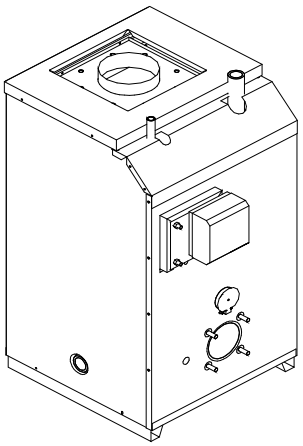
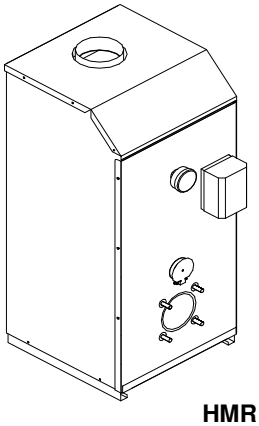
Installation Instructions and Homeowner's Manual

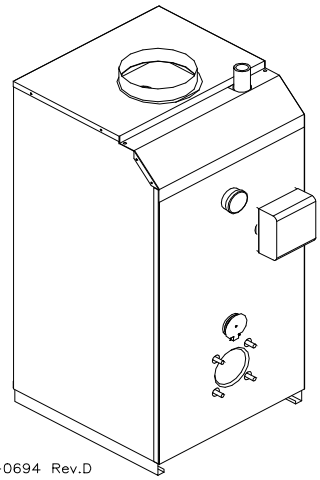
OIL FIRED
HOT WATER BOILER



HMT



HMR



HM2

DNS–0694 Rev.D

Models :

HMR
HMT
HM2

INSTALLER / SERVICE TECHNICIAN:

USE THE INFORMATION IN THIS MANUAL FOR THE INSTALLATION AND SERVICING OF THE FURNACE AND KEEP THE DOCUMENT NEAR THE UNIT FOR FUTURE REFERENCE.

HOMEOWNER:

PLEASE KEEP THIS MANUAL NEAR THE FURNACE FOR FUTURE REFERENCE.

Caution: Do not tamper with the unit or its controls. Call a qualified service technician.

Manufactured by:

DETTSON INDUSTRIES INC.
3400 Industrial Boulevard
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www.dettson.ca

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PART 1
INSTALLATION

1.1) SAFETY LABELLING AND SIGNAL WORDS

DANGER, WARNING AND CAUTION

The words DANGER, WARNING and CAUTION are used to identify the levels of seriousness of certain hazards. It is important that you understand their meaning. You will notice these words in the manual as follows:

⚠ DANGER

Immediate hazards which **WILL** result in death or serious bodily and/or material damage.

⚠ WARNING

Hazards or unsafe practices which CAN result in death or serious bodily and/or material damage.

CAUTION

Hazards or unsafe practices which **CAN** result in minor bodily and/or material damage.

It is important that you have a qualified technician install your boiler.

⚠ WARNING

- This boiler is designed to provide you with comfort, savings and reliability for many years to come. However, its performance depends on the appliance being installed, brought on-line, and maintained in accordance with the instructions provided in this manual.
- If the heat exchanger is subject to corrosion caused by the constant presence of air or oxygen in the water due to frequent water changes, an improperly designed distribution system or the use of plastic piping without oxygen barrier, the warranty will not be applicable.
- This boiler is equipped with a burner designed to burn only No. 2 fuel oil (furnace oil). Never attempt to burn used motor oil or any oil containing gasoline.
- Make sure that the boiler and system are filled with water and that all air has been bled before attempting to start the burner.
- Never operate the burner above the maximum temperature indicated on the boiler nameplate.
- Never attempt to start the burner when the combustion chamber contains excess oil, is overheated, or when a strong smell of oil permeates the appliance.
- Close oil valves if the boiler will not be in use for an extended period of time.
- Never store garbage or combustibles near the boiler.
- Never burn garbage or paper in your boiler.
- DO NOT TAMPER WITH THE UNIT OR ITS CONTROLS.

