entitled "Important Regulatory and Installation Requirements."



■ Carbon monoxide

Improper installation, adjustment, service and/or maintenance can cause flue products to flow into living space. Flue products contain *poisonous* carbon monoxide gas.



WARNING

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

■ Equipment venting

Never operate boiler without an *installed venting system*.



WARNING

Improper, incomplete, obstructed, or deteriorated vent system can present a serious risk of flue gases leaking into living space which could cause carbon monoxide poisoning.

■ Advice to owner

Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shut-down procedure, and the need for professional service annually before the heating season begins.

■ Warranty

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



	Page
Safety	
Important Regulatory and Installation Requirements....	4
Set-up	
Product Delivery	4
Burner Set-up	5
Start-up/Appendix	
Start-up Information	9
Technical Data	10
Wiring Diagram	12
Maintenance Record	13

Important Regulatory and Installation Requirements



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

Codes

The installation of this unit shall be in accordance with local codes. In the absence of local codes, use:

- CSA B-139 for oil installations in Canada
- NFPA 31 Standard for the Installation of Oil Burning Equipment for oil installations in the US

Always use latest editions of codes.

All electrical wiring is to be done in accordance with the latest edition of CSA C22.1 Part 1 and/or local codes. In the U.S. use the National Electrical Code ANSI/NFPA 70. The heating contractor must also conform to the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1 where required by the authority having jurisdiction.

Working on the equipment

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

Ensure **main power** supply to equipment, the heating system, and all external controls has been **deactivated**. **Close main oil supply valve**. Take precautions in both instances to avoid accidental activation of power during service work.

IMPORTANT

Install the boiler as described in its technical documentation before installing or operating the burner.



WARNING

Turn off electric power supply before servicing. Contact with live electric components can cause shock or loss of life.

Product Delivery

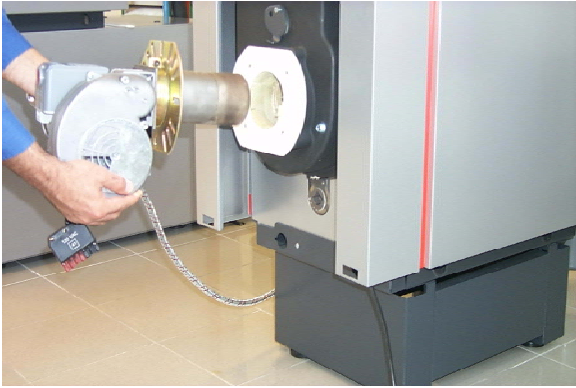
Riello burners shipped by Viessmann are factory tested and calibrated on the correct boiler size using combustion analysis equipment.

Product delivery

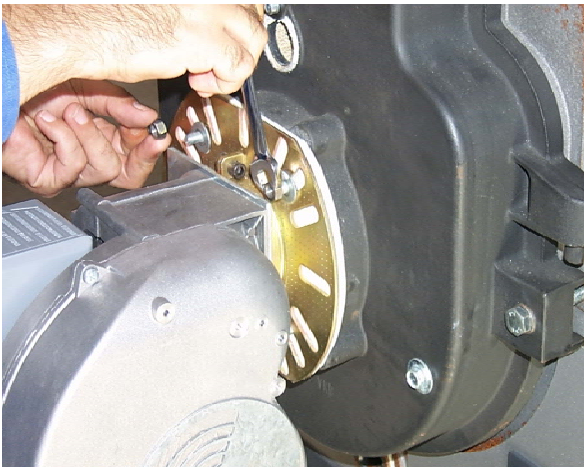
Ensure each of the following has been delivered:

- Carton with oil burner
- Carton with burner hood and fittings package

Burner Set-up



*Fig. 1
Installing burner*



*Fig. 2
Securing burner flange to combustion chamber door*



*Fig. 3
Oil filter*

Installation

1. Remove burner from carton. The mounting flange has been installed at the factory.
2. Mount burner as shown in Fig. 1.

Continue with point 3.
See overview on page 6.

