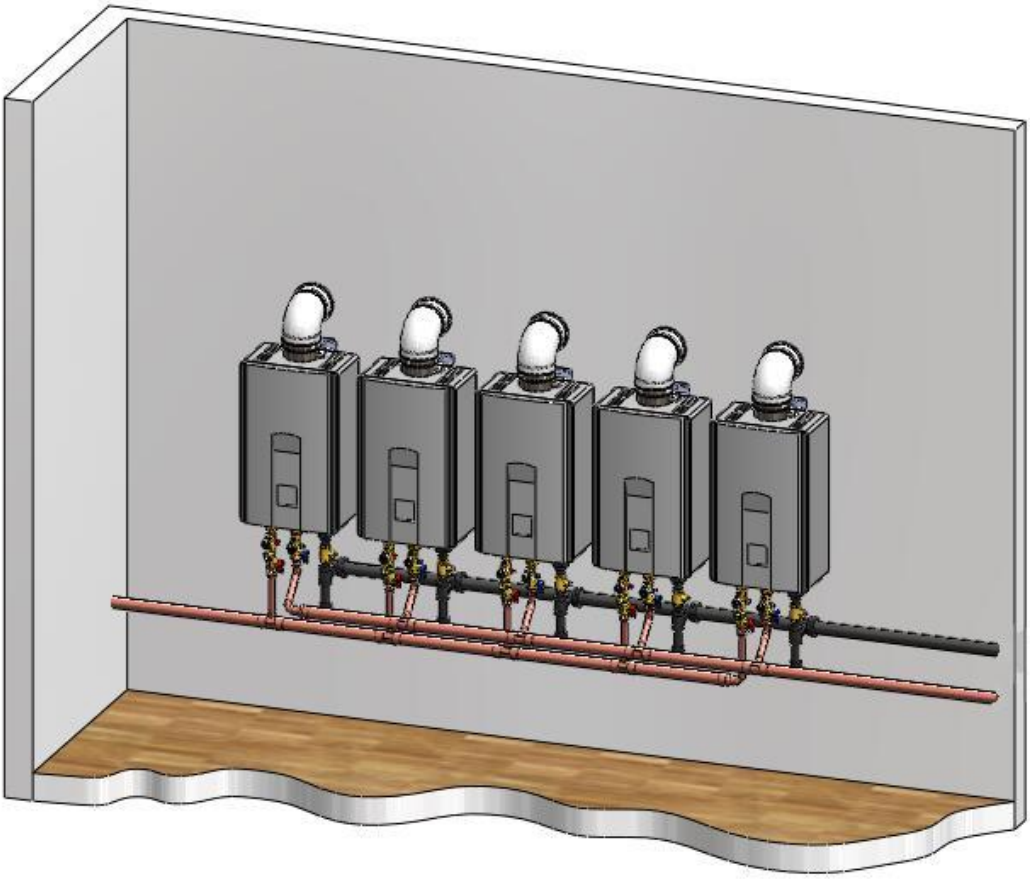
Rinnai®

Hot Water System Design Manual

Plumbing schematics for single and multiple Rinnai tankless water heaters in use with domestic systems, recirculation, and storage tanks.



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Certifications

Indoor Water Heaters

Trade Name	CSA Listing
V53i, RV53i	*REU-VB2020FFU-US-(N, P) ✶*
R50LSi	*REU-VA2019FFUD-US-(N, P) * ✶*
R75LSi, RL75i	*REU-VB2528FFUD-US-(N, P) * ✶*
R75LSi	*REU-VA2528FFUD(A)-UC-(N, P) * ✶*
R75LSi	*REU-VA2528FFUD(A)-US-(N, P) **
R75LSi	*REU-VA2528FFUD-US-(N, P) **
R94LSi, RL94i	*REU-VB2735FFUD-US-(N, P) * ✶*
R94LSi	*REU-VA2535FFUD-UC-(N, P)* ✶*
R94LSi	*REU-VA2535FFUD-US-(N, P)**
R98LSi	*REU-VA3237FFU-US-(N, P) **
R98LSiASME	*REU-VA3237FFU-ASME-(N, P) **
R53i	*REU-V2520FFU-US-(N, P)*
C53i	*REU-V2520FFUC-US-(N, P) **
R53i	*REU-V2520FFUD-US-(N, P)*
C53i	*REU-V2520FFUCD-US-(N, P) **
R85i	*REU-V2532FFU-US-(N, P)*
C85i	*REU-V2532FFUC-US-(N, P) **
R85iPLUS	*REU-V2532FFUD-US-(N, P)*
C85iPLUS	*REU-V2532FFUCD-US-(N, P) **
R98i	*REU-V3237FFU-US-(N, P)*
C98i	*REU-V3237FFUC-US-(N, P) **
R98iASME	*REU-V3237FFU-ASME-(N, P)*
C98iASME	*REU-V3237FFUC-ASME-(N, P) **
RC80HPi, RC80i	*REU-KA2530FFUD-US-(N, P)* ✶*
RC98HPi, RC98i	*REU-KA3237FFUD-US-(N, P)* ✶*

Outdoor Water Heaters

Trade Name	CSA Listing
V53e, RV53e	*REU-VAM1620W-US-(N, P) ✶*
R63LSe	*REU-VA2024WD-US-(N, P) **
R63LSe2	*REU-VA2024WD(A)-UC-(N, P) * ✶*
R75LSe, RL75e	*REU-VB2528WD-US-(N, P) * ✶*
R75LSe	*REU-VA2528WD(A)-UC-(N, P) * ✶*
R75LSe	*REU-VA2528WD(A)-US-(N, P) **
R75LSe	*REU-VA2528WD-US-(N, P) **
R94LSe, RL94e	*REU-VB2735WD-US-(N, P) * ✶*
R94LSe	*REU-VA2535WD-UC-(N, P) * ✶*
R94LSe	*REU-VA2535WD-US-(N, P) **
R98LSe	*REU-VA3237W-US-(N, P) **
R98LSeASME	*REU-VA3237W-ASME-(N, P) **
R42e	*REU-V1616W-US-(N, P)*
C42e	*REU-V1616WC-US-(N, P) **
R53e	*REU-V2020W-US-(N, P)*
C53e	*REU-V2020WC-US-(N, P) **
R70e	*REU-V2526W-US-(N, P)*
R85e	*REU-V2532W-US-(N, P)*
C85e	*REU-V2532WC-US-(N, P) **
R85ePLUS	*REU-V2532WD-US-(N, P)*
C85ePLUS	*REU-V2532WCD-US-(N, P) **
R98e	*REU-V3237W-US-(N, P)*
C98e	*REU-V3237WC-US-(N, P) **
R98eASME	*REU-V3237W-ASME-(N, P)*
C98eASME	*REU-V3237WC-ASME-(N, P) **
RC80HPe, RC80e	*REU-KA2530WD-US-(N, P)* ✶*
RC98HPe, RC98e	*REU-KA3237WD-US-(N, P)* ✶*

* authorized for commercial use
✶ Energy Star Qualified

The models listed above have received the following certifications except where noted:

Certified to applicable U.S. standards for appliances using gas or other petroleum fuel.

Certified to applicable Canadian standards for appliances using gas or other petroleum fuel.

Certified by the Uniform Plumbing Code (UPC)

Certified by National Sanitation Foundation (NSF), www.nsf.org

(indoor models must use the NSF approved top guard)

REU-VAM1620W is not NSF approved

Energy efficiency certified by Gas Appliance Manufacturers Association (GAMA), www.ahrinet.org

Meets the California Energy Commission (CEC) standards

Meets California and Texas NOX emission rules

Approved by the Commonwealth of Massachusetts

Approved for installations in New York City

Energy Star Qualified (models indicated with ✶)

Certifications

R98LSiASME	*R98iASME*	*R98eASME*
R98LSeASME	*C98iASME*	*C98eASME*

These models are built in accordance with the requirements of the ASME Boiler and Pressure Vessel Code and received the Certificate of Authorization from the National Board. The heat exchanger has the NB and the HLW stamps.

Rinnai Accessories

Multiple Unit Connections (refer to model applicability)

MSB Controller: The MSB kits can electronically connect up to 25 water heaters and allows them to function as one hot water source. For use with Rinnai Tankless Water Heaters (except for models V53e, V53i, and R63LSe which must use pressure activation valves, PVA). Refer to the information in the next section for components.

EZConnect™ : The EZConnect™ cable is an optional accessory that electronically connects 2 water heaters and allows them to function as one hot water source.

PVA Valves: Pressure activated valves that allow each water heater (max 5) to turn on as necessary to meet the demand for hot water. A PVA valve is also useful when dedicating one Rinnai in a multiple Rinnai system for hot water circulation. The PVA valve will allow flow from the cold water supply to the dedicated unit when a differential pressure is exerted on the PVA valve due to domestic demand.

Guidelines for multiple unit connections:

- Do not install both the EZConnect™ and the MSA/MSB packs because they are not designed to operate together.
- Water heaters connected with the EZConnect™ Cable or the MSA/MSB packs cannot be used for the bathfill function.
- Temperature settings can only be changed on the controller for the primary unit.
- Do not use the EZConnect™ or MSA/MSB packs with storage tank applications.

Rinnai Installation Kits - Valve kits provide isolation valves (for hot and cold lines) and a pressure relief valve. Models RV53e, RV53i, RL75i/e, RL94i/e, RC80i/e, and RC98i/e include isolation valves and a pressure relief valve.

WRIK-LF-F	Valve kit (for models rated below 200,000 Btuh), Lead Free, 3/4" - E2 version, FNPT X FNPT, (threaded)
WRIK-LF-32F	Valve kit (for models rated above 200,000 Btuh**),** Lead Free, 3/4" - E2 version, FNPT X FNPT, (threaded)
104000059	Freeze Protection Solenoid Valve Kit

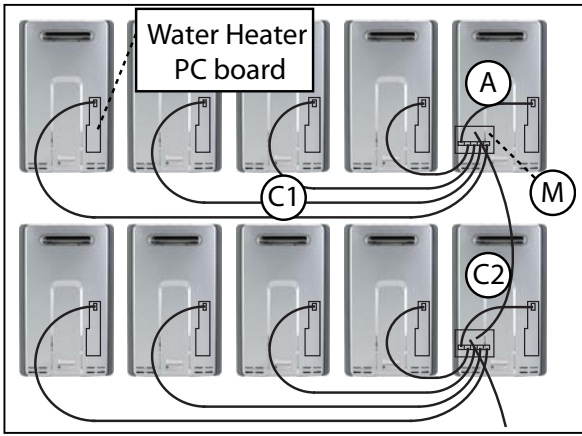
Remote Controllers: MC-91-1US - Controller included with the unit except for the V53e and V53i.
MCC-91-1US - For commercial and hydronic applications allowing temperatures above 140º F.
MC-100V-1US - Deluxe controller
BC-100V-1US - Bathroom controller

Recess Boxes: Recesses unit into the wall, protecting and hiding the unit from view

Pipe Covers: For security, weather protection, and finished look

Rinnai is continually updating and introducing new products and accessories. For the latest information, contact Rinnai at 1-800-621-9419, FAX: 1-888-474-6624, or www.rinnai.us.

MSB Kits for Connecting Multiple Water Heaters



Each bank is controlled by an MSB-M control board. These boards are connected to each other with MSB-C2 cables. One MSB-M is the controlling or master MSB-M for the entire system.

- (M) MSB-M control board
- (A) Connector cable A (part of MSB-M kit; replace with MSB-C3 cables for V Series)
- (C1) MSB-C1 cable for connecting water heaters within a banked system (up to 5), (use MSB-C3 cables for V Series)
- (C2) MSB-C2 cable for connecting MSB-M control boards (up to 5)

		Number of Kits Required			
No. of water heaters	**No. of water heaters for each bank**	**MSB-M**	**MSB-C1 See note ***	**MSB-C2**	**MSB-C3 See note ***
2**	2	1	NA	NA	1
3	3	1	1	NA	2
4	4	1	2	NA	3
5	5	1	3	NA	4
6	3/3	2	2	1	4
7	4/3	2	3	1	5
8	4/4	2	4	1	6
9	5/4	2	5	1	7
10	5/5	2	6	1	8
11	4/4/3	3	5	2	8
12	4/4/4	3	6	2	9
13	5/4/4	3	7	2	10
14	5/5/4	3	8	2	11
15	5/5/5	3	9	2	12
16	4/4/4/4	4	8	3	12
17	5/4/4/4	4	9	3	13
18	5/5/4/4	4	10	3	14
19	5/5/5/4	4	11	3	15
20	5/5/5/5	4	12	3	16
21	5/4/4/4/4	5	11	4	16
22	5/5/4/4/4	5	12	4	17
23	5/5/5/4/4	5	13	4	18
24	5/5/5/5/4	5	14	4	19
25	5/5/5/5/5	5	15	4	20

MSB Kits - Parts Needed

Use the table to determine the type and number of kits necessary for your system.

Up to 5 water heaters can be connected together using the MSB-M and MSB-C1 kits. When over 5 water heaters are connected together, MSB-M control boards are connected using MSB-C2 kits.

If multiple MSB-M control boards are used, then at least three water heaters should be connected to each MSB-M. Example: With 7 water heaters, one MSB-M should control 4 water heaters and the other MSB-M should control 3 water heaters.

Detailed installation instructions are provided with each of the kits.

* VA, VB, and KA (Condensing) models use the MSB-M, MSB-C1, and MSB-C2 cables

V Series models use the MSB-M, MSB-C2, and MSB-C3 cables. V Series models must use the MSB-C3 cables instead of the MSB-C1 cables and the Cable A in the MSB-M.

** The Rinnai EZConnect™ is less expensive and is specifically designed for connecting 2 water heaters. Applicable models are VA, VB, KA, and V3237.

Model Applicability (Accessories)

Outdoor

Model	Recess Boxes	Pipe Covers	Electronic Connection	Remote Controllers
V53e, RV53e	RGB-20-U	PC-20-W *(white)*	[6]	[1]
R63LSe2		PCD01-SM2 (*silver)*	EZConnect™ [5], MSA-2, MSB	[2]
R75LSe, RL75e, R94LSe, RL94e	RGB-25-U or RGB-25U-MSAL *(with moisture seal flange)*	PCD03-SM2 (*silver)*		[2]
R98LSe, R98LSeASME	RGB-32	PC-32-W *(white)* PC-32-G *(gray)*		[2]
RC80HPe, RC80e, RC98HPe, RC98e	RGB-CTWH	PCD07		[2]

Indoor

Model	Venting Type	Integrated Condensate Collector	Electronic Connection	Remote Controllers
V53i, RV53i R50LSi R75LSi, RL75i, R94LSi, RL94i	Concentric 3” / 5” [4]	YES	EZConnect™ [5], MSA-2, MSB	[2]
R98LSi, R98LSiASME	4” for intake and 4” for exhaust [4]	NO [3]		[2]
RC80HPi, RC80i, RC98HPi, RC98i	Concentric 3” / 5” [4]	YES		[2]

Notes

[1] MC-91, MC-100, BC-100

[2] MC-91, MC-100, BC-100, MCC-91

[3] The Condensate Collector vent piece and the Condensate Trap (224050) for trapping and draining condensate may be required depending on your installation. Refer to the Operation and Installation Manual.

[4] Refer to the Operation and Installation Manual

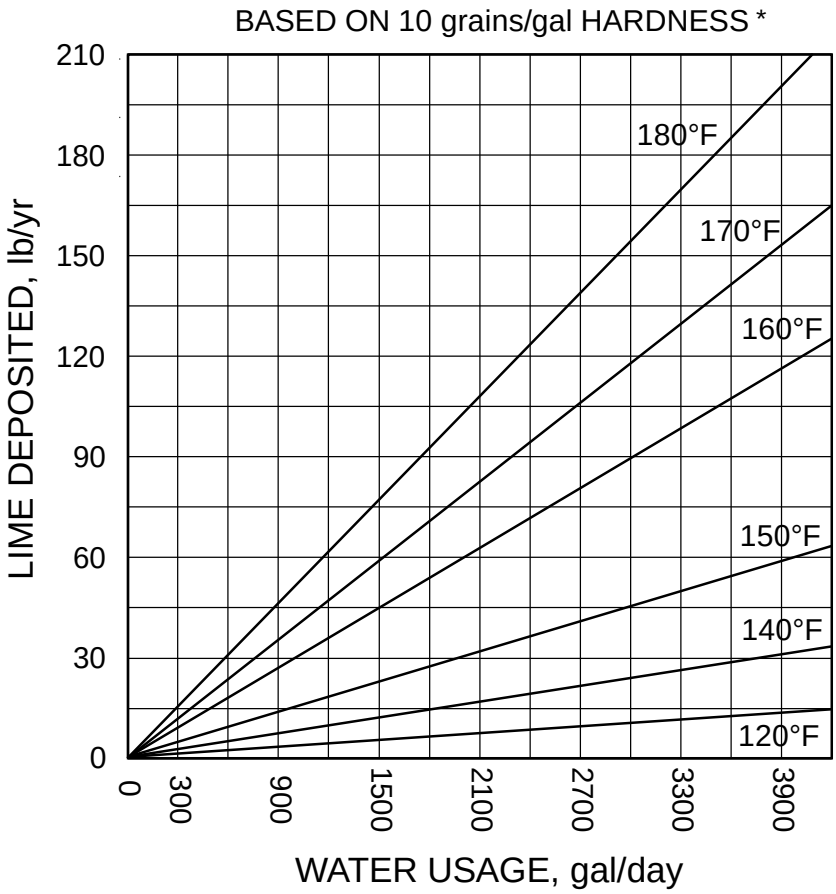
[5] The EZConnect™ will connect a maximum of 2 water heaters.

[6] Electronic connection is not available for this model. Connection can be made using pressure activating Rinnai PVA valves.

Water Quality and Scale

A complete water analysis and an understanding of system requirements are needed to protect the Rinnai tankless water heaters and water heating systems from scale. Water analysis shows whether water is hard or soft. Hard water, unless treated, will cause scaling or liming of the Rinnai heat exchanger.

The rate of scaling increases with temperature and usage because calcium carbonate and other scaling compounds lose solubility (fall out of solution) at higher temperatures. For example, for every 20°F over 140°F, the rate of scale increases by a factor of 2 (See figure below). Reference target water quality levels below and treat the water if these levels are exceeded.



* Source 2003 ASHRAE Handbook HVAC Applications

Consideration of care for your water heater should include evaluation of water quality.

Water that contains chemicals exceeding the levels shown in the table affect and damage the heat exchanger. Replacement of the heat exchanger due to water quality damage is not covered by the warranty.

If you live in an area that is known to have hard water or that causes scale build-up you must treat your water and/or flush the heat exchanger regularly.

When scale build-up in the heat exchanger begins to affect the performance of the water heater, a diagnostic code “LC” will display. Flush the heat exchanger to prevent damage to it. Scale build up is caused by hard water set at a high temperature.

	Maximum Level
Total Hardness	Up to 200 mg / L
Aluminum *	Up to 0.2 mg / L
Chlorides *	Up to 250 mg / L
Copper *	Up to 1.0 mg / L
Iron *	Up to 0.3 mg / L
Manganese *	Up to 0.05 mg / L
pH *	6.5 to 8.5
TDS (Total Dissolved Solids) *	Up to 500 mg / L
Zinc *	Up to 5 mg / L

* Source: Part 143 National Secondary Drinking Water Regulations

Pump Sizing for Circulation

1. Use the chart below or one appropriate for your conditions to determine the heat loss in the length of the hot water supply and return piping. For example, 100 ft of 1-1/2 in bare copper tubing results in a heat loss of 5300 Btu/h.

Approximate Heat Loss from Piping at 140 ºF Inlet, 70 ºF Ambient *

Nominal Size, in.	Bare Copper Tubing, Btu/h-ft	1/2 in. Glass Fiber Insulated Copper Tubing, Btu/h-ft
3/4	30	17.7
1	38	20.3
1-1/4	45	23.4
1-1/2	53	25.4
2	66	29.6
2-1/2	80	33.8
3	94	39.5
4	120	48.4

* Source: 2011 ASHRAE Handbook HVAC Applications

2. Determine the acceptable temperature drop at the last fixture in the loop. For example, if the supply temperature from the water heater is 120 ºF (49 ºC) and an acceptable temperature at the last fixture is 100 ºF (38 ºC) then the acceptable temperature drop is 20 ºF (7 ºC).
3. Calculate the required pump flow rate using the following formula:

$$\text{FLOW RATE (gpm)} = \frac{\text{HEAT LOSS (BTU / h)}}{500 \times \text{ACCEPTABLE TEMPERATURE DROP (ºF)}}$$

4. Based on the above calculations select a pump for the type of circulation system you will be utilizing:

   A). Optional Method (reference drawing WH1-RGE) - Reference pump manufacturers flow vs. pressure specifications to select a pump that can provide the flow rate calculated above while overcoming the pressure loss through:

   - Tank water heater (reference manufacturer's information)
   - All building supply and return plumbing in the circulation loop (reference local plumbing codes, standards, or practices)

   B). Preferred Method (WH1-CD-O, WH1-CD) - Reference pump manufacturers flow vs. pressure specifications to select a pump that can provide 3 gpm of flow or the flow rate calculated above, whichever is greater, while overcoming the pressure loss through:

   - Rinnai tankless water heater (reference flow vs. pressure curve of the Rinnai model being used)
   - Optional storage tank (reference manufacturer's information)
   - All building supply and return plumbing in the circulation loop (reference local plumbing codes, standards, or practices)

NOTE: Only use pumps of brass, bronze, or stainless steel construction. Do not use pumps of iron construction as they will oxidize and clog the inlet filter on the appliance. The pump should be controlled by an aquastat, timer, or combination of the two. A demand control (motion sensor, push button, or door contact) may also be used.

Tank Water Heaters in a Circulation Loop

The following applies when using a tank water heater (gas or electric) to provide heat for a circulation loop. Drawing WH1-RGE is an example.

The heat ***output*** of the tank must be equal to or greater than the calculated circulation loop heat loss.

(Reference page 7, Step 1 on calculating heat loss).

Electric Tank Water Heater

Since the input and output are the same for an electric tank water heater, this can be expressed as:

$$\text{Electric Tank Input (Kw)} \geq \frac{\text{Circulation loop heat loss (Btuh)}}{3413}$$

(1 Kilowatt = 3,413 BTU)

Gas Tank Water Heater

When using a gas style water heater, the efficiency of the tank must be taken into account.

Available Btuh output = (Btu input of tank) x (efficiency) $\geq$ Circulation loop heat loss (Btuh)

Example:

30,000 Btuh input gas tank
0.62 EF

30,000 x .62 = 18,600 available Btuh output

Additional Guidelines

Rinnai water heaters not recovering a storage tank: In applications involving a commercial dishwasher, a hot water circulation loop feeding the dishwasher is required.

Rinnai water heater recovering a storage tank: In applications involving a commercial dishwasher, a hot water circulation loop feeding the dishwasher may be required depending on the distance between the dishwasher and the storage tank. Refer to local codes when determining the need for circulation loops to dishwashers.

When using a Rinnai product as the heat source for a circulation loop, the piping systems should be designed with a hot water circulation loop having a minimum circulating flow rate of 3 gpm. You must also review pressure drop curves for the Rinnai when sizing circulators.

Rinnai water heaters cannot be used in applications requiring 180º-195º F water at a DISHWASHER, unless a booster heater capable of producing 180º-195º F water is provided at the dishwasher. The Rinnai water heater is not to be used as a booster water heater in these applications.

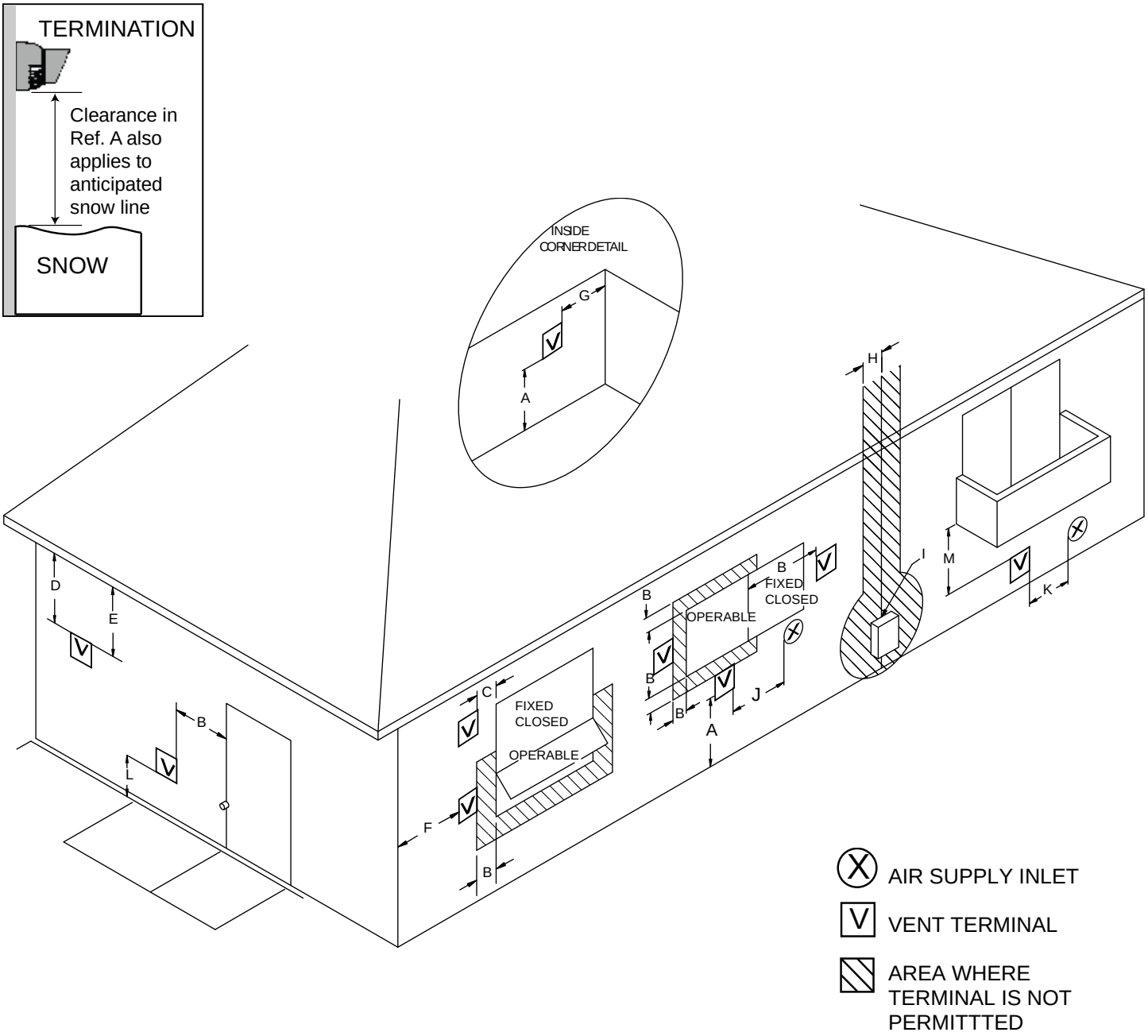
For beauty salon applications, a hot water circulation loop feeding the head wash stations is highly recommended. This provides instant hot water to the head wash stations and reduces the possibility of cold bursts at the stations. (Refer to the piping schematics in this manual.) Insulation of circulation piping is also recommended for heat retention.

