

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK



CITY OF PORTLAND

BUILDING PERMIT

This is to certify that PeterS Adams

Located At 49 MERRILL ST

Job ID: 2011-10-2352-HVAC

CBL: 014- E-008-001

has permission to Install Rinnai heater

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.

A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be

Fire Prevention Officer

Code Enforcement Officer / Plan Reviewer

**THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY
PENALTY FOR REMOVING THIS CARD**

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

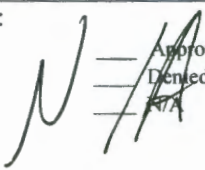

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

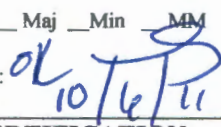
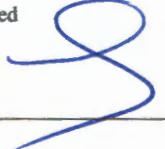
The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No: 2011-10-2352-HVAC	Date Applied: 09/30/2011	CBL: 014- E-008-001	
Location of Construction: 49 MERRILL ST	Owner Name: Peter S Adams	Owner Address: 65 CENTER ST YARMOUTH, ME 04096	Phone:
Business Name:	Contractor Name: Paradis Mechanical - Bob	Contractor Address: P.O. Box 168, Sabattus, ME 04280	Phone: 318-1400
Lessee/Buyer's Name:	Phone:	Permit Type: HVAC	Zone: R-6
Past Use: Single family	Proposed Use:\Same: Same: Single Family - to install Rinnai heater	Cost of Work: \$12,000.00	CEO District:
		Fire Dept: <input type="checkbox"/> Approved <input checked="" type="checkbox"/> Denied <input type="checkbox"/> N/A	Inspection: Use Group: R-3 Type: HVAC
		Signature: 	Signature: 
Proposed Project Description: instal Rinnai heater		Pedestrian Activities District (P.A.D.)	
Permit Taken By: Planning		Zoning Approval	

Special Zone or Reviews	Zoning Appeal	Historic Preservation
<input type="checkbox"/> Shoreland	<input type="checkbox"/> Variance	<input checked="" type="checkbox"/> Not in Dist or Landmark
<input type="checkbox"/> Wetlands	<input type="checkbox"/> Miscellaneous	<input type="checkbox"/> Does not Require Review
<input type="checkbox"/> Flood Zone	<input type="checkbox"/> Conditional Use	<input type="checkbox"/> Requires Review
<input type="checkbox"/> Subdivision	<input type="checkbox"/> Interpretation	<input type="checkbox"/> Approved
<input type="checkbox"/> Site Plan	<input type="checkbox"/> Approved	<input type="checkbox"/> Approved w/Conditions
<input type="checkbox"/> Maj <input type="checkbox"/> Min <input type="checkbox"/> MM	<input type="checkbox"/> Denied	<input type="checkbox"/> Denied
Date: 	Date:	Date: 

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE



FILL IN AND SIGN WITH INK

rec'd 10/4

APPLICATION FOR PERMIT HEATING OR POWER EQUIPMENT

014 Roof

To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL 49 Merrill St Use of Building HOME Date 9-28-2011
Name and address of owner of appliance Adams

Installer's name and address Paradis Mechanical (Bob)
P.O. Box 169 SABATUS ME, 04280 Telephone 207-318-1400

Location of appliance:

- Basement
- Attic
- Floor
- Roof

Type of Fuel:

- Gas
- Oil
- Solid

Appliance Name:

U.L. Approved Yes No

Will appliance be installed in accordance with the manufacture's installation instructions? Yes No

IF NO Explain:

The Type of License of Installer:

- Master Plumber # _____
- Solid Fuel # _____
- Oil # _____
- Gas # ME PNT 2300
- Other _____

Type of Chimney:

- Masonry Lined
Factory built _____
- Metal
Factory Built U.L. Listing # _____
- Direct Vent
Type UL#

Type of Fuel Tank

- Oil
- Gas

Size of Tank N/A

Number of Tanks N/A

Distance from Tank to Center of Flame N/A feet.

Cost of Work: \$ 12,000.

Permit Fee: \$ 140.00

RECEIVED

SEP 30 2011

Dept. of Building Inspections
City of Portland Maine

Approved

Fire: _____

Ele.: _____

Bldg.: _____

Approved with Conditions

- See attached letter or requirement

Inspector's Signature _____

Date Approved _____

Signature of Installer [Signature]

White - Inspection Yellow - File Pink - Applicant's Gold - Assessor's Copy



CITY OF PORTLAND, MAINE

Department of Building Inspections

Original Receipt

Sept 20 2011

Received from Robert Powell

Location of Work 49 Merrill St.

Cost of Construction \$ _____ Building Fee: _____

Permit Fee \$ _____ Site Fee: _____

Certificate of Occupancy Fee: _____

Total: _____

Building (I1) Plumbing (I5) _____ Electrical (I2) Site Plan (U2) _____

Other NVAC

CBL: 014 E008

Check #: 1000 Total Collected \$ 140.00

**No work is to be started until permit issued.
Please keep original receipt for your records.**

Taken by: Mayle

WHITE - Applicant's Copy
YELLOW - Office Copy
PINK - Permit Copy

Installation & Servicing Instructions

High efficiency condensing gas boiler

~~Q85SN/Q130SN/Q175SN/Q205SN/Q175CN~~
Q85SP/Q130SP/Q175SP/Q205SP/Q175CP



Pictured: Q85SN, Q130SN
Q85SP, Q130SP

CAUTION!

Read this manual thoroughly before installing, servicing, putting into operation or using this boiler and vent system.

WARNING!

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury (exposure of hazardous materials)* or loss of life. Refer to the user's information manual provided with this boiler. Installation and service must be performed by a qualified installer, service agency or the gas supplier (who must read and follow the supplied instructions before installing, servicing, or removing this boiler).

CAUTION!

The user manual is part of the documentation that is delivered to the installation's operator. Go through the information in this manual with the owner/operator and make sure that he or she is familiar with all necessary operating instructions.

NOTICE!

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



WARNING!

If you do not follow these instructions 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 vapors and liquids in the vicinity of this or any other appliance.
- **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.

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Address: 103 International Drive, Peachtree City, GA, 30269
Toll-free: 1-800-621-9419 • Fax: 678-829-1666 • www.rinnai.us



8W.51.40.01/08.10 Changes reserved.

These instructions to be retained by user.

Français: voir page 127

Contents of instructions

These installation instructions contain important information for the safe installation, start-up and maintenance of boilers with capacities 85,000 through 205,000 BTU/hr.

These installation instructions are intended for professional installers, who have the necessary knowledge and are approved for working on heating and gas systems.

Subject to technical changes

Changes may be made without notice to the illustrations, process steps and technical data as a result of our policy of continuous improvement.

Updating of documentation

Please contact us if you have any suggestions for improvements or corrections.

Find our contact details on the back of this manual.

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1 Safety and general instructions

Please observe these instructions in the interest of your own safety.

1.1 Designated use

The boiler is designed for heating water for a central heating system and, if applicable, generating domestic hot water. The boiler is delivered with a burner controller (MCBA) pre-installed. The boiler can be fitted with a modulating outdoor reset sensor ARV12 (included with the boiler) or an On/Off thermostat or relay panel end switch (accessories).

1.2 Hazard definitions

The following defined terms are used throughout the documentation to bring attention to the presence of hazards of various risk levels. Notices give important information concerning the operation of the product.



DANGER

DANGER:

Indicates the presence of hazards that will cause severe personal injury, death or substantial property damage.



WARNING

WARNING:

Indicates the presence of hazards that can cause severe personal injury, death or substantial property damage.



CAUTION

CAUTION:

Indicates presence of hazards that will or can cause minor personal injury or property damage.



CAUTION

CAUTION:

Risk of electric shock. Indicates presence of hazards due to electric shock.



NOTICE

NOTICE:

Indicates special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

1.3 Symbol definitions

The following (safety) symbols may be encountered in these installation instructions and on the unit:



This symbol indicates that the unit must be stored away from frost.



This symbol indicates that the packaging and/or contents can be damaged as a result of insufficient care taken during transport.



This symbol indicates that, whilst still in its packaging, the unit must be protected from weather conditions during transport and storage.

1.4 The following instructions must be followed

- The boiler must only be used for its designated purpose, as described in the Installation Instructions.
- Each unit is fitted with a data plate. Consult the details on this plate to verify whether the boiler is compliant with its intended location, e.g.: gas type, power source and venting classification.
- Only use the boiler with the accessories and spare parts listed.
- Other combinations, accessories and consumables must only be used if they are specifically designed for the intended application and do not affect the system performance and the safety requirements.
- Maintenance and repairs must only be performed by trained professionals.
- Installation of a condensing gas boiler must be reported to the relevant gas utility company and have it approved.
- You are only allowed to operate the condensing gas boiler with the vent system that has been specifically designed and approved for this type of boiler.
- Please note that local permission for the vent system and the condensate water connection to the public sewer system may be required.

You must also respect:

- The local building codes stipulating the installation rules.
- The local building codes concerning the air intake and outlet systems and the chimney connection.
- The regulations for the power supply connection.
- The technical rules laid down by the gas utility company concerning the connection of the gas connection to the local gas mains.
- The instructions and standards concerning the safety equipment for the water/ space heating system.
- The Installation Instructions for building heating systems.
- The boiler must be located in an area where leakage of the boiler or connections will not result in damage to the area adjacent to the boiler or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan be installed under the boiler.
- The boiler must be installed in such way that the all components are protected from water (dripping, spraying, rain etc.) during boiler operation and service.
- The boiler must not be installed on or against carpeting.
- Do not restrict or seal any air intake or outlet openings.
- If you find any defects, you must inform the owner of the system of the defect and the associated hazard in writing.



DANGER

**DANGER. Gas is flammable and may cause an explosion.
Beware if you smell gas: there may be an explosion hazard!**

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

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



WARNING

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.



WARNING

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

1.5 Follow these instructions for the space heating water

Unsuitable heating system water can cause the formation of scale or sludge, which affects system efficiency. It can also cause corrosion and reduce life of the heat exchanger.

- You must follow Rinnai guidelines for boiler water quality.
- Thoroughly flush the system prior to filling.
- Follow the Rinnai cleaning instructions.
- Never use water that has been treated by a reverse osmosis, D.I., or distilled water to soften the water to fill the heating system.
- Do not use inhibitors or other additives unless approved by Rinnai for that purpose!
- When frost protection of the heating system is desired, only use Rinnai-approved antifreezes. The allowed maximum concentration is 50%.
- When using oxygen-permeable pipes, e. g. for under floor heating systems, you must separate the system from the boiler using plate heat exchangers.
- Valve off boiler while flushing system, do not introduce any system cleaner into the boiler loop. Flush system thoroughly to remove all system cleaner before filling boiler.

Approved antifreeze: • Rhomar RhoGard Multi-Metal (AL safe)
(max. concentration 50%) • Noble Noburst AL

Approved system cleaner: • Noble Noburst Hydronic System Cleaner
• Fernox F3 Cleaner
• Rhomar Hydro-Solv 9100



NOTICE

The system cleaners from NoBurst, Rhomar, and Fernox are not to be used in the boiler. The boiler must be closed off (valved off) from the rest of the system or not connected while the cleaners are in the system. The system should then be drained and then thoroughly flushed with clean water to remove all the system cleaner.

Approved inhibitors: • Rhomar Pro-tek 922
• Noble Noburst AL inhibitor

See the Rinnai Boiler Applications Manual or Chapter 6 and 10 of this manual for additional information.

1.6 Tools, materials and additional equipment

For the installation and maintenance of the boiler you will need:

- Standard tools for space heating, gas and water fitting
- Digital manometer that is capable of reading both positive and negative pressures
- Combustion analyzer (intended for use with condensing boilers)
- Digital multimeter
- pH digital meter
- Metric Allen wrenches
- Metric socket wrenches

In addition, a handtruck with a fastening belt is useful.

For maintenance to the boiler you need, apart from standard tooling for space heating, gas and water fitting the following items:

- Rinnai toolkit Q and E-Series

1.7 Relevant Installation, Service and User manuals

- Vent system
- Rinnai Boiler Applications Manual

1.8 Disposal

- Dispose of the boiler packaging in an environmentally sound manner.
- Dispose of components of the heating system (e.g. boiler or control device), that must be replaced in an environmentally responsible manner.

2 Regulations and guidelines

The installation must comply to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the latest edition of the National Fuel Gas Code, ANSI Z223.1/NFPA 54. In Canada, installation must be in accordance with the requirements of CAN/CSA B149.1, Natural Gas and Propane Installation Code.

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

Install CO detectors per local regulations. Boiler requires an inspection every 2 years and maintenance every 4 years or 4000 hours. See maintenance section chapter 14.

Operating Limits of the boiler:

Max. boiler temperature: 176 °F (80 °C)

Max. operating pressure: 45 psi (3 bar)

Max Allowable Working Temperature ASME: 200 °F (93 °C)

Max. Allowable Working Pressure ASME: 45 psi (3 bar)

The hot water distribution system must comply with all applicable codes and regulations. When replacing an existing boiler, it is important to check the condition of the entire hot water distribution system to ensure safe operation.

Room sealed boiler

The boiler retrieves its combustion air from outside then discharges the flue gasses to the outside.

Condensing

Retrieves heat as much as possible from the flue gasses. Water condensates on the heat exchanger.

Modulating

Stepless higher or lower burning according to the heat demand.

The Rinnai Q boiler is a room sealed, condensing and modulating central heating boiler, with an optional integrated DHW cylinder (integrated DHW on the Q175C only). The QxxS boiler models have the ability to control a domestic hot water indirect tank.

The boiler is provided with a compact stainless steel heat exchanger with smooth tubes. This design is a well thought out principle using durable materials.

The boiler burns gas for supplying heat. The heat is transferred in the heat exchanger to the water in the central heating system. By cooling down the exhaust gases condensate is formed. This results in high efficiency. The condensate, which has no effect on the heat exchanger and the function of the boiler, is drained through condensate collector trap.

The boiler is provided with an intelligent control system (CMS Control Management System). The boiler anticipates the heat demand of the central heating system or the domestic hot water facility system.

When an outdoor sensor is connected to the boiler it will operate weather dependantly using outdoor reset. This means that the boiler control measures the outside temperature and supply temperature. With this data the boiler calculates the optimal supply temperature for the installation.

Explanation of the type indication: Rinnai Q205SN

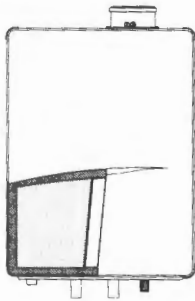
Q = Type

205 = Nominal load in (x1,000) BTU

S = System/Solo (C = Combi)

N = Natural Gas (P = Propane Gas)

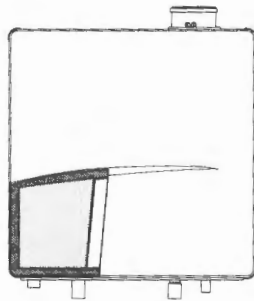
Different boiler types:



System/Solo boilers:

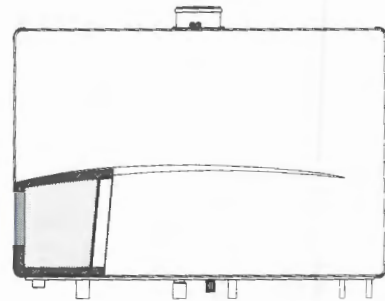
Q85SN, Q130SN

Q85SP, Q130SP



Q175SN, Q205SN

Q175SP, Q205SP



Combi boiler with integrated DHW cylinder

Q175CN

Q175CP

4 Packaging and transportation

4.1 Scope of delivery

The boiler is supplied ready for use.