Burner Set-up (Continued)

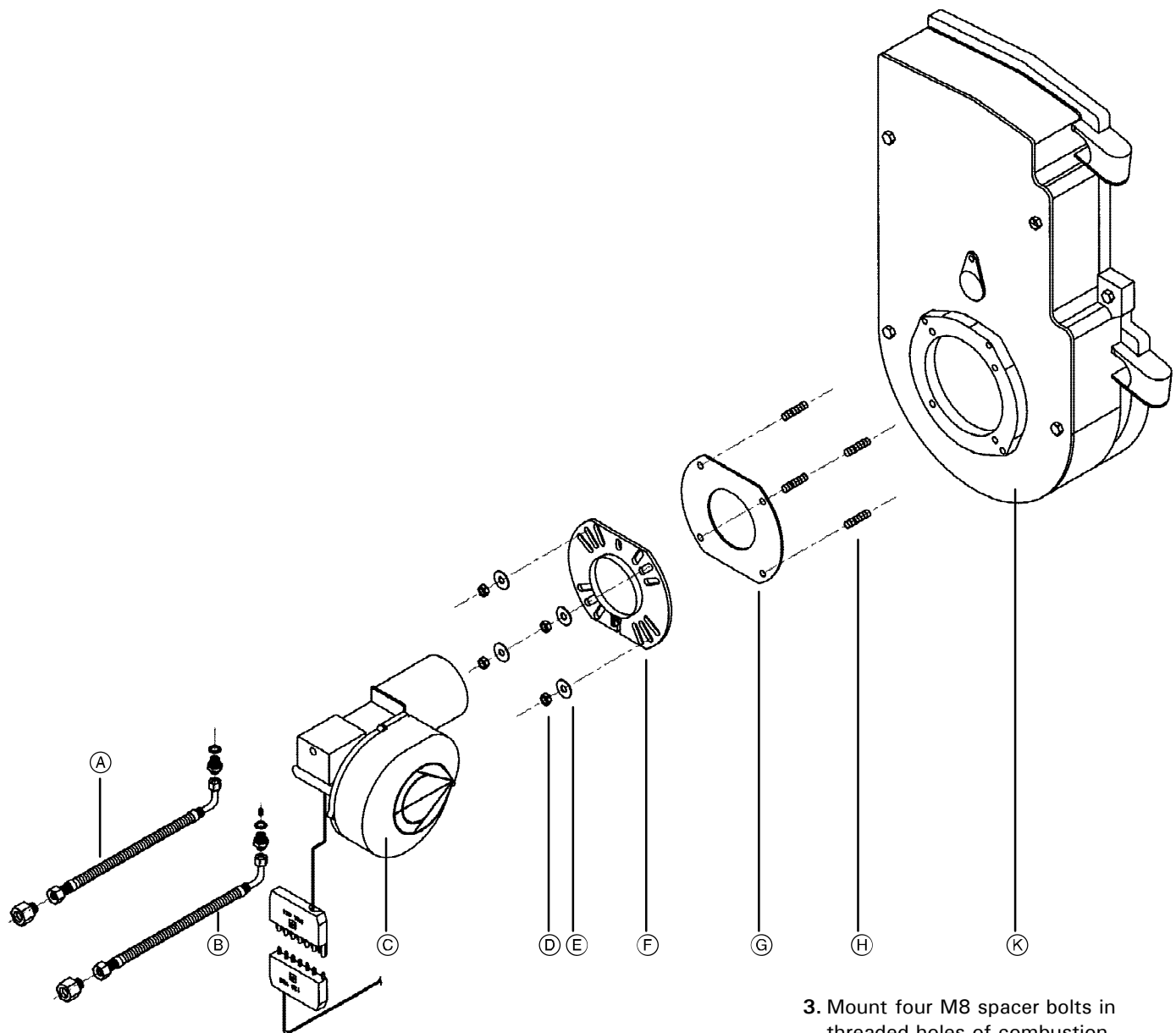


Fig. 4
Burner mounting overview

- (A) Oil supply line (red markings) with $\frac{3}{8}$ " NPTF adaptor
- (B) Oil return line (blue markings, with 2-pipe systems only)
- (C) Riello burner
- (D) Hex nut, M8
- (E) Washer $\frac{5}{16}$
- (F) Flange
- (G) Gasket
- (H) Spacer bolt, M8 x 20
- (K) Combustion chamber door

IMPORTANT

The oil burner is shipped for use with single-pipe supply piping (gravity system where oil tank is above the burner). For two-pipe systems, order an optional kit separately from Viessmann.

