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Rinnai is continually updating and improving products; therefore, drawings and specifications are subject to change without prior notice. Local, state, provincial and federal codes must be adhered to prior to installation.
Training

Before installing the Rinnai Boiler, Rinnai recommends that the installer attend Installation and Service training classes. For further information on boiler programing and settings please contact Rinnai.

Low Limit Switch

When using a boiler and an air handler together it is advisable to use a low limit switch to prevent the air handler fan from energizing before the water temperature has increased sufficiently to ensure warm air delivery. A low limit switch which closes at 130°F to supply power to the fan and then opens again at 120°F to disconnect power from the fan should be selected. The low limit switch should be selected with a minimum amp rating sufficient to safely operate with the air handler. Refer to the table below for air handler model and amp rating information. This will ensure that the air handler will deliver comfortable air temperatures at all times.

If a low limit switch is not used then the air handler may deliver cool air for a period of time until the boiler water temperature achieves its set point. The amount of time the boiler takes to achieve the set point can be changed by altering the gradient curve in the boiler. The gradient curve of the boiler parameter 14 can be adjusted 1°F to 28°F per minute. If the heating system is comprised of multiple types of heat emitters this curve should be left near the factory settings that are selected with parameter 2 for the highest temperature type of heat emitter in the system. Increasing the gradient to the maximum will decrease the overall efficiency of the boiler and the system and lead to shorter run times. When the boiler is being used with a system that has both radiant heat and an air handler it is highly recommend that the gradient not be increased to prevent short cycling of the boiler.

<table>
<thead>
<tr>
<th>Air Handler Model</th>
<th>Low Limit Switch Minimum Rating (Amps)</th>
</tr>
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<tbody>
<tr>
<td>AHB45</td>
<td>7</td>
</tr>
<tr>
<td>AHB60</td>
<td>7</td>
</tr>
<tr>
<td>AHB75</td>
<td>9</td>
</tr>
<tr>
<td>AHB90</td>
<td>12</td>
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</tbody>
</table>

Dirt Trap

A dirt trap is a device that is used in a closed loop hydronic system to separate out small particles of dirt, sand, solder, rust, and any other impurity that may be circulating through the system. The dirt trap removes these particles in much the same manner that air is separated from the system by a micro bubble air separation device. The particles then collects in the bottom of the dirt trap creating no pressure loss. A dirt trap is an improvement over a typical Y strainer because it will collect smaller particles as well as not creating a pressure drop as the particles falls out of solution. A dirt trap can easily be cleaned through the drain on the bottom of the trap. Both Spirotherm and Caleffi make dirt traps in a variety of sizes capable of suiting all systems.
Q and E Series Boiler
Venting Multiple Terminations
Single Row

Minimum spacing between vertical boiler terminations on a flat roof is 24" from the outside edge of the termination to the outside edge of the next termination. For more than four terminations in a given area please contact the engineering department.
Q and E Series Boiler Venting

Minimum spacing between vertical boiler terminations on a flat roof is 24" from the outside edge of the termination to the outside edge of the next termination. For more than four terminations in a given area please contact the engineering department.
Q and E Series Boiler
Venting Multiple Terminations

Min 60”
### Vent Termination Clearances

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<th>For Twin pipe systems or Single pipe (non-direct vent)</th>
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<tr>
<td>A</td>
<td>below gutters, soil pipes or drain pipes</td>
<td>36&quot;</td>
</tr>
<tr>
<td>B</td>
<td>below eaves, balconies, and porches *</td>
<td>36&quot;</td>
</tr>
<tr>
<td>C</td>
<td>from vertical drain pipes and soil pipes</td>
<td>6&quot;</td>
</tr>
<tr>
<td>D</td>
<td>from internal or external corners</td>
<td>12&quot;</td>
</tr>
<tr>
<td>E</td>
<td>from a terminal facing a terminal and from a terminal facing a wall</td>
<td>48&quot;</td>
</tr>
<tr>
<td>F</td>
<td>vertically from a terminal on the same wall</td>
<td>60&quot;</td>
</tr>
<tr>
<td>G</td>
<td>horizontally from a terminal on the same wall</td>
<td>12&quot;</td>
</tr>
<tr>
<td>H</td>
<td>horizontally from a vertical terminal to a wall or parapet</td>
<td>24&quot;</td>
</tr>
</tbody>
</table>

* must be open on a minimum of 2 sides
Boiler PVC Venting

A “T” (3” x 1 ½” x 3”) should be installed to drain condensate in order to maximize the life of the condensate tray in an installation with long runs of PVC venting.