- Please check if the packaging is intact.
- Check if all the items listed are included in the delivery.

The supply kit contents:

Description	Amount		
	Q85S Q130S	Q175S Q205S	Q175C
Boiler with:			
Outdoor reset sensor ARV12	1	1	1
Compression ring Ø15 brass			4
Compression ring Ø22 brass			2
Compression ring Ø28 brass	2		
Compression ring Ø35 brass		2	2
Bolt M5X16mm	1	1	1
Cover air supply Ø120/Ø80	1	1	1
Gasket vent system ø80	1	1	1
Power cable pull safety Q-Series	1	1	1
Flue pipe Ø 80 PP	1	1	1
Nut 15mm compression fitting			2
Nut W1.1/8x1/14 22 Compression fitting			1
Nut W1.3/8"x1/14 28 compression fitting	2		
Nut W1.610x1/14 35 compression fitting		2	2
Screw 6X60mm	5	5	5
Lip-ring flue pipe ø80	1	1	1
Feed through + plug flue gas	1	1	1
Cap de-aerator	1	1	1
Adapter fitting 15mm x 3/4"NPT ext.			2
Adapter fitting 22mm x 3/4"NPT ext.			1
Flue adapter Ø80/Ø3" pps UL appr.	2	2	2
Flow restriction MR01 FG 21,0L red			1
Wall mounting suspension bracket	1	1	1
Plumbing kit Q85S/Q130S	1	1	
Plumbing kit Q175S/Q175C/Q205S			1
3/4" Gas valve	1	1	1
Template on inside of package	1	1	1
Installation & Service Instructions	1	1	1
User information manual	1	1	1
Warranty document	1	1	1
ICSL book	1	1	1

4.2 Transportation



CAUTION

The boiler may be damaged when not secured properly.

- Only transport the boiler using appropriate transportation equipment, such as a handtruck with a fastening belt or special equipment for maneuvering steps.
- When shipping the boiler must be secured on the transportation equipment to prevent it from falling off.
- Protect all parts against impacts if they are to be transported.
- Follow the transportation markings on the packaging.
- Packaged boilers must always be lifted and carried by two people, or you must use a handtruck or special equipment for transport.

5.1 Requirements for the installation room



DANGER

- The room where the boiler will be placed must always be frost free.
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Never use or store any chlorinated detergents or halogenated hydrocarbons (e.g. in spraycans, solvents and detergents, paints, adhesives) in proximity of the boiler.
- The boiler must be installed in such a way that it is protected from water (dripping, spraying, rain, etc.) during operation and service (circulator replacement, condensate trap, control replacement, etc.)
- This boiler is for intended for indoor installations only.

Products to avoid present in boiler room and/or around combustion air intake

Spray cans containing chloro-/fluorcarbons
 Ammonium and/or ammonium solutions
 Permanent wave solutions
 Chlorinated waxes and/or cleaners
 Swimming pool chemicals based on chlorine
 Calcium chloride used for thawing
 Sodium chloride used for water softening
 Refrigerant leaks
 Paint or varnish removers
 Hydrochloric acid/muriatic acid
 Cements and glues
 Antistatic fabric softeners used in clothes dryers
 Chlorine-type bleaches, detergents, and cleaning solvents found in household laundry rooms
 Adhesives used to fasten building products and other similar products

Areas likely to have contaminants

Dry cleaning/laundry areas and establishments
 Swimming pools
 Metal fabrication plants
 Beauty shops
 Refrigeration repair shops
 Photo processing plants
 Auto body shops
 Plastic manufacturing plants
 Furniture refinishing areas and establishments
 New building construction
 Remodeling areas
 Garages with workshops

5.2 Fitting the boiler



NOTICE

- Remove the packaging materials.
- **Do not tear the packaging. Take notice of the presence of the mounting template at the inside of the carton wrapper.**
- **Lay the boiler on its back during unpacking. When unpacking, the casing can be removed from the boiler. This part can be kept apart during installation. It must be placed on the boiler and fixed with the screw behind the door before the boiler is started up.**



NOTICE

Turn the boiler to its side and remove the wall bracket from the back of the boiler by removing the 2 screws.

The boiler can be mounted practically to any wall with the suspension bracket and the enclosed mounting equipment.

- The wall must be flat and of sufficient strength in order to be able to securely hold and support the boiler weight with its water content.
- Take note of the necessary space around the boiler for installation of venting system, pipework and servicing. See drawing in section 5.3.

The location of the boiler can be determined by using the template which is printed on the inside the boiler package wrapping. Remember to account for the spacing of the plumbing kit.

- Drill the necessary holes using the template
- Install the mounting bracket to the wall using the supplied mounting materials



CAUTION

Lifting and carrying precautions.

To avoid personal injury please follow these recommendations:

- **Always lift the boiler with 2 people or use special equipment.**
- **When lifting the boiler, bend the knees, and keep the back straight and feet apart.**
- **Do not lift and twist at the same time.**
- **Lift and carry the boiler close to the body.**
- **Wear protective clothing and gloves to protect from any sharp edges.**

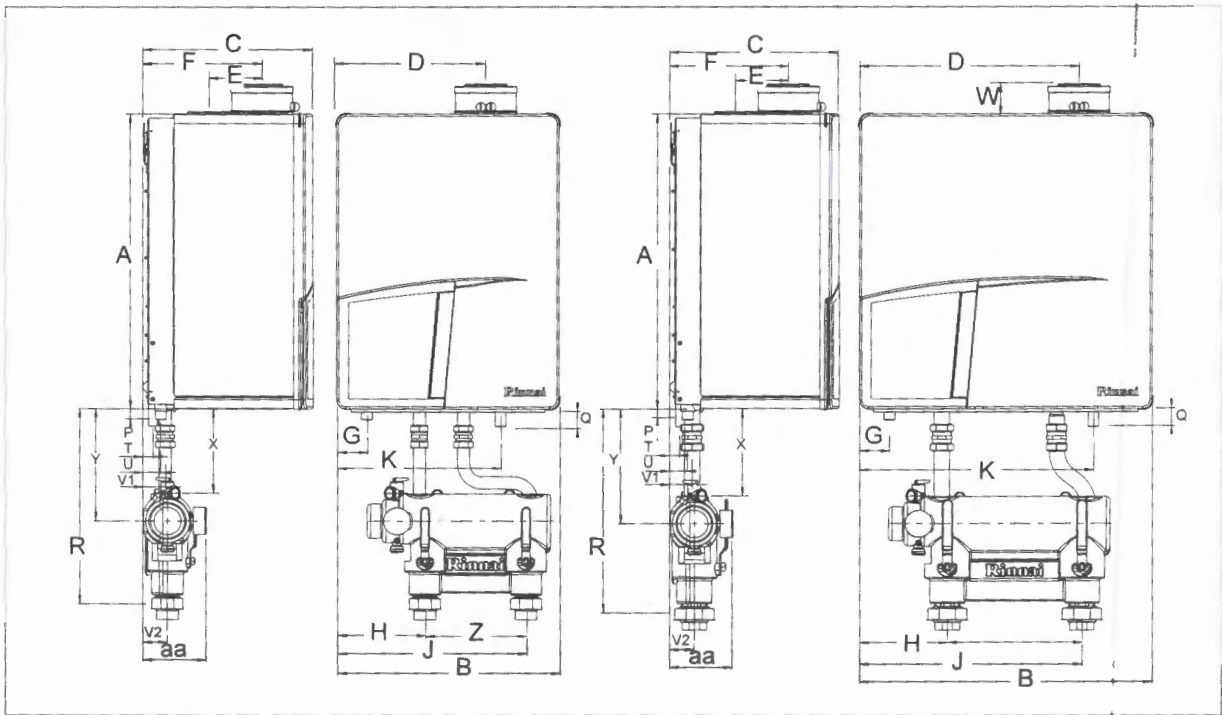


WARNING

Lift the boiler only by the boiler's rear wall.

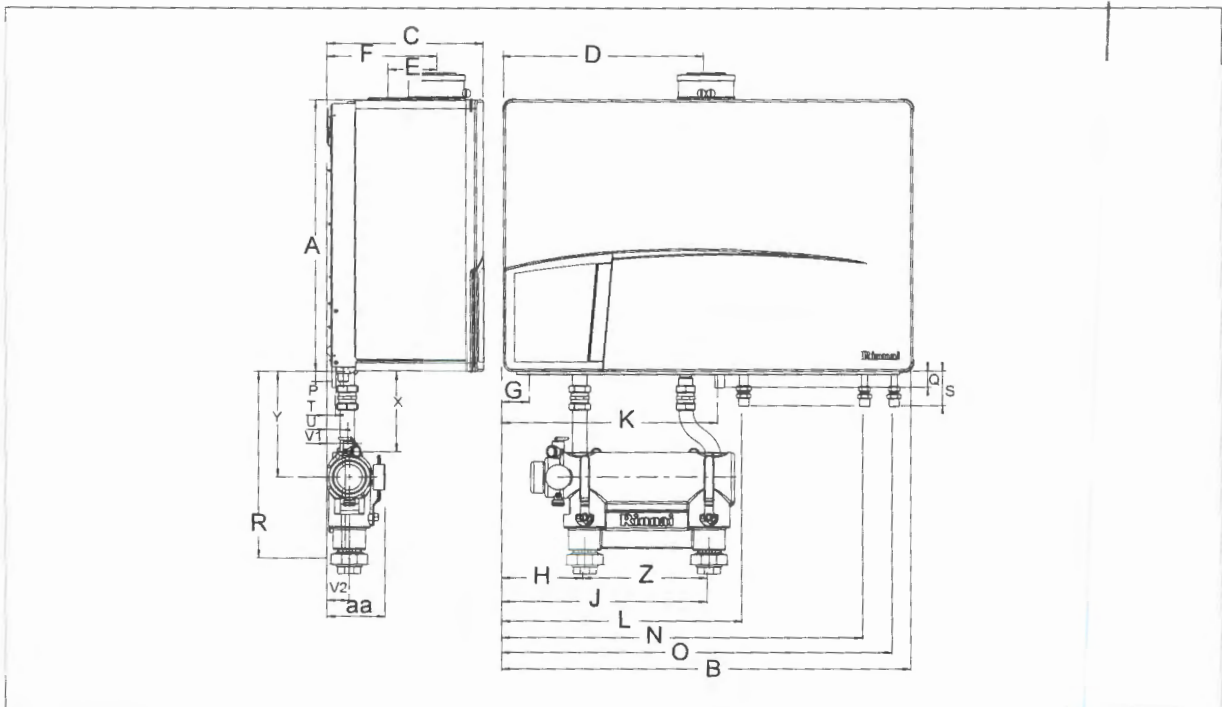
- Dispose the packaging materials.

5.3 Dimensions



dimensions Q85S, Q130S, Q175S and Q205S

figure 1



dimensions Q175C

figure 2

Dimensions

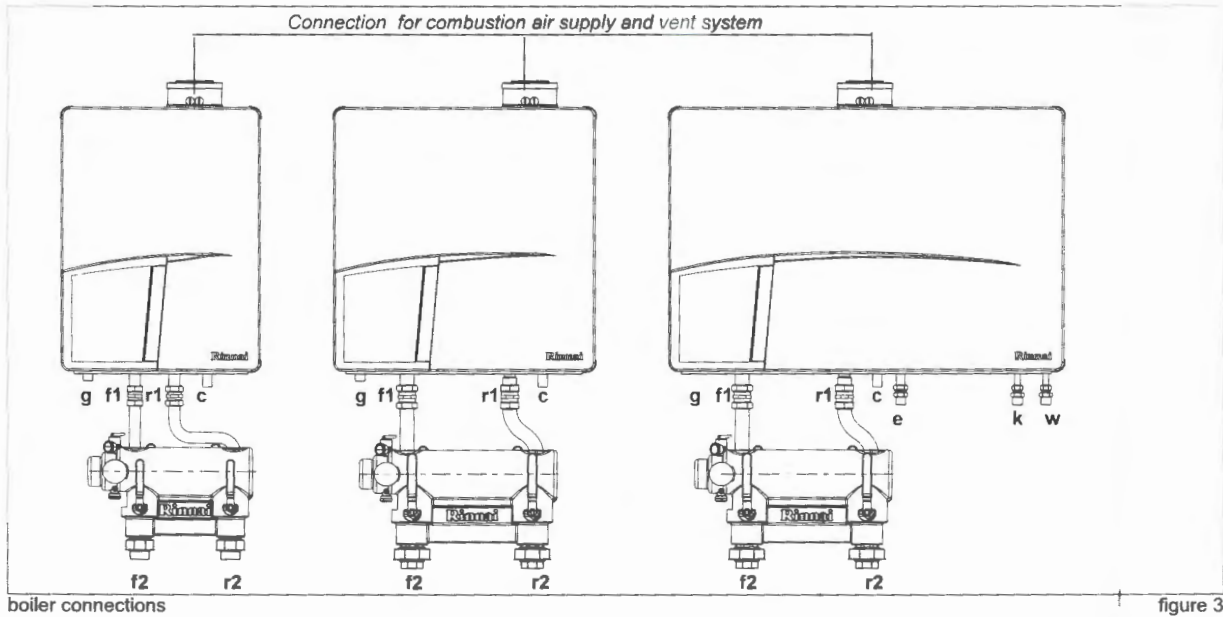
	Boiler type		Solo		Combi
			Q85SN/Q85SP	Q175SN/Q175SP	
			Q130SN/Q130SP	Q205SN/Q205SP	Q175CN/Q175CP
		inch / mm	inch / mm	inch / mm	
A	Height	26.8" / 680	26.8" / 680	26.8" / 680	
B	Width	19.7" / 500	26" / 660	39.4" / 1000	
C	Depth	15.2" / 385	15.2" / 385	15.2" / 385	
D	Left side / vent	13.2" / 335	19.5" / 495	19.5" / 496	
E	Center to center / vent and air supply	4.7" / 120	4.7" / 121	4.7" / 122	
F	Back / vent	10.6" / 270	10.6" / 270	10.6" / 270	
G	Left side / gas pipe	2.6" / 65	2.6" / 65	2.6" / 65	
H	Left side / supply pipe	7.8" / 199	7.8" / 199	7.8" / 199	
J	Left side / return pipe	16.8" / 428	19.8" / 504	19.8" / 504	
K	Left side / condensate pipe	14.6" / 370	20.9" / 530	20.9" / 530	
L	Left side / expansion pipe			23.2" / 590	
N	Left side / cold water pipe			34.8" / 885	
O	Left side / hot water pipe			37.6" / 955	
P	Pipe length of g*	0.7" / 18	0.7" / 18	0.7" / 18	
Q	Pipe length of c*	2" / 50	2" / 50	2" / 50	
R	Pipe length of f and r*	17.7" / 450	18.5" / 470	18.5" / 470	
S	Pipe length of e, k and w*			3.5" / 89	
T	Back / Center of pipe c*	1" / 25	1" / 25	1" / 25	
U	Back / Center of pipe g*	1.6" / 40	1.6" / 40	1.6" / 40	
V1	Back / Center of pipe f, r, e, k and w*	2" / 50	2" / 50	2" / 50	
V2	Back / Center of pipe f and r*	2.1" / 54	2.1" / 54	2.1" / 54	
W	Pipe length vent co-axial	2.6" / 65	2.6" / 65	2.6" / 65	
	Pipe length vent parallel	5.8" / 147	5.8" / 147	5.8" / 147	
X	Bottom side boiler to center safety valve	7.7" / 195	8" / 200	8" / 200	
Y	Bottom side boiler to center header	10.2" / 260	10.4" / 265	10.4" / 265	
Z	Center to center of f and r*	9" / 229	12" / 305	12" / 305	
aa	Depth plumbing kit	5.6" / 142	5.6" / 142	5.6" / 142	