3. Mount four M8 spacer bolts in threaded holes of combustion chamber door.
4. Slide burner gasket over spacer bolts.
5. Mount burner with M8 nuts and washers.
6. Connect the flexible hose (with red strips) to the oil line or oil filter ($\frac{3}{8}$ " NPTF adaptor is supplied). A single-line oil supply is standard.
7. Install an oil filter and manual shut-off valve. For oil piping and tank layouts, please refer to the original Riello technical literature also shipped with the burner.

Burner Set-up (Continued)

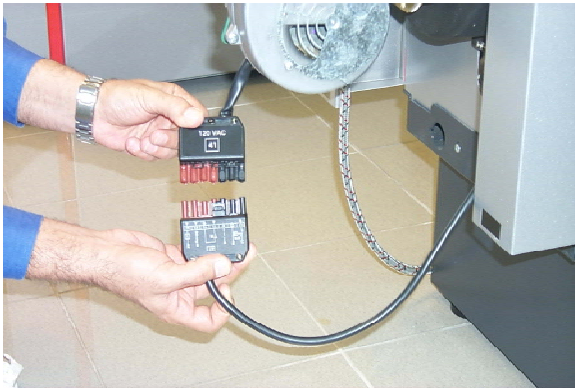


Fig. 5
The quick-connect plug-in system



Fig. 6
Inserting profile screw



Fig. 7
Mounting the burner hood

Electrical connections

1. For models VR2-40 through VR2-63, run the **41** plug-in connector cable down behind the front panel and out through the wire strain relief as per the boiler installation instructions (Electrical Connections).
2. Connect the **41** plug of the burner to the **41** plug of the Vitotronic control. See Fig. 5.

Burner hood

1. Install both profile screws (shipped in fittings package of burner hood) on the two corresponding holes of the boiler front panel. See Fig. 6.
2. Mount the burner hood on the boiler front panel and align its top two holes with their corresponding two profile pins (installed in point 1) on the front panel. See Fig. 7.

Continue with point 3.

Burner Set-up (Continued)



Fig. 8
Locking the burner hood in place

3. Insert the tip of a screwdriver (or similar tool) into the opening of the hood lock. To secure the burner hood with the boiler front panel, turn the tool such that the lock surface and the hood surface are both flush together. See Fig. 8.
4. Plug the opening in the burner hood with the orange plastic cap supplied in the fittings package. See Fig. 9.



Installation Instructions
Riello oil burner



Fig. 9
Inserting the orange plastic cap

Start-up Information

Boiler start-up



Start-up/Service Instructions of boiler, as well as literature of burner, burner test sheet and literature of control

Combustion analysis

This oil burner requires combustion measurements performed at the final installation site to verify factory settings, or to be used as a guide in changing burner settings to suite local conditions.

Examples of local conditions which influence combustion results include: weather conditions, length of horizontal vent pipe, diameter and height of the chimney, side wall venting (power vent), altitude above sea level, quality and heating value of oil used, maximum number of other fuel burning appliances running at the same time. These conditions affect the burner set-up. The burner must be adjusted for acceptable combustion results under local conditions of the installation.

Combustion measurements (CO₂, stack temperature, draft and CO) are taken in the flue pipe between boiler and barometric draft regulator before dilution air (see the installation manual). Overfire draft is measured at the combustion chamber observation port opening. The expected CO₂ average range for #2-oil is from 11.0% to 13.0%.

The CO concentration should be as shown on the Viessmann quality control burner test results. If the CO concentration is above 50 ppm, then measures should be taken to decrease concentration to a value below 50 ppm. Steps to be taken include: ensuring sufficient supply of combustion air, adjusting air gate settings, ensuring chimney and vent are correct and meet safety codes, verifying boiler input and burner settings, replacing any defective part on burner, contacting manufacturer's technical sales representative for assistance.

WARNING

DO NOT USE GASOLINE CRANKCASE DRAININGS OR ANY OIL CONTAINING GASOLINE.