Installation

The T should be installed as close as possible to the boiler to ensure most of the condensate from the venting drains back through it rather than the boiler. The T must be installed on a horizontal section of venting with the 1 ½” leg oriented towards the ground. Follow the drawing on the next page for the best location of the T and how to connect it to the boiler condensate drain. The condensate trap must be a minimum of 4” (see drawing on next page).

The condensation drain pipe should be connected to a drain in the building by means of an open connection (air gap, see drawing). An open connection prevents the possibility of drain gases affecting the boiler.

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.

The exhaust must be pitched a minimum of a 1/4” inch per foot back to the boiler (to allow drainage of condensate).

Contact Rinnai Engineering Department (1-800-621-9419, FAX 678-829-1666) if you have additional questions.

| NOTICE | Before putting the boiler into operation the condensate trap on both the venting and the boiler must be filled. Please refer to the boiler installation manual for information on filling the boiler condensate trap. To fill the PVC venting condensate trap pour water into the trap until it begins to drain out of the trap. If the boiler will be installed in a high temperature installation such as baseboard, fill the condensate trap with mineral oil instead of water. |

| NOTICE | Do not drain the condensation water to the external rain gutter or drain because of the danger of freezing and blockage of the drain. |
A single zone relay should be used with E combi boilers, if the relay is not used the system pump will be activated any time the boiler fires for heat or DHW.
Q boiler
4 Zone Valve with DHW

Note:
100% zone valve systems with DHW should use only the ZVC 406. See wiring diagram for further details (must have secondary end switch for priority).
Q boiler
3 On-Off High Temperature Zones

Note:
See wiring diagram

Note:
A single pole single throw relay is used to create a call for heat on both the boiler and the air handler simultaneously. A low limit switch is used to prevent the fan from starting until the water in the loop has reached a stable temperature. This prevents cold air from being circulated through the building. The low limit switch should be placed on the supply line to the air handler as close to the air handler as possible.
Q boiler
Direct Coupled Radiant System
(Not suggested for use with the Q175C)
Q boiler
Snow Melt System

120V Input

Low Loss Header

Bypass for system flushing only

Supply to Heating System

Return from Heating System

Teknor 800 Series Control

This is not an engineering drawing; it is intended only as a guide and not as a replacement for professional engineering project drawings. This drawing is not intended to describe a complete system. It is up to the contractor or engineer to determine the necessary components and configuration of the particular system to be installed. The drawing does not imply compliance with local building code requirements. It is the responsibility of the engineer or contractor to ensure that the installation is in accordance with local building codes. Contact with local building officials before installation.
Q boiler
Rinnai Air Handler with Low Limit Switch

Note:
A single pole single throw relay is used to create a call for heat on both the boiler and the air handler simultaneously. A low limit switch is used to prevent the fan from starting until the water in the loop has reached a stable temperature. This prevents cold air from being circulated through the building. The low limit switch should be placed on the supply line to the air handler as close to the air handler as possible.

Note:
See wiring diagram
Q boiler
3 Zone Valves using a modulating pump
(Grundfos Alpha)

Note: The use of a modulating pump such as a Grundfos Alpha allows for zone valves to be used with out a differential pressure bypass.
Q boiler
3 Boiler Cascade Install

Optional Probe Type
Low Water Cut Off for
use when required by
local code

Optional Probe Type
Low Water Cut Off for
use when required by
local code

Optional Probe Type
Low Water Cut Off for
use when required by
local code

Optional Manual Reset
High Limit when
required by local code

Optional Manual Reset
High Limit when
required by local code

Optional Manual Reset
High Limit when
required by local code

Low Loss Header

Low Loss Header

Low Loss Header

Bypass for system
Bypass for system
Bypass for system
Bushing only
Bushing only
Bushing only

120V Input

20A N4C controller

Air vent

Air vent

Air vent

Air vent

Pressure gauge

Pressure gauge

Pressure gauge

Manual Fill Valve

Manual Fill Valve

Manual Fill Valve

Air Separator

Dirt Trap

Back Flow Preventer

Air Mixing Valve

Supply to Heating System

Return from Heating System

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as a replacement for professional engineering project drawings. This
drawing is not intended to describe a complete system. It is up to the
contractor or engineer to determine the necessary components and
configuration of the particular system to be installed. The drawing does
not comply with local building code requirements, it is the
responsibility of the engineer or contractor to ensure that the installation is
in accordance with applicable building codes. Contact with local building
officials before installation.