*) See figure 3

dimensions

table 1

Dimensions



	Boiler type	Solo		Combi
		Q85SN/Q85SP Q130SN/Q130SP	Q175SN/Q175SP Q205SN/Q205SP	Q175CN/Q175CP

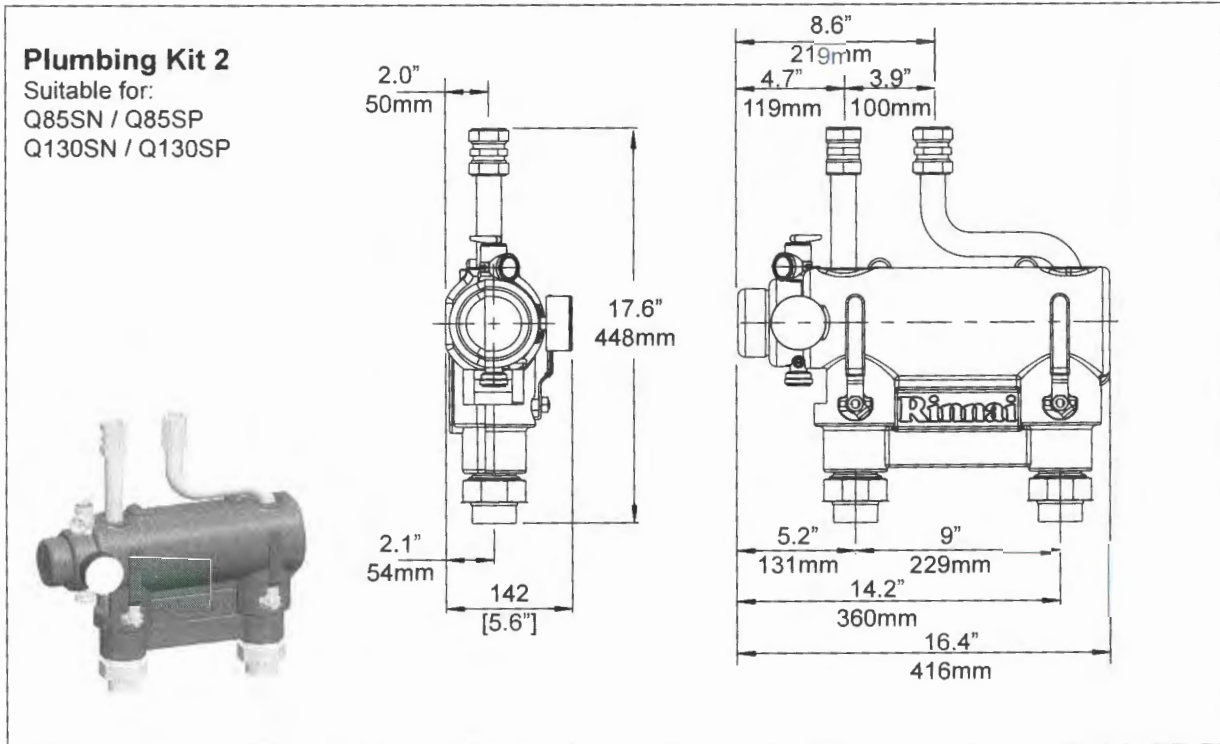
Vent system / Combustion air supply		80/125mm	80/125mm	80/125mm
Gas pipe	g	3/4"M-NPT	3/4"M-NPT	3/4"M-NPT
Supply pipe	boiler side - f1	28mm	35mm	35mm
	system side - f2	1 1/4"M-NPT	1 1/2"M-NPT	1 1/2"M-NPT
Return pipe	boiler side - r1	28mm	35mm	35mm
	system side - r2	1 1/4"M-NPT	1 1/2"M-NPT	1 1/2"M-NPT
Condensate pipe	c	0.95" / 24mm	0.95" / 24mm	0.95" / 24mm
Expansion pipe	e			0.87"x 3/4"M-NPT / 22mm
Cold water pipe	k			0.6"x 3/4"M-NPT / 15mm
	w			0.6"x 3/4"M-NPT / 15mm

connection diameters

table 2

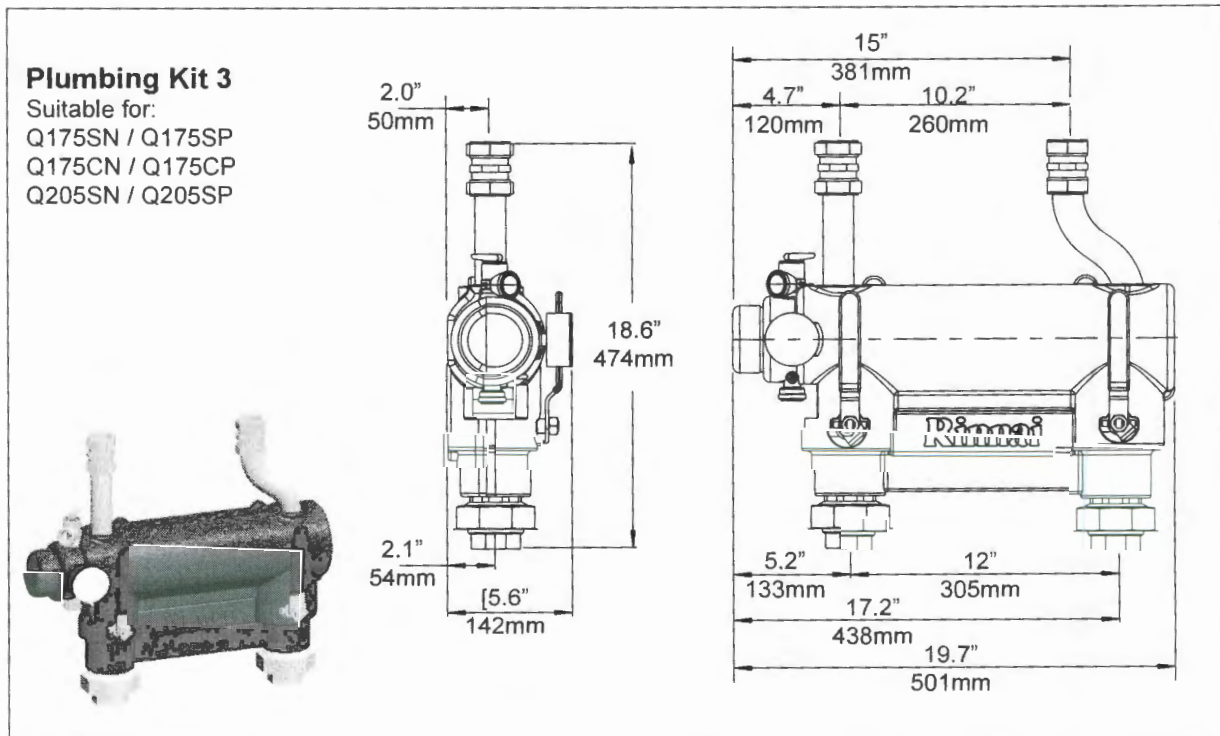
5.3.1 Plumbing Kits

Rinnai boilers are supplied with a Plumbing kit from factory. Find below the dimensions. See chapter 6.1 for additional information.



Plumbing kit 2

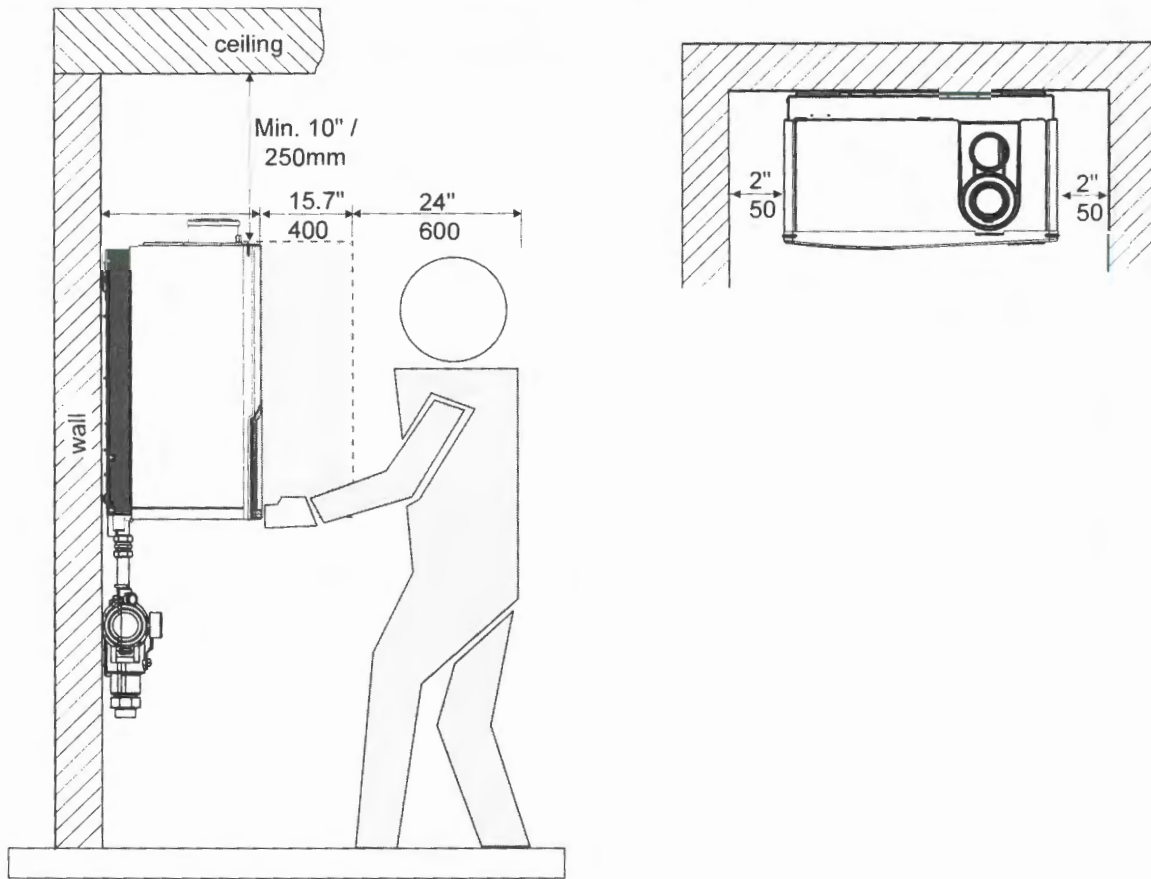
figure 4



Plumbing kit 3

figure 5

5.3.2 Clearances from the boiler



service clearances to the boiler

figure 6

	Minimum required clearances to combustibles	Minimum required clearances to non-combustibles	Recommended service clearances
	All types inch / mm	All types inch / mm	All types inch / mm
Top of boiler	2" / 50	2" / 50	10" / 250
Back of boiler	0"	0"	0
Front of boiler	6" / 150	6" / 150	24" / 600
Left side of boiler	2" / 50	2" / 50	2" / 50
Right side of boiler	2" / 50	2" / 50	2" / 50
Floor / Ground	12" / 300	12" / 300	30" / 762
Vent	0"	0"	0"

clearances to the boiler

table 3

For offset installation: clearance is 1" / 25mm from the front.

Low Loss Header

Clearances to combustible and non-combustible is 0 inch for sides, top, front and floor/ground

5.4 Technical specifications

Boiler type		Q-Series				
		Combi	Q85SN	Q130SN	Q175SN	Q205SN
		Q175CN Q175CP	Q85SP	Q130SP	Q175SP	Q205SP
Input Hs CH	BTU/hr kW	175,000 51	85,000 25	130,000 38	175,000 51	205,000 60
Q _n Output non-condensing CH	BTU/hr kW	157,000 45.9	77,000 22.5	117,000 34.2	157,000 45.9	184,000 54.0
Q _n Output EN677 efficiency CH	BTU/hr kW	172,400 50.2	84,000 24.7	127,600 37.3	172,400 50.2	202,200 59.1
Q _n Output AFUE CH	BTU/hr kW	167,500 48.8	82,000 24.1	117,000 36.5	167,500 48.8	184,000 57.4
Efficiency at 98.6/86°F (36/30°C) part load, Hs, EN677 CH	%	98.5	98.8	98.2	98.5	98.5
AFUE according IBR	%	95.7	96.5	96.1	95.7	95.7
O ₂ (at full load)	%		Natural gas: 4.4 - 4.7 (Propane: 4.8 - 5.1)			
Electr. power consumption max.	W	210	137	144	210	234
Electr. power consumption stand by	W			14		
Current	V/Hz			120Vac/60Hz		
Fuse rating	A			5AF & 4AT		
Degree of protection acc. EN 60529				IPX0D		
Weight (empty)	lbs / kg	196 / 89	110 / 50	117 / 53	141 / 64	141 / 64
Water content CH	gallon / liter	1.8 / 7	0.9 / 3.5	1.3 / 5	1.8 / 7	1.8 / 7
Water content DHW	gallon / liter	3.7 / 14				
After run time pump CH	min			5		
After run time pump DHW	min			1		
P _{MS} Water pressure min.-max.	PSI / bar			14-43 / 1-3		
P _{MW} Water pressure DHW max.	PSI / bar	150 / 10	n.a.	n.a.	n.a.	n.a.
Flow temperature max.	°F / °C			176 / 80		
Pump type		UPER 20-78	UPER 20-58	UPER 20-78	UPER 20-78	UPER 20-78
Available pump height CH (ΔT = 25K)	PSI / kPa	2.9 / 20	5.2 / 36	3.0 / 21	2.9 / 20	5.5 / 38
Approvals		ASME, CSA	ASME, CSA	ASME, CSA	ASME, CSA	ASME, CSA
DHW flow (at 50°F)	gallon/min	6.2				
DHW flow (at 10°C)	liter/min	23.5				
DHW flow (at 75°F)	gallon/min	4.1				
DHW flow (at 23.9°C)	liter/min	15.5				
Max. DHW flow rate	gallon/min	6.2				
	liter/min	23.5				
Pressure difference DHW	PSI / bar	4.3 / 0.3				
CSA number				2183087		
CRN number				8101.7CL		

Technical specifications

Table 4

The boiler has the following connection pipes;

- The central heating circuit pipes.
These must be connected to the Plumbing Kit by means of adapter fittings. See further chapter 6.1;
- The gas supply pipe.
It is provided with a 3/4" male thread into which the tail piece of the gas valve can be screwed. See further chapter 6.4;
- The condensation drain pipe.
It consists of an oval 1" (24 mm) plastic pipe. The drain pipe can be connected to this by means of an open connection. If the open connection is fitted in a different location, then the pipe can be lengthened by means of a 1 1/4" (32 mm) PVC sleeve. See further chapter 6.6;
- The vent system and air supply system.
It consists of a concentric connection 3"5" (80/125 mm). The boiler can be converted to a twin pipe connection that will accept 80mm flue and intake air or with the use of the included adapters 3" PVC / CPVC flue and intake. See further chapter 6.7.
- Cold and hot water pipes for domestic hot water (DHW).
Combi boilers only: *These consist of 3/4" (15 mm) copper pipe and can be connected to the installation by means of 3/4" M-NPT adapter fittings. See further chapter 6.5;*



NOTICE

The pipe to be connected to the boiler must be cleaned before connecting in order to prevent dirt from entering and damaging the boiler.