1.2) UNIT IDENTIFICATION

It is very important that you consult Figures 1 to 3 to identify the characteristics of each of the models offered in the “HMR - HMT – HM2” series.

Figure 1: “HMR” boilers without sanitary hot water coil and with a 13 cm (5") flue-pipe. The models are identified as HMR-080, HMR-092, HMR-103 and are available with either Beckett or Riello burners.

Figure 2: “HMT” boilers with or without sanitary hot water coil and with a 15 cm (6") flue-pipe. The models are identified as HMT12, HMT14, HMT16 and HMT18 and are available with either Beckett or Riello burners. These boilers are also approved with sealed combustion systems model VTK.

Figure 3: "HM2" boilers with or without sanitary hot water coil and with a 20 cm (8") flue-pipe. The models are identified as HM-185, HM-212, HM-240, HM-266 and HM-293. Available with the Beckett and Riello burners.

Each of these boilers has its own characteristics: location of return and supply pipes, sanitary hot water coil, relief valve and thermo manometer, diameter of the flue-pipe, etc.

1.3) DELIVERY

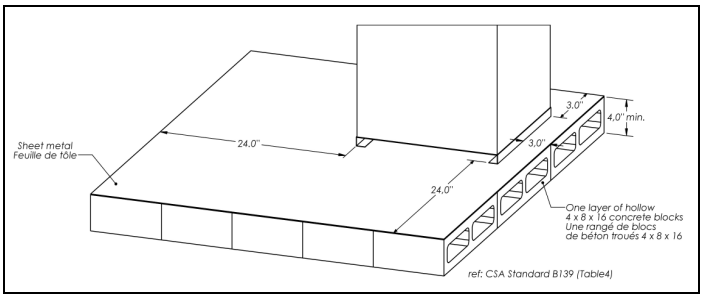
Carefully check your boiler upon delivery for any evidence of damage that may have occurred during shipping and handling. Any claims for damages or lost parts must be made with the Transport Company.

1.4) INSTALLATION

Your unit must be installed according to regulations as set out by competent authorities. Refer to the CSA B139 Installation Code.

1.4.1) Positioning

The boiler must be installed in a clean and dry area, as closely as possible to a chimney. The boiler is NOT approved for installation on a combustible floor. See sketch below for an example of a non combustible floor construction.



The unit must be installed in a location where the ambient temperature is over 15°C (60°F).

1.4.2) Clearances

The following minimum clearances from combustible surfaces must be observed:

Top:	22.86 cm (9")
Flue-pipe:	22.86 cm (9")
One side:	7.62 cm (3")
Other side:	0.60 m (24")
Front (from the cabinet)	0.60 m (24")
Rear:	7.62 cm (3")

1.5) WIRING

The boiler must be connected to a 15 amp / 120 Vac protected circuit. The installer must wire the boiler according to the appropriate electrical diagram. Refer to typical wiring diagrams, Figures 5.1 to 5.5. All wiring must be in accordance with the "Canadian Electrical Code" CSA C22.1/ Part I.

CAUTION

Always select the wiring diagram based on the distribution system (piping) and whether or not the boiler has a sanitary hot water coil.

"HMR – HMT – HM2" boilers with integrated by-pass are designed for installation on any type of distribution (piping) system that is equipped with a circulating pump such as finned tube baseboard and cast iron radiators as shown in Figure 4. The integrated by-pass permits a stabilisation of the temperature rise between the supply and return pipes to approximately Δ11°C (Δ20°F), whatever the return temperature. In addition, the integrated by-pass prevents condensation in the boiler when using the circulator contact available on the boiler aquastat.

This way, thermal shocks in the pipes are eliminated, off-cycling of the circulator is reduced and water temperature throughout the system is better controlled.

If more than 1 circulator is used, we recommend the use of an RC-02 circulator control.