Rinnai

Rinnai America Corporation
151 International Drive
Hayward, CA 94545
-650-612-9419

Q Series Boiler
3 Boiler Install

Fraction max
x,x,x,0.030
x,x,x,0.015
x,x,x,0.005

Endorsement:

QPC-09-002

11/19/09
Q boiler
2 Boiler Cascade with DHW

Note:
See wiring diagram
Rinnai America Corporation
103 International Drive
Peachtree City, GA 30269
1-800-621-9419

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Q Series boilers
2 boilers with DHW indirect tank

Note:
See 2 boiler with DHW indirect tank drawing.

Supply Sensor
Outside Sensor
Bus Controller
Room Therm.
On/Off
Thermostat/zone control

Heating Circulator
120V Relay
TPST
DHW Circulator
Cylinder connection
Three way valve

N
L
Heat Demand From
Thermostat/zone control

120V
Low voltage
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Q Series Boiler
Single Zone Circuit with Priority DHW

DHW Pump Relay

Heating Pump Relay*

Note: See piping diagram Single Zone Priority DHW

*May substitute for multi zone relay
Q boiler
4 Zone Valves with Priority DHW

Note: 100% zone valve systems with DHW should use only the ZVC 406

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Q Series Boiler  
Multiple Zone Circuit with Priority DHW

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Rinnai America Corporation  
103 International Drive  
Peachtree City, GA 30269  
1-800-621-9419

Approved By  
NTS AA  
3/12/10
Rinnai Hydronic Furnace

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Low Limit switch

Note: Rinnai Hydronic Furnaces have a circulator factory installed.

Note:
- Place low limit switch on Heat Wire
- AHB045 – Black Wire
- AHB060 – Black Wire
- AHB075 – Blue Wire
- AHB090 – Blue Wire

Q boiler
- Rinnai Hydronic Furnace on low limit switch

Note:
- See piping diagram
- Q boiler and Air handler on low limit switch

Note:
- Place low limit switch on Heat Wire
- AHB045 – Black Wire
- AHB060 – Black Wire
- AHB075 – Blue Wire
- AHB090 – Blue Wire

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Rinnai Hydronic Furnace

Note:
Rinnai Hydronic Furnaces have a circulator factory installed.

T stat

- Y1, Y2, W, G, O, R, C

Lawn Limit switch

Fan

Low Voltage

120V

High Voltage

Cool H

Heat

Q Series Boiler
3 On-Off High Temperature Zones with Hydronic Furnace on Low limit switch

Note:
See piping diagram
3 On-Off High Temperature Zones

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**Tankless Water Heaters**
- Residential and Commercial Applications
- Continuous Hot Water
- ENERGY STAR® qualified models
- Up to 9.8 GPM
- Internal or External Installation
- Digital Temperature Control

**Direct Vent Furnaces**
- High Efficiency
- Cool-to-the-touch Cabinet
- Vent Terminal A Included
- Blower Included

**Direct-Vent Fireplace, RHFE-750ETRA**
- Up to 83% AFUE Energy Efficiency
- Zero-Clearance Installation
- Available in Four Options of Fronts
- Remotes and Fan Included
- Gas Conversion Kit Available

**Hydronic Air Handler**
- Designed for Use with Rinnai Systems
- Domestic Hot Water Priority
- Optional Programmable Thermostat
- Zero Clearance to Combustibles
- Accommodates Standard Cased-Coils

**Boilers**
- Residential and Commercial Applications
- ENERGY STAR® qualified models
- Up to 96.5% AFUE efficiency
- Compact wall mounted design
- ASME accredited models

**Condensing Tankless Water Heaters**
- Residential and Commercial Applications
- ENERGY STAR® qualified models
- Up to 95% thermal efficiency
- Internal or External Installation
- Pair up with the Rinnai Air Handler for efficient home heating

**Rinnai Impression - Outdoor Fireplace**
- Options include one-sided open, two-sided open, and freestanding.
- No electrical requirements
- Propane or convertible to natural gas with conversion kit provided
- Modular construction offers design flexibility