6.1 Central heating system

Connect the central heating system according to its instructions.

The boiler pipes can be connected to the installation by means of compression fittings. Reducers should be used for connecting to thick-walled pipe (welded or threaded).



NOTICE

When removing the plastic sealing caps from the pipes, dirty testing water may drain from the boiler.



NOTICE

A Plumbing Kit must be fitted to the boiler.



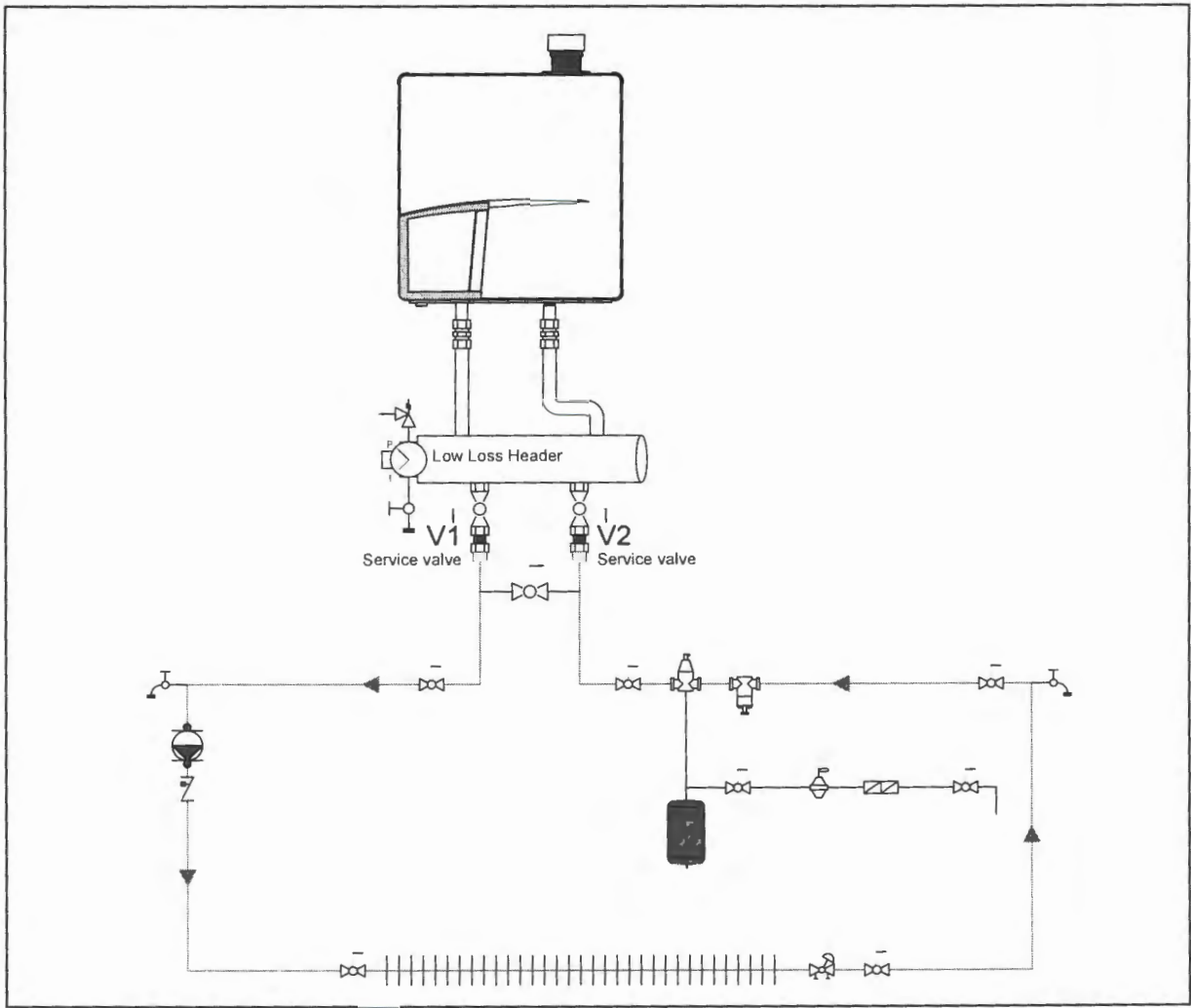
NOTICE

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



NOTICE

The boiler piping system of a hot water 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.



Boiler basic piping

figure 7

6.1.1 Plumbing Kit installation

i NOTICE

Rinnai supplies specific Plumbing Kits with each boiler type, which must be fitted directly underneath the boiler on the supply and return pipe. Find in chapter 5.3 the dimensions. Use of the Rinnai boiler without the plumbing kit will result in the void of warranty.

To protect the entire heating system we recommend installing a dirt particle trap in the return circuit. When the boiler is installed to an existing heating system this trap is required. Use of a Y strainer is not permitted as a substitute for a dirt trap.

- Install shut-off valves immediately before and after the dirt particle filter to allow the trap to be cleaned.
- Position 3 (figure 8) is a garden hose thread boiler drain that can be used to drain the boiler or add water treatment additives to the system such as inhibitors or glycol.
- Position 4 (figure 8) is the supply connection for an indirect tank when used with the optional 3-way valve kit.
- For information on locating the expansion tank and system fill, please see the Rinnai Boiler Applications Manual.

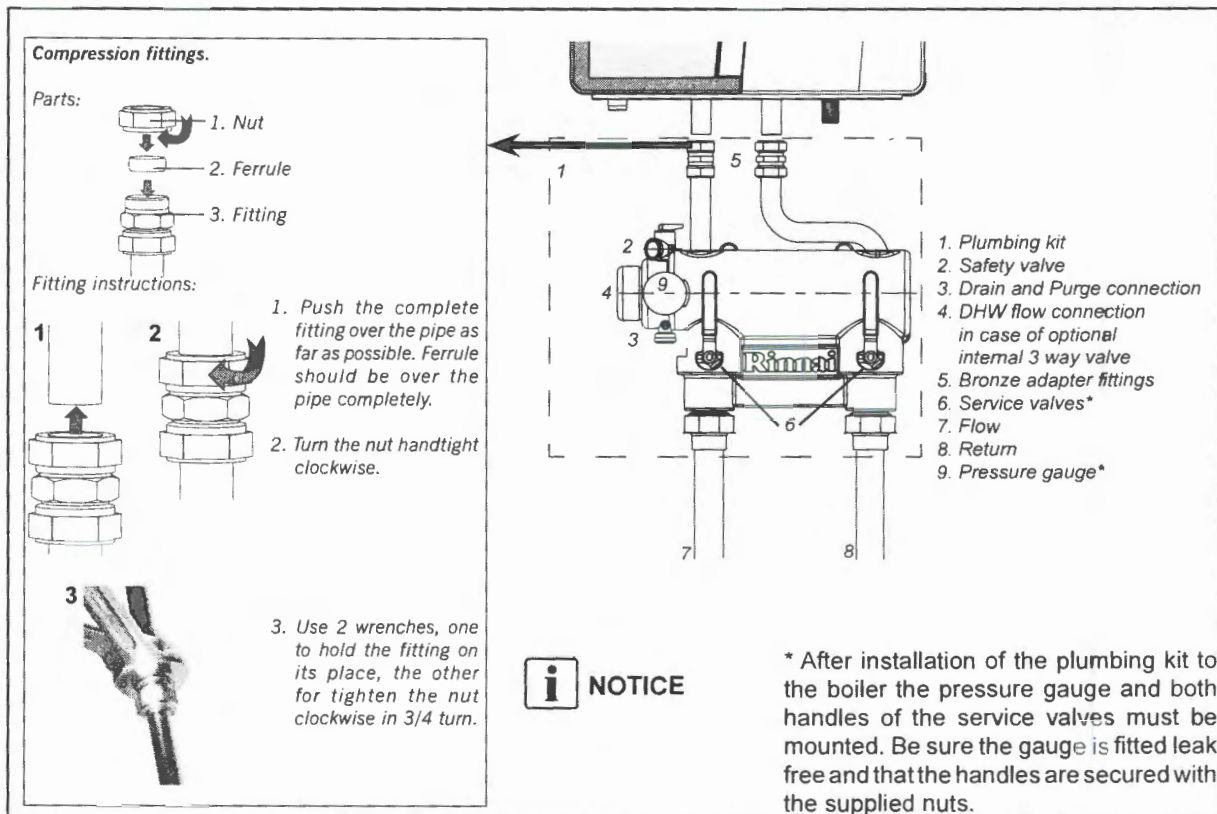
i NOTICE

Thoroughly flush all pipes and radiators. We recommend the use of a Rinnai approved system cleaner. Please refer to the list of approved Rinnai system cleaners in this chapter.

- Refer to the installation template and chapter 5.3 for the pipe connection dimensions.

i NOTICE

The plumbing kit is not intended to support the weight of the piping. Appropriate piping supports should be used to support all attached piping to the boiler and plumbing kit.

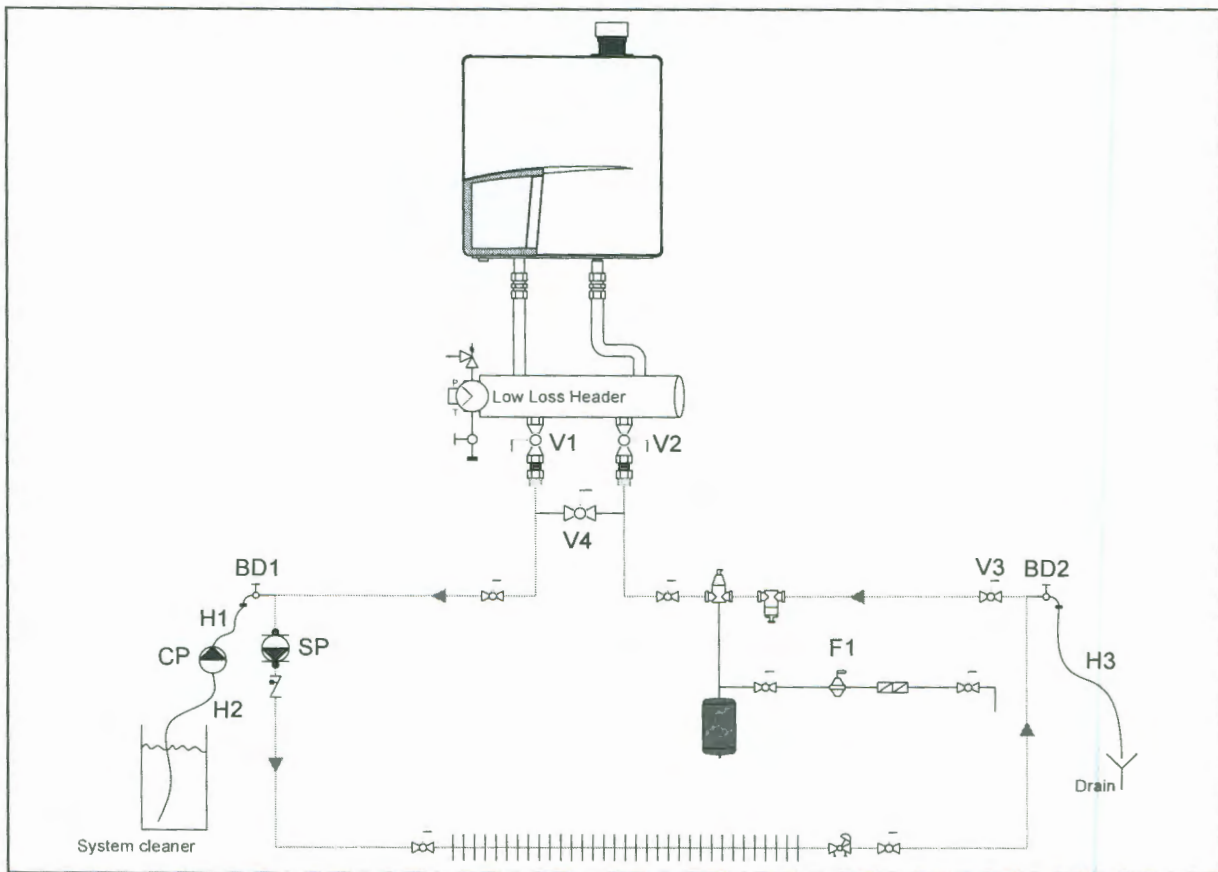


- Boiler system flushing (Not Boiler heat exchanger)

When replacing an existing boiler the heating system should be flushed with the old boiler in place before the new boiler is added to the system. If the old boiler has already been removed a bypass must be piped in when the new boiler is installed in order to facilitate the flushing of the system.

The boiler must be valved off from the system, while the system is flushed. No system cleaner should ever enter the boiler heat exchanger because of its caustic nature it could damage the heat exchanger.

1. Close the shutoff valves on both the supply and return connections on the plumbing kit (V1 and V2).
2. Open the bypass valve (V4).
3. Connect pump outlet hose (H1) to the supply side purge station (BD1)
4. Connect drain hose (H3) to the return side purge station (BD2).
5. Pour the system cleaner into a pail and follow the system cleaner instructions about circulation time and volume to be added to the system.
6. Operate the charging pump (CP) and charge the system with the required volume of system cleaner
7. Close the supply side purge station (BD1)
8. Turn on the system pump(s) (SP) and circulate the cleaner through the system for required time by the cleaner manufacturer.
9. Once the time require by the system cleaner manufacturer has been met place the drain hose (H3) in a drain.
10. Turn off the system pump(s) (SP)
11. Close the main valve on the system return (V3) and open the return side purge station (BD2).
12. Open the auto feed on the system (F1) and allow water to rinse the system for whichever is greater; 10 minutes or the required rinse time by the system cleaner manufacturer.



Boiler system flushing

figure 9

13. If the installation is a zone system be sure to purge out each zone individually
14. Close the auto feed on the system (F1)
15. Close the return side purge station (BD2) and disconnect the hose (H3).
16. Open the main valve on the system return (V3)
17. Close the bypass valve below the plumbing kit (V4).
18. Open shutoff valves on both the supply and return connections on the plumbing kit (V1 and V2).
19. Clean out the dirt trap
20. Test the pH of the water that will be used for filling the system
21. Test the water hardness of the water that will be used for filling the system
22. Use the proper water treatment to ensure the pH and water hardness are within the Rinnai boiler water quality guidelines
23. The boiler and system may now be filled

The following is a list of approved system cleaners, inhibitors, and antifreeze.

Approved antifreeze:

- Rhomar RhoGard Mutli-Metal (AL safe)
- Noble Noburst AL

Approved system cleaner:

- Noble Noburst Hydronic System Cleaner
- Fernox F3 Cleaner
- Rhomar Hydro-Solv 9100



NOTICE

The system cleaners from NoBurst, Rhomar, and Fernox are not to be used in the boiler. The boiler must be closed off (valved off) from the rest of the system or not connected while the cleaners are in the system. The system should then be drained and then thoroughly flushed with clean water to remove all the system cleaner.