1.6) OIL SUPPLY

The installation of the oil tank and lines must be in accordance with local codes and regulations. The burner can be hooked up to a one pipe system if the oil level in the tank is always above the burner. On an outside, above ground fuel tank hook-up, a one pipe system with a nominal dimension of 1.3 cm (½") diameter is ideal. Be sure to install the oil filter and at least 3 m (10') of piping inside the building, to allow the fuel oil to warm up in very cold weather, before reaching the burner.

The oil pump configuration is for a 1 pipe system. Insert the by-pass plug for a 2 pipe system (refer to the manufacturer's Instruction Manual).

The installation must include an oil filter and a shutoff valve. Ensure that the piping has no leaks and that there are no obstructions. Do not use couplings or compression fittings on oil lines. On a two pipe system, use the same diameter pipe for both the suction and the return lines and set them at the same depth in the oil tank. Additional information can be found in the burner installation manual provided with your boiler.

Check the entire oil distribution system for leaks at the beginning of each heating season.

TABLE 1
Chimney draft

Model	Chimney size		Connecting pipe	Recommended draft
	Minimum	Maximum		
HMR	12.70 cm (5")	15.24 cm (6")	12.70 cm (5")	8.71Pa (0.035")
HMT	12.70 cm (5")	15.24 cm (6")	15.24 cm (6")	8.71Pa (0.035")
HM2	17.78 cm (7")	20.32 cm (8")	20.32 cm (8")	12.44Pa (0.050")

1.7) CHIMNEY

1.7.1) Chimney draft

The chimney draft must be strong enough to ensure the safe and reliable operation of your unit.

1.7.2) Installation

The connecting flue pipe diameter must never exceed that of the chimney and its horizontal runs should have a minimum upward slope toward the chimney of 2 cm per 1 m (1/4" per foot) of run. The use of a damper in the connecting flue pipe is strictly prohibited. The use of a draft control is compulsory. Its omission constitutes sufficient grounds for voiding the warranty on the unit.

NOTICE

It is possible that an efficient hot water boiler will cause the formation of condensation on the three outer sides of an outside chimney. Should this happen, a chimney liner or an "SMH" side wall venting system should be installed.

1.7.3) Side wall venting

"HMR-HMT-HM2" hot water boilers are approved for installation with the SMH side wall venting system. HMT hot water boiler is also approved for installation with the VTK sealed combustion system.
If such a system is used, please refer to the installation manual supplied with the venting system.

1.8) BLOCKED VENT SHUT-OFF (BVSO) For chimney venting

⚠ WARNING

IT IS IMPERATIVE THAT THIS DEVICE BE INSTALLED BY A QUALIFIED SERVICE TECHNICIAN.

This device is designed to detect the insufficient evacuation of combustion gases in the event of a vent blockage. In such a case the thermal switch will shut down the oil burner. The device will then need to be restarted MANUALLY.

Refer to the wiring diagrams and the detailed instructions supplied with the BVSO for the installation and wiring procedures. The length of wires supplied with the unit is such that the safety device must be installed between the flue outlet of the appliance and the draft regulator, as indicated in the instructions.

It is further imperative that the BVSO be maintained annually. For more details refer to the instructions supplied with the device itself, as well as Section 3 of this Manual.

CAUTION

A positive pressure venting system (Sealed Combustion System or Direct Vent) MUST NOT use the BVSO. Follow the instructions supplied with the venting system.

1.9) BURNER INFORMATION

The burner is shipped in a box, separate from the boiler and must be installed as follows:

1. Check that the model number on the burner carton matches the one on the boiler nameplate;
2. Remove the burner from its box;
3. Check the electrode settings;
4. Install the burner on the boiler, using the nuts which are already on the studs. Be sure to install the fireproof gasket supplied with the burner. Also, ensure that the end of the blast tube is flush with the inside surface of the combustion chamber when installing a Riello burner with an adjustable flange;
5. Connect the oil pipe(s) to the burner pump;
6. Wire the electrical connections in accordance with the appropriate diagram (see Section 1.5.)