WARNING

Always keep the manual fuel supply valve shut off if the burner is shut down for an extended period of time.

WARNING

Do not tamper with the unit or controls.

WARNING

DO NOT START THE BURNER UNLESS THE COMBUSTION CHAMBER DOOR IS SECURED IN PLACE.

WARNING

DO NOT ATTEMPT TO START THE BURNER WHEN EXCESS OIL HAS ACCUMULATED, WHEN THE UNIT IS FULL OF VAPOR, OR WHEN THE COMBUSTION CHAMBER IS VERY HOT.

Technical Data

Boiler Model	Model No.	VR2-18	VR2-22	VR2-27	VR2-33
Burner model	Riello	F3	F3	F3	F5
Nozzle	Danfoss	n.a.	0.50 GPH 60° AS	0.60 GPH 60° AS*	0.75 GPH 60° AS
	Delavan	0.40 GPH 80° A	0.50 GPH 60° SS	0.60 GPH 60° W	0.75 GPH 60° A 0.75 GPH 60° W*
	Hago	0.40 GPH 80° H	0.50 GPH 60° SS*	0.60 GPH 60° ES	n.a.
	Steinen	0.40 GPH 80° H*	n.a.	n.a.	n.a.
Nozzle firing rate	MBH	77	91	105	140
	kW	23	27	31	41
Nozzle flow rate	GPH @ psig	0.55 @ 190 psig	0.65 @ 175 psig	0.75 @ 175 psig	1.00 @ 175 psig
Air tube length	inches	7	7	7	6 ⁵ / ₁₆
	mm	178	178	178	160
Air tube insertion Fig. 12, dimension "a" (see page 11)	inches	5 ⁵ / ₈	5 ⁵ / ₈	5 ⁵ / ₈	4 ⁷ / ₈
	mm	143	143	143	124
		see Fig. 10	see Fig. 10	see Fig. 10	see Fig. 11

Boiler Model	Model No.	VR2-40	VR2-50	VR2-63
Burner model	Riello	F5	F5	F10
Nozzle	Danfoss	0.85 GPH 60° AH*	1.10 GPH 60° AH	1.35 GPH 60° AH*
	Delavan	0.85 GPH 60° A 0.85 GPH 60° W	1.10 GPH 60° A*	1.35 GPH 60° A 1.35 GPH 60° W
	Hago	0.85 GPH 60° H	1.10 GPH 60° H 1.10 GPH 60° SS	1.35 GPH 45° SS
	Steinen	n.a.	n.a.	n.a.
Nozzle firing rate	MBH	161	196	245
	kW	47	57	72
Nozzle flow rate	GPH @ psig	1.15 @ 175 psig	1.40 @ 175 psig	1.75 @ 175 psig
Air tube length	inches	6 ⁵ / ₁₆	6 ⁵ / ₁₆	7
	mm	160	160	178
Air tube insertion Fig. 12, dimension "a" (see page 11)	inches	4 ⁷ / ₈	4 ⁷ / ₈	5 ³ / ₄
	mm	124	124	146
		see Fig. 12	see Fig. 12	see Fig. 13

n.a. not applicable

* Nozzle is part of burner standard equipment.

Additional nozzle of same type included for replacement purposes.

IMPORTANT

In multiple boiler installations, a booster pump may be required.

Technical Data (Continued)