Approved inhibitors:

- Rhomar Pro-tek 922
- Noble Noburst AL inhibitor

- Connect the expansion tank to the system. See chapter 6.2.
- Connect the pipes so that they are free from strain.

Connecting boiler with DHW tank

- Connect the external DHW tank according to the installation instructions of the DHW tank and fittings concerned. See chapter 7 and the Rinnai Boiler Applications Manual for additional information.

6.1.2 Safety valve

An ASME 30 psi pressure relief valve is installed on the plumbing kit included with the boiler.

6.1.3 Low water cut off



NOTICE

The Rinnai Q boiler has a factory installed pressure switch type Low Water Cut Off (LWCO). Check your local codes to see if a Low Water Cut Off is required (LWCO) and if this device conforms to local code. See the Rinnai Boiler Applications Manual for further information.

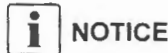
The Low water cut off is not serviceable.

6.2 Expansion tank



NOTICE

An expansion tank must be part of the central heating system. The expansion tank must be appropriate to the water content of the installation. The pre-charge pressure depends on the installation height above the mounted expansion tank. The expansion tank is NOT a part of the delivery and should be sourced locally. Please refer to the expansion tank manufacturer for further information. The Combi boiler Q175C is equipped with an expansion tank connection. This pipe is connected with the three way valve and boiler pump.



NOTICE

Fill expansion tank to a minimum of 14.5 psi.



NOTICE

For the boiler to function correctly, it is necessary to connect the expansion tank to the expansion tank connection on the boiler. If the expansion tank is not connected to the supplied connection damage to the boiler may occur.

Note:

The solo boilers Q85S, Q130S, Q175S and Q205S can be provided with an optional internal three way valve. When this valve is installed in the boiler, the boiler is provided with an expansion tank connection. This pipe is connected with the three way valve and boiler pump.

For the boiler to function correctly, it is necessary to connect the expansion tank to the expansion tank connection on the boiler. If the expansion tank is not connected to the supplied connection damage to the boiler may occur.



NOTICE

See the Rinnai Boiler Applications Manual for further information regarding placement of the expansion tank in the system. See the Rinnai 3-way valve indirect tank installation manual for further information regarding the installation of the 3-way valve indirect tank kit.

6.3 Underfloor heating system (plastic pipes)

When using oxygen-permeable pipes, e. g. for floor heating systems, you must separate the system using plate heat exchangers.



NOTICE

No recourse can be made to the terms of the warranty in the event of failure to observe the regulations pertaining to plastic underfloor heating pipes.

6.4 Gas connection



DANGER

Only work on gas lines if you are licensed for such work. If these instructions are not followed exactly, a fire or explosion may result causing property damage, personal injury or death.



WARNING

Rinnai wall mounted boilers are built to run on Natural Gas or Propane Gas. The gas type the boiler is suitable for is indicated on the packaging and on the boiler by a blue label with Natural Gas or a green label with Propane Gas and on the identification plate on the boiler. First check the identification plate on the boiler for the suitable gas type.



DANGER

Do not use the boiler for another type of gas than indicated on the identification plate of the boiler. This will cause improper functioning and can damage the boiler.

Natural gas: refer to chapter 6.4.1

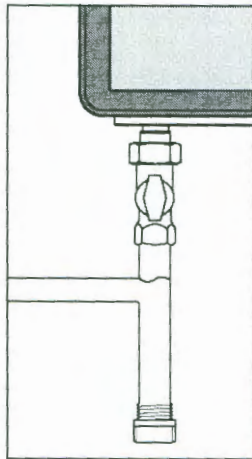
Propane gas: refer to chapter 6.4.2

6.4.1. Gas connection with natural gas



NOTICE

The gas supply connection must comply with local regulations or, if such regulations do not exist, with the National Fuel Gas Code, ANSI Z 223.1. For Canada, the gas connection must comply with local regulations or, if such regulations do not exist, with the CAN/CSA B149.1, Natural Gas and Propane Installation Code.



Sediment trap figure 10

Pipe sizing for natural gas

Contact gas supplier to size the gas supply line and meter.

Gas piping

A sediment trap must be installed upstream of the gas controls.

The boiler gas pipe is equipped with external 3/4" M-NPT thread, onto which the tail piece of the gas shut off valve can be connected. Use appropriate sealing.

The connection to the boiler must include a suitable method of disconnection and a gas control valve must be installed adjacent to the boiler for isolation purposes. The nominal inlet working gas pressure measured at the boiler should be 7" W.C. (18 mbar) for Natural gas (Gas A). Maximum pressure with no flow (lockup) or with the boiler running is 10.5 inches W.C. Minimum pressure with the gas flowing (verify during boiler startup) is 4.0 inches W.C.

The gas pipe must be fitted to the gas valve free from any strain.



NOTICE

Make sure that the gas pipe system does not contain dirt, particularly with new pipes.



DANGER

Always check the safety of the gas pipe system by means of a bubble test using leak-search spray.



NOTICE

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 test pressures in excess of 1/2 PSI (3.5kPa).



NOTICE

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

6.4.2 Gas connection with propane gas

NOTICE

The gas supply connection must comply with local regulations or, if such regulations do not exist, with the National Fuel Gas Code, ANSI Z 223.1. For Canada, the gas connection must comply with local regulations or, if such regulations do not exist, with the CAN/CSA B149.1, Natural Gas and Propane Installation Code.

Pipe sizing for propane gas

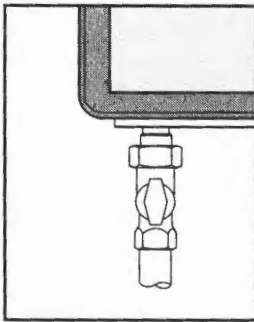
- Contact gas supplier to size pipes, tanks, and 100% lockup gas pressure regulator.

Propane Supply Pressure Requirements

- Adjust propane supply regulator provided by the gas supplier for 14 inches W.C. maximum pressure.
- Pressure required at gas valve inlet pressure port:
 - Maximum 14 inches W.C. with no flow (lockup) or with boiler running.
 - Minimum 8 inches W.C. with gas flowing (verify during boiler startup).

Ensure that the high gas pressure regulator is installed at least 6 to 10 feet upstream of the boiler.

DANGER



Gas shut off valve onto boiler
figure 11

Gas piping

- Use a gas shut off valve compatible with propane gases.
- A sediment trap must be provide upstream of the gas controls.

The boiler pipe is provided with external 3/4" M-INPT thread, onto which the tail piece of the gas shut off valve can be screwed. Use appropriate sealing.

The connection to the boiler must include a suitable method of disconnection. A gas control valve must be installed adjacent to the boiler for isolation purposes. The nominal inlet working gas pressure measured at the boiler should be 12 inch W.C. (30mbar) for Propane gas (Gas E).

The gas pipe must be fitted to the gas valve free from any strain.

NOTICE

Make sure that the gas pipe system does not contain dirt, particularly with new pipes.

DANGER

Always check the safety of the gas pipe system by means of a bubble test using leak-search spray.

NOTICE

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 test pressures in excess of 1/2 PSI (3.5kPa).

NOTICE

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

6.5 Hot water supply (Combi boiler Q175CN/Q175CP)

Connection of the drinking water installation should be performed according to the national secondary drinking water regulations.

DANGER



flow regulator valve figure 12


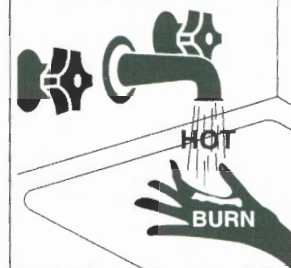
Do NOT use toxic chemicals, such as those used for boiler treatment in potable water heating systems used for space heating.

The sanitary water pipes can be connected to the installation by use of adapter fittings. The cold water inlet on the Combi boilers must be equipped with the following components (counted in the water flow direction): Flow regulator valve (supplied), Safety group, Expansion vessel 87 PSI / 6bar (potable water, blue).

A flow regulator valve is supplied with the boiler. The flow regulator valve ensures that a quantity of water is supplied which has an outlet temperature of 120°F (assuming a cold water temperature of 45°F). The quantity of water is virtually unaffected by the water pressure. The 3/4" NPT adapter fitting with the flow reducing valve must be fitted in the cold water connection (see Dimensions 5.3, cold water pipe -k).

NOTICE

When there is a water pressure lower than 22PSI / 1.5 bar it is advisable to remove the inside mechanism of the flow reducing valve. Contact Rinnai for removal instructions.

 DANGER	Hot water can be dangerous, especially for infants or children, the elderly, or infirm. There is hot water scald potential if the thermostat is set too high.
	Water temperatures over 125° F (51° C) can cause severe burns or scalding resulting in death.
	Hot water can cause first degree burns with exposure for as little as:
	3 seconds at 140° F (60° C)
	20 seconds at 130° F (54° C)
	8 minutes at 120° F (48° C)
Test the temperature of the water before placing a child in the bath or shower.	
Do not leave a child or an infirm person in the bath unsupervised.	

6.5.1 Domestic Water quality

Appropriate steps must be taken to ensure the indirect tank water heater does not become plugged by scale caused by hard water or sediment. If the indirect tank water heater becomes plugged by either scaling from hard water or sediment it is not the responsibility of Rinnai.

1. Water hardness for DHW

When there is a water hardness of more than 6 to 7 grains hardness is used for domestic water a water softener must be installed on the inlet side of the DHW connection.

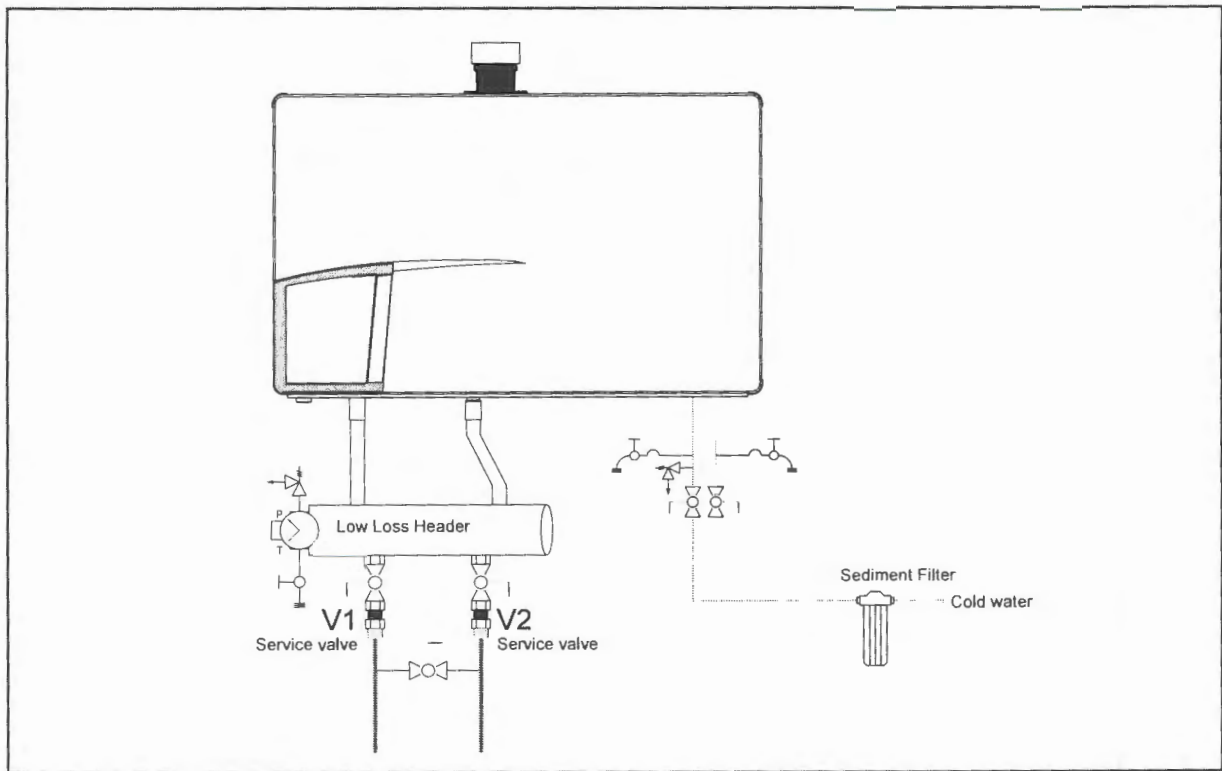
2. Sediment in DHW

If there is sediment in your domestic water supply sediment filter or other suitable device should be used to remove it before the water enters the indirect tank water heater.

6.5.2 Installing a valve kit

A means to isolate the domestic indirect tank water heater for cleaning must be provided at installation. Refer to figure 13 for proper piping layout. A Rinnai valve kit can be used on domestic water connections for all combi boilers to allow for cleaning of indirect tank water heater and installation of the domestic hot water pressure relief valve.

- Rinnai recommends the use of the MARIK-T (3/4" NPT thread connection) or MARIK-S kit (MARIK-S (3/4" sweat connection) when connecting the domestic water lines to the boiler.
- Use of this kit will assist in flushing the indirect tank water heater in areas where water quality issues exist, as well as improve overall product serviceability.



Boiler DHW piping

figure 13

6.5.3 Pressure relief Valve for Combi boilers

- An approved pressure relief valve is required by Rinnai for all water heating systems.
- The relief valve must comply with the standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems ANSI Z21.22 and/or the standard Temperature, Pressure, Temperature and Pressure Relief Valves and Vacuum Relief Valves, CAN1-4.4.
- The relief valve must be rated up to 150 psi and to at least the maximum BTU/hr of the appliance.
- The discharge from the pressure relief valve should be piped to the ground or into a drain system to prevent exposure or possible burn hazards to humans or other plant or animal life. Follow local codes. Water discharged from the relief valve could cause severe burns instantly, scalds, or death.
- The pressure relief valve must be manually operated once a year to check for correct operation.
- The relief valve should be added to the hot water outlet line according to the manufacturer instructions. DO NOT place any other type valve or shut off device between the relief valve and the water heater.
- Do not plug the relief valve and do not install any reducing fittings or other restrictions in the relief line. The relief line should allow for complete drainage of the valve and the line.
- If a relief valve discharges periodically, this may be due to thermal expansion in a closed water supply system. Contact the water supplier or local plumbing inspector on how to correct this situation. Do not plug the relief valve.
- Rinnai does not require a combination temperature and pressure relief valve for this appliance. However local codes may require a combination temperature and pressure relief valve.

6.6 Condensate drain pipe

This boiler produces condensate. Condensate must be drained otherwise the boiler will not function and can cause property damage.

The condensation drain pipe should be connected to a drain in the building by means of an open connection. By this means the possibility of drain gases effecting the boiler is prevented. The drain connection should have a minimum diameter of 1.3" / 32mm.

Install the condensation drain pipe according to the applicable rules and regulations.

If the condensate outlet of the boiler is lower than the public sewage system a condensate pump must be used.

The condensate produced by the boiler has a pH value between 3 and 4.

Install a neutralization unit if required by the local code. It is recommended, but not required to install a condensate neutralizer.

 NOTICE

Do not drain the condensation water to the external rain gutter because of the danger of freezing and blockage of the drain.

 NOTICE

Before putting the boiler into operation fill the condensate trap with 1.27 cups / 300 ml of water. If the boiler will be installed in a high temperature installation such as baseboard with a supply temperature of 160°F or above, fill the condensate trap with vegetable oil instead of water.