CAUTION

NEVER use the "interrupted ignition" function if a Honeywell R7184 series combustion relay is installed on the burner.

1.10) COMBUSTION AIR SUPPLY

In order to function reliably, every oil heating system requires an adequate supply of combustion air. If the boiler must be installed in a confined area, 2 permanent openings must be provided. Both openings must be sized at 240 cm^2/l (1 ft^2) per U.S. gallon of oil burned per hour. One opening must be located near the ceiling, the other near the floor.

1.11) PIPING

The satisfactory operation of your boiler depends greatly on the installation of your plumbing. Refer to Figure 4.

In any event, the installation must include:

1. A pressure reducing valve, set at 83 kPa (12 psi), installed on the boiler cold water supply;
2. An expansion tank pressurized to 83 kPa (12 psi), installed on the piping;
3. An automatic air vent, to eliminate trapped air in the boiler;
4. A correctly sized water circulator, installed on the heating loop;
5. Stop valves and threaded unions, installed on the return and supply pipes of the boiler.

Always use quality pipe sealant on all threaded connections and ensure that these connections are well tightened. Avoid flushing the system when the boiler is a replacement for an existing one, to limit oxygen from getting into the system.

CAUTION

To avoid water damage and/or scalding due to relief valve operation, a discharge line must be connected to the valve outlet and run to a drainage area. The discharge line shall be installed in such a way that it will allow for the complete drainage of the valve and discharge line.

1.12) BVSO PERFORMANCE TEST

The purpose of the following test is to check that the electrical outlet on the furnace, designated to the BVSO, is functional.

1. Start up the burner;
2. Remove the three-pole plug from the BVSO outlet on the furnace;
3. The burner must shut-off immediately.

If the test is not in line with the above, call a QUALIFIED SERVICE TECHNICIAN.

1.13) SANITARY HOT WATER HEATING COIL

Before attempting to install a coil, always check the water quality to avoid premature scaling, which quickly renders your installation inefficient. Consult a specialist and have a water treatment system installed, if necessary.

Locate the water inlet with the marking “IN”. We strongly recommend the use of a thermostatic mixing valve to achieve safe and optimal operation from the installation.

1.14) THERMOSTAT

The thermostat must be mounted on an inside wall, approximately 1.5 m (5') above the floor. The location should be such that the thermostat is not subjected to air currants and/or exposed to direct sunlight.

1.15) DRAFT REGULATOR

For chimney venting, a barometric draft regulator must be installed on the connecting pipe between the chimney and the boiler. It must be located in an easily serviceable location. Please refer to the installation instructions supplied with it.

PART 2
OPERATION

We recommend that a qualified service technician start-up and service your boiler. Ensure that the boiler and the system are always full of water and that all air has been bled before starting the burner.

2.1) FUEL

Use only No. 2 fuel oil. Never attempt to use a heavier fuel oil, gasoline, motor oil or any other sort of fuel with your boiler.

2.2) START UP

1. Make sure that the tank contains fuel oil and that the fuel and water valves are open;
2. The main power switch must be “OFF”;
3. Set the Limit Control to the desired temperature, for example 82º C (180º F);
4. Install a 0 - 1400 kPa (200 psi) pressure gage on the oil pump. The use of a suction gage may also be appropriate at the oil pump inlet, if suction of over 20.7 kPa (3 psi) may be encountered;
5. Pre-adjust the burner according to the specifications of Tables 2, 3 or 4. These specifications should only be used as a reference for initial start-up. Refer to the manual provided with the burner for further information on adjustments;
6. Turn the main switch “ON” and start the burner by setting the thermostat to its maximum;
7. Air can be bled from oil lines through the bleed port on the oil pump. If there is no ignition and the burner combustion relay goes into safety mode, see Section 2.3 below;
8. Adjust the oil pressure to the specified value in Tables 2, 3 or 4;
9. Adjust the chimney draft as specified in Table 1. Take this reading midway between the draft regulator and the outlet of the boiler;
10. Adjust the burner air band(s) for a smoke scale reading of 0 on the Bacharach scale;
11. Analyse the combustion gases with an appropriate instrument and set the burner accordingly.