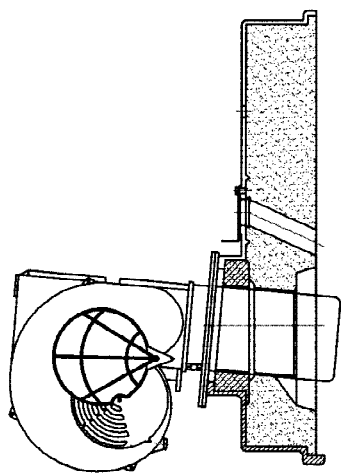


Fig. 10

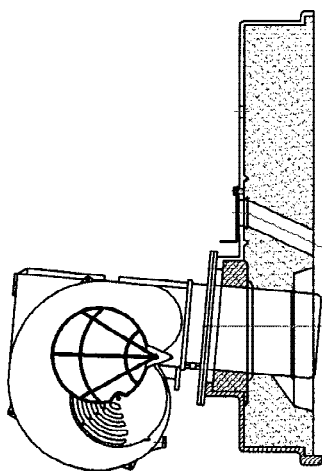


Fig. 11

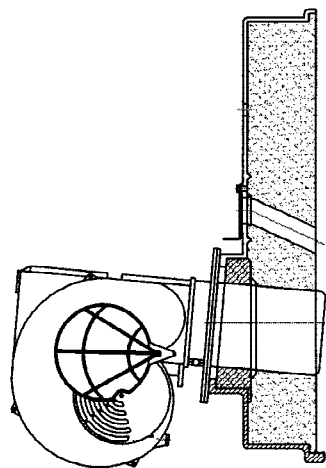


Fig. 12

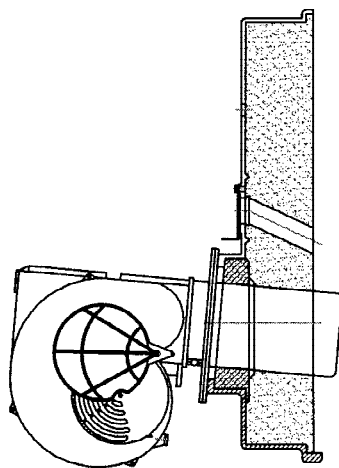


Fig. 13

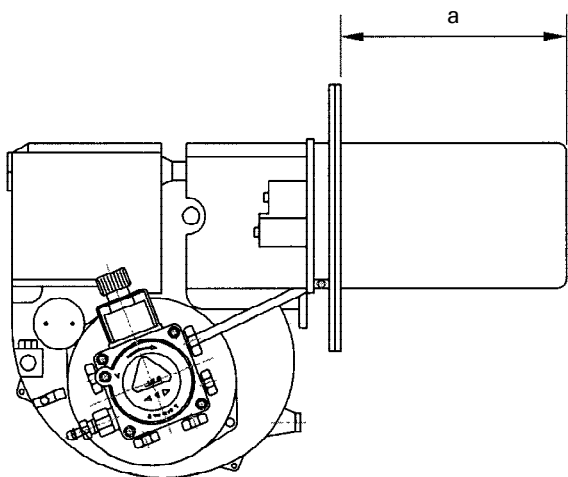
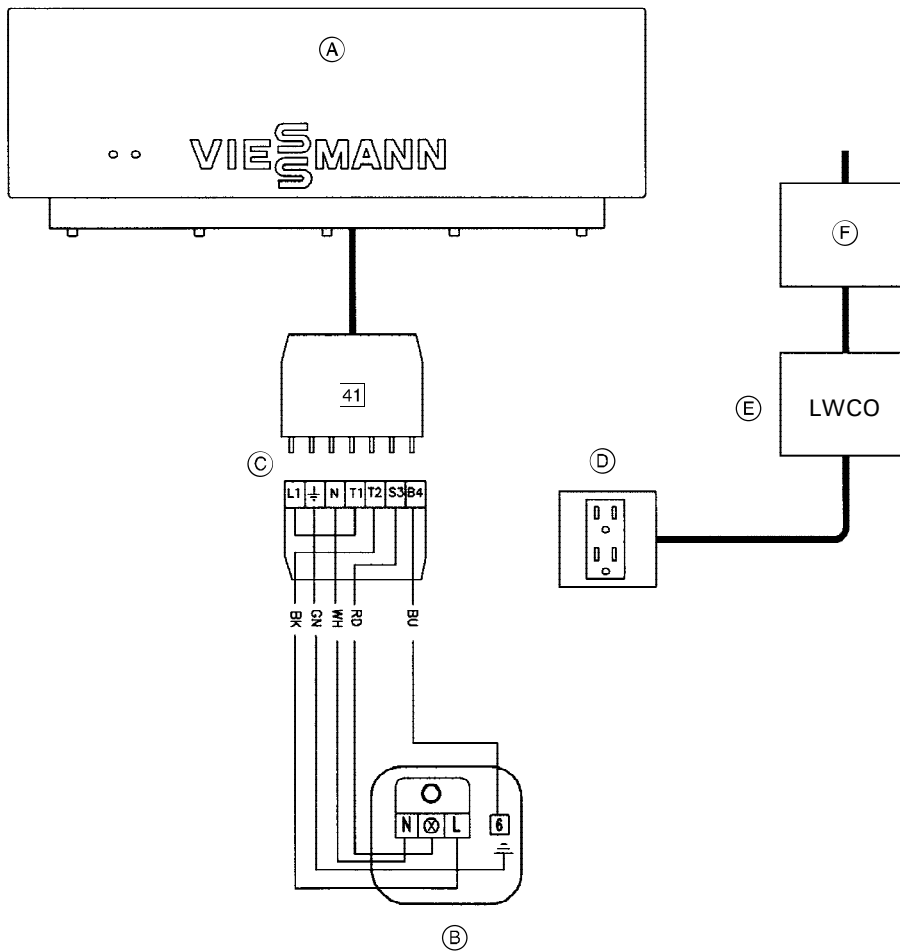