 NOTICE

Use materials approved by the authority having jurisdiction. In absence of such authority, PVC and CPVC pipe must comply with ASTM D1785, F441 or D2665. Cement and primer must comply with ASTM D2564 or F493. For Canada, use CSA or ULC certified PVC or CPVC pipe, fittings and cement.

 NOTICE

Periodic cleaning of the condensate disposal system must be carried out. See the Rinnai Boiler Applications Manual for further information and a piping diagram for the condensate.

6.7 Vent system and air supply system

Provisions for combustion and ventilation air must be made in accordance with section, Air for Combustion and Ventilation of the National Flue Gas Code, ANSI Z223.1, or Sections 7.2, 7.3 of 7.4 of CAN/CGA B149.1, Installation Codes, or applicable provisions of the local building codes.

- Do not store chemicals near the boiler or in rooms where the air is being supplied to the boiler. **See the list on page 10.**
- Do not allow the flue gases of other appliances to enter the boiler.
- Keep cabinet free of moisture

NOTICE

In the event that the system has actuated to shut off the main burner gas, do not attempt to place the boiler in operation. Contact a qualified service agency.

6.7.1 Intake / Exhaust Guidelines

Refer to the specific instructions on your vent product for additional installation requirements.

- For direct vent boilers, proper reassembly and resealing of the vent-air intake system.
- You must use vent components that are certified and listed with this model.
- Do not combine vent components from different manufacturers.
- Venting should be as direct as possible with a minimum number of pipe fittings.
- Avoid dips or sags in horizontal vent runs by installing supports per the vent manufacturer's instructions.
- Support horizontal vent runs every four feet and all vertical vent runs every six feet or in accordance with local codes.
- Vent diameter must not be reduced.
- The boiler is unsuitable to install on a common vent installation, see also chapter 20.
- Do not connect the venting system with an existing vent or chimney.
- Do not common vent with the vent pipe of any other water heater or appliance.
- Vent connections must be firmly pressed together so that the gaskets form an air tight seal.
- Refer to the instructions of the vent system manufacturer for component assembly instructions.
- If the vent system is to be enclosed, it is suggested that the design of the enclosure shall permit inspection of the vent system. The design of such enclosure shall be deemed acceptable by the installer or the local inspector.

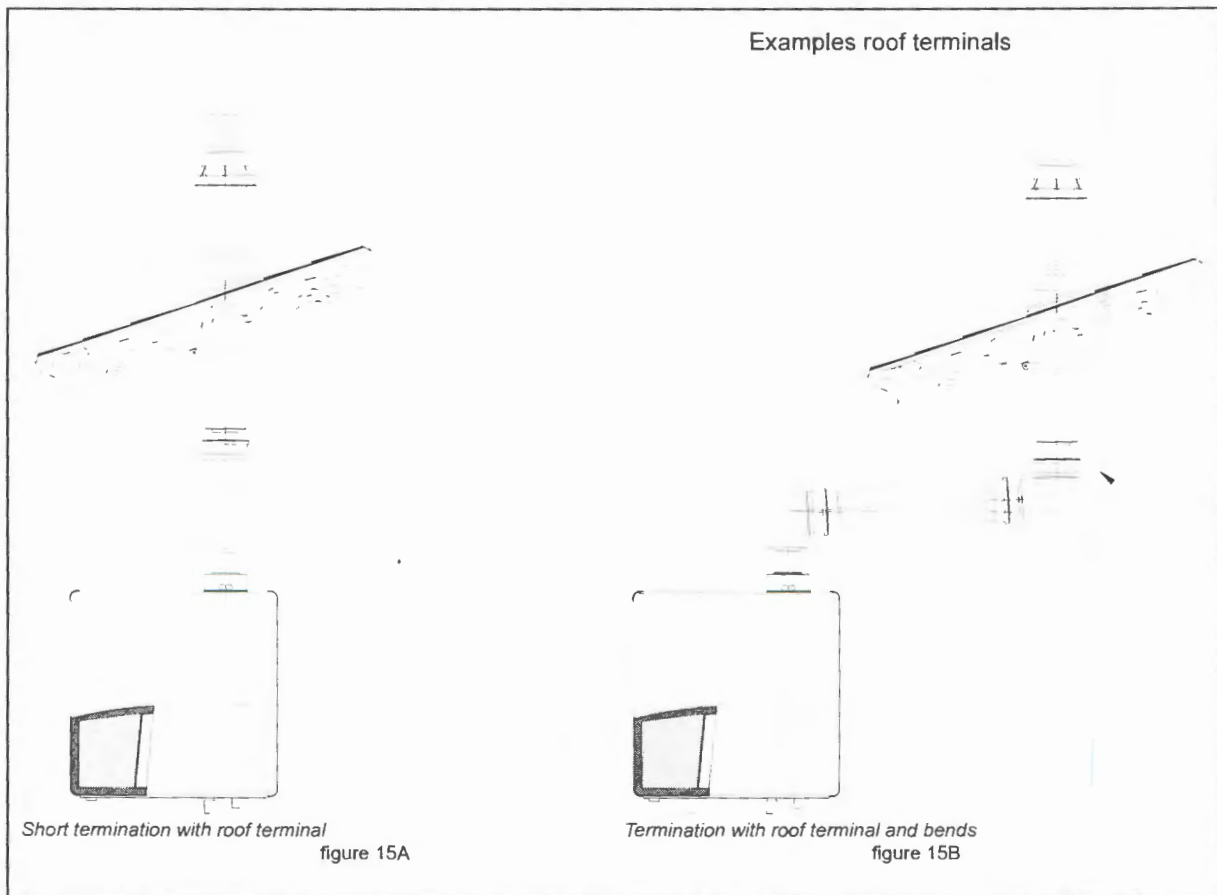
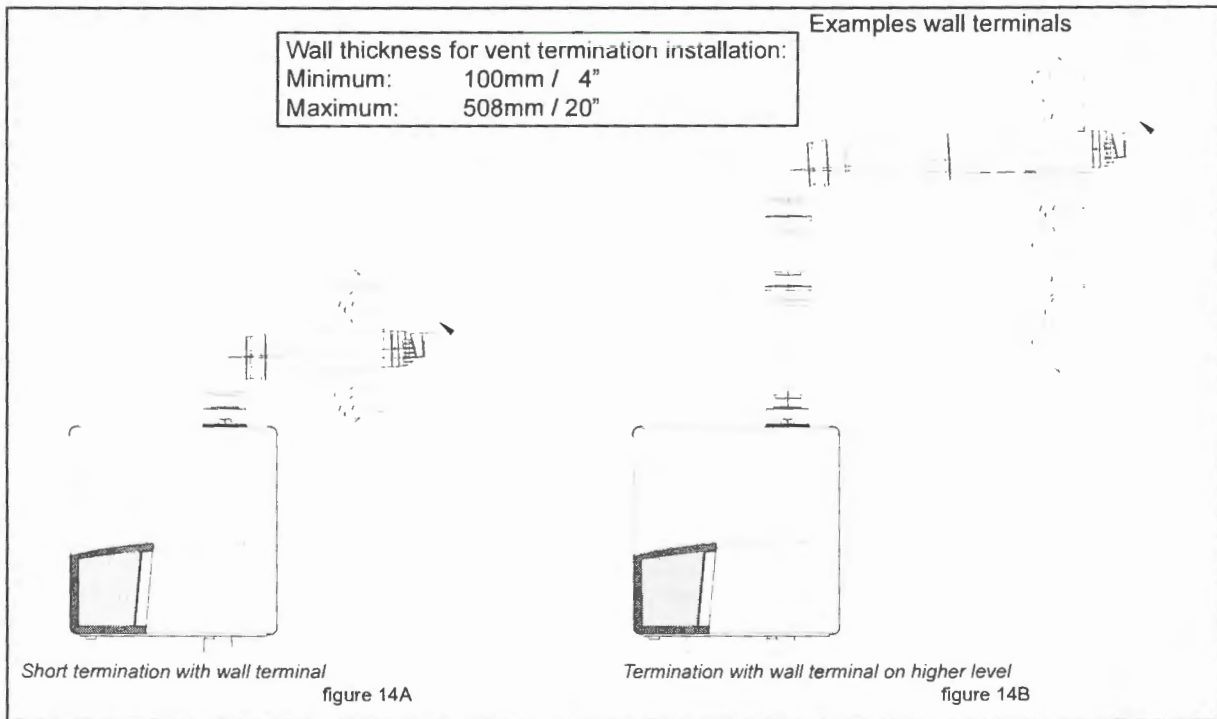
NOTICE

If it becomes necessary to access an enclosed vent system for service or repairs, Rinnai is not responsible for any costs or difficulties in accessing the vent system. Warranty does not cover obtaining access to an enclosed vent system.

The instructions for the installations of the venting system shall specify that the horizontal portions of the venting system shall be supported to prevent sagging; the methods of and intervals for support shall be specified. These instructions shall also specify that the venting system:

- For category I, II and IV boilers, have horizontal runs sloping upwards not less than 1/4" per foot (21mm/m) from the boiler to the vent terminal;
- For category III boilers, slope shall be as specified in the boiler manufacturer's instructions;
- For category II and IV boilers, be installed so as to prevent accumulation of condensate; and
- For category II and IV boilers, where necessary, have means provided for drainage of condensate.

6.7.2a Examples vent and air supply systems (concentric)



6.7.2b Examples vent and air supply systems (parallel)

Wall thickness for vent termination installation:
 Minimum: 100mm / 4"
 Maximum: 508mm / 20"

Examples sealed combustions



Horizontal with concentric termination

figure 16A



Horizontal with parallel termination

figure 16B

10" MINIMUM INSIDE EDGE
TO INSIDE EDGE



Vertical vent and horizontal air intake

figure 16C



Vertical with concentric termination

figure 16D



Vertical with parallel termination

figure 16E

6.7.3 Installation of the vent system



NOTICE

Consult local and state codes pertaining to special building code and fire department requirements. Adhere to national code requirements.



NOTICE

Follow the listed maximum length of vent systems, which are boiler output dependent. The maximum permissible lengths are listed in table 9, chapter 6.7.7.

The maximum permissible lengths are listed in table 9, chapter 6.7.7.
Decide how to install the exhaust and air intake system. You can choose among:

- Concentric system

The concentric connection is provided standard initially.
The boiler concentric connection diameter is 3"/5" (80/125 mm), to which the venting and air supply system can be fitted, with or without elbow pieces. The maximum permissible pipe length is displayed in table 9, chapter 6.7.7.

- Parallel system

The boiler can be converted to a parallel system with supplied adapters.
It is possible to use a parallel pipe connection of 2x 3". In this case a separate supplied kit, with 2 vent adapters 3" (ø80mm), cover 5" (ø125mm), vent exhaust pipe and gaskets should be fitted instead of the concentric vent adapter on top of the boiler. See chapter 6.7.3.1 for installation. The maximum permissible pipe length is set out in table 9, chapter 6.7.7.

- Room Air System (indoor combustion air)

The boiler can use room air for combustion. If this option is selected the boiler must first be converted to the parallel system. A single exhaust pipe can then be fitted. It is required to use a room air filter (Art. nr. 808000025) when using indoor air for combustion. See chapter 6.7.3.2 for installation. The maximum permissible pipe length is set out in table 9, chapter 6.7.7.



NOTICE

Rinnai strongly recommends the use of the room air filter in case of Room Air System (indoor combustion air).



NOTICE

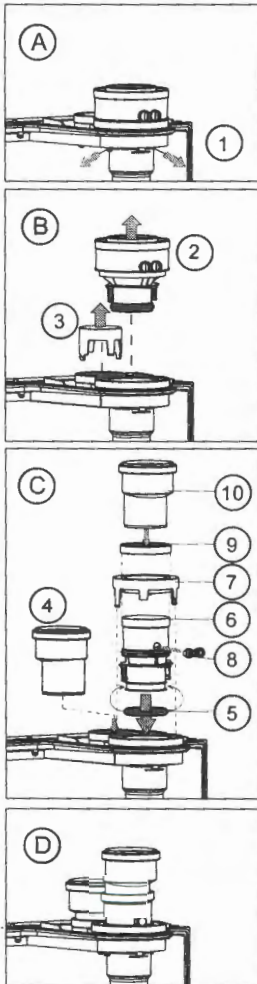
When the boiler is installed in any of the areas listed in chapter 5.1, "Areas likely to have contaminants" or any area exposed to the contaminants listed in chapter 5.1, then sealed combustion is required.



NOTICE

We advise to install a vent system out of the venting system program supplied by Rinnai (See chapter 19 Parts list Vent system). For further information about the available components of the venting and air supply system we recommend you consult Rinnai and the Installation instructions and parts list documentation.

6.7.3.1 Boiler conversion from concentric to parallel



boiler conversion from
concentric to parallel
figure 17

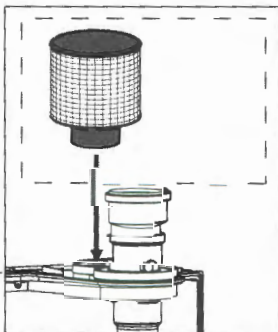
A. 1. Push the 2 clips slightly outwards

B. 2. Pull the concentric adaptor out of the boiler
3. Press the cover in the connection at the back from inside out

C. 4. Push the 3" adapter into the connection at the back of the boiler (= air intake)
5. Pull the rubber seal around the bottom of the exhaust connector
6. Push the exhaust connector in the boiler, in the boiler exhaust pipe until 'CLICK'
7. Push the 5" cover over the exhaust connector in the 5" opening until 'CLICK'
8. Push the rubber plug in open position in the O₂ measuring opening and close the stop.
9. Push the gasket around the top of the exhaust connector
10. Push the 3" exhaust adaptor in the exhaust connector.

D. Connect the parallel vent system.

6.7.3.2 Placing air filter



placing air filter on air intake
figure 18

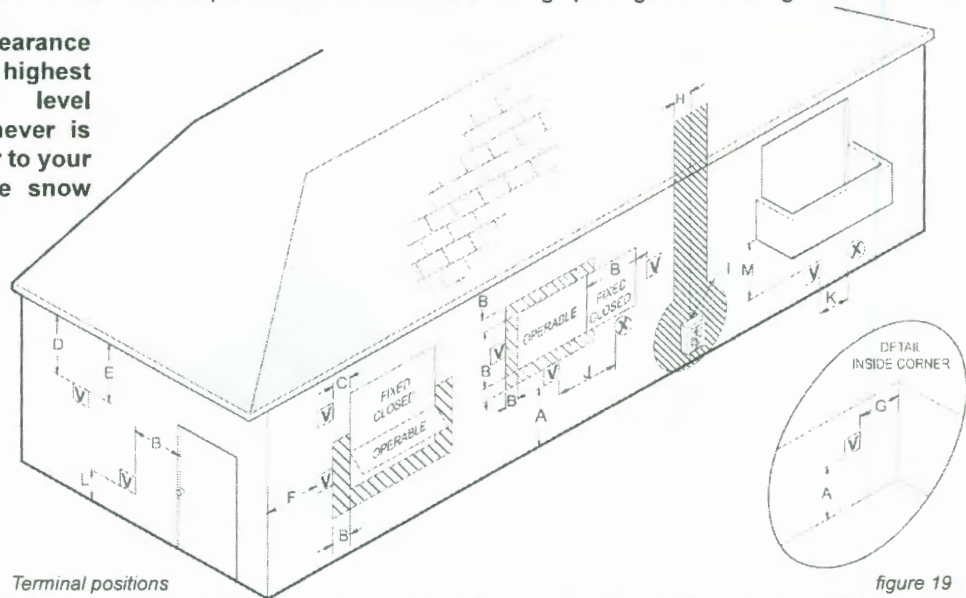
Push the air filter into the air intake on top of the boiler. See figure 18.