Exhaust gases from beauty salon applications and fume hoods of commercial dish washers with chemical sanitizers can be highly corrosive and may cause premature failure of water heater components. Care must be taken to ensure that the water heater and vent termination are installed away from that area. An uncontaminated supply of combustible air must be maintained for optimum performance of the water heater.

If the intended installation is located in hard water area, a softener or similar water treatment system must be used. Always remember to perform routine maintenance.

For any applications requiring temperatures above 140º F, an MCC-91 temperature controller must be purchased separately.

Vent Termination Clearances



Vent Termination Clearances

Ref	Description	Canadian Installations	US Installations
A	Clearance above grade, veranda, porch, deck, or balcony	12 inches (30 cm)	12 inches (30 cm)
B	Clearance to window or door that may be opened	36 inches (91 cm)	12 inches (30 cm)
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	36 inches (91 cm)	12 inches (30 cm)
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
L	Clearance above paved sidewalk or paved driveway located on public property	7 feet (2.13 m) ①	*
M	Clearance under veranda, porch, deck, or balcony	12 inches (30 cm) ②	*

NOTE: An outdoor water heater with integral vent and intake is functionally similar to a direct vent product in that the combustion air is drawn from the outside and the flue products are vented to the outside. These clearances apply to indoor and outdoor water heaters.

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.

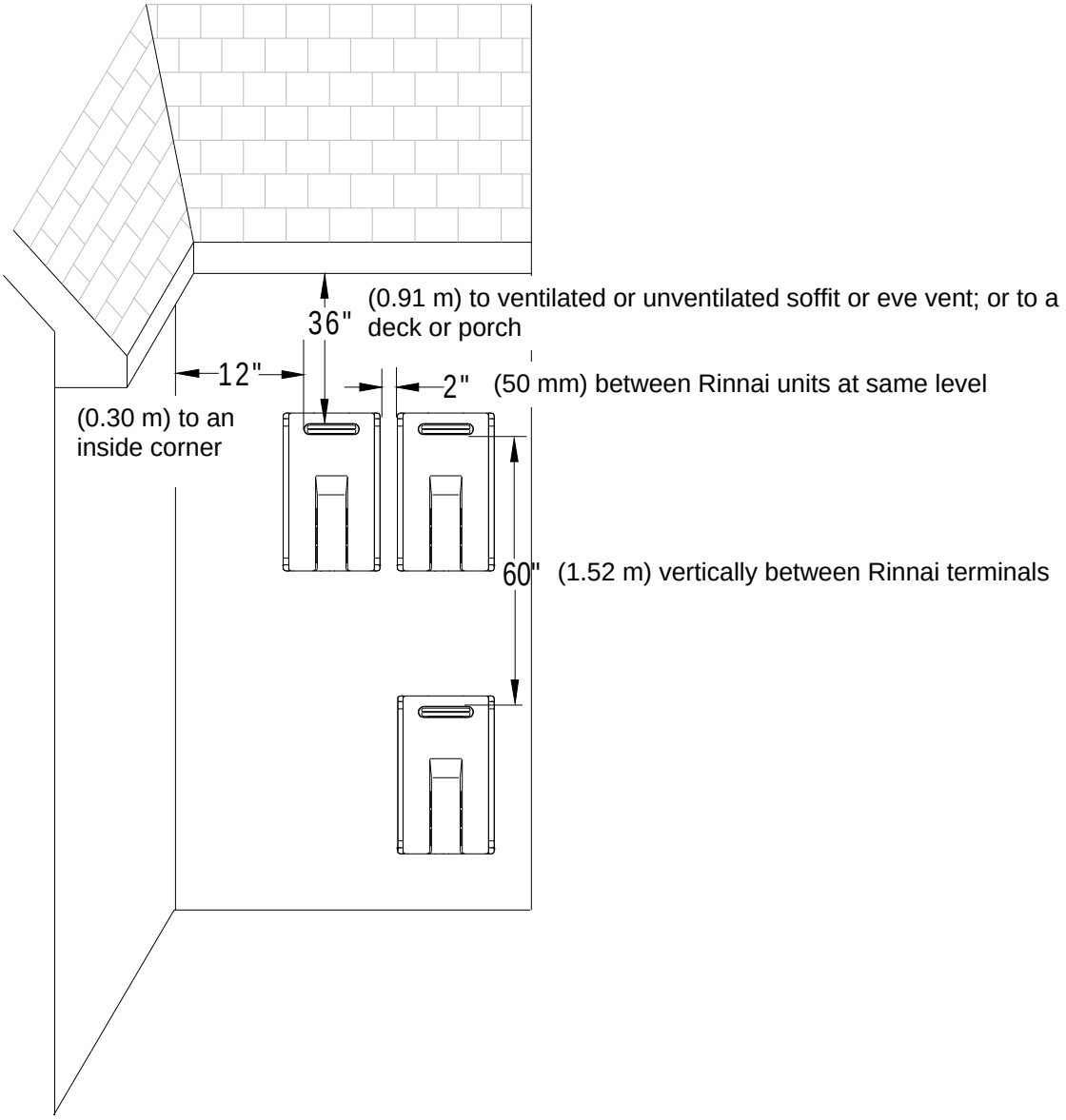
Additional Clearances

These clearances are to supplement the clearances specified in ANSI Z223.1 which are currently in the FFU (indoor) and W (outdoor) manuals. They apply to all water heater models. Local codes supersede these recommendations.

General Recommendations

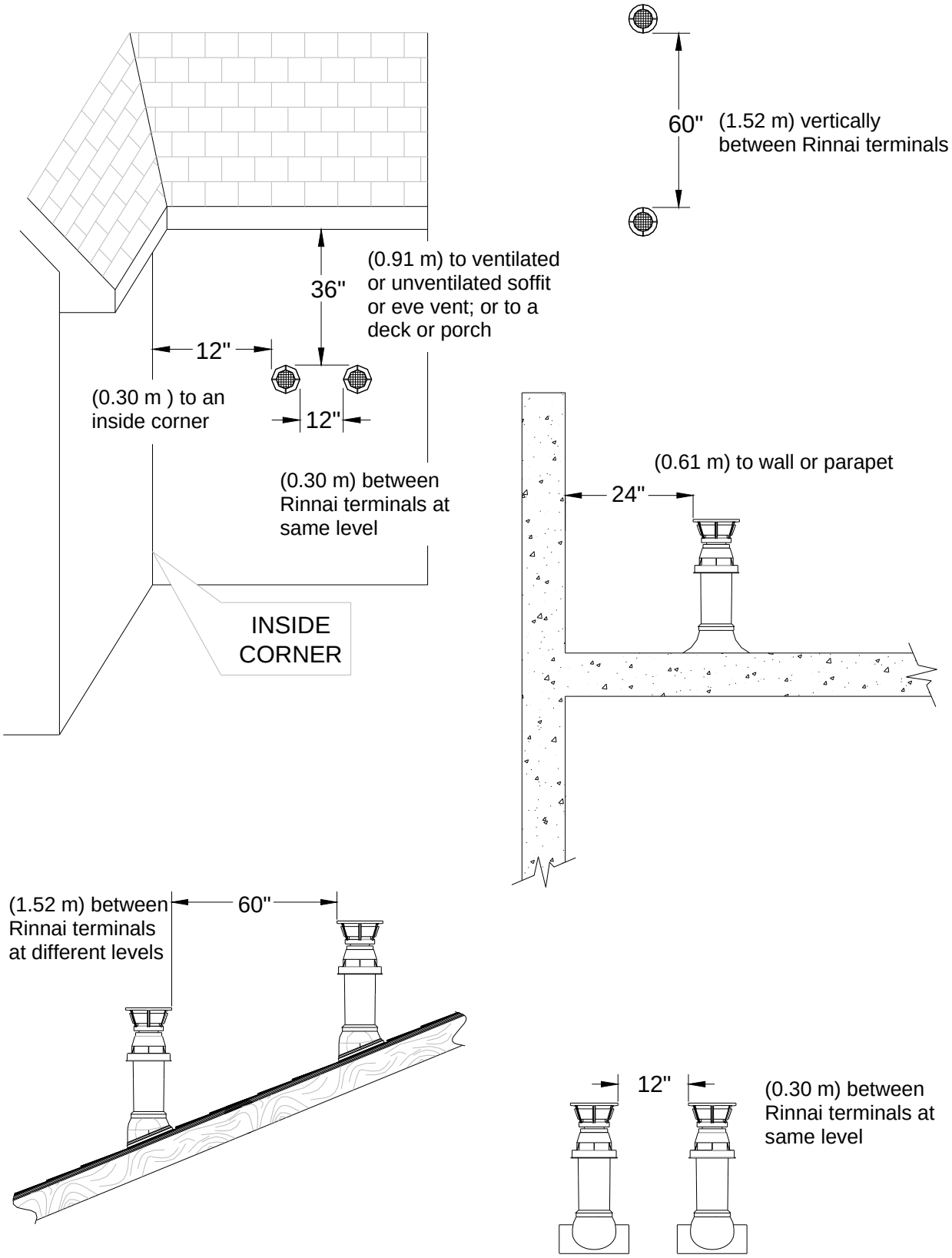
- Avoid termination locations near a dryer vent. (See TB-46 for more information.)
- Avoid termination locations near commercial cooking exhaust.

W (Outdoor) Models



Additional Clearances

Termination of FFU (Indoor) Models



Pump Sizing for Storage Tank Application

The following applies when using Rinnai tankless water heaters to recover a storage tank. Drawing WH1-BC is an example.

Rinnai Tankless water heaters have a pressure loss which must be considered in the system design. Reference the pressure loss curve for the Rinnai model being used to determine the pump size for the desired recovery rate.

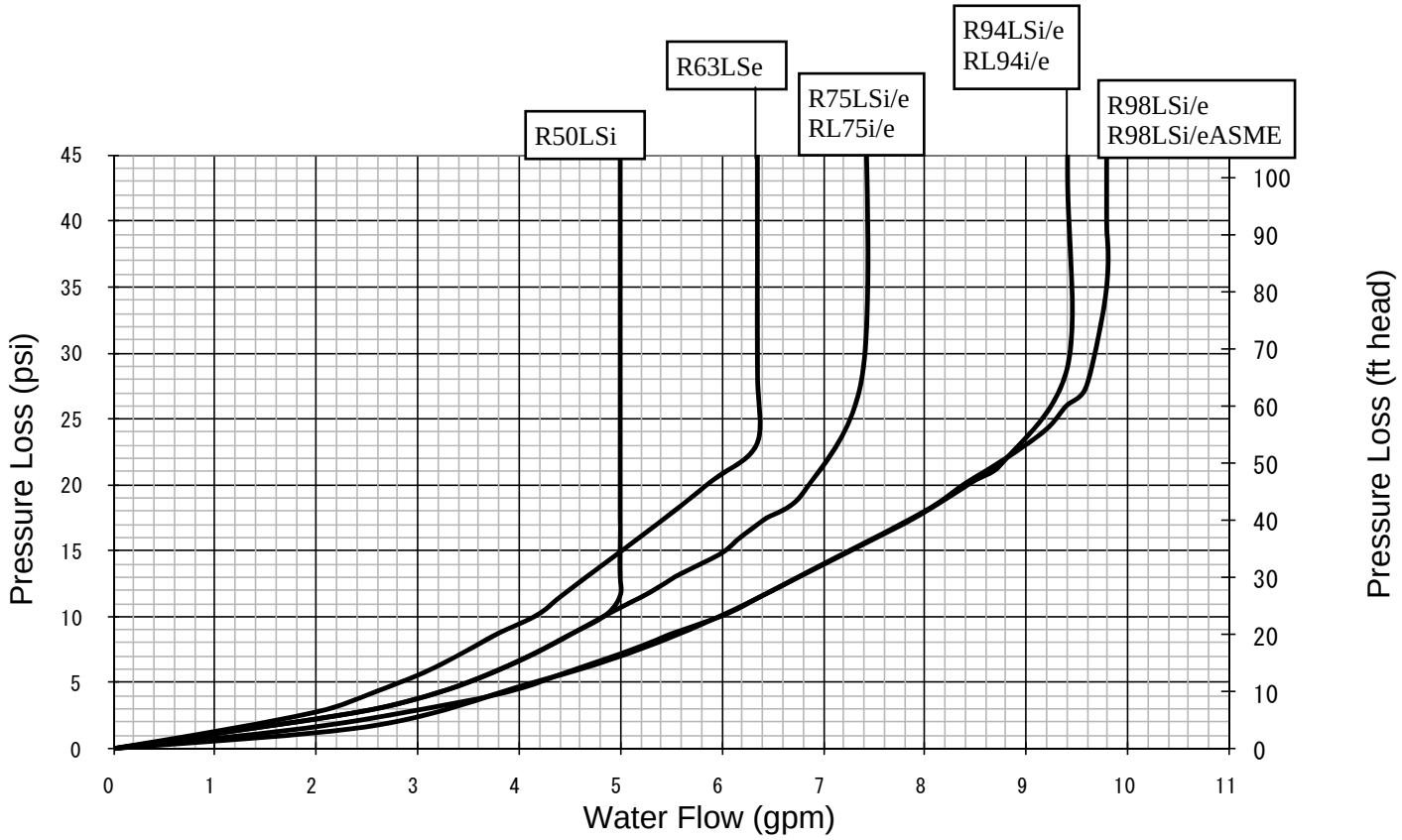
For recommended pump sizes use the table below. Additional pressure losses in plumbing between the Rinnai(s) and the storage tank must also be taken into consideration.

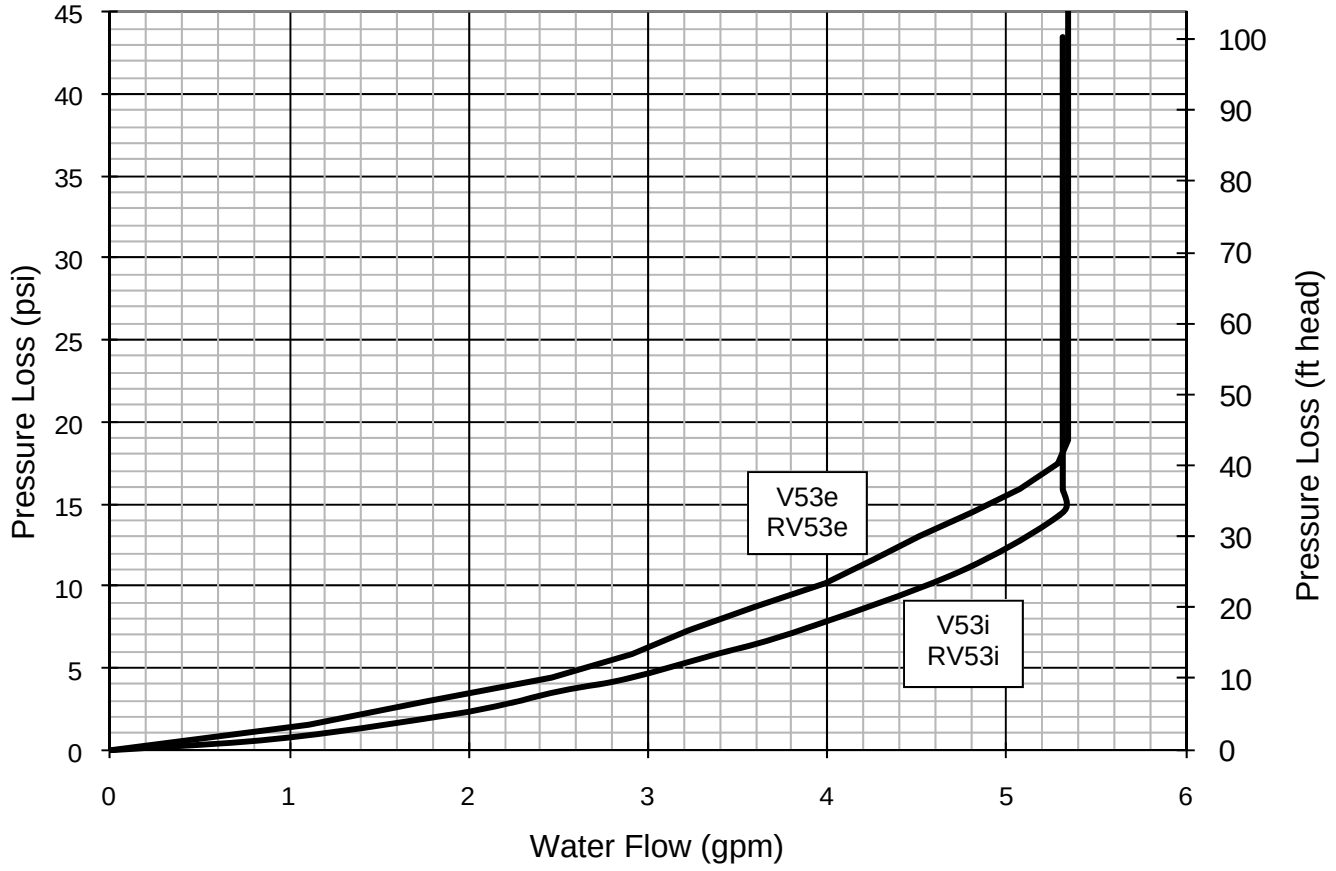
The specified pump size is to provide maximum recovery of the storage tank. A smaller pump size may be used, but could result in longer recovery time of the tank. Please contact the engineering department with any questions on pump sizing.

NOTE: Only use pumps of brass, bronze, or stainless steel construction. Do not use pumps of iron construction as they will oxidize and clog the inlet filter on the appliance.

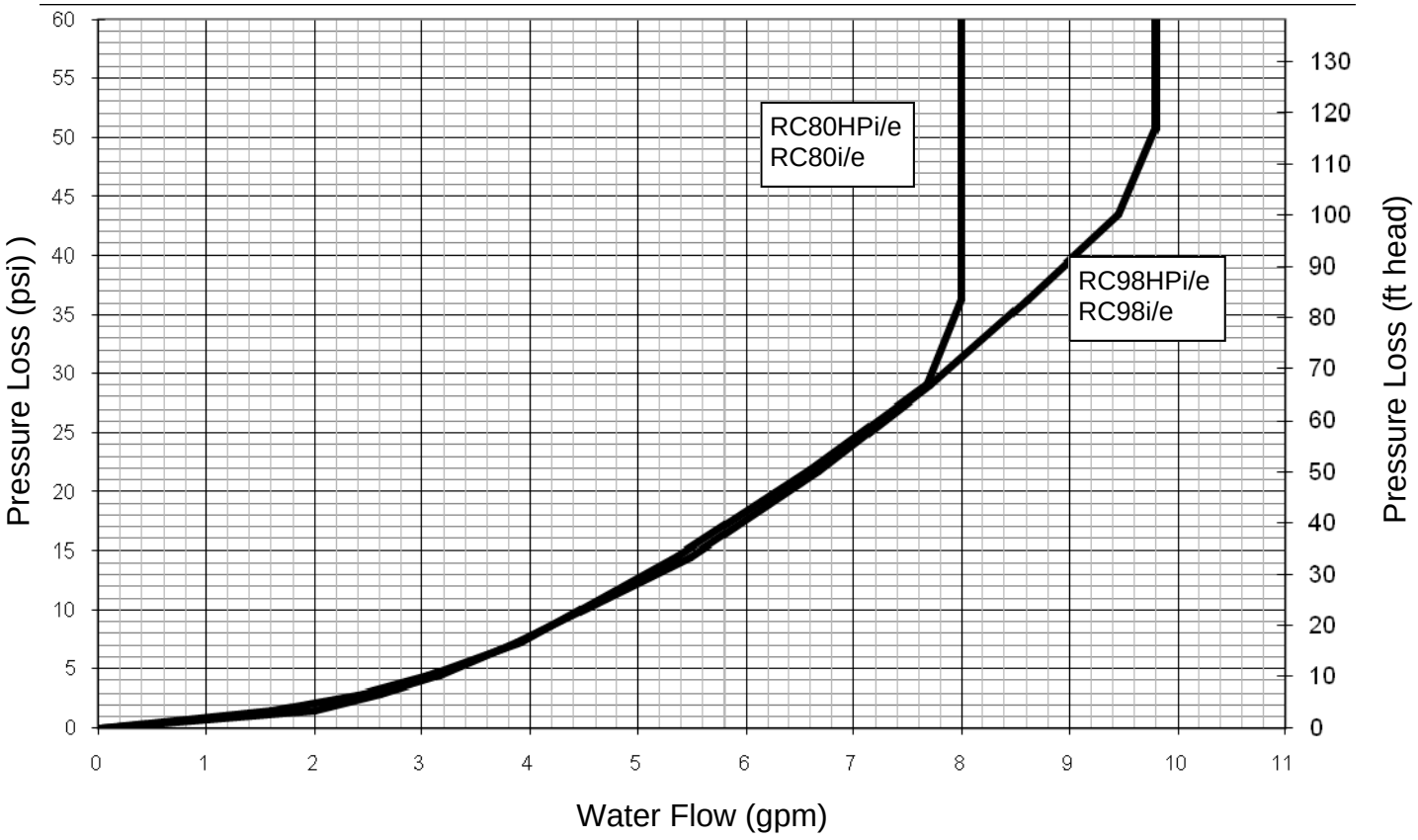
Pump Flow Requirements			
Number of Rinnai Water Heaters	**R94LSi/e, RL94i/e R98LSi/e(ASME) RC80HPi/e, RC80i/e RC98HPi/e, RC98i/e**	**R/C53i(PLUS) R70e R75LSi/e, RL75i/e**	**V53e, RV53e V53i, RV53i R50LSi R63LSe2**
1	6 gpm @ 30' head	5 gpm @ 25' head	4 gpm @ 25' head
2	12 gpm @ 30' head	10 gpm @ 25' head	8 gpm @ 25' head
3	18 gpm @ 30' head	15 gpm @ 25' head	12 gpm @ 25' head
4	24 gpm @ 30' head	20 gpm @ 25' head	16 gpm @ 25' head
5	30 gpm @ 30' head	25 gpm @ 25' head	20 gpm @ 25' head
6	36 gpm @ 30' head	30 gpm @ 25' head	24 gpm @ 25' head
7	42 gpm @ 30' head	35 gpm @ 25' head	28 gpm @ 25' head
8	48 gpm @ 30' head	40 gpm @ 25' head	32 gpm @ 25' head
9	54 gpm @ 30' head	45 gpm @ 25' head	36 gpm @ 25' head
10	60 gpm @ 30' head	50 gpm @ 25' head	40 gpm @ 25' head
11	66 gpm @ 30' head	55 gpm @ 25' head	44 gpm @ 25' head
12	72 gpm @ 30' head	60 gpm @ 25' head	48 gpm @ 25' head
13	78 gpm @ 30' head	65 gpm @ 25' head	52 gpm @ 25' head
14	84 gpm @ 30' head	70 gpm @ 25' head	56 gpm @ 25' head
15	90 gpm @ 30' head	75 gpm @ 25' head	60 gpm @ 25' head

Pressure Loss Curves - Non Condensing Models





Pressure Loss Curves - Condensing Models



Condensing Tankless
Single Unit

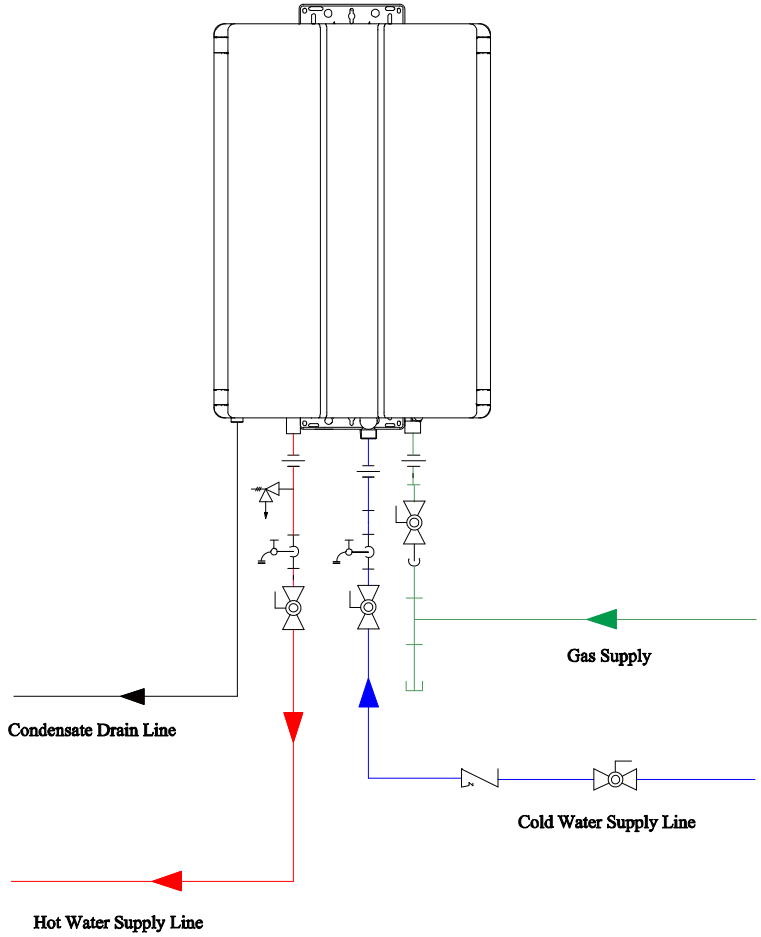
Note:

Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed of according to local codes.