Fig. 14
Air tube insertion

Wiring Diagram



- Ⓐ Vitotronic boiler control
- Ⓑ Riello oil burner
120 VAC, 60 Hz, 2.5 A
- Ⓒ Burner ⁴¹ plug-in connector
(male and female)
*Connect blue wire to terminal
number 6 on the control box.*
- Ⓓ Receptacle (site)
120 VAC
- Ⓔ Low water cut-off
(field supplied, if required)
- Ⓕ Heating system ON/OFF switch
120 VAC, installer must provide
15 A overcurrent protection



! WARNING

Turn off electric power supply before servicing. Contact with live electric components can cause shock or loss of life.



! WARNING

Safety high limit aquastats are inside boiler control. Do not operate burner without boiler control. Never bypass aquastats.



! CAUTION

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

IMPORTANT

Install the boiler as described in its technical documentation before installing or operating the burner.

IMPORTANT

120 VAC is switched to burner via ⁴¹ plug-in connector. Do not connect additional 120 VAC to burner.

IMPORTANT

If any of the original wire as supplied with the appliance must be replaced, it must be replaced with 221°F / 105°C rated or its equivalent. Minimum size 18 AWG



For use with chimney venting only. Do not use in conjunction with sidewall power venting or direct vent application. These venting systems will provide a safety shutdown in case the vent system becomes blocked.

IMPORTANT

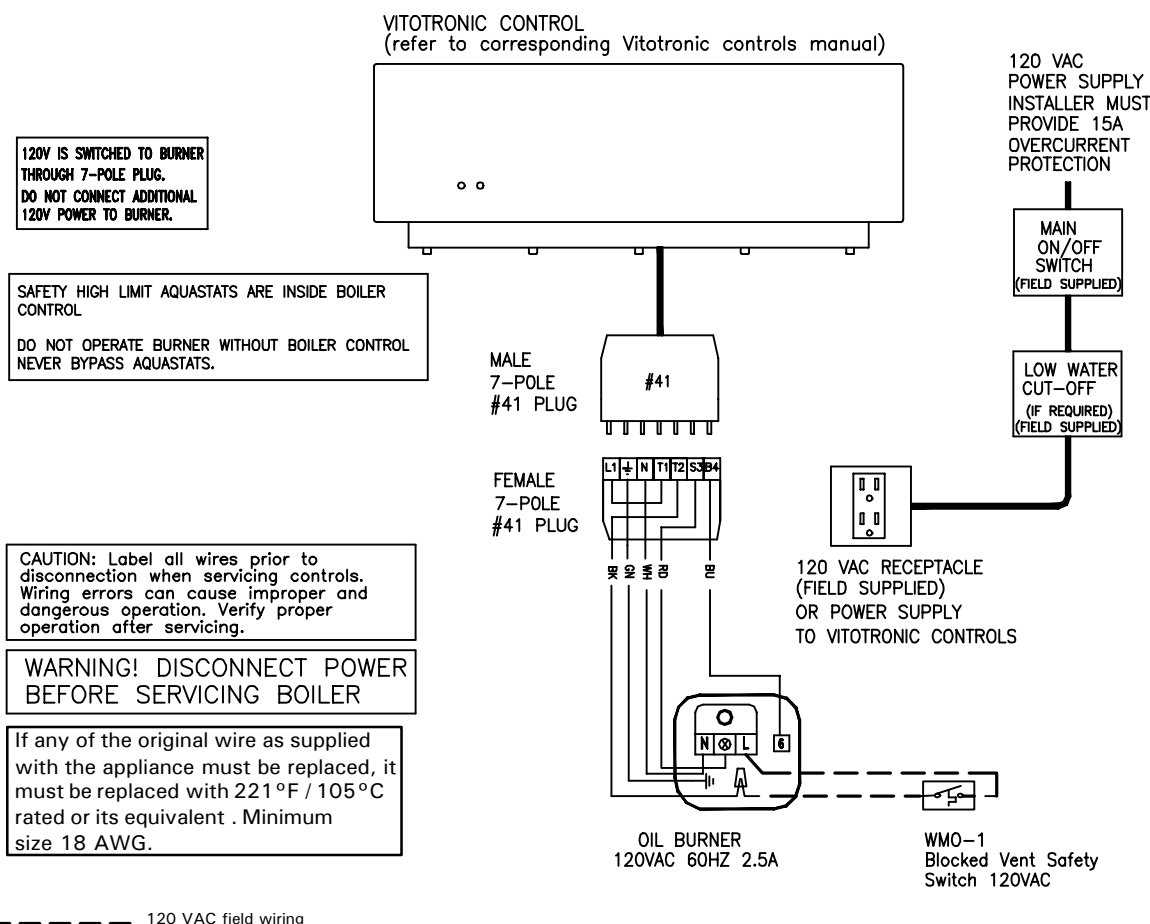
There are additional parts supplied in this kit. Refer to appropriate page for specific instructions on burner/boiler combination.