The equivalent length of the combustion room air filter is 12ft (3.66m).

6.7.4 Recommended vent/air intake terminal position

Terminals should be positioned as to avoid products of combustion entering openings into buildings or other vents.

Maintain 12" of clearance above the highest anticipated snow level or grade or, whichever is greater. Please refer to your local codes for the snow level in your area.



Terminal positions

figure 19

Ref	Description	Canadian Installations - Direct Vent and non Direct Vent	US Installations Direct Vent	US Installations non Direct Vent
A	Clearance above grade, veranda, porch, deck, or balcony	12 inches (30 cm)	12 inches (30 cm)	12 inches (30 cm)
B	Clearance to window or door that may be opened	6 inches (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 12 inches (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW), 36 inches (91 cm) for appliances > 100,000 Btuh (30 kW)	6 inches (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 9 inches (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 50,000 Btuh (30 kW), 12 inches (91 cm) for appliances > 50,000 Btuh (30 kW)	4 feet (1.2 m) below or to side of opening; 1 foot (300 mm) above opening
C	Clearance to permanently closed window	*	*	*
D	Vertical clearance to ventilated soffit, located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	*	*	*
E	Clearance to unventilated soffit	*	*	*
F	Clearance to outside corner	*	*	*
G	Clearance to inside corner	*	*	*
H	Clearance to each side of center line extended above meter/regulator assembly	3 feet (91 cm) within a height 15 feet (4.5 m) above the meter/regulator assembly	*	*
I	Clearance to service regulator vent outlet	36 inches (91 cm)	*	*
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 inches (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 12 inches (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW), 36 inches (91 cm) for appliances > 100,000 Btuh (30 kW)	6 inches (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 9 inches (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 50,000 Btuh (30 kW), 12 inches (91 cm) for appliances > 50,000 Btuh (30 kW)	4 feet (1.2 m) below or to side of opening; 1 foot (300 mm) above opening
K	Clearance to a mechanical air supply inlet	6 feet (1.83 m)	3 feet (91 cm) above if within 10 feet (3 m) horizontally	3 feet (91 cm) above if within 10 feet (3 m) horizontally
L	Clearance above paved sidewalk or paved driveway located on public property	7 feet (2.13 m) [1]	*	7 feet (2.13 m)
M	Clearance under veranda, porch, deck, or balcony	12 inches (30 cm) [2]	*	*

[1] A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

[2] Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

* For clearances not specified in ANSI Z223.1/NFPA 54 or CSA B149.1, clearances are in accordance with local installation codes and the requirements of the gas supplier.

clearances of venting system terminals

table 6

 NOTICE

The termination shall be at least 4 feet (1,220 mm) for the US and 6 feet (1,830 mm) for Canada distance from electric meters, gas meters, regulators and relief equipment. (for room air application only)

 CAUTION

Horizontal vent systems should always be installed sloping towards the boiler (min. 21 mm/m, 1/4" / feet), in order to avoid condensate retaining in the vent system. With the condensate running back to the boiler the risk of ice forming at the terminal is reduced.

 CAUTION

The whole route of the vent system must be installed upwards, never downwards, completely nor partly.

 NOTICE

Place pipe supports every 4 feet (1,219 mm) of horizontal run, beginning with support near the boiler to prevent movement in fittings and allow boiler to be free from any strain or weight on boiler or fittings.

 NOTICE

The terminal should be located where dispersal of combustion products is not impeded and with due regard for the damage or discolouration that might occur to building products in the vicinity (see fig 19 and 20).

In certain weather conditions condensation may also accumulate on the outside of the air inlet pipe. Such conditions must be considered and where necessary insulation of the inlet pipe may be required.

In cold and/or humid weather water vapor may condense on leaving the vent terminal. The effect of such 'water condensation' must be considered.

 NOTICE

The terminal must be located in a place not likely to cause a nuisance.

Use the Instructions of the Rinnai venting system for installation and service.

 NOTICE

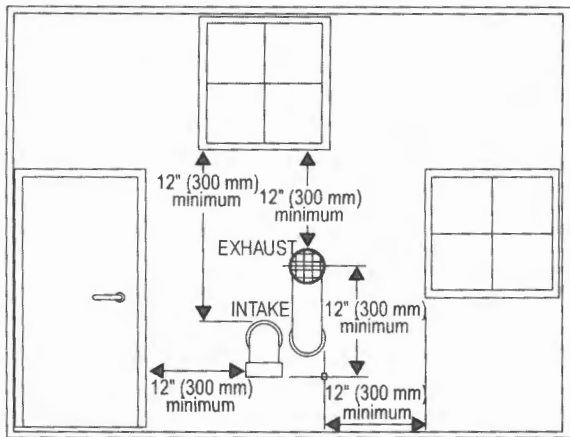
Cellular or Foam core PVC is not permitted for use with the boiler.

Item Description	Flue Material	Approval Codes for Installation	
		United States	Canada
Plastic Vent and/or air pipes and fittings	PVC Schedule 40	ANSI/ASTM D1785	ULC S636
	PVC - DWV	ANSI/ASTM D2665	
	CPVC Schedule 40	ANSI/ASTM F441	
Plastic Pipe cement and primer	PVC	ANSI/ASTM D2564	
	CPVC	ANSI/ASTM F493	

Item Description	Flue Material	Manufacturer	Approval code		Flue system
			US/CAN		
Stainless steel vent systems	Stainless Steel	Heat Fab	UL1738	Concentric twin pipe	Saf-T Vent SC Saf-T Vent EZ Seal
Stainless steel vent systems	Stainless Steel	Simpson Dura-Vent	UL1738	Flexible liner	FastNSeal Flex
			UL1738	Concentric twin pipe	FastNSeal
Stainless steel vent systems	Stainless Steel	Ubbink			Rolux Condensing Vent System
Plastic Vent System	PPS	Ubbink			Rolux Condensing Vent System
Plastic Vent System	PVC/CPVC	IPEX	ULC S636		System 636

Approval codes for installation of venting system

table 7



Terminal positions PVC

figure 17

Fittings or Piping Equivalent	feet	m
45 degree elbow	3	0.91
90 degree elbow	6	1.83
plastic pipe per foot	1	0.30
concentric vent kit	5	1.52

Equivalent friction loss of PVC/CPVC

table 8

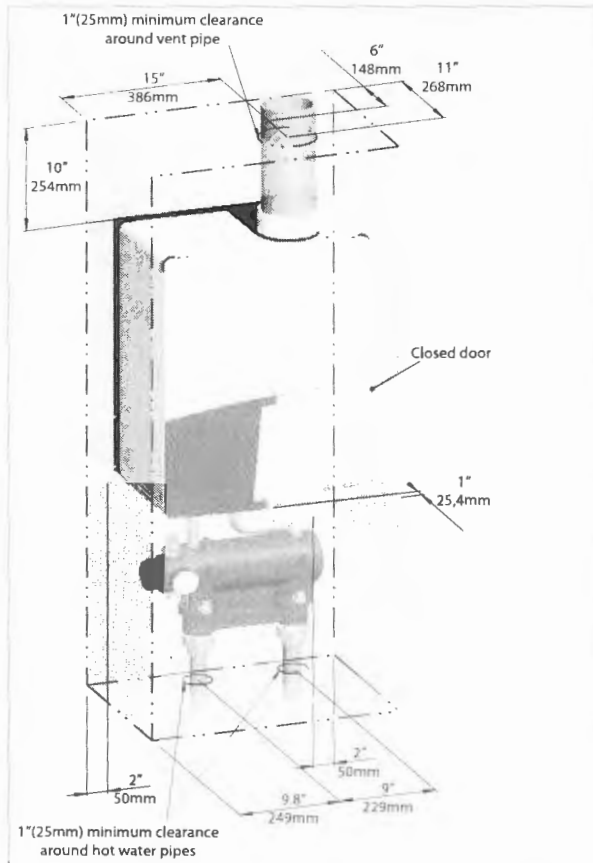
6.7.5 Direct vent closet and alcove installation



WARNING

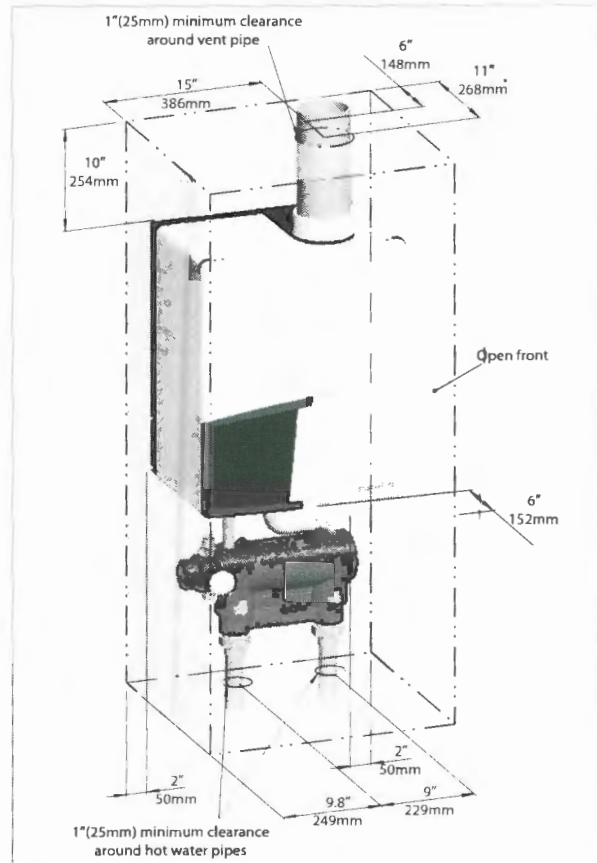
For closet and alcove installation, CPVC material, instead of PVC, must be used in a closet/alcove structure. Failure to follow this warning could result in fire, personal injury, or death.

Rinnai strongly suggests the use of concentric venting for all closet and alcove installations. For non direct vent room air applications see sections 6.7.6 and 6.7.9.



Closet installation

figure 21



Alcove installation

figure 22

6.7.6 Dimensioning of the exhaust and air intake duct



DANGER

The wall mounted boiler must be vented and supplied with combustion and ventilation air as described in this section.

Ensure the vent and air piping and the combustion air supply comply with these instructions regarding vent system, air system, and combustion air quality.

Inspect finished vent and air piping thoroughly to ensure all are airtight and comply with the instructions provided and with all requirements of applicable codes.

Failure to provide a properly installed vent and air system may cause severe personal injury or death.



WARNING

Use only the material listed in Rinnai's vent documentation for vent pipe, and fittings. Failure to comply could result in severe personal injury, death or substantial property damage.



NOTICE

Installation must comply with local requirements and with the National Fuel Gas Code, ANSI Z223.1 for U.S installations or CSA B 149.1 for Canadian installations.



WARNING

For closet and alcove installation, CPVC material, instead of PVC, must be used in a closet/alcove structure. Failure to follow this warning could result in fire, personal injury, or death.



NOTICE

All vent pipes must be connected and properly supported, and the exhaust must be pitched a minimum of a 1/4"/foot (21 mm/m) back to the boiler (to allow drainage of condensate). Please refer to the venting manufacturer's manual to see if a larger pitch is required for specific venting systems. The venting system manufacturer's required venting pitch must always be followed if larger than 1/4" (21 mm). Ubbink concentric condensing venting requires a pitch of 3/4"/foot (6mm/m).



NOTICE

Combustion air piping from the outside **MUST** must comply to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the latest edition of the National Fuel Gas Code, ANSI Z223.1/NFPA 54. In Canada, installation must be in accordance with the requirements of CAN/CSA B149.1, Natural Gas and Propane Installation Code.



NOTICE

See the Rinnai Boiler Applications Manual for further information on venting.

6.7.7 Combustion air and vent piping lengths.

In the table below you find the maximum equivalent pipe length of the vent/air system based on 3" diameter. These lengths are for single pipe (room air), twin pipe, and concentric venting systems.

Boiler type	3" Max Vent equivalent length	3" Max Air equivalent
Q85	100 feet	100 feet
Q130	100 feet	100 feet
Q175	80 feet	80 feet
Q205	40 feet	40 feet

Equivalent vent length

table 9

Calculation of equivalent length vent system

Choose the vent type and fill out the corresponding table.

* When determining equivalent combustion air and vent length, add 6 feet for each 90° elbow, 3 feet for each 45° elbow, 5 feet for the concentric terminal in the Parallel System, 2 feet for the concentric terminal in the Concentric System and 12 ft for the combustion room air filter.

Parallel system

Length tube	Number of elbows 90° x 6*	Number of elbows 45° x 3*	Concentric terminal Add 5 ft.*	Total	Multiply with factor	Equivalent length
ft	ft	ft	ft	ft	0.5	ft
Combustion air						
ft	ft	ft	ft	ft	0.5	ft
Vent						
ft	ft	ft	ft	ft	0.5	ft
Total equivalent length						<u>ft</u>

Concentric system

Length concentric tube, boiler to roof horizontal	Number of elbows 90° x 6*	Number of elbows 45° x 3*	Concentric terminal Add 2 ft.*	Total	Multiply with factor	Total equivalent length
ft	ft	ft	ft	ft	1.0	ft

Example of calculation:

Twin tube (parallel) with terminal

Combustion air length : 24 ft with elbow 3 x 90°
Vent length : 24 ft with elbow 2 x 90°, elbow 2 x 45°

Calculation:

Equivalent Air Length : $(24+3 \times 6+2) \times 0.5 = 23 \text{ ft}$
Equivalent Vent Length : $(24+2 \times 6+2 \times 3+2) \times 0.5 = 23 \text{ ft} +$
Total = 46 ft.

6.7.8 Calculation of compensation factor

The compensation factor eliminates or reduces the natural effect of derate of maximum input caused by the resistance of the vent system and/or the impact of the altitude.

1. Determine the Compensation Factor Vent System CF(V) in the table below.

Eq. length (ft)		Boiler type			
min	max	Q85	Q130	Q175	Q205
		CF (V)			
0	10	0	0	0	0
11	20	0	0	2	3
21	30	0	2	4	6
31	40	1	4	6	10
41	60	2	6	10	n.a.
61	80	3	8	15	n.a.
81	100	4	10	n.a.	n.a.

Compensation factor vent system CP(V)

table 10

2. Determine the Compensation Factor Altitude CF(A) in the table below.

Altitude (ft)		Boiler type
min	max	Q85, Q130, Q175, Q205
		CF (A)
0	1	0
1,000	2,000	6
2,000	3,000	12
3,000	4,000	18
4,000	5,000	24
5,000	6,000	30
6,000	7,000	36
7,000	8,000	42
8,000	9,000	48
9,000	10,000	54

Compensation factor altitude CP(A)

table 11

NOTICE

Any application or installation above 10,000 must be reviewed by Rinnai's Engineering group. This is to ensure the product is installed and the overall system is designed properly and that the units are commissioned properly. Not involving of Rinnai's Engineering group would result in no support of the product and no warranty.