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Rinnai

Condensing Tankless
Single Unit

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH1	D

DATE 03/02/11 SHEET 1 of 1

Condensing Tankless
Two Units

Note:

Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

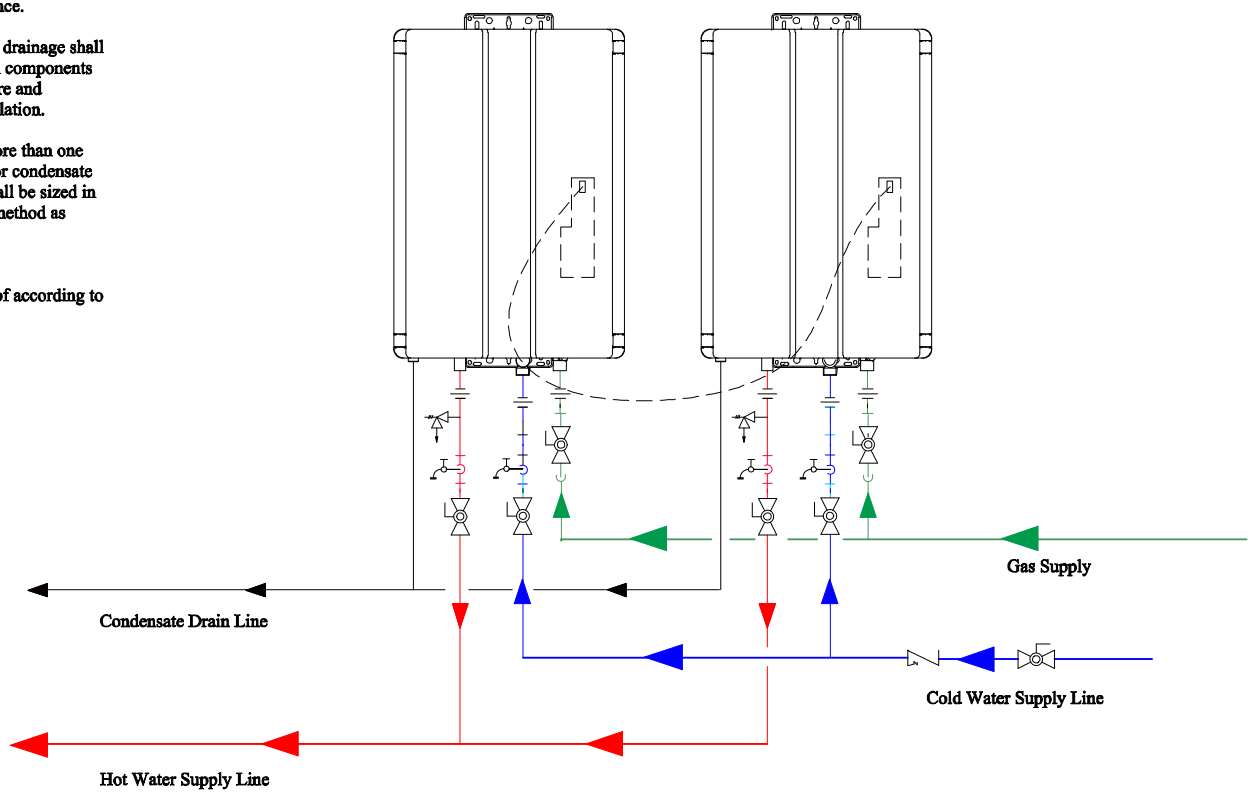
Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated
by local codes.

Condensate must be disposed of according to local codes.

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	2
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai
Condensing Tankless
Two Units

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH2	D
DATE 03/02/11		SHEET 1 of 1	

Condensing Tankless
Three Units

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	3
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details

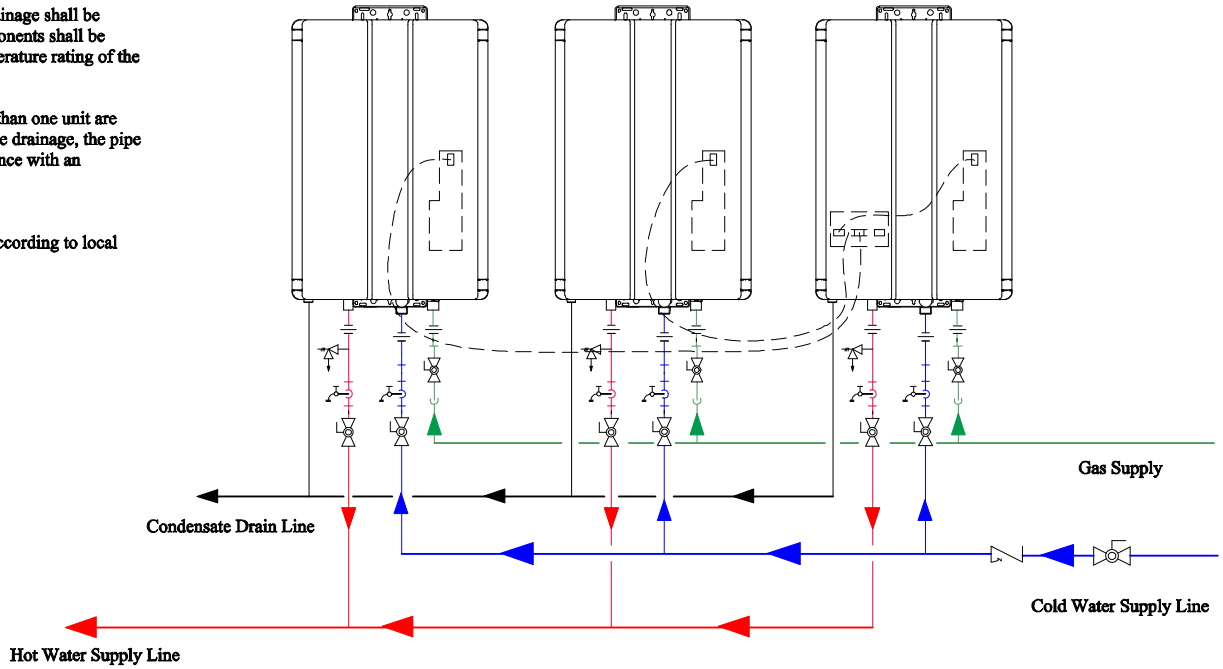
Note:

Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed of according to local codes.



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Rinnai
Condensing Tankless
Three Units

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH3	D
DATE 03/02/11		SHEET 1 of 1	

Condensing Tankless
Six Units

Note:

Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

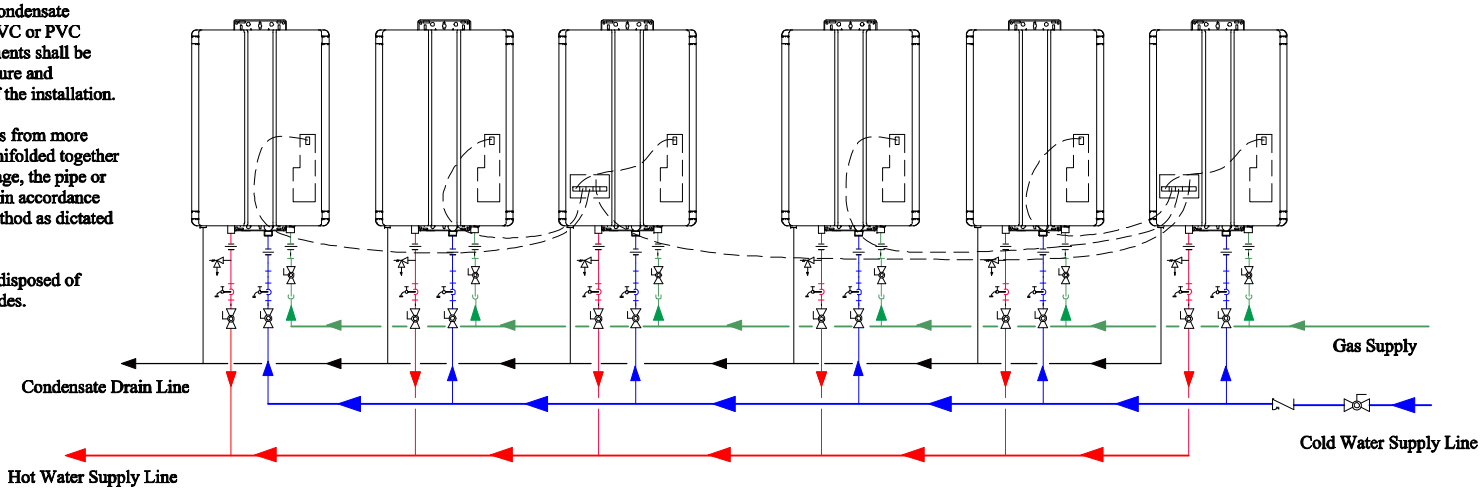
Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed of according to local codes.

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	6
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Condensing Tankless
Six Units

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH6	D

DATE 03/02/11 | SHEET 1 of 1

Condensing Tankless
Single Unit Circulation

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	1

Note:

Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

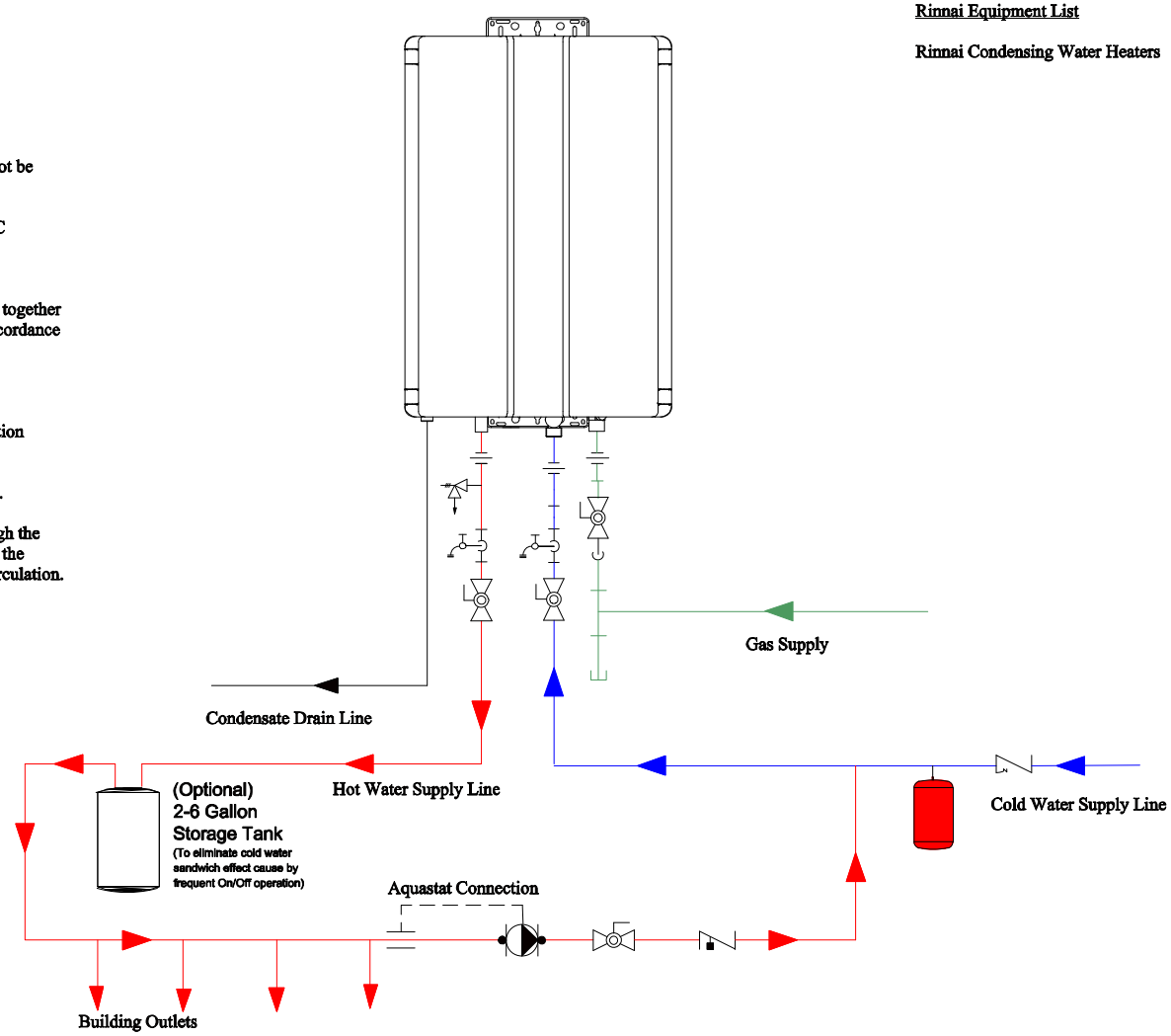
Condensate must be disposed of according to local codes.

Pump should be controlled by an Aquastat, Timer or Combination Aquastat and Timer.

Pump should be sized to maintain circulation loop temperature.

The pump should be sized to overcome the pressure loss through the tankless water heater, supply, and return plumbing. Reference the Rinnai Hot Water System Design Manual, Pump Sizing for Circulation.

Pump should be of bronze or stainless construction.



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Rinnai
Condensing Tankless
Single Unit Circulation

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH1-C	D
DATE 03/02/11		SHEET 1 of 1	

Condensing Tankless
Two Unit Circulation

Note:

Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed of according to local codes.

Pump should be controlled by an Aquastat, Timer or Combination Aquastat and Timer.

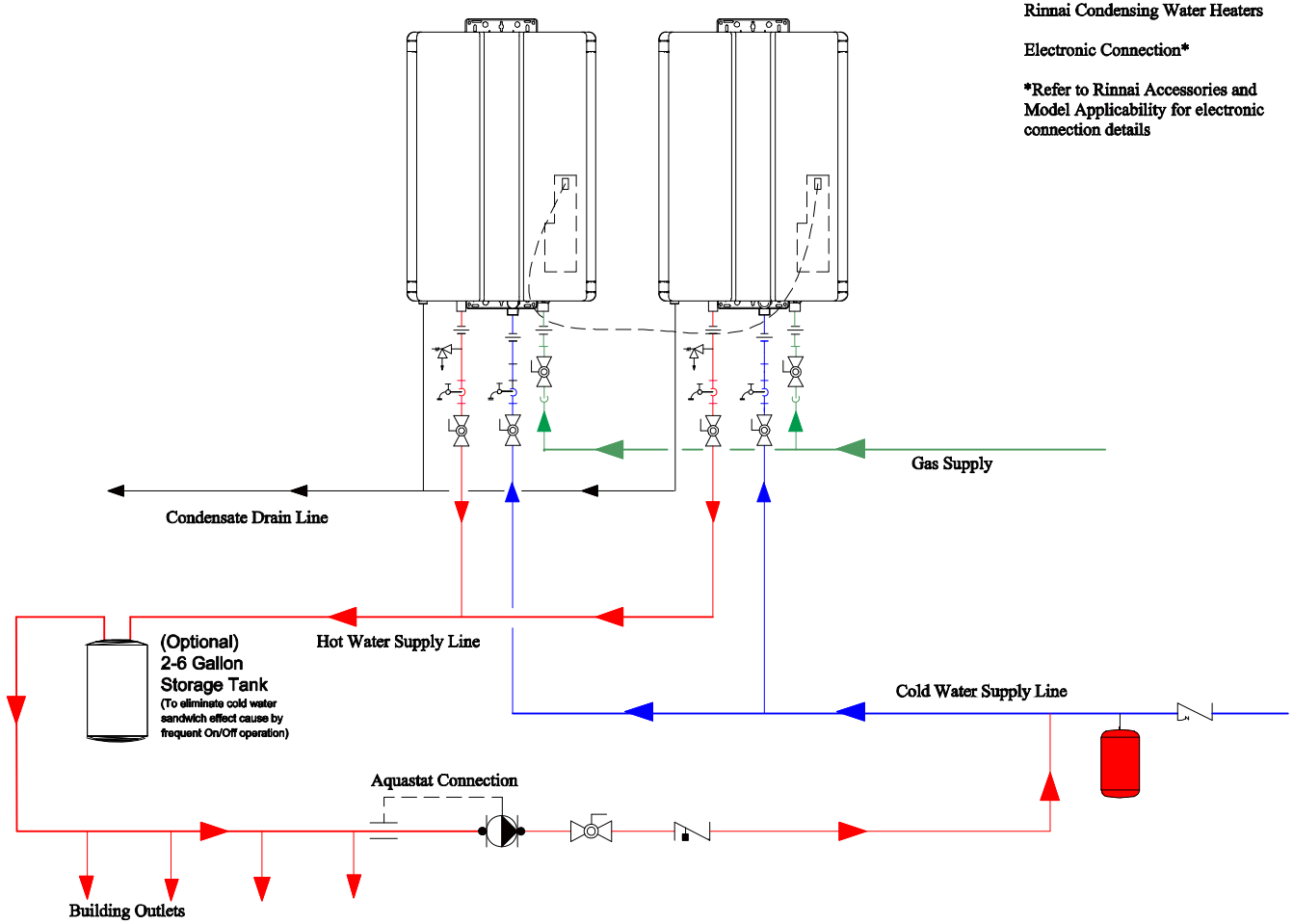
Pump should be sized to maintain circulation loop temperature.

The pump should be sized to overcome the pressure loss through the tankless water heater, supply, and return plumbing. Reference the Rinnai Hot Water System Design Manual, Pump Sizing for Circulation.

Pump should be of bronze or stainless construction.

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	2
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai
Condensing Tankless
Two Unit Circulation

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH2-C	D

DATE 03/02/11 SHEET 1 of 1

Condensing Tankless
Three Unit Circulation

Note:

Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed of according to local codes.

Pump should be controlled by an Aquastat, Timer or Combination Aquastat and Timer.

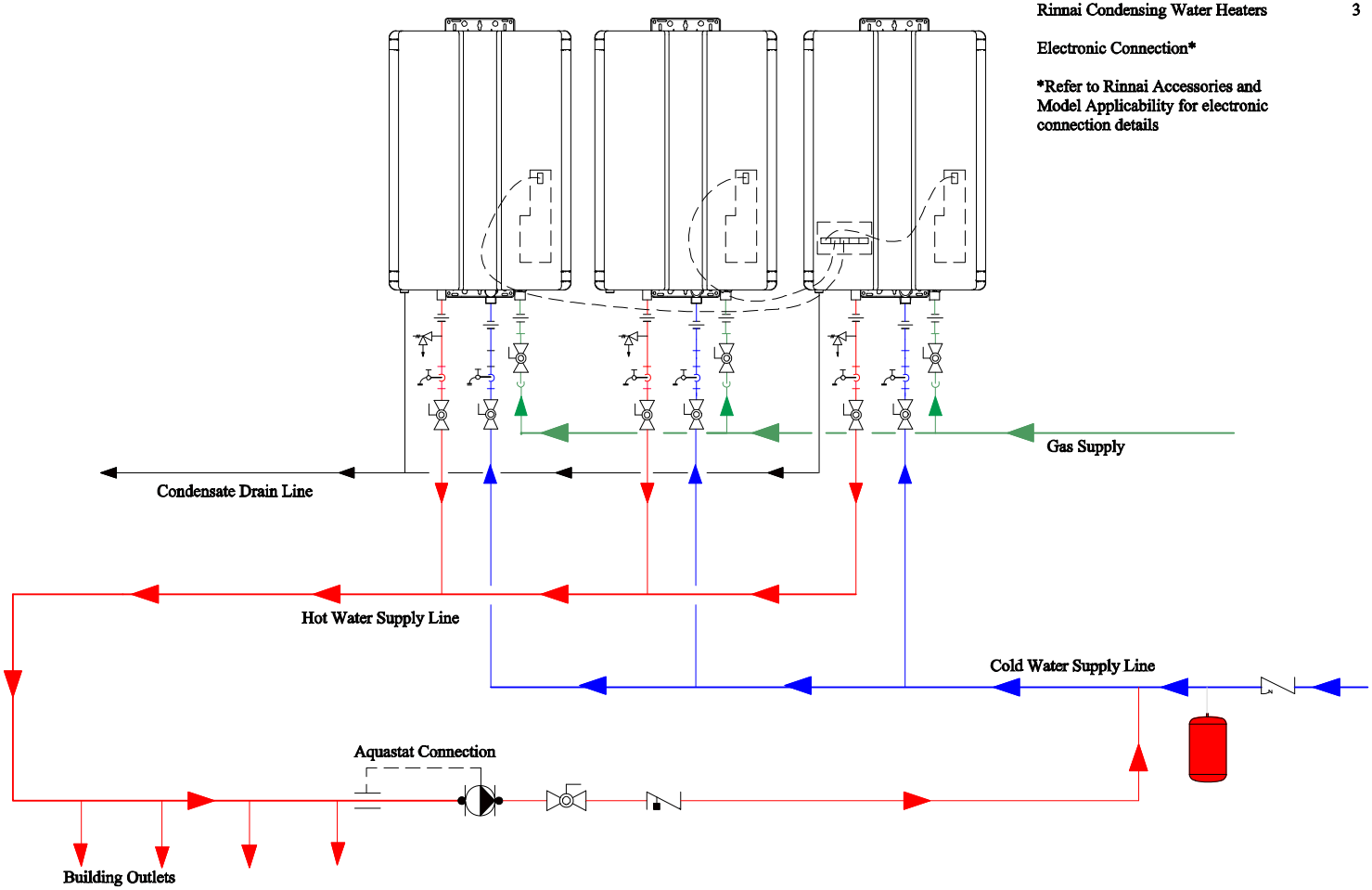
Pump should be sized to maintain circulation loop temperature.

The pump should be sized to overcome the pressure loss through the tankless water heater, supply, and return plumbing. Reference the Rinnai Hot Water System Design Manual, Pump Sizing for Circulation.

Pump should be of bronze or stainless construction.

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	3
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai
Condensing Tankless
Three Unit Circulation

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH3-C	D
DATE 03/02/11		SHEET 1 of 1	

Condensing Tankless
Six Unit Circulation

Note:

Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed of according to local codes.

Pump should be controlled by an Aquastat, Timer or Combination Aquastat and Timer.

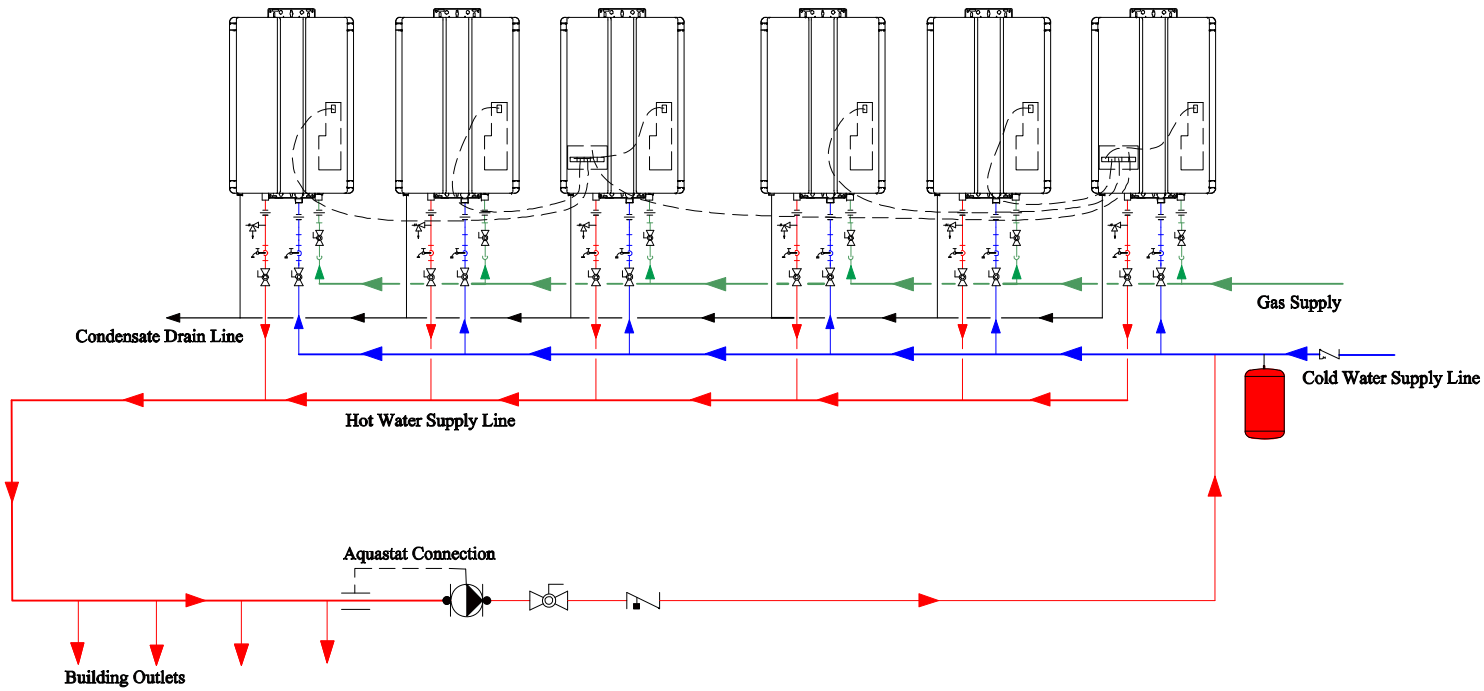
Pump should be sized to maintain circulation loop temperature.