Installation Instructions

Blocked Vent Safety Switch

1. Install blocked vent switch (A)
(see enclosed FieldControls WMO-1
Installation Instructions).
2. Run BX cable (armored cable) or any
other approved wire (required by
local authorities having jurisdiction)
from WMO-1 switch to burner base.
Install electrical connector bracket
using supplied screw and lock
washer.
3. Disconnect black wire (BK) of 7-pole
41 plug from oil burner primary
control base.
4. Rewire (wire nut included) the black
wire (BK) through WMO-1 safety
switch and back to terminal "L" of
the oil burner primary control.



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Maintenance Record

	Start-up	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service
on:					
by:					

	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service
on:					
by:					

Service binder

- 1. File all Parts Lists, Operating and Service Instructions into the Service Binder.
- 2. Install a protective hanging coffer near the boiler and store the Service Binder in this location.

Maintenance

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

- 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 checked, and if necessary, adjusted for proper combustion and operation. Check for adequate supply of fresh outside combustion and ventilation air.

 **WARNING**

Neglecting to perform necessary maintenance can cause unsafe operation.

Notes

Conversion Table

■ "w.c. x 2.54 = mbar
■ mbar x 0.394 = "w.c.
■ kW x 3413 = Btu
■ bar x 14.5 = psig
■ kg x 0.289 = USG (#2 oil)
■ BHP x 9.8 = kW
■ BHP x 33779 = Btu
■ m x 3.28 = ft.
■ m ³ x 35.3 = ft. ³
■ kcal x 3968 = Btu
■ Cal value NG = 950 - 1050 Btu/ft. ³
■ Cal value LP = 2450 - 2500 Btu/ft. ³
■ Motor kW x 1.31 = Motor HP

NG Natural Gas

LP Liquid Propane

Quick Reference

°C	°F
-40	-40
-35	-31
-25	-13
-20	-4
-18	0
-16	+3
-14	+7
-12	+10
-10	+14
-9	+16
-8	+18
-7	+19
-6	+21
-5	+23
-4	+25
-3	+27
-2	+28
-1	+30
0	+32
+1	+34
+2	+36
+3	+37
+4	+39
+5	+41
+6	+43
+7	+45
+8	+46
+9	+48
+10	+50
+12	+54
+14	+57
+16	+61
+18	+64
+20	+68
+25	+77
+30	+86
+35	+95
+40	+104
+50	+122
+60	+140
+70	+158
+80	+176
+90	+194
+100	+212
+110	+230

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