3. Calculate the Compensation Factor Total CF(T):

$$CF(T) = CF(V) + CF(A)$$

The result is the setting for Parameter 73.

Change parameter 73 according to this result. See Chapter 11.1 how to change parameters.

Example of calculation:

Q175

Eq. length vent system (taken from previous example)

Altitude

46 ft CF(V) = 10

7,200ft $\frac{CF(A)}{CF(T)} = 42 +$

CF(T) = 52

Parameter setting (Par. 73) = 52

WARNING

Do not overcompensate the boiler by setting a higher value than calculated, otherwise the boiler could be seriously damaged.

6.7.9 Room Air System (indoor combustion air)

When using indoor air, Rinnai strongly recommends the use of an indoor air filter, P/N 808000025.

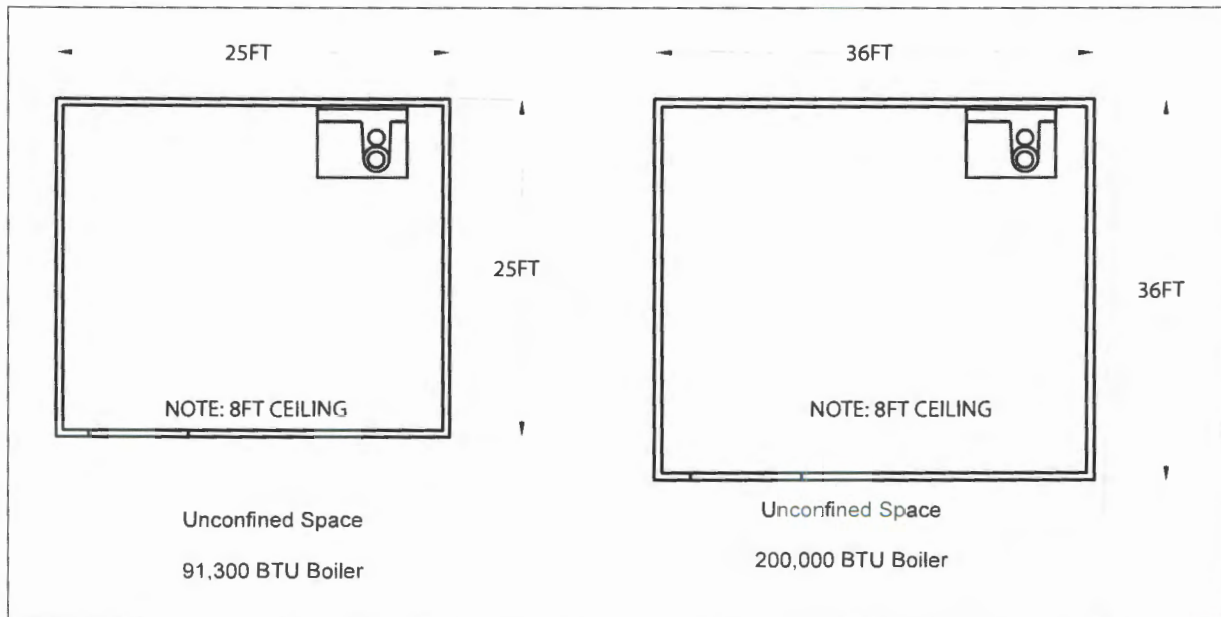
This boiler requires adequate combustion air for ventilation and dilution of flue gases. Failure to provide adequate combustion air can result in unit failure, fire, explosion, serious bodily injury or death. Use the following methods to ensure adequate combustion air is available for correct and safe operation of this water heater.

Important: Combustion air must be free of corrosive chemicals. Do not provide combustion air from corrosive environments. Appliance failure due to corrosive air is not covered by warranty.

Combustion air must be free of acid forming chemical such as sulfur, fluorine and chlorine. These chemicals have been found to cause rapid damage and decay and can become toxic when used as combustion air in gas appliances. Such chemicals can be found in, but not limited to bleach, ammonia, cat litter, aerosol sprays, cleaning solvents, varnish, paint and air fresheners. Do not store these products or similar products in the vicinity of this water heater.

Unconfined Space:

An unconfined space is defined in NFPA #54 "as a space whose volume is not less than 50 cubic feet per 1000 Btu/hr (4.8 m³ per kW per hour) of the aggregate input rating of all appliances installed in that space. Rooms communicating directly with the space in which the appliances are installed, through openings not furnished with doors, are considered a part of the unconfined space." If the "unconfined space" containing the appliance(s) is in a building with tight construction, outside air may still be required for proper operation. Outside air openings should be sized the same as for a confined space.



Unconfined space

figure 23

Confined Space:

(Small Room, Closet, Alcove, Utility Room, Etc.)

A confined space is defined in the NFPA #54 as "a space whose volume is less than 50 cubic feet per 1000 Btu/hr (4.8 m³ per kW per hour) of the aggregate input rating of all appliances installed in that space." A confined space must have two combustion air openings. Size the combustion air openings based on the BTU input for all gas utilization equipment in the space and the method by which combustion air is supplied:

Using indoor air for combustion

Using outdoor air for combustion

Louvers and Grills

When sizing the permanent opening as illustrated in figure 24, consideration must be taken for the design of the louvers or grills to maintain the required free area required for all gas utilizing equipment in the space. If the free area of the louver or grill design is not available, assume wood louvers will have 25% free area and metal louvers or grills will have 75% free area. Under no circumstance should the louver, grill or screen have openings smaller than 1/4".

Example:

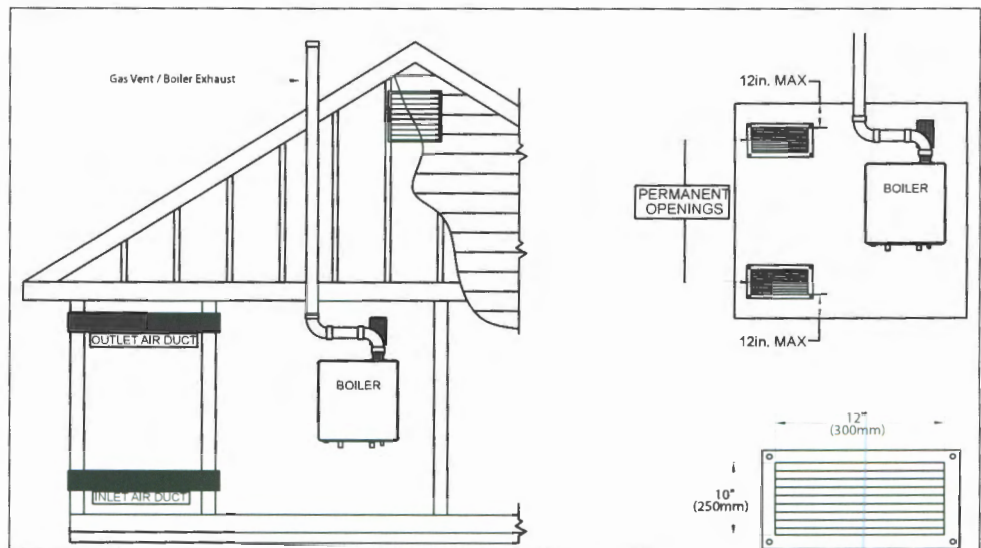
Wood: 10 in x 12 in x 0.25 = 30 in²

Metal: 10 in x 12 in x 0.75 = 90 in²

Location

To maintain proper circulation of combustion air two permanent openings (one upper, one lower) must be positioned in confined spaces. The upper shall be within 12 inches of the confined space and the lower opening shall be within 12 inches of the bottom of the confined space. Openings must be positioned as to never be obstructed.

Combustion air provided to the appliance should not be taken from any area of the structure that may produce a negative pressure (i.e. exhaust fans, powered ventilation fans).



Louvers and grills

figure 24

Using Indoor Air For Combustion

When using air from other room(s) in the building, the total volume of the room(s) must be of adequate volume (Greater than 50 cubic feet per 1000 Btu/hr). Each Combustion air opening must have at least one square inch of free area for each 1000 Btu/h, but not less than 100 square inches each.

Using Outdoor Air For Combustion

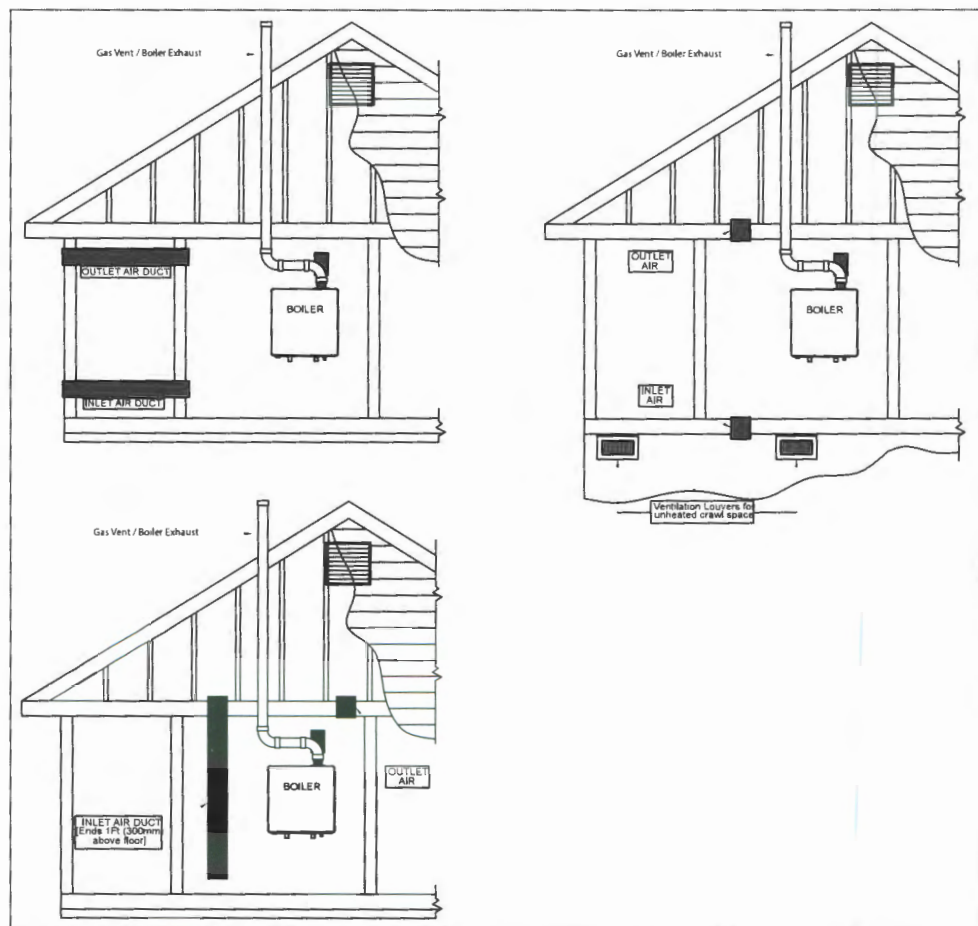
Outdoor air can be provided to a confined space through two permanent openings, one commencing within 12 in. (300mm) of the top and one commencing within 12" (300mm) of the bottom, of the confined space. The openings shall communicate to the outside by one of two ways:

- directly through horizontal ducts
- indirectly through vertical ducts

When communicating directly with the outdoors through horizontal ducts, each opening shall have a minimum free area of 1 in²/2000 Btu/hr (1100 mm²/kW) of total input rating of all appliances in the confined space.

Note: If ducts are used, the cross sectional area of the duct must be greater than or equal to the required free area of the openings to which they are connected.

When communicating indirectly with the outdoors through vertical ducts, each opening shall have a minimum free area of 1 in²/4000 Btu/hr (550 mm²/kW) of total input rating of all appliances in the confined space. Combustion air to the appliance can be provided from a well ventilated attic or crawl space.

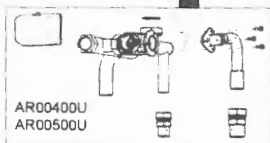
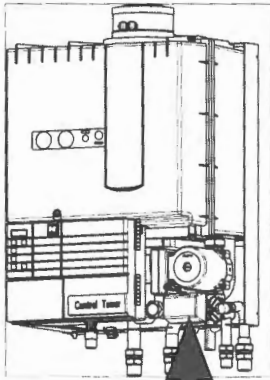


Louvers and grills

figure 25

7 External domestic hot water tanks

WARNING



way valve conversion kit
figure 26

Note the local codes for requirements for connecting an external hot water cylinder to the boiler. The installation must comply to these codes.

Depending on the domestic hot water requirements and comfort preferences various external hot water tanks can be connected to the boiler.

Connecting an external hot water tank to the Q175C is NOT possible.

Connecting an external hot water tank to the Q-Series solo boilers can be done in 2 ways:

1. For Q85S, Q130S, Q175S, Q205S:
Using an optional three-way valve installed in the return line under the boiler between boiler and plumbing kit and directly controlled by the boiler control. For the Q-Series Solo boilers a special internal three-way valve conversion kit is available (fig. 26).
 - **Part.no. 804000013:** For the Q85S and Q130S
 - **Part.no. 804000014:** For the Q175S and Q205S

2. For Q85S, Q130S, Q175S, Q205S :
An external hot water tank connected on the secondary side of the plumbing kit, separately controlled by another device.

The capacity of the boiler must be defined by the installer.

The choice of the tank depends on the coil output.

The coil output of the tank must comply with the boiler output.

For the Q85S or Q130S the minimum coil output must be 85,000 BTU/hr. This to prevent the boiler for short cycling.

The Q175S and the Q205S have limited outputs with the 3 way valve kit. Both boilers are limited to 130,000 BTU/hr for the DHW output when using the 3 way valve kit. Please take this into account when sizing the indirect hot water tank.

For additional information on piping and control of indirect tanks, please see the Rinnai Boiler Applications Manual.

For additional information on the Rinnai 3-way valve indirect tank kit, please see the installation manual for the kit.

Rinnai recommends the use of a thermostatic mixing valve on all indirect tanks used with Q boilers on the domestic hot water side to prevent scalding. This valve will regulate the water temperature leaving the indirect tank.

NOTICE

NOTICE

NOTICE

NOTICE

NOTICE

8 Electrical connections

The electrical connections to the boiler must be made in accordance with all applicable local codes and the latest revision of the National Electrical Code, ANSI/NFPA-70. Installations should also conform with CSA C22.1 Canadian Electrical Code Part 1 if installed in Canada.

Devices such as, outdoor sensor, room thermostat or temperature control, 3-way valve (except Q175CN/Q175CP), temperature sensor or thermostat and an external pump are all connected to the internal connection terminal. The connection terminal is situated in the Control Tower.

Connecting incoming power

Lead the cable through the back part of the boiler using a strain relief and lead the cable through the cable supports to the Control Tower.

Connect a power supply cable to the cable harness terminal strip that connects to both the power switch on the front of the Control Tower and the terminal strip with positions 1,2, and 3 on the inside of the Control Tower.



The boiler must be electrically grounded in accordance with local codes, or in absence of local codes, with the National Electrical Code, ANSI/NFPA 70 and/or the CSA C22.1, Electrical Code.

RISK OF ELECTRIC SHOCK.

Once the main power supply is on then there is 120V on terminals 1 to 12 if the main switch at the front of the Control Tower is switched on.



- No changes may be made to the wiring of the boiler.
- All connections should be designed in accordance with the applicable regulations.



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



- Verify proper operation after operation servicing.