The pump should be sized to overcome the pressure loss through the tankless water heater, supply, and return plumbing. Reference the Rinnai Hot Water System Design Manual, Pump Sizing for Circulation.

Pump should be of bronze or stainless construction.

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	6
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai
Condensing Tankless
Six Unit Circulation

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH6-C	D
DATE 03/02/11		SHEET 1 of 1	

Condensing Tankless
Single Unit with Backup Storage

For this application:

Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

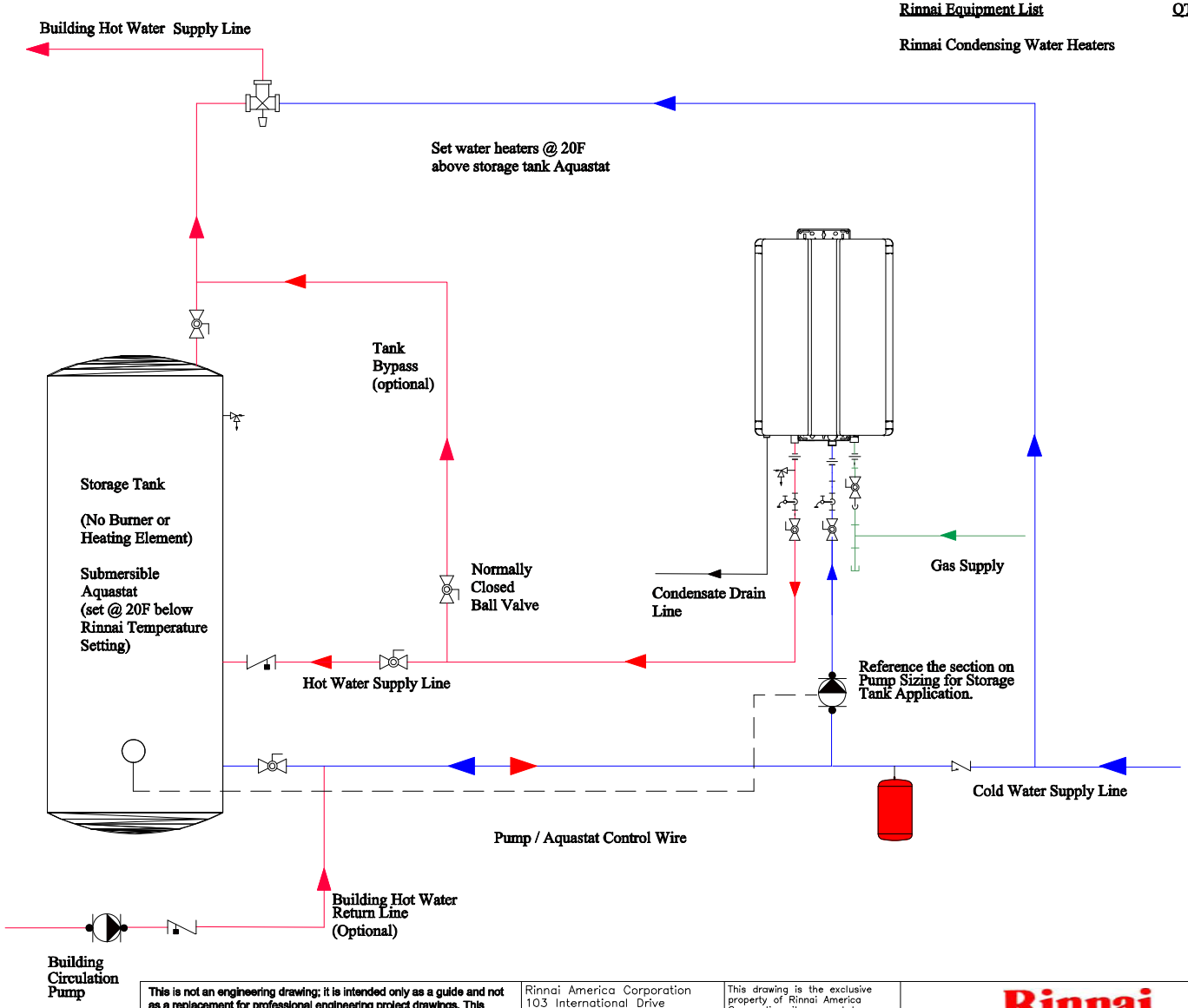
Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed according to local codes.

Do not use manifold electronic controls with storage tank applications

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	1



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Rinnai
Condensing Tankless
Single Unit with Backup Storage

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH1-BC	D
DATE 03/02/11		SHEET 1 of 1	

Condensing Tankless
Two Units with Backup Storage

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	2

For this application:

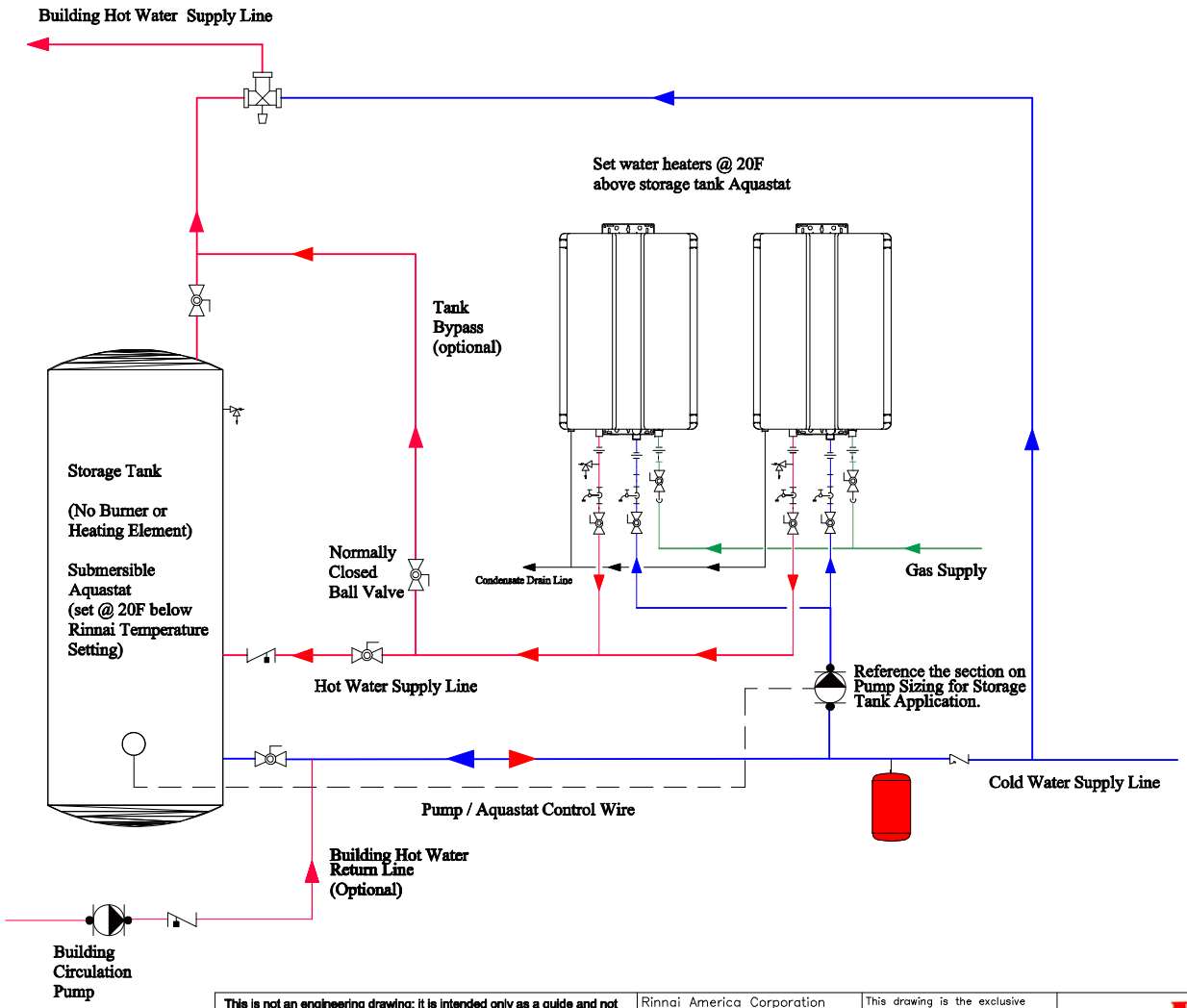
Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed according to local codes.

Do not use manifold electronic controls with storage tank applications



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Rinnai

Condensing Tankless
Two Units with Backup Storage

Drawn By	Approved By	SIZE	SCALE	DWG NO.	REV
DRM	RS	A	NTS	CWH2-BC	D
DATE 03/02/11		SHEET 1 of 1			

Condensing Tankless
Three Units with Backup Storage

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	3

For this application:

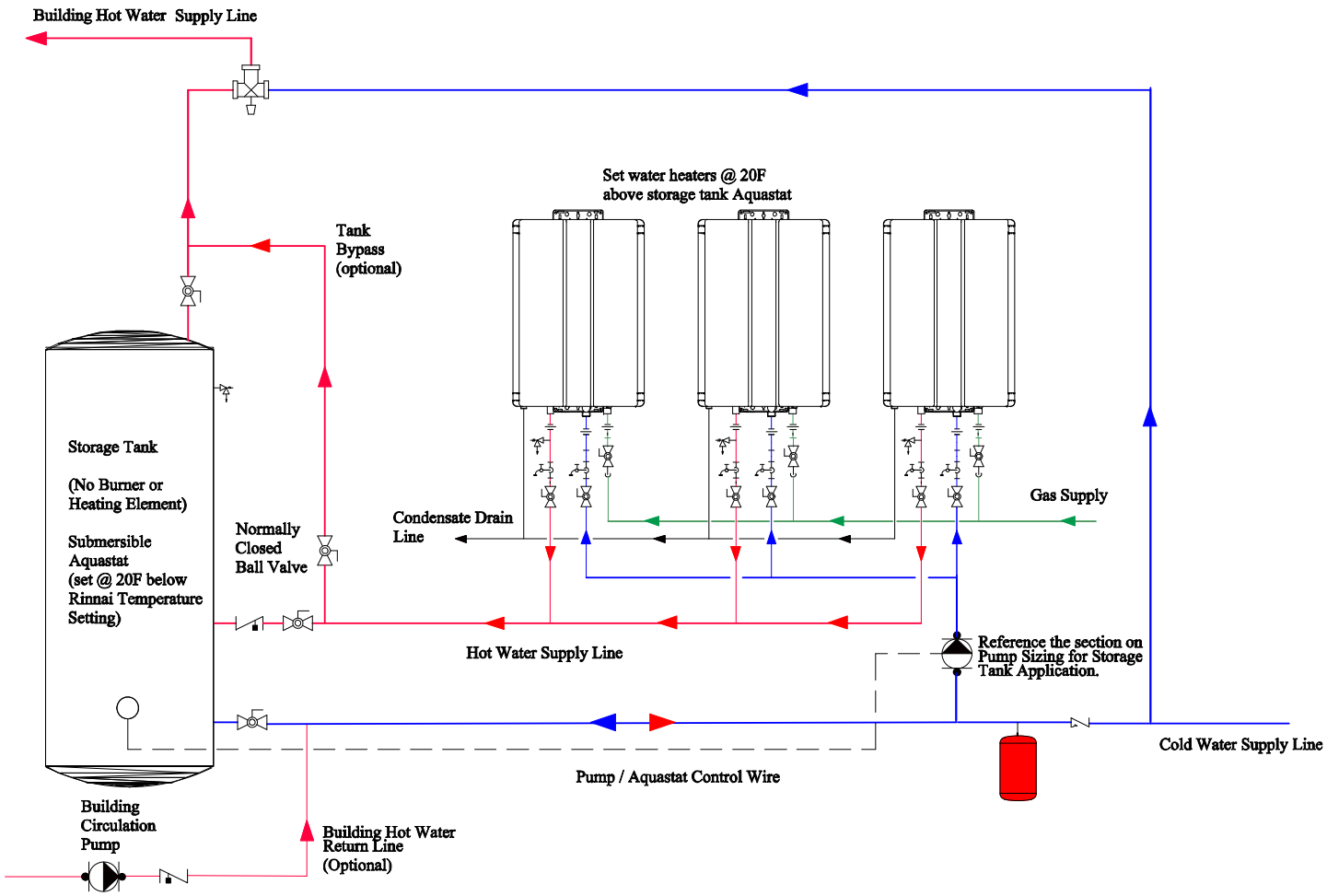
Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed according to local codes.

Do not use manifold electronic controls with storage tank applications



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Rinnai
Condensing Tankless
Three Units with Backup Storage

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH3-BC	D
DATE 03/02/11		SHEET 1 of 1	

Condensing Tankless
Six Units with Backup Storage

Rinnai Equipment List	QTY
Rinnai Condensing Water Heaters	6

For this application:

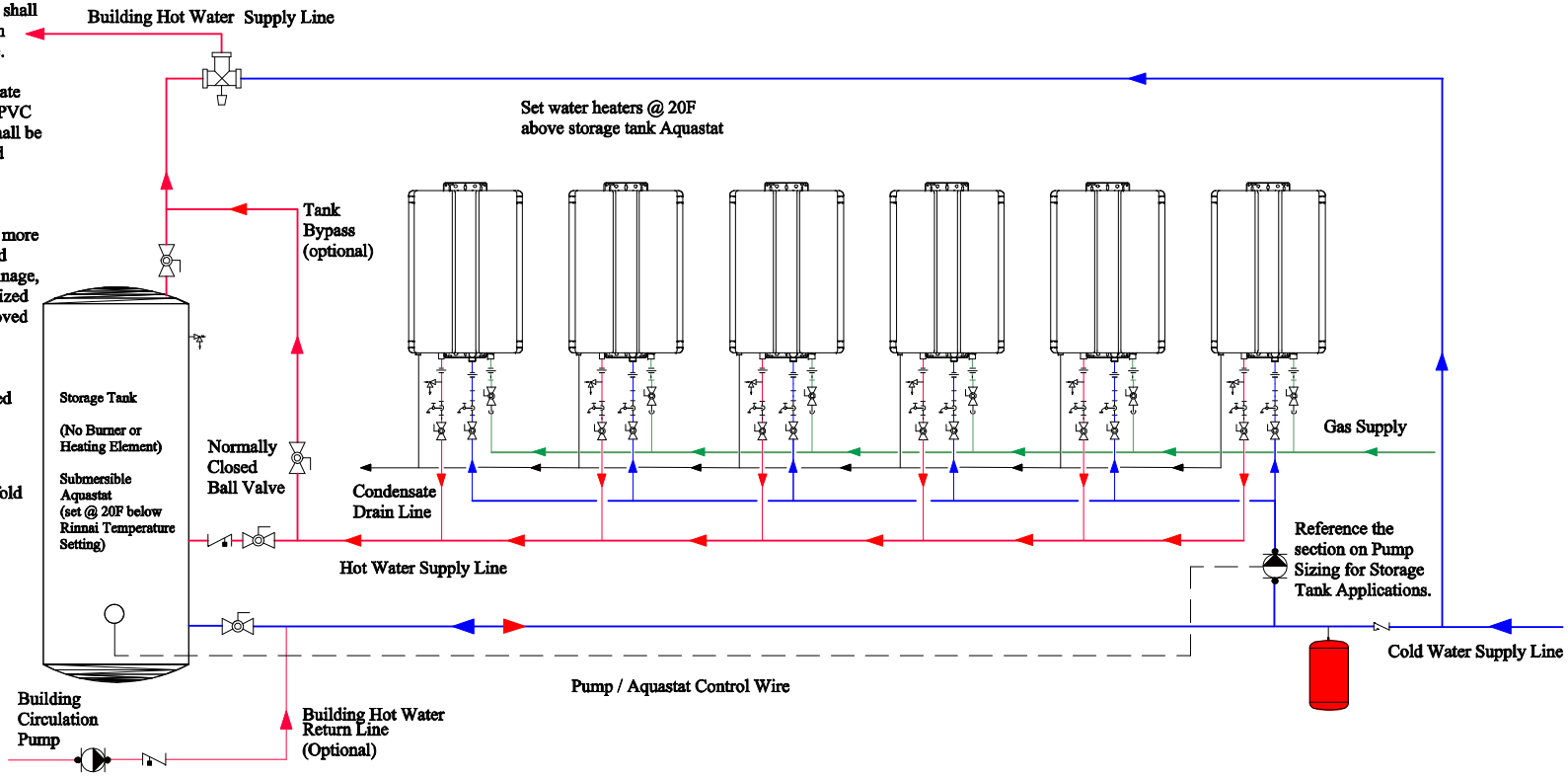
Condensate piping shall be CPVC or PVC material and shall not be smaller than the drain connection on the appliance.

Components of the condensate drainage shall be CPVC or PVC material. All components shall be selected for the pressure and temperature rating of the installation.

Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method as dictated by local codes.

Condensate must be disposed according to local codes.

Do not use electronic manifold controls with storage tank applications



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Drawn By: DRM
Approved By: RS

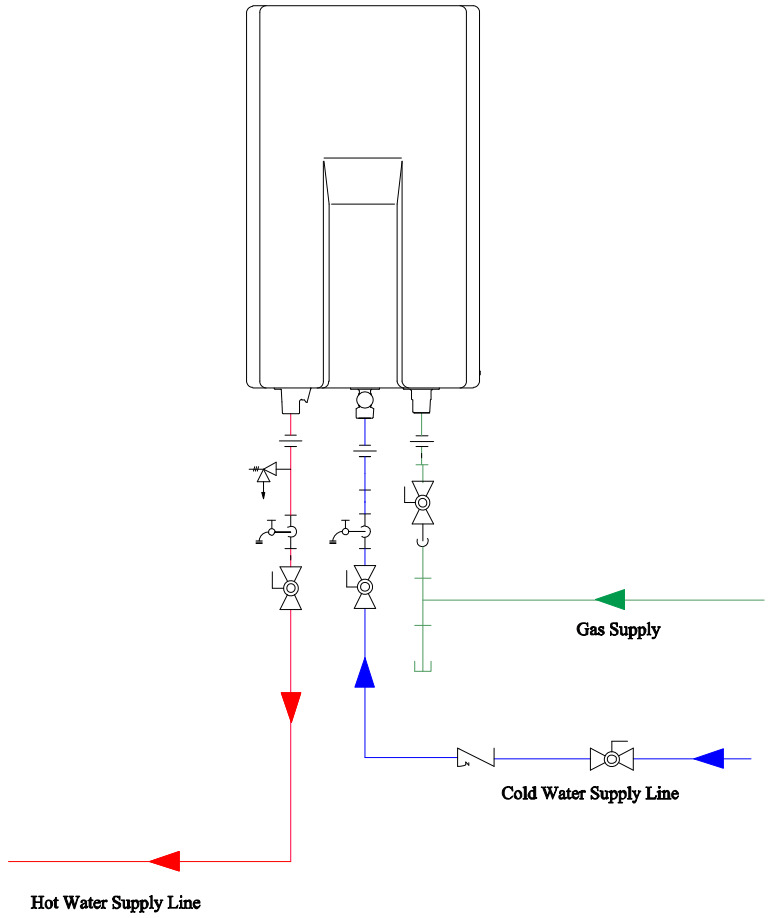
Rinnai
Condensing Tankless
Six Units with Backup Storage

SIZE	SCALE	DWG NO.	REV
A	NTS	CWH6-BC	D

DATE 03/02/11 SHEET 1 of 1

Non-Condensing Tankless
Single Unit

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	1



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Drawn By DRM
Approved By RS

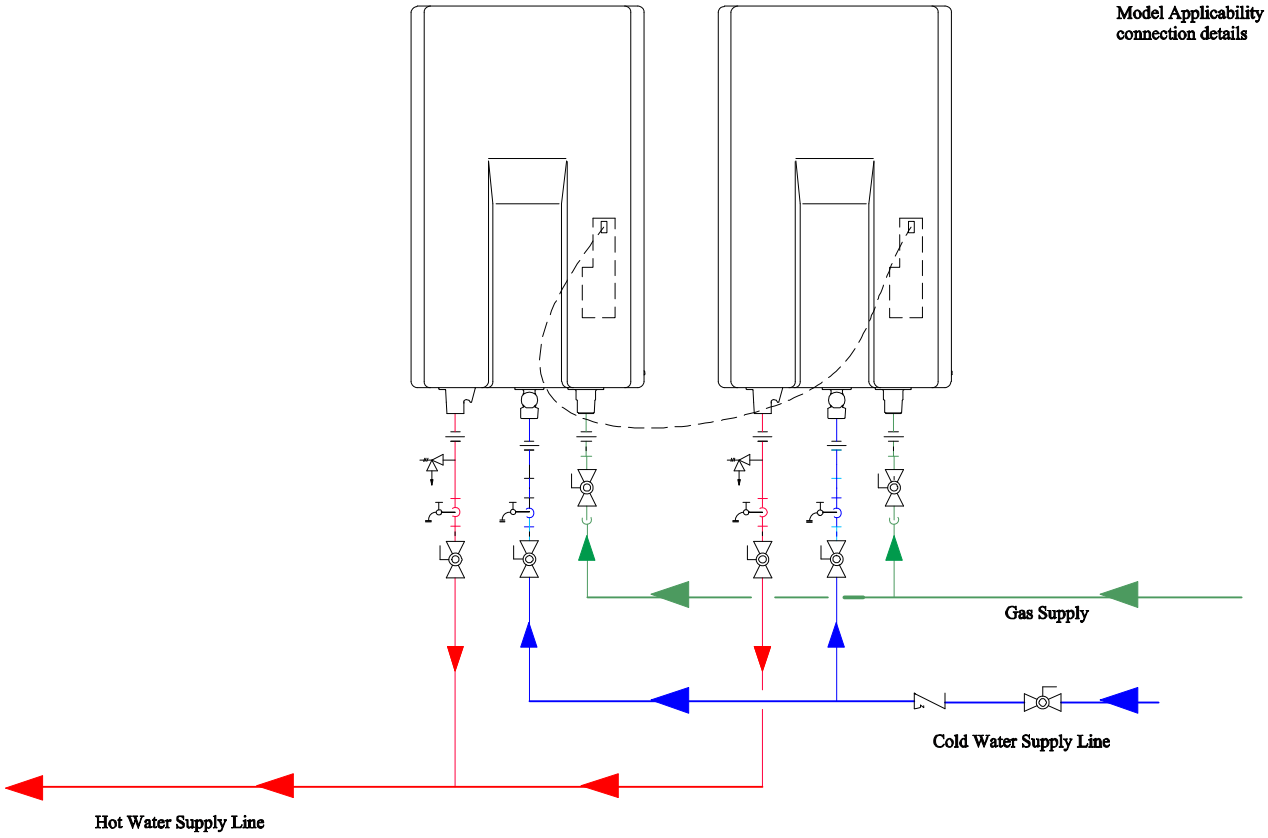
Rinnai
Non-Condensing Tankless
Single Unit

SIZE	SCALE	DWG NO.	REV
A	NTS	WH1	D
DATE 03/02/11		SHEET 1 of 1	

Non-Condensing Tankless
Two Units

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	2
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai

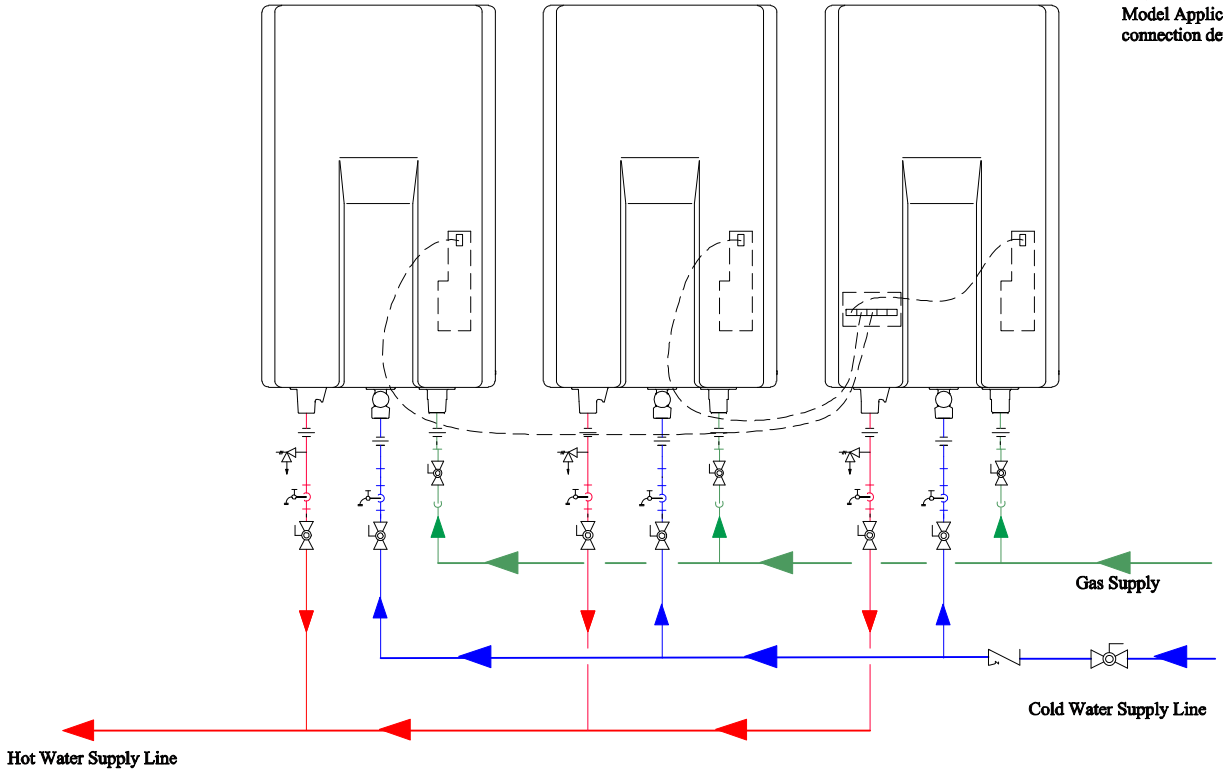
Non-Condensing Tankless
Two Units

Drawn By	DRM	SIZE	SCALE	DWG NO.	REV
Approved By	RS	A	NTS	WH2	D
		DATE 03/02/11		SHEET 1 of 1	

Non-Condensing Tankless
Three Units

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	3
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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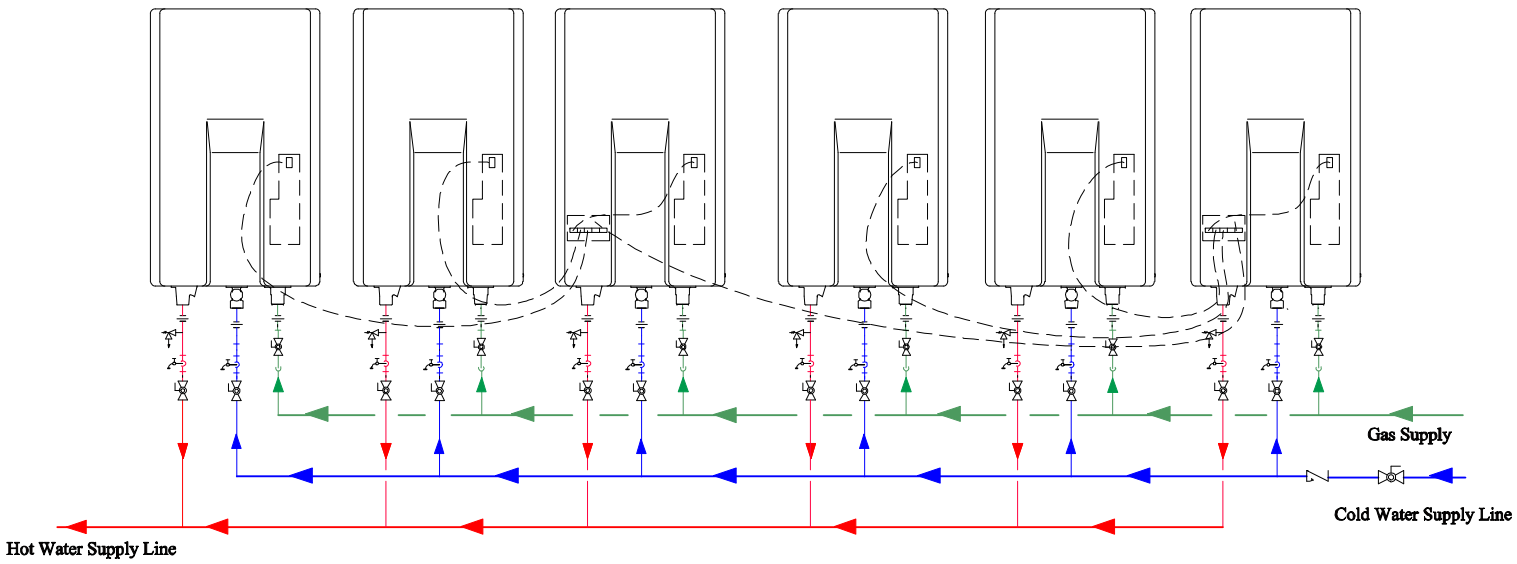
Rinnai
Non-Condensing Tankless
Three Units

SIZE	SCALE	DWG NO.	REV
A	NTS	WH3	D
DATE 03/02/11		SHEET 1 of 1	

Non-Condensing Tankless
Six Units

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	6
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai
Non-Condensing Tankless
Six Units

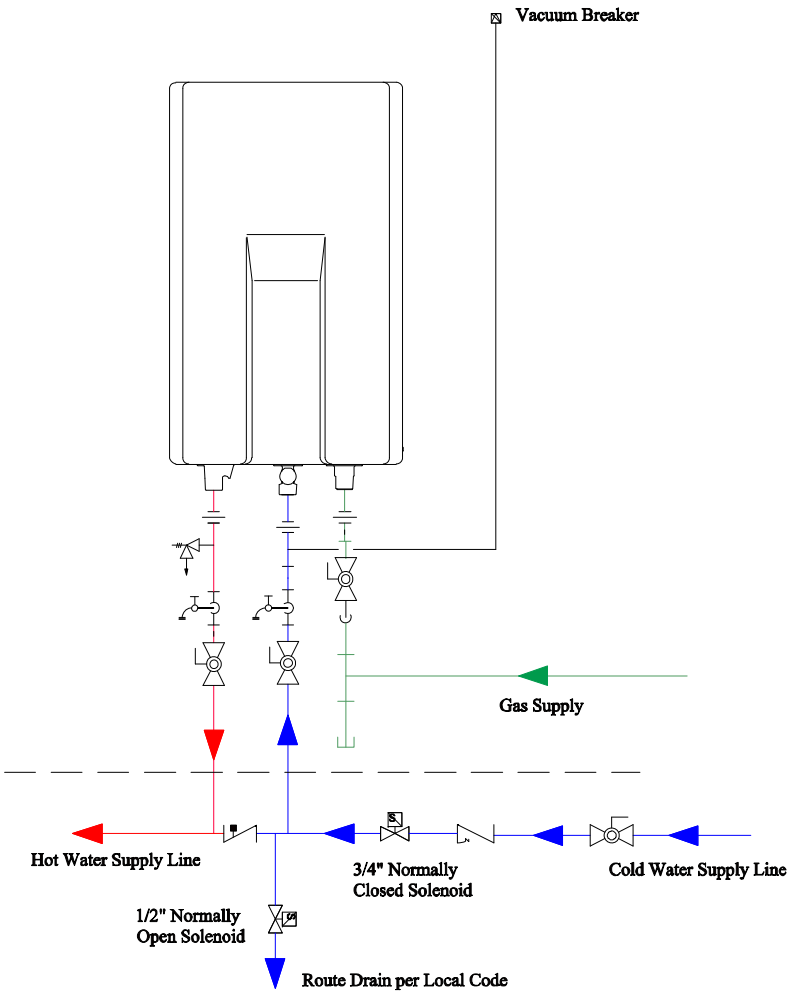
SIZE	SCALE	DWG NO.	REV
A	NTS	WH6	D
DATE 03/02/11		SHEET 1 of 1	

Non-Condensing Tankless
Single Unit Freeze Protection

Notice:

Warranty does not cover damage due to freezing. The unit may be drained manually. However, Rinnai highly recommends that drain down solenoid valves be installed that will automatically drain the unit if power is lost. Rinnai also recommends the installation of a surge protector with terminals that attaches to the PC board in the unit and allows the solenoid valves to operate if the unit is disabled due to an error code. When the electrical power to the water heater fails, the 3/4" solenoid valve closes (stopping the flow of water into the heater) and the 1/2" solenoid valve opens (allowing the water heater and associated piping to drain. Ensure that you run the drain for the solenoids to the outside environment to prevent discharging water inside the building causing water damage.

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	1



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NOTE:
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The vacuum breaker line should be located inside the building structure.

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Rinnai
Non-Condensing Tankless
Single Unit Freeze Protection

SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-D	D

DATE 03/02/11 SHEET 1 of 1

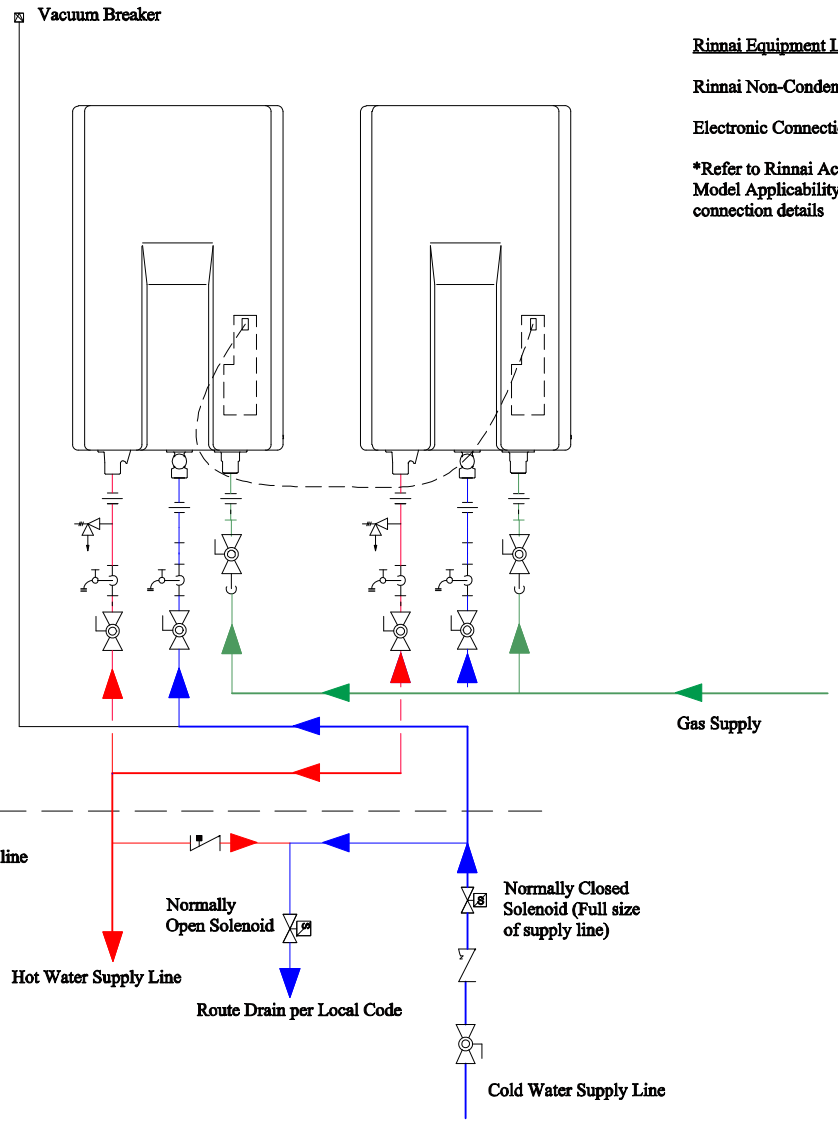
Non-Condensing Tankless
Two Unit Freeze Protection

Notice:

Warranty does not cover damage due to freezing. The unit may be drained manually. However, Rinnai highly recommends that drain down solenoid valves be installed that will automatically drain the unit if power is lost. Rinnai also recommends the installation of a surge protector with terminals that attaches to the PC board in the unit and allows the solenoid valves to operate if the unit is disabled due to an error code. When the electrical power to the water heater fails, the 3/4" solenoid valve closes (stopping the flow of water into the heater) and the 1/2" solenoid valve opens (allowing the water heater and associated piping to drain. Ensure that you run the drain for the solenoids to the outside environment to prevent discharging water inside the building causing water damage.

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	2
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai
Non-Condensing Tankless
Two Units Freeze Protection

SIZE	SCALE	DWG NO.	REV
A	NTS	WH2-D	D

DATE 03/02/11 SHEET 1 of 1

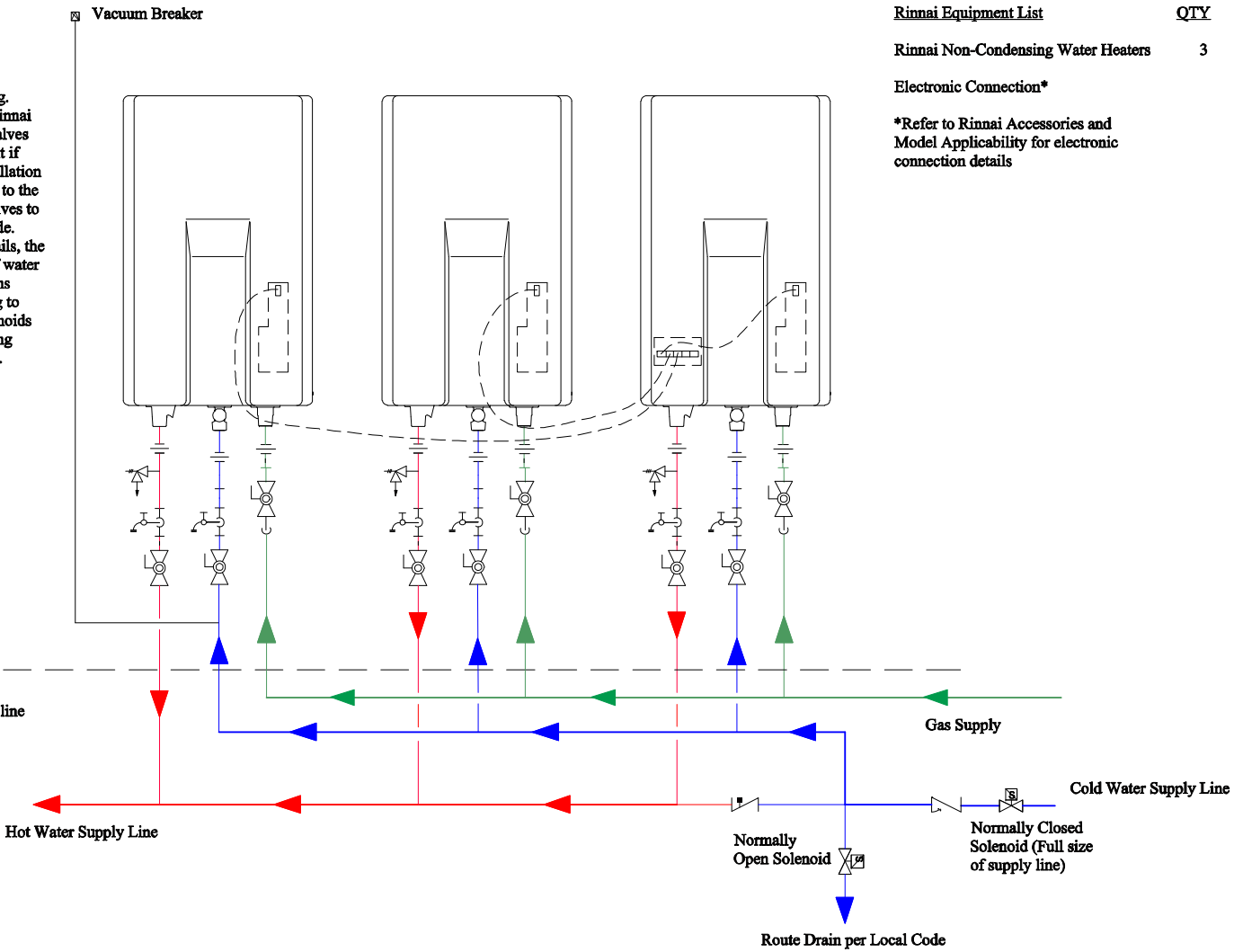
Non-Condensing Tankless
Three Unit Freeze Protection

Notice:

Warranty does not cover damage due to freezing. The unit may be drained manually. However, Rinnai highly recommends that drain down solenoid valves be installed that will automatically drain the unit if power is lost. Rinnai also recommends the installation of a surge protector with terminals that attaches to the PC board in the unit and allows the solenoid valves to operate if the unit is disabled due to an error code. When the electrical power to the water heater fails, the 3/4" solenoid valve closes (stopping the flow of water into the heater) and the 1/2" solenoid valve opens (allowing the water heater and associated piping to drain. Ensure that you run the drain for the solenoids to the outside environment to prevent discharging water inside the building causing water damage.

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	3
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai
Non-Condensing Tankless
Three Units Freeze Protection

SIZE	SCALE	DWG NO.	REV
A	NTS	WH3-D	D

DATE 03/02/11 SHEET 1 of 1

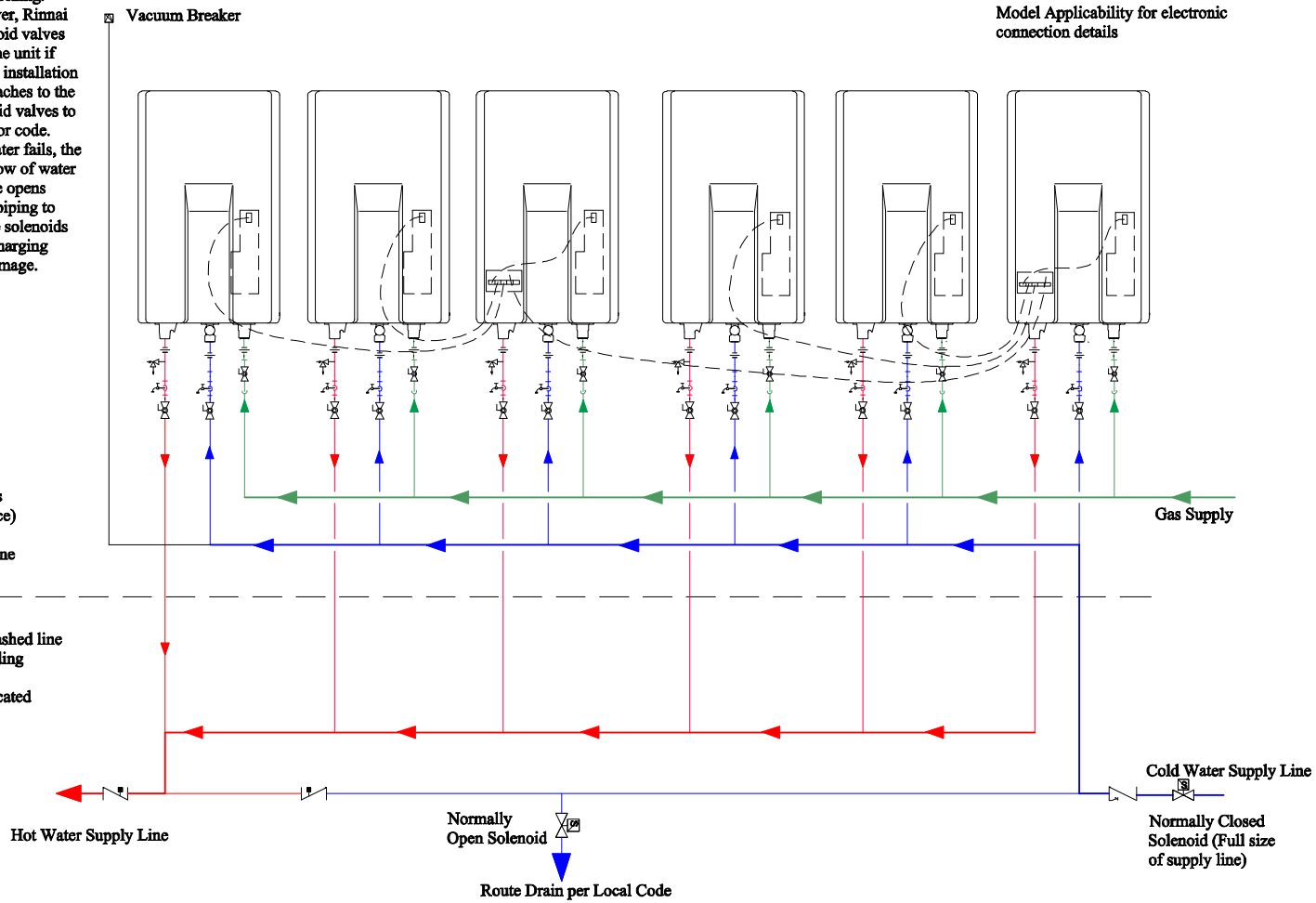
Non-Condensing Tankless
Six Unit Freeze Protection

Notice:

Warranty does not cover damage due to freezing. The unit may be drained manually. However, Rinnai highly recommends that drain down solenoid valves be installed that will automatically drain the unit if power is lost. Rinnai also recommends the installation of a surge protector with terminals that attaches to the PC board in the unit and allows the solenoid valves to operate if the unit is disabled due to an error code. When the electrical power to the water heater fails, the 3/4" solenoid valve closes (stopping the flow of water into the heater) and the 1/2" solenoid valve opens (allowing the water heater and associated piping to drain. Ensure that you run the drain for the solenoids to the outside environment to prevent discharging water inside the building causing water damage.

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	6
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai
Non-Condensing Tankless
Six Units Freeze Protection

SIZE	SCALE	DWG NO.	REV
A	NTS	WH6-D	D
DATE 03/02/11		SHEET 1 of 1	

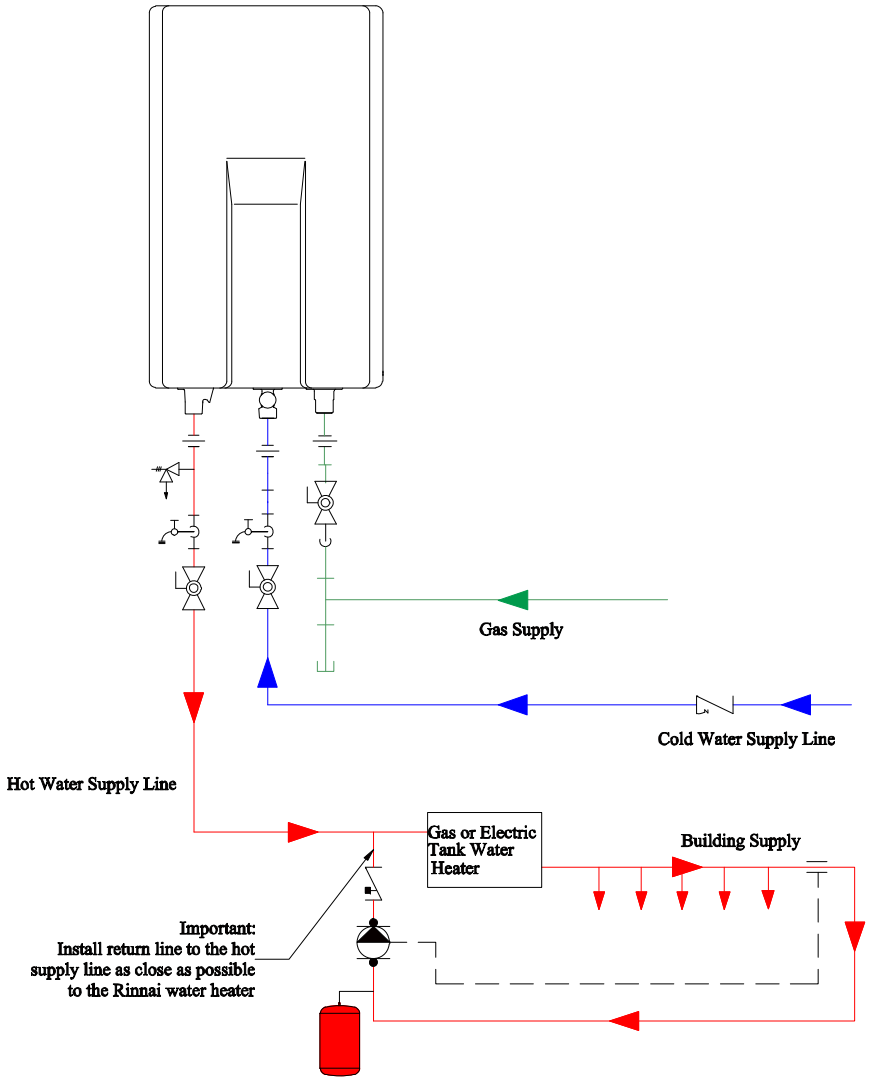
Non-Condensing Tankless
Single Unit Preferred Recirculation

For this application:

Pump should be controlled by an Aquastat, Timer or Combination Aquastat and Timer.
Pump should be sized to maintain circulation loop temperature.
The pump should be sized to overcome the pressure loss through the tank water heater and supply and return plumbing in the circulation loop.
Reference the section Pump Sizing for Circulation.
Pump should be of bronze or stainless construction.

NOTE: Consult with the manufacturer of the tank water heater to confirm that it can be used for this application.

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	1



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Rinnai
Non-Condensing Tankless
Single Unit Recirculation

SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-RGE	D

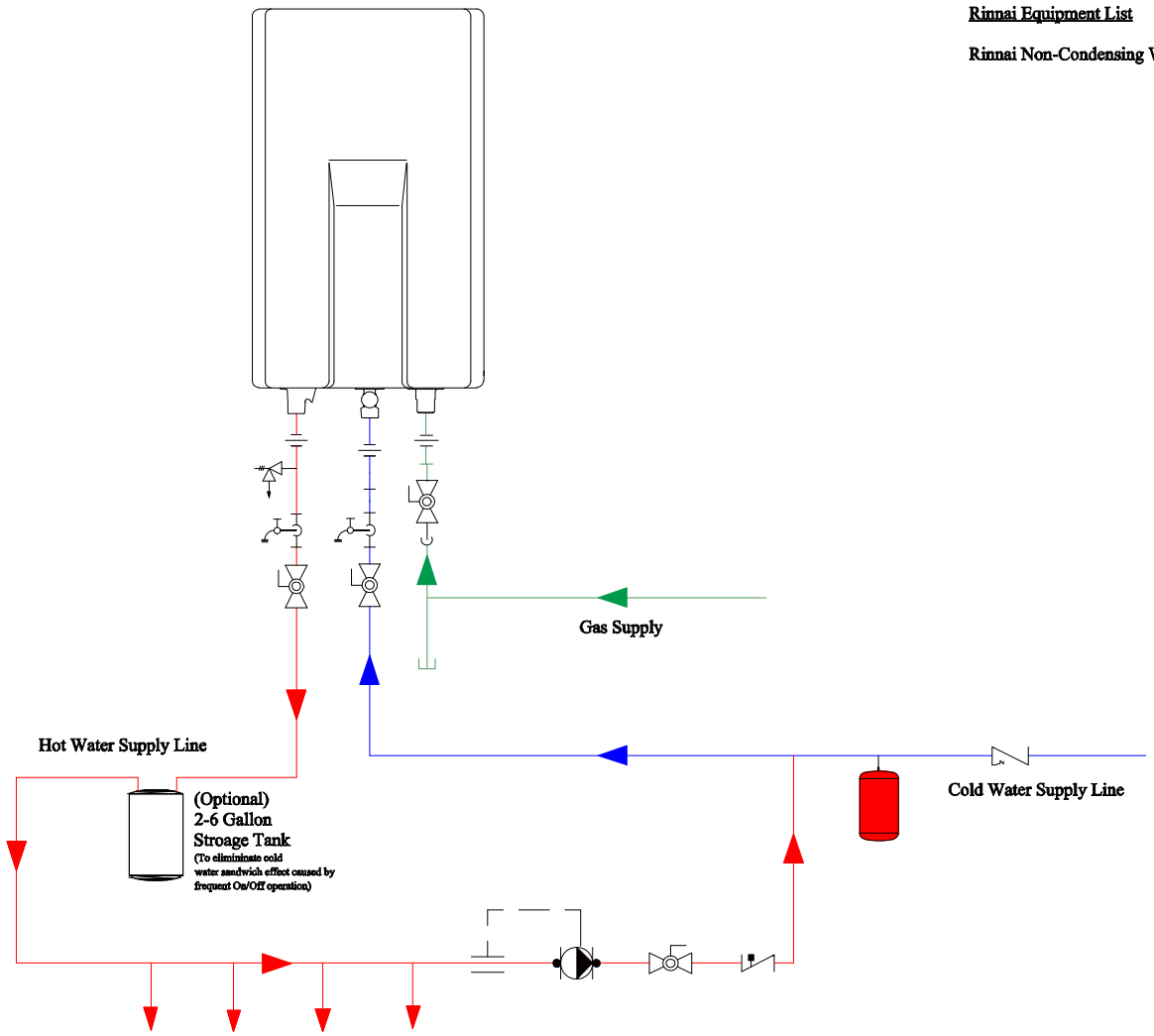
DATE 03/02/11 SHEET 1 of 1

Non-Condensing Tankless
Single Unit Optional Recirculation

For this application:

Pump should be controlled by an Aquastat, Timer or Combination Aquastat and Timer.
Pump should be sized to maintain circulation loop temperature.
The pump should be sized to overcome the pressure loss through the tankless water heater and supply and return plumbing in the circulation loop.
Reference the section Pump Sizing for Circulation.
Pump should be of bronze or stainless construction.
Reference warranty section of Installation Manual for this configuration

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	1



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Rinnai
Non-Condensing Tankless
Single Unit Optional Recirculation

SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-R	D
DATE 03/02/11		SHEET 1 of 1	

Rinnai Tankless
Single Unit D'MAND Circulation Option

For this application:

Demand Circulator should be controlled by push button, motion sensor or door contacts.
Demands Circulators should be designed specifically for tankless waters.

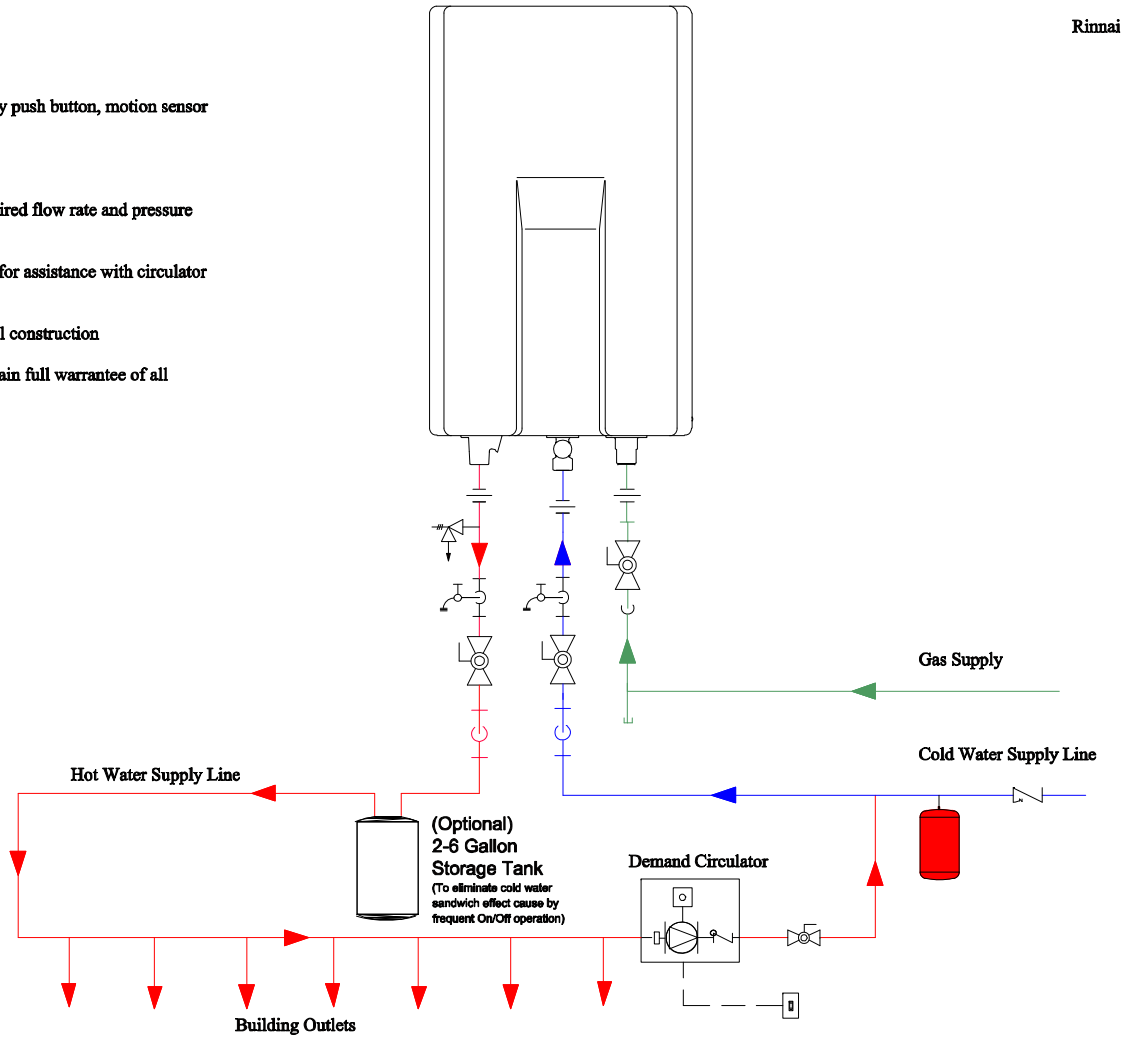
Ensure Demand Circulator is sized for desired flow rate and pressure drop of circulation loop.

Contact Demand Circulator manufacturer for assistance with circulator sizing.

Pump should be of bronse or stainless steel construction

The use of Demand Circulators will maintain full warrantee of all Rinnai water heaters.

Rinnai Equipment List	QTY
Rinnai Tankless Water Heaters	1



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Approved By: RS

Rinnai
Rinnai Tankless
Single Unit D'MAND Circulation Option

SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-CD-O	D

DATE 03/02/11 SHEET 1 of 1

Rinnai Tankless
Single Unit D'MAND Circulation

For this application:

Demand Circulator should be controlled by push button, motion sensor or door contacts.
Demands Circulators should be designed specifically for tankless waters.

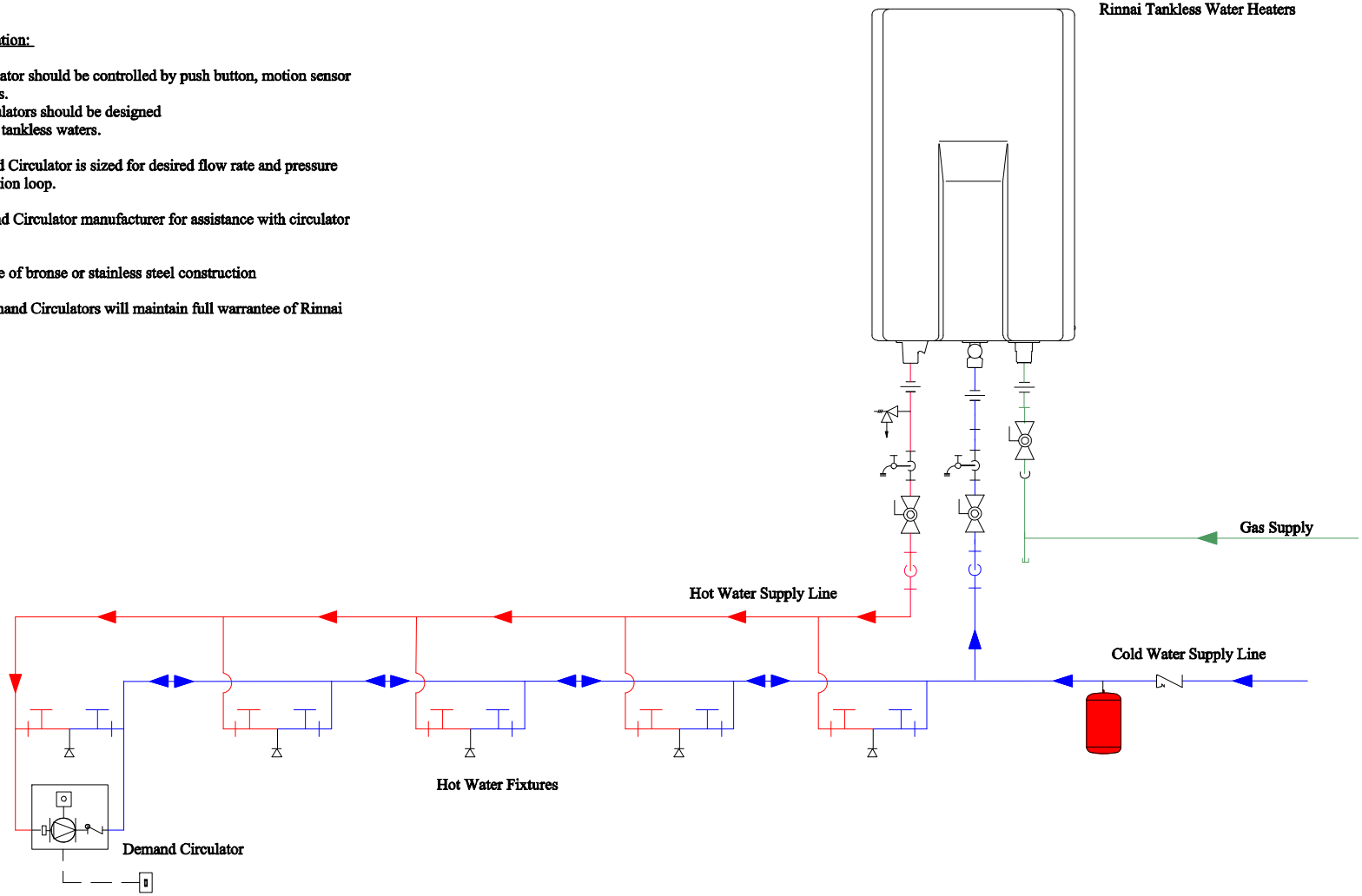
Ensure Demand Circulator is sized for desired flow rate and pressure drop of circulation loop.

Contact Demand Circulator manufacturer for assistance with circulator sizing.

Pump should be of bronse or stainless steel construction

The use of Demand Circulators will maintain full warrantee of Rinnai water heaters.

Rinnai Equipment List	QTY
Rinnai Tankless Water Heaters	1



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Approved By: RS

Rinnai
Rinnai Tankless
Single Unit D'MAND Circulation

SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-CD	D

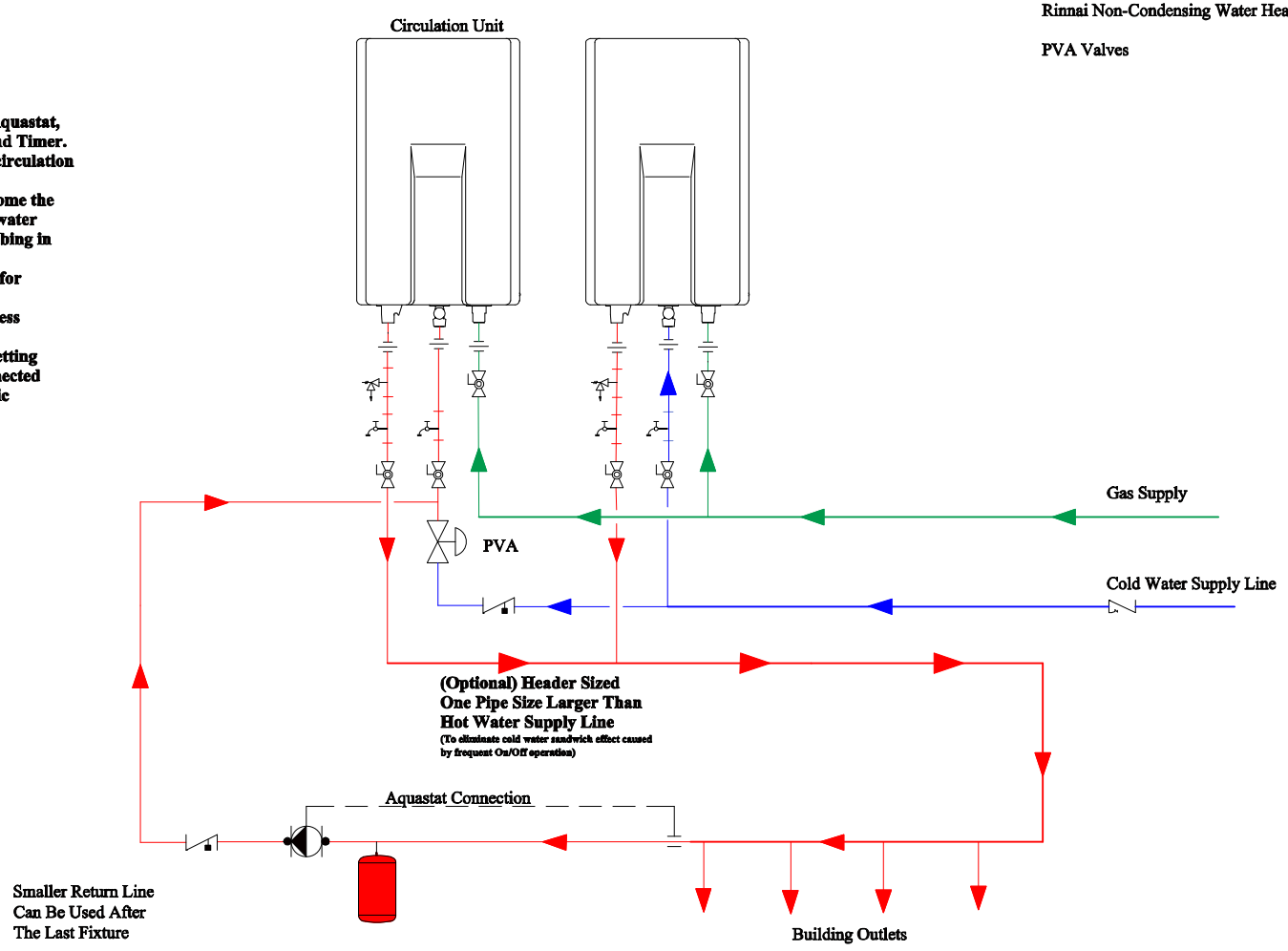
DATE 03/02/11 SHEET 1 of 1

Non-Condensing Tankless
Two Units Circulation

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	2
PVA Valves	1

For this application:

Pump should be controlled by an Aquastat, Timer or Combination Aquastat and Timer.
Pump should be sized to maintain circulation loop temperature.
The pump should be sized to overcome the pressure loss through the tankless water heater and supply and return plumbing in the circulation loop.
Reference the section Pump Sizing for Circulation.
Pump should be of bronze or stainless construction.
PVA to remain at factory default setting
Circulation unit should not be connected electronically to manifold electronic controllers.



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Approved By: RS

Rinnai
Non-Condensing Tankless
Two Units Circulation

SIZE	SCALE	DWG NO.	REV
A	NTS	WH2-CP	D
DATE 03/02/11		SHEET 1 of 1	

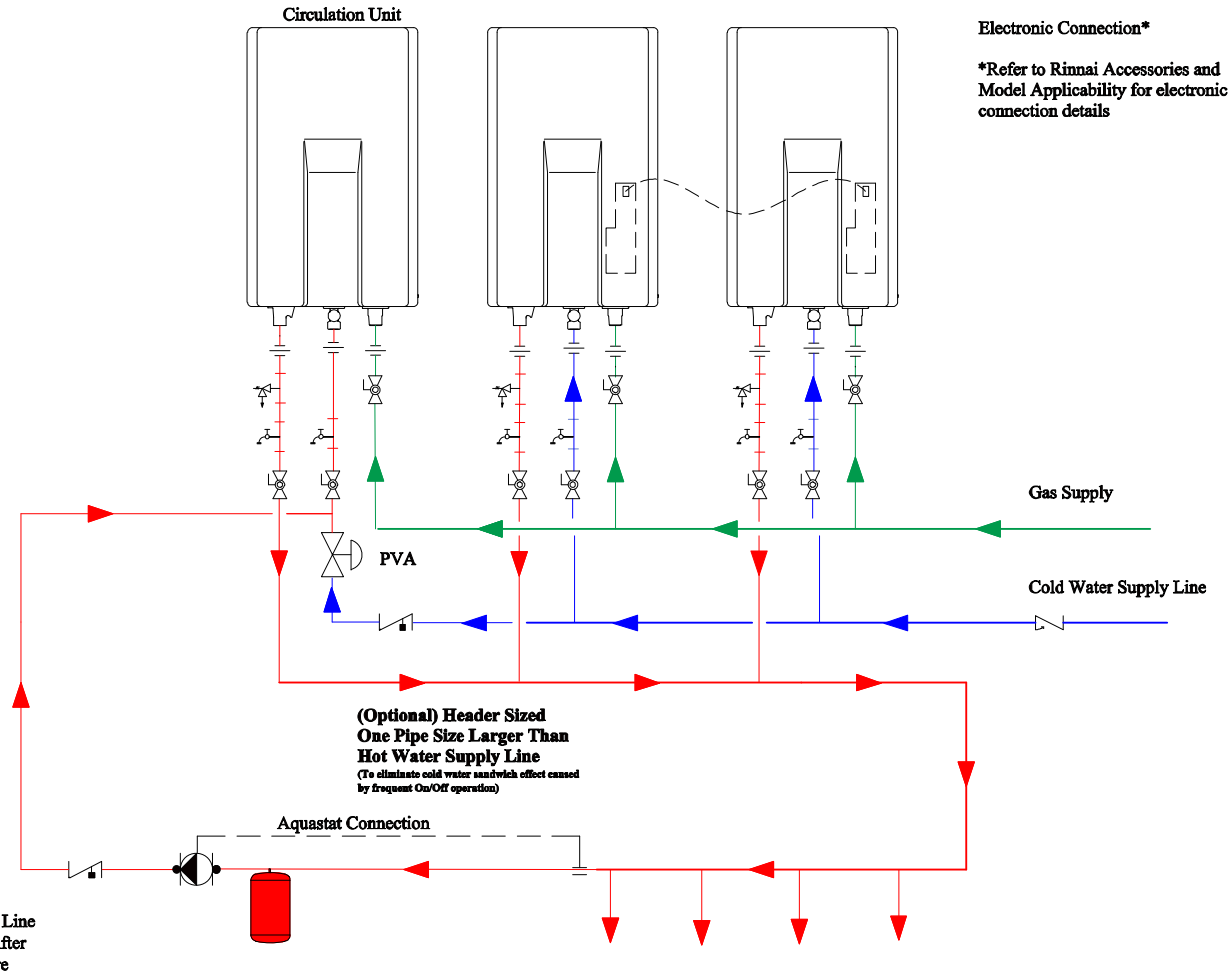
Non-Condensing Tankless
Three Units Circulation

For this application:

Pump should be controlled by an Aquastat, Timer or Combination Aquastat and Timer.
Pump should be sized to maintain circulation loop temperature.
The pump should be sized to overcome the pressure loss through the tankless water heater and supply and return plumbing in the circulation loop.
Reference the section Pump Sizing for Circulation.
Pump should be of bronze or stainless construction.
PVA to remain at factory default setting
Circulation unit should not be connected electronically to manifold electronic controllers.

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	3
PVA Valves	1
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Non-Condensing Tankless
Three Units Circulation

Drawn By	DRM	SIZE	A	SCALE	NTS	DWG NO.	WH3-CP	REV	D
Approved By	RS	DATE	03/02/11			SHEET	1 of 1		

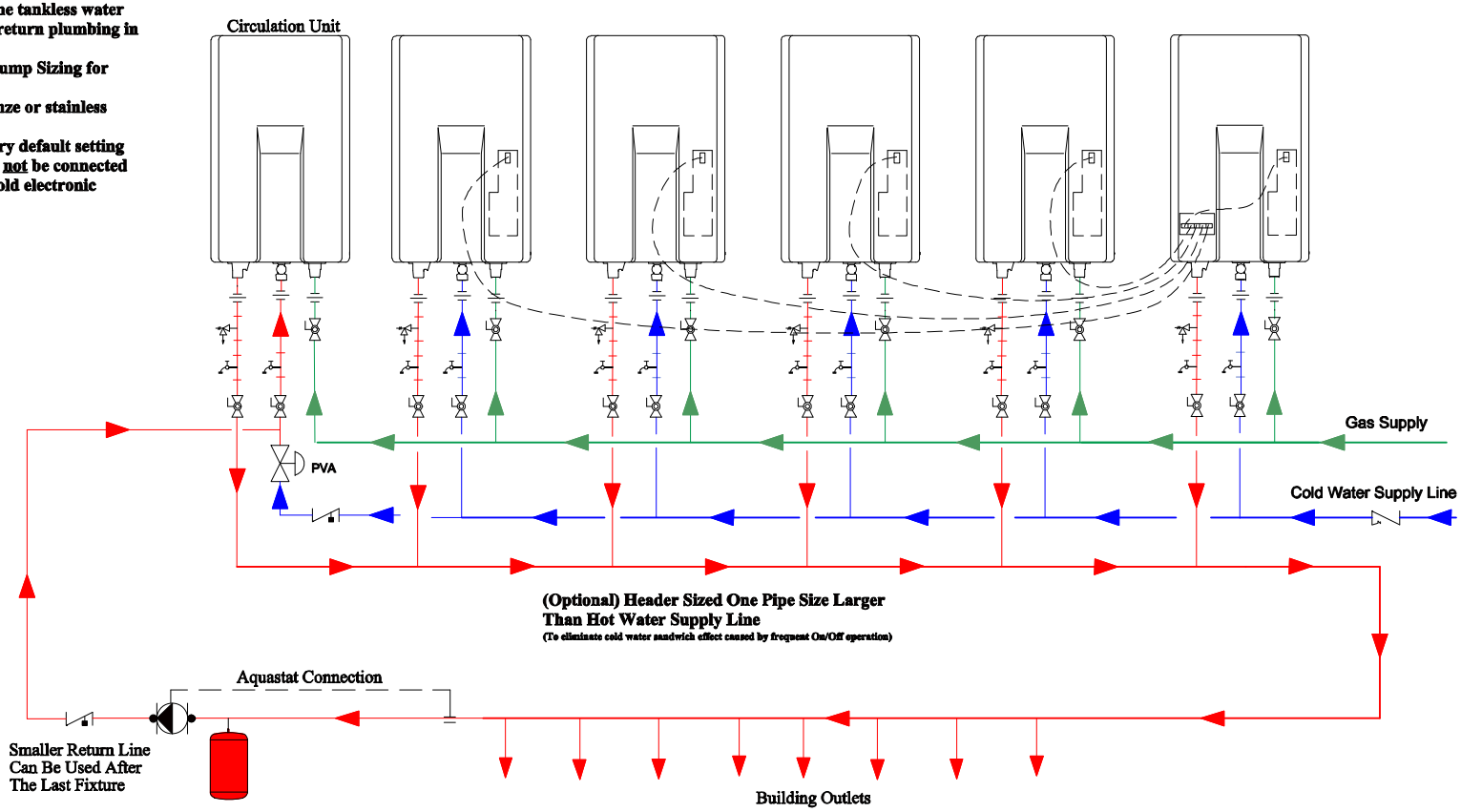
Non-Condensing Tankless
Six Units Circulation

For this application:

Pump should be controlled by an Aquastat, Timer or Combination Aquastat and Timer.
Pump should be sized to maintain circulation loop temperature.
The pump should be sized to overcome the pressure loss through the tankless water heater and supply and return plumbing in the circulation loop.
Reference the section Pump Sizing for Circulation.
Pump should be of bronze or stainless construction.
PVA to remain at factory default setting
Circulation unit should not be connected electronically to manifold electronic controllers.

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	6
PVA Valves	1
Electronic Connection*	

*Refer to Rinnai Accessories and Model Applicability for electronic connection details



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Rinnai
Non-Condensing Tankless
Six Units Circulation

SIZE	SCALE	DWG NO.	REV
A	NTS	WH6-CP	D

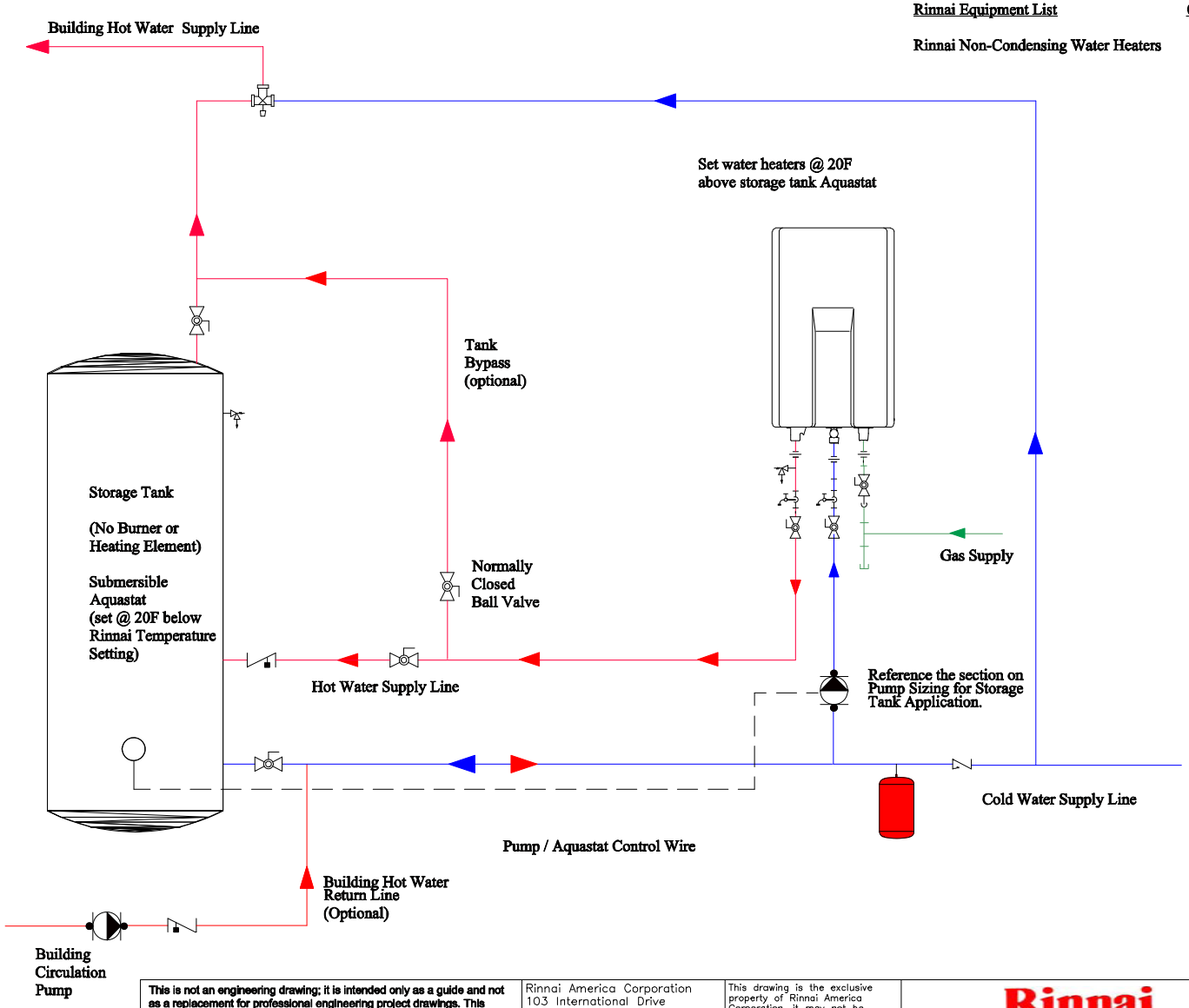
DATE 03/02/11 SHEET 1 of 1

Non-Condensing Tankless
Single Unit with Backup Storage

For this application:

Do not use electronic manifold controls with storage tank applications

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	1



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Rinnai
Non-Condensing Tankless
Single Unit with Backup Storage

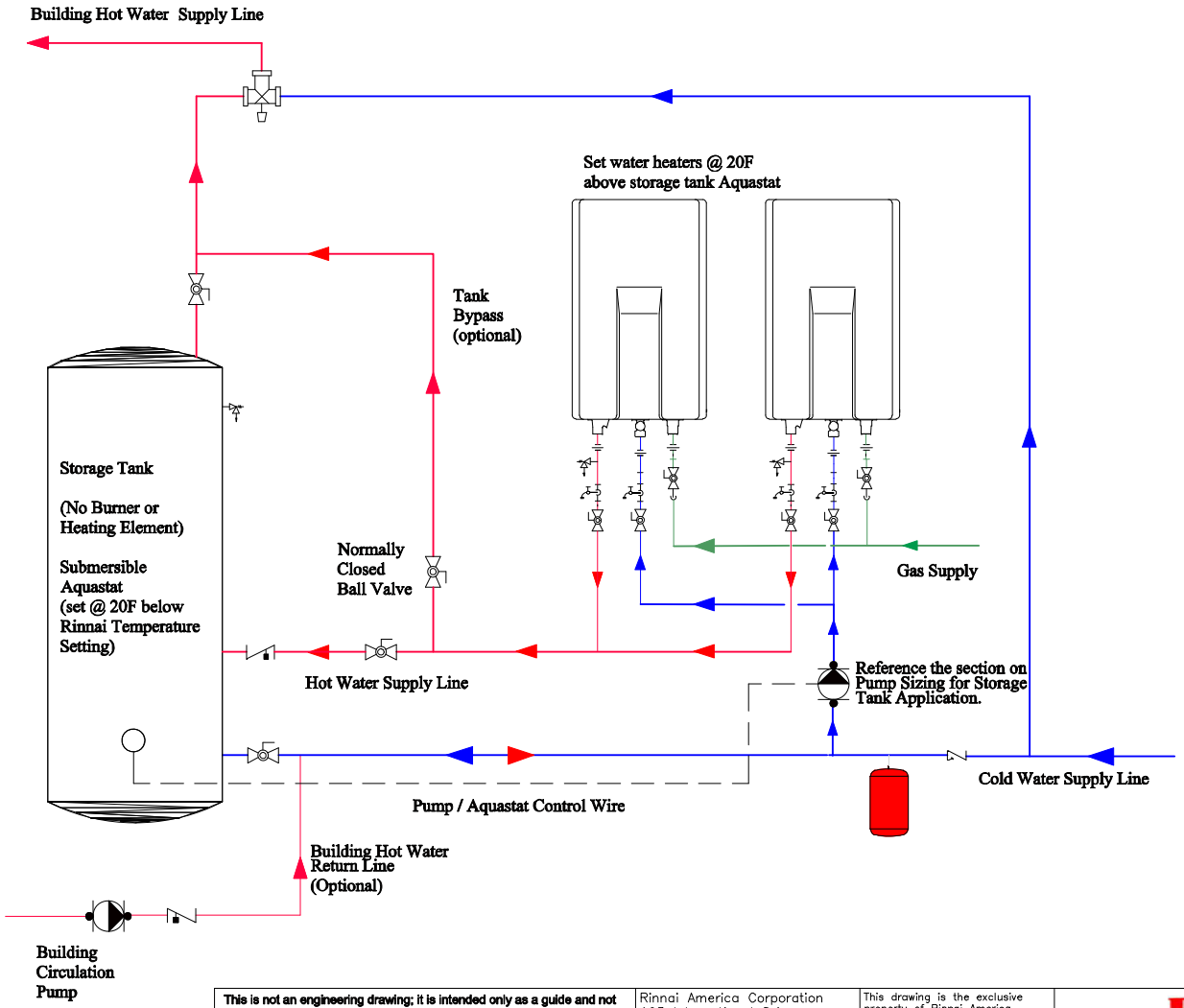
SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-BC	D
DATE 03/02/11		SHEET 1 of 1	

Non-Condensing Tankless
Two Units with Backup Storage

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	2

For this application:

Do not use manifold electronic controls with storage tank applications



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Rinnai
Non-Condensing Tankless
Two Units with Backup Storage

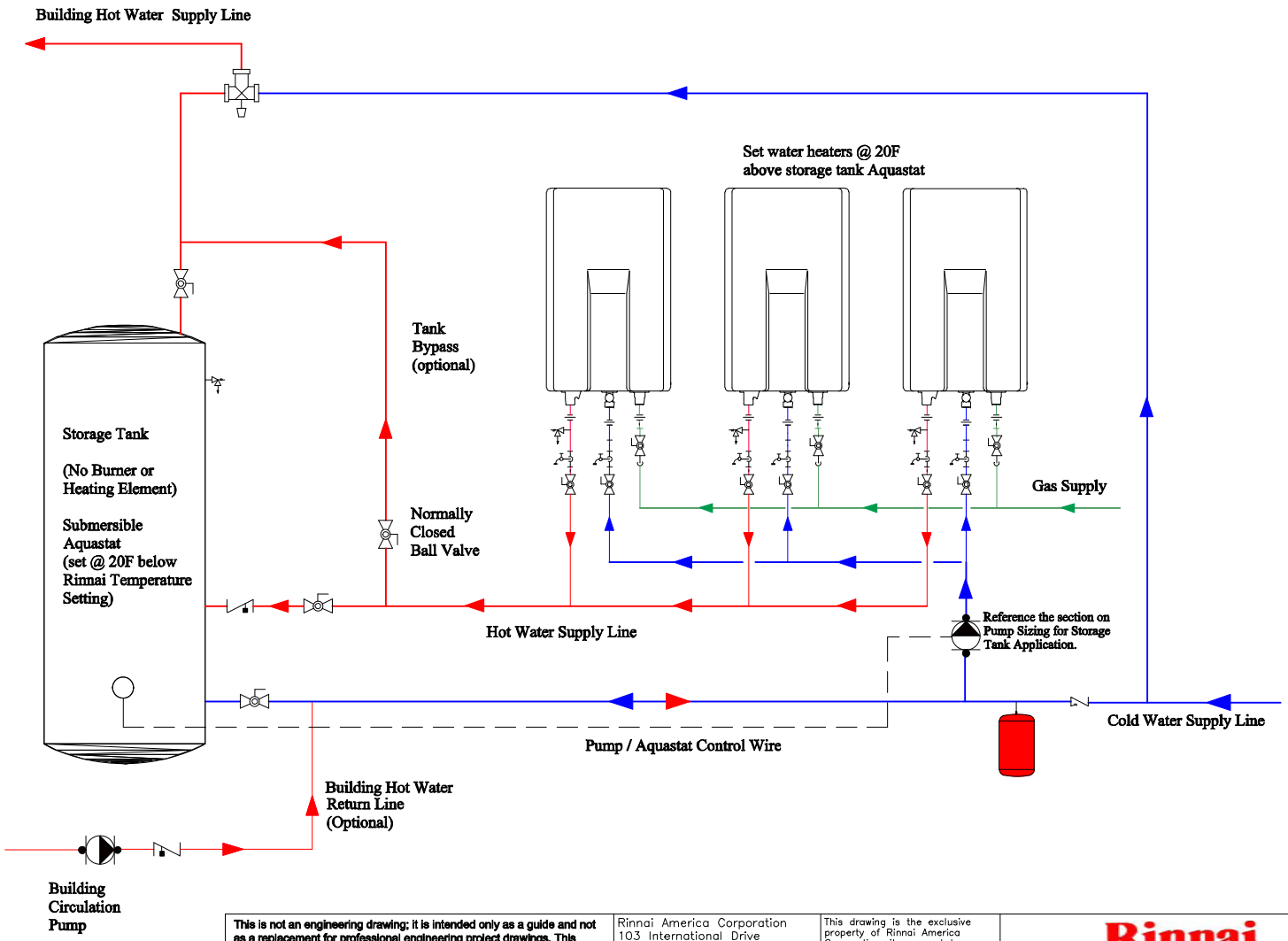
SIZE	SCALE	DWG NO.	REV
A	NTS	WH2-BC	D
DATE 03/02/11		SHEET 1 of 1	

Non-Condensing Tankless
Three Units with Backup Storage

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	3

For this application:

Do not use manifold electronic controls with storage tank applications



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Rinnai
Non-Condensing Tankless
Three Units with Backup Storage

SIZE	SCALE	DWG NO.	REV
A	NTS	WH3-BC	D

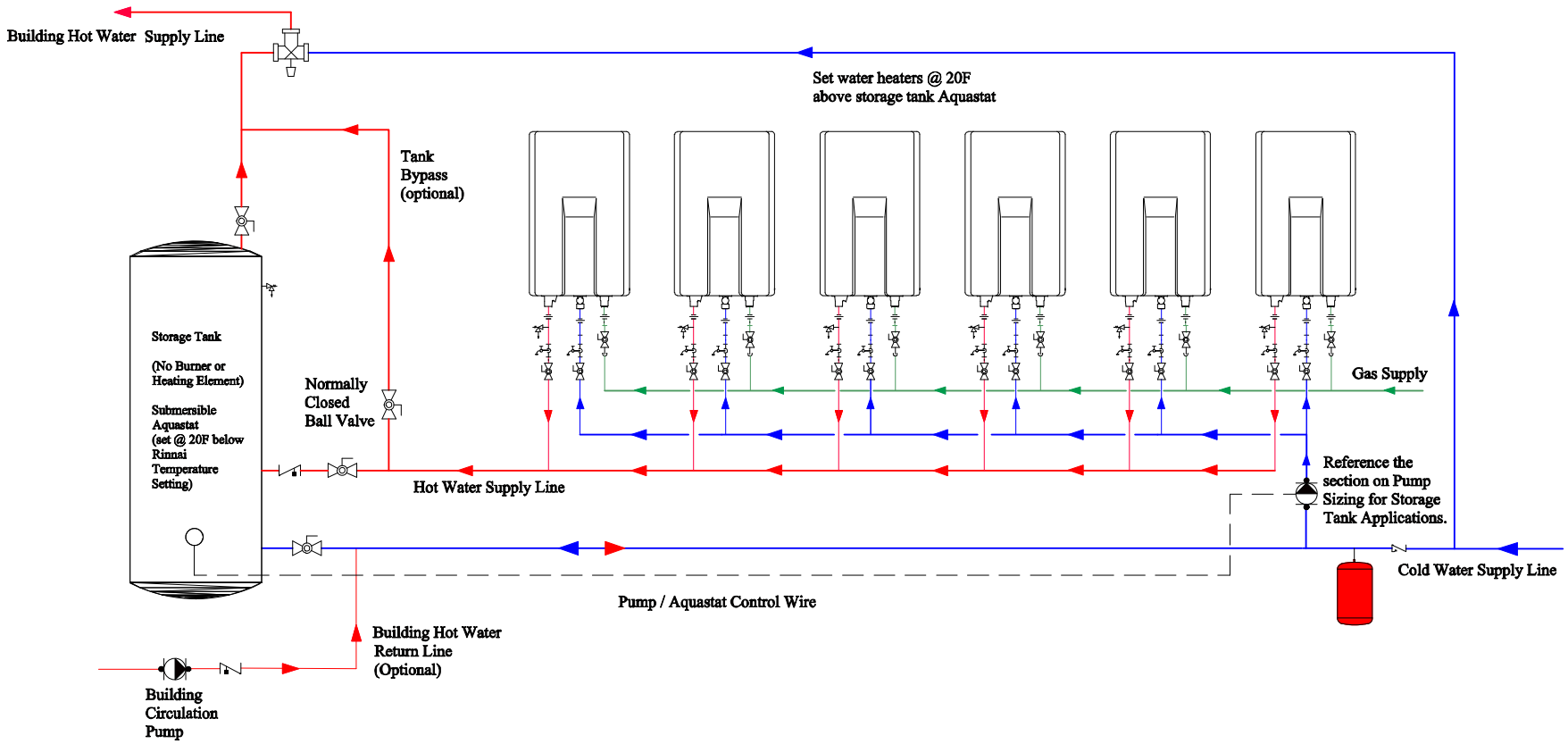
DATE 03/02/11 SHEET 1 of 1

Non-Condensing Tankless
Six Units with Backup Storage

Rinnai Equipment List	QTY
Rinnai Non-Condensing Water Heaters	6

For this application:

Do not use manifold electronic controls with storage tank applications



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Rinnai
Non-Condensing Tankless
Six Units with Backup Storage

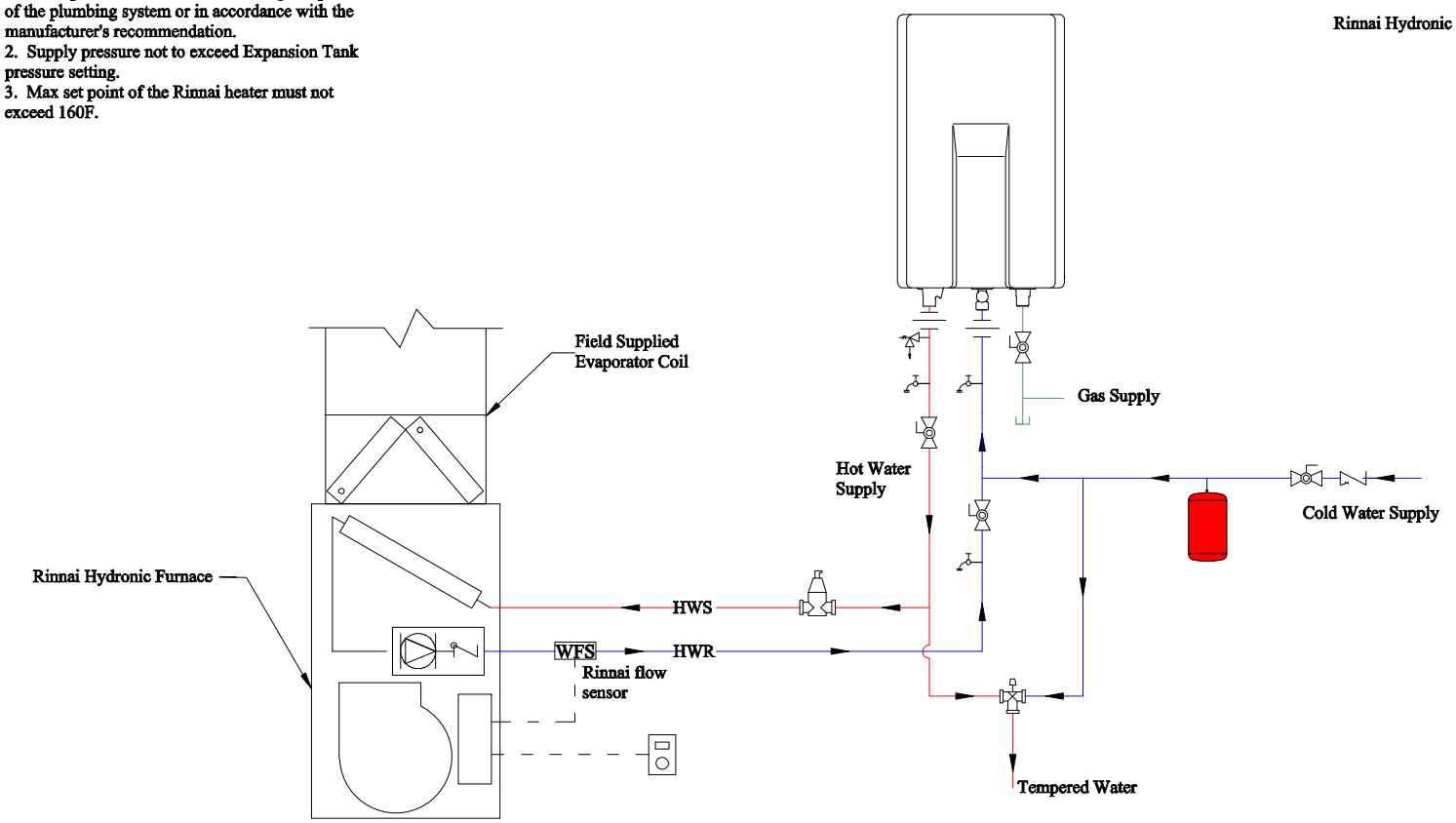
SIZE	SCALE	DWG NO.	REV
A	NTS	WH6-BC	D

DATE 03/02/11 SHEET 1 of 1

Rinnai Tankless
Single Unit with Hydronic Furnace

Notes:
1. Air Separator to be located at the highest point of the plumbing system or in accordance with the manufacturer's recommendation.
2. Supply pressure not to exceed Expansion Tank pressure setting.
3. Max set point of the Rinnai heater must not exceed 160F.

Rinnai Equipment List	QTY
Rinnai Tankless Water Heaters	1
Rinnai Hydronic Furnace	1



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Rinnai Tankless
Hydronic Furnace

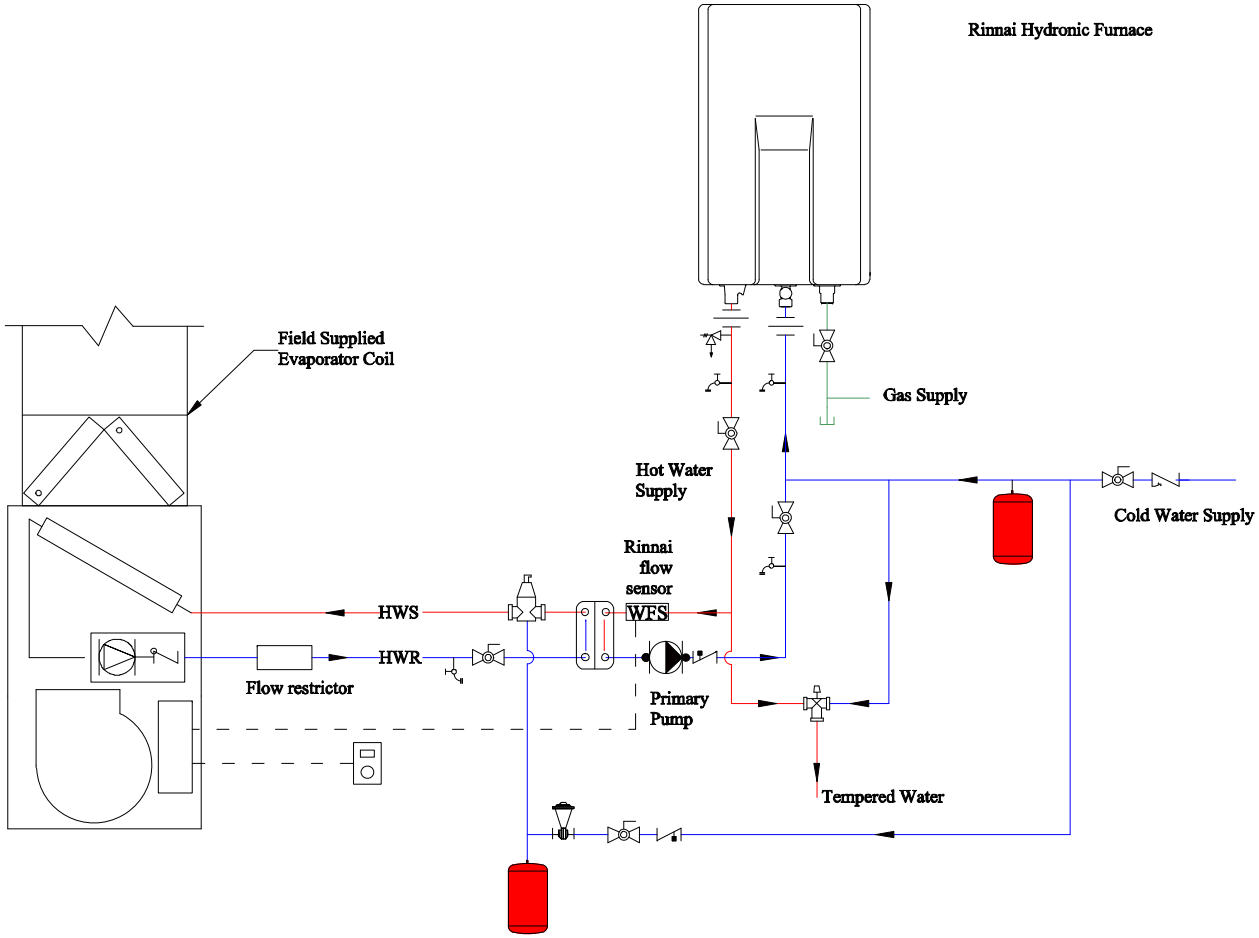
Drawn By	DRM	SIZE	SCALE	DWG NO.	REV
Approved By	RS	A	NTS	WH1-AHU	D
		DATE 03/02/11		SHEET 1 of 1	

Rinnai Tankless
Single Unit with Hydronic Furnace and Heat Exchanger

Notes:

1. Air Separator to be located at the highest point of the plumbing system or in accordance with the manufacturer's recommendation.
2. Supply pressure not to exceed Expansion Tank pressure setting.
3. Primary pump must be sized to overcome the pressure loss through the system (Rinnai, piping, and flat plate heat exchanger) at the desired heating system flow rate. Refer to the tankless operation and installation manual for pressure loss curve.
4. Primary pump to be interlocked with integral pump of air handling unit.
5. Pump to be suitable for potable water use.
6. Flat plate heat exchanger to be sized for desired heating system capacity and flow rate.
7. Max set point of the Rinnai heater = 160F.
8. Primary pump to be sized for 4gpm plus the pressure loss of the tankless water heater, flat plate heat exchanger, and piping.
9. Flow restrictor should be set to 4gpm.
10. Rinnai water heater set point temperature to be 10F above air handler design entering water temperature to air handler. Reference data tables in Rinnai air handler manual as needed.

Rinnai Equipment List	QTY
Rinnai Tankless Water Heaters	1
Rinnai Hydronic Furnace	1



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Rinnai Tankless
Hydronic Furnace and Heat Exchanger

SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-AHU-RES	D

DATE 03/02/11 SHEET 1 of 1

Rinnai Tankless
Single Unit D'MAND System with Hydronic Furnace

For this application:

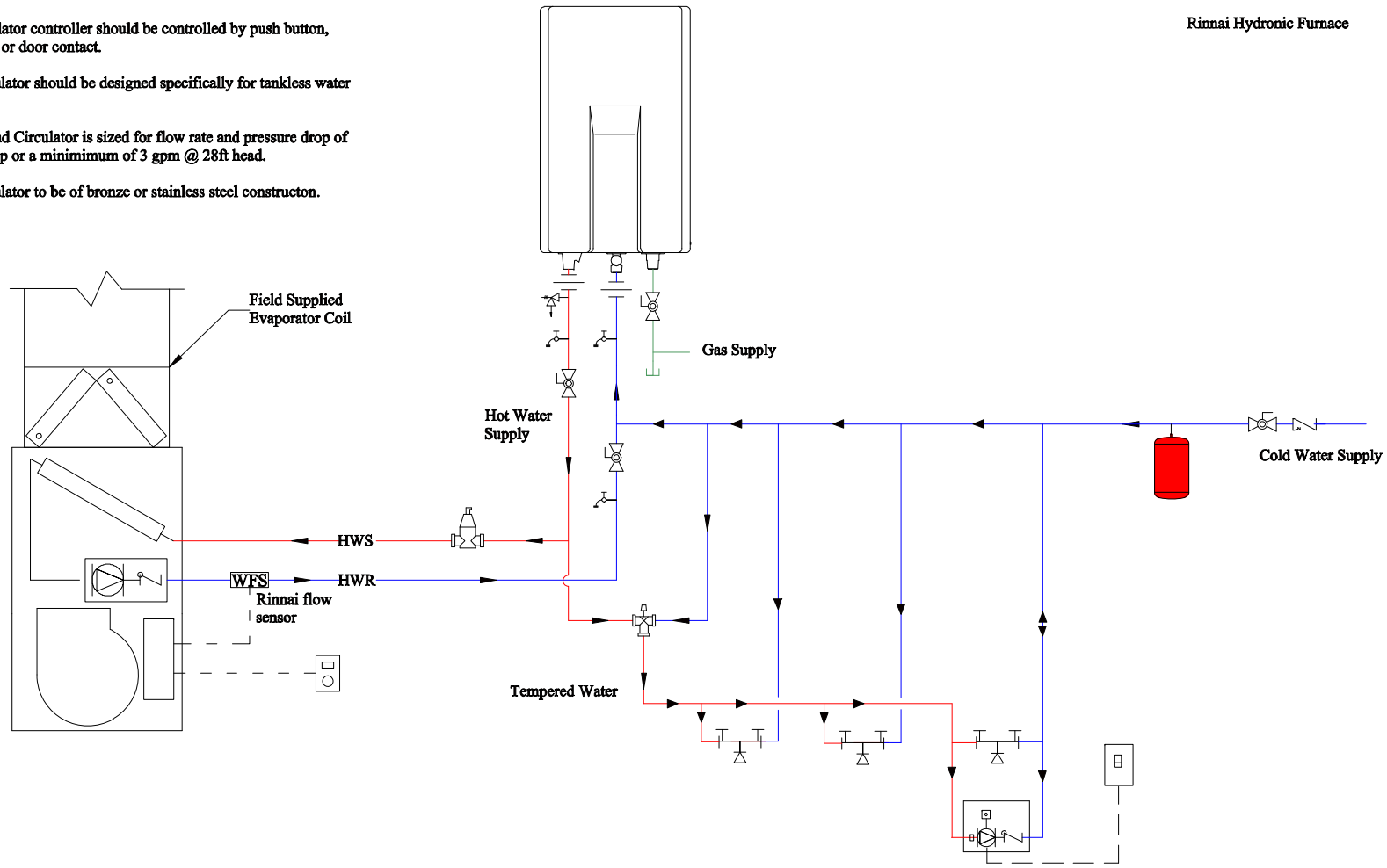
Demand circulator controller should be controlled by push button, motion sensor or door contact.

Demand Circulator should be designed specifically for tankless water heaters.

Ensure Demand Circulator is sized for flow rate and pressure drop of circulation loop or a minimimum of 3 gpm @ 28ft head.

Demand Circulator to be of bronze or stainless steel constructon.

Rinnai Equipment List	QTY
Rinnai Water Heaters	1
Rinnai Hydronic Furnace	1



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Rinnai
Rinnai Tankless
D'MAND System Hydronic Furnace

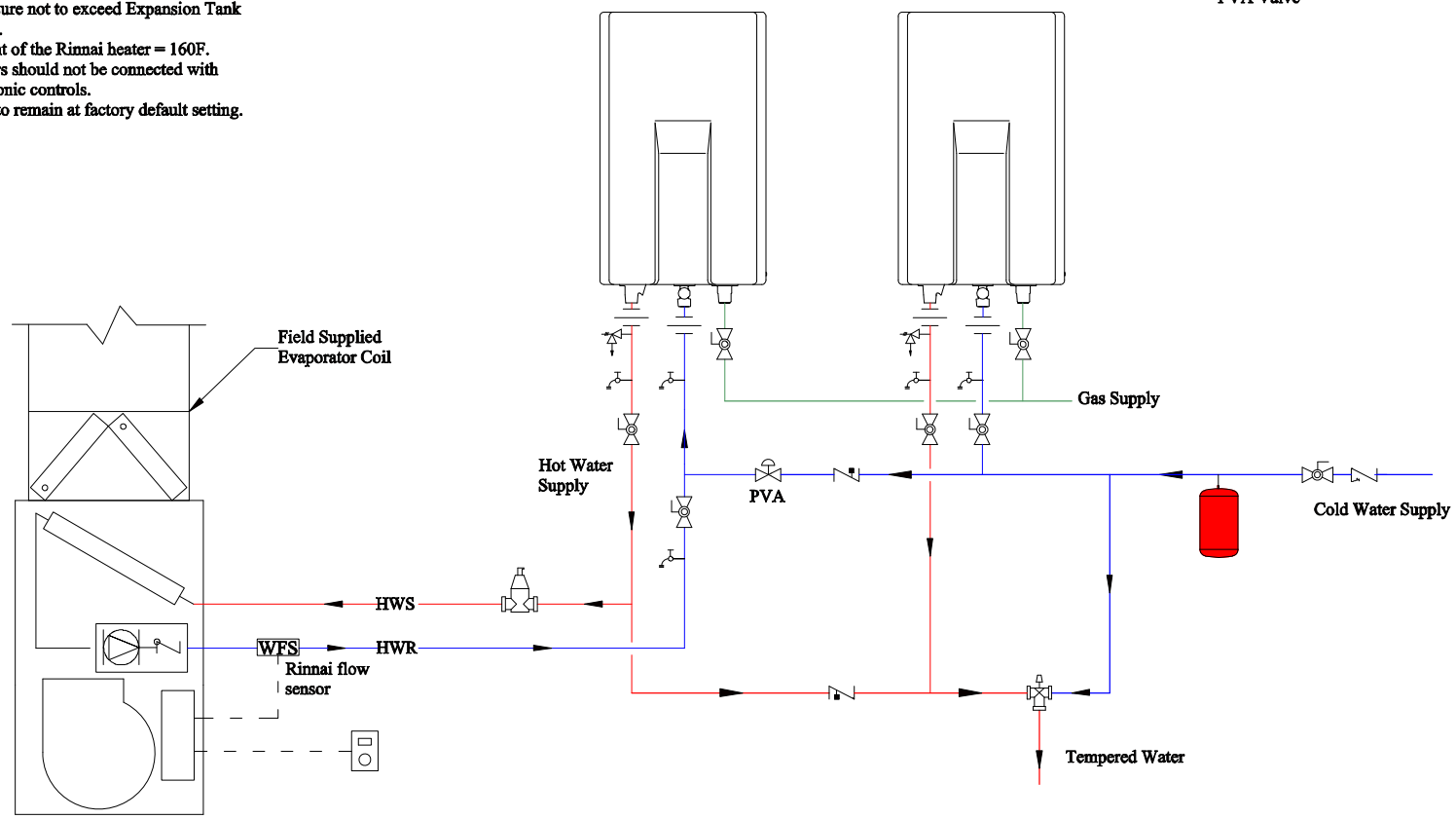
SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-A1-CD	D
DATE 03/02/11		SHEET 1 of 1	

Tankless Water Heaters
Two Units with Hydronic Furnace

Notes:

1. Air Separator to be located at the highest point of the plumbing system or in accordance with the manufacturer's recommendation.
2. Supply pressure not to exceed Expansion Tank pressure setting.
3. Max set point of the Rinnai heater = 160F.
4. Water heaters should not be connected with manifold electronic controls.
5. PVA Valve to remain at factory default setting.

Rinnai Equipment List	QTY
Rinnai Water Heaters	2
Rinnai Hydronic Furnace	1
PVA Valve	1



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Rinnai

Non-Condensing Tankless
Two Tankless with Hydronic Furnace

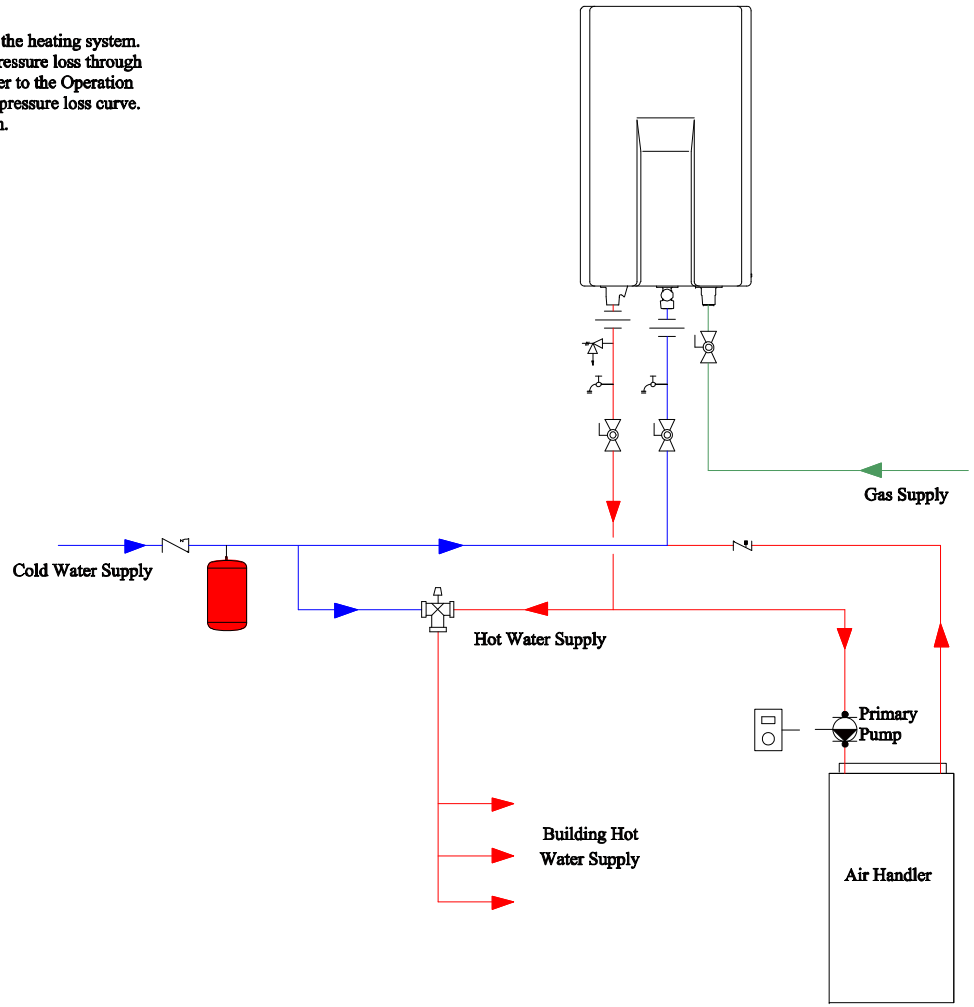
SIZE	SCALE	DWG NO.	REV
A	NTS	WH2-A1-CD	D

DATE 03/02/11 SHEET 1 of 1

Rinnai Tankless
Generic Air Handler

Primary Pump
Pump must be sized for the flow rate of the heating system. Pump must also be sized to overcome pressure loss through the system at the desired flow rate. Refer to the Operation and Installation Manual for the model's pressure loss curve. To be of bronze or stainless construction.

Rinnai Equipment List	QTY
Rinnai Tankless Water Heaters	1



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Rinnai Tankless
Generic Air Handler

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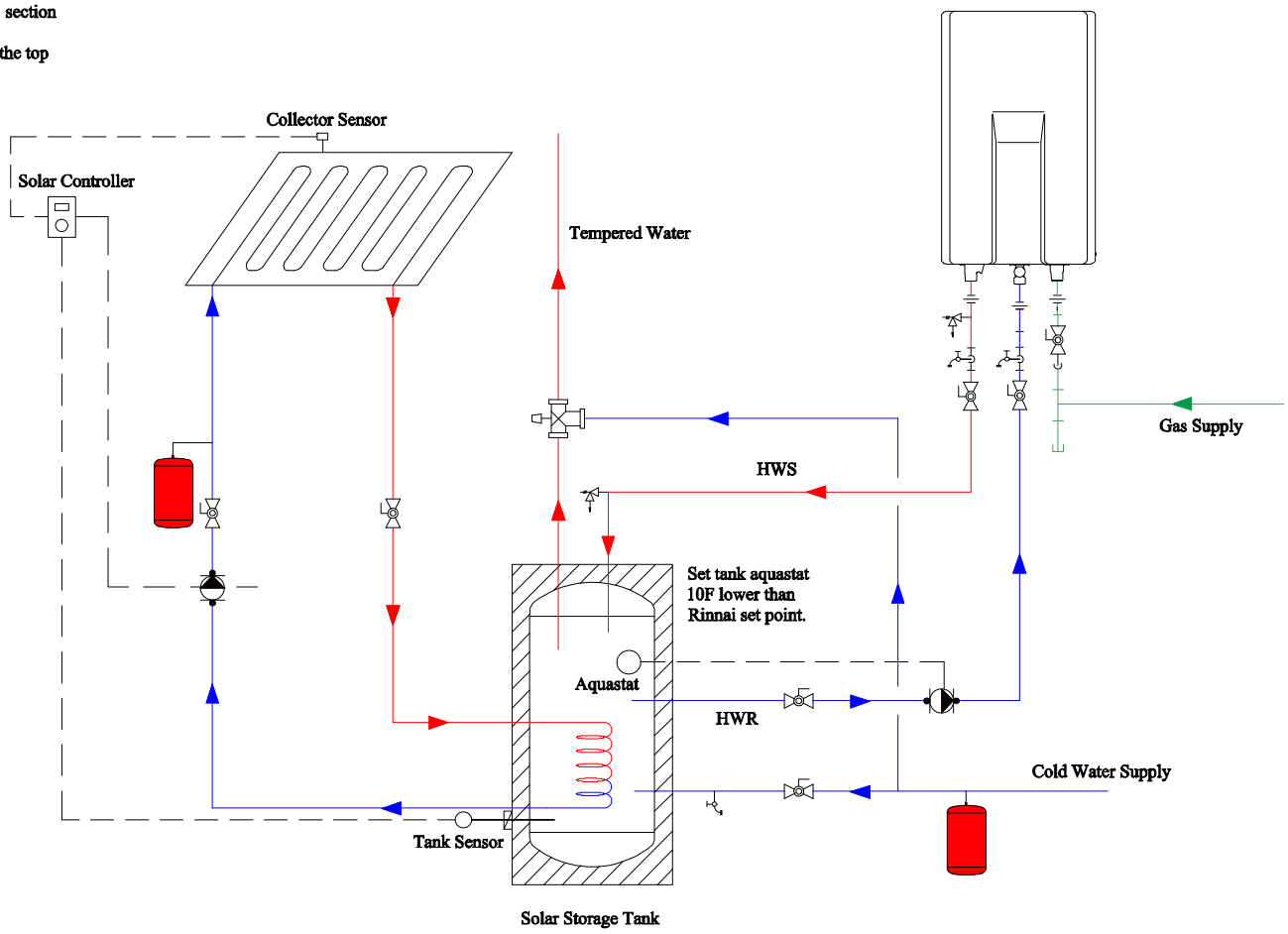
		DATE 03/02/11		SHEET 1 of 1	

Rinnai Tankless
Solar Backup

Rinnai Equipment List	QTY
Rinnai Tankless Water Heaters	1

Notes:
1. Ensure tank aquastat is in top 1/3 section of the tank.
2. Ensure the hot water return is in the top 1/2 section of the tank.



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Rinnai
Rinnai Tankless
Solar Backup

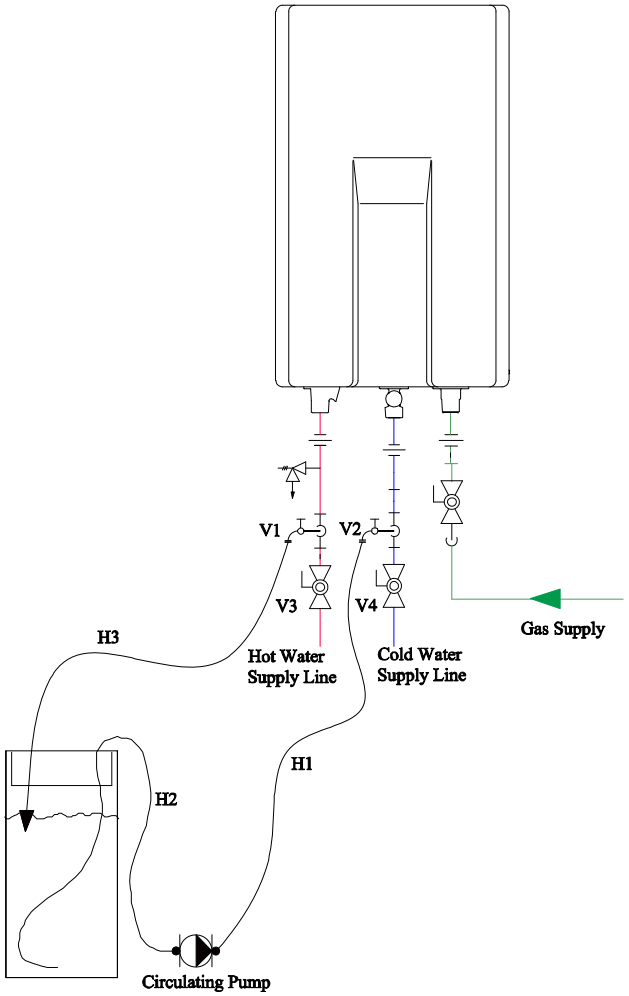
SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-S-1	D

DATE 03/02/11 SHEET 1 of 1

Flush Procedure

Single Unit Flush Procedure

1. Disconnect electrical power to the water heater.
2. Close the shutoff valves on both the hot water and cold water lines (V3 and V4).
3. Connect pump outlet hose (H1) to the cold water line at service valve (V2).
4. Connect drain hose (H3) to service valve (V1).
5. Pour 4 gallons of undiluted virgin, food grade, white vinegar into pail.
6. Place the drain hose (H3) and the hose (H2) to the pump inlet into the cleaning solution.
7. Open both service valves (V1 and V2) on the hot water and cold water lines.
8. Operate the pump and allow the cleaning solution to circulate through the water heater for at least 1 hour at a rate of 4 gallons per minute (15.1 liters per minute).
9. Turn off the pump.
10. Rinse the cleaning solution from the water heater as follows:
    a. Remove the free end of the drain hose (H3) from the pail. Place in sink or outside to drain.
    b. Close service valve, (V2), and open shutoff valve, (V4). Do not open shutoff valve, (V3).
    c. Allow water to flow through the water heater for 5 minutes.
    d. Close shutoff valve (V4). When unit has finished draining remove the in-line filter at the cold water inlet and clean out any residue. Place filter back into unit and open valve (V4).
    e. Close service valve, (V1), and open shutoff valve, (V3).
11. Disconnect all hoses.
13. Restore electrical power to the water heater.



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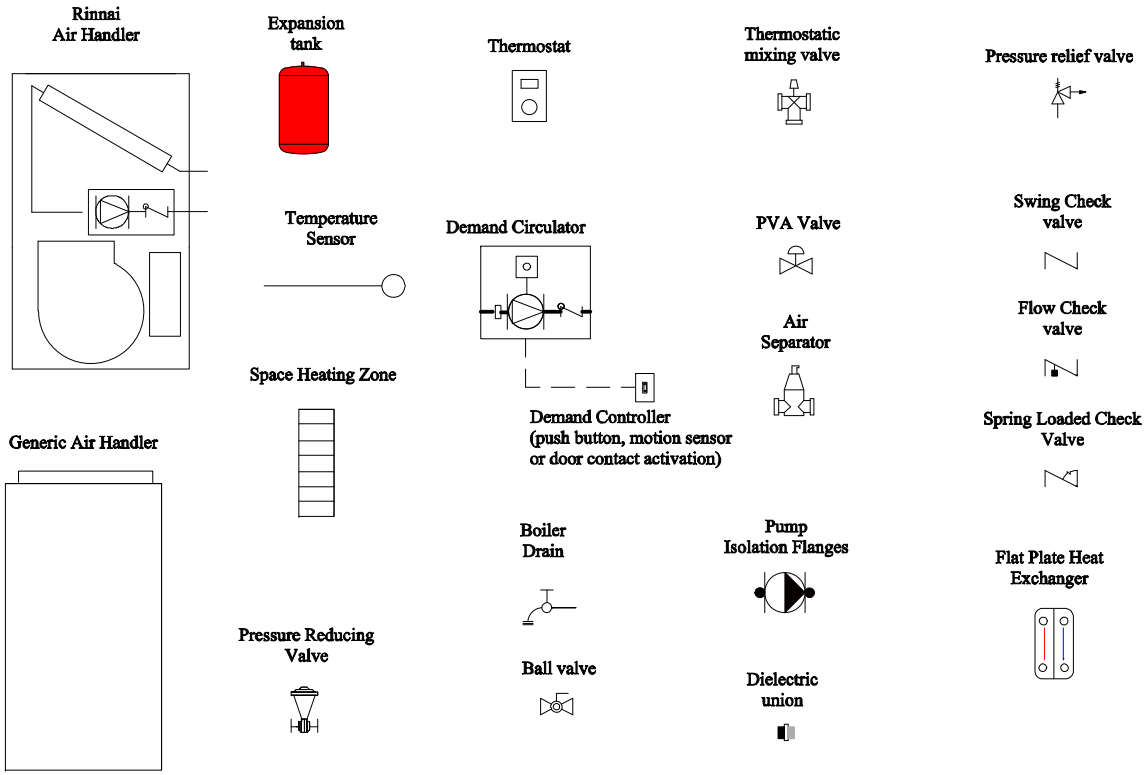
Rinnai Tankless
Single Unit Flush Procedure

SIZE	SCALE	DWG NO.	REV
A	NTS	WH1-F	D
DATE 03/02/11		SHEET 1 of 1	

Tankless Water Heaters
LEGEND



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Tankless Water Heaters
LEGEND

Drawn By	DRM	SIZE	SCALE	DWG NO.	REV
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- Vent Terminal A Included
- Gas Conversion Kit 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 96.5% AFUE efficiency
- Compact wall mounted design
- ASME accredited models

Condensing Tankless Water Heaters

- Residential and Commercial Applications
- ENERGY STAR ® qualified models
- Up 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 contruction offers design flexiblity

Register your product at www.rinnairegistration.com or call 1-866-RINNAI1 (746-6241)

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