Note: If a burner cabinet is used, ensure that all tests are done with this cabinet in place. Do not forget to tighten the adjustment screws once the burner is adjusted, before putting the burner cabinet back permanently.

12. Check the correct operation of the temperature controls and the burner combustion relay;
13. Adjust the limits and the thermostat to the desired set points. Be sure to avoid operating settings which will result in the boiler water temperature going below 60°C (140°F).

2.3) RESTARTING AFTER IGNITION FAILURE

1. Check the oil level in the fuel tank;
2. Make sure the fuel supply valve is open;
3. Make sure the oil filter is not clogged;
4. Check the electrical circuit (fuse or breaker);
5. Check the burner electrode settings. Refer to the burner instruction manual;
6. Check if the thermostat is calling for heat;
7. Check for air in the oil pump suction line.

If after following these steps and pressing the red Burner Reset Button, the burner still does not fire, call a qualified service technician. Never attempt to re-start the burner if excess fuel oil or fumes have accumulated in the combustion chamber.

2.4) SUMMER SEASON

Make sure the fuel oil valve is closed when the boiler is not in use for a long period of time.

2.5) START-UP AT THE BEGINNING OF THE HEATING SEASON

1. Clean the chimney, the connecting flue pipes and the boiler. Follow the steps in Section 3.6);
2. Replace the oil filter;
3. Have the burner electrodes cleaned along with the burner retention head and change the nozzle;
4. Check the operation of the high temperature Limit Control;
5. Check the operation of the circulating pump.

PART 3
MAINTENANCE

3.1) MAINTENANCE

The area around the boiler must be kept free of combustibles, excessive dust and humidity, and highly flammable products at all times. Fresh air openings to the boiler and the boiler room must be kept clear. Repair any water and oil leaks without delay.

3.2) NOZZLE

A dirty or clogged nozzle can prevent ignition or cause odours. If this is the case, it must be replaced.

3.3) FUEL TANK

Regularly check the level in the fuel tank. Should the tank run dry, the fuel lines will have to be bled before restarting the burner.

3.4) OIL FILTER

Replace the oil filter at the beginning of each heating season.

3.5) BURNER AND CIRCULATING PUMP MOTORS

Motors should be lubricated at least once a year (except permanently lubricated motors), with 2 to 3 drops of SAE 20 detergent-free oil.

3.6) CLEANING THE BOILER

1. Turn the main power switch “OFF” before cleaning;
2. Remove and clean the connecting flue pipe, sweep and check the chimney;

CAUTION

The boiler being equipped with a sound trap, make sure not to damage the acoustical material when cleaning the boiler. The use of a flexible cleaning brush is strongly recommended.

3. Remove the smoke box and the fire tube baffles and clean the fire tubes, with the help of a 5 cm (2") diameter steel brush.
4. Remove the burner and clean the combustion chamber. Take care to not damage the ceramic bottom insulation;
5. Examine the cleaned surfaces for corrosion and correct the cause, as needed;
6. Re-install all components in their original positions and re-adjust the unit.

3.7) BLOCKED VENT SHUT-OFF (BVSO) CLEANING

For continued safe operation, the Blocked Vent Shut-Off System (BVSO) is required to be inspected and maintained annually by a qualified service technician.

1. **Disconnect power to the appliance.**
2. Remove the two screws holding on the BVSO assembly cover.
3. Remove the cover.
4. Remove the two screws holding the control box to the heat transfer tube assembly. Sliding the control box in the appropriate direction will unlock it from the heat transfer tube assembly;
5. Carefully remove any build-up from the thermal switch surface;

CAUTION

Do not dent or scratch the surface of the thermal switch. If the thermal switch is damaged, replacement is required.

6. Clear and remove any build-up or obstruction inside the heat transfer tube.
7. Re-mount, lock and fasten the control box with the 2 screws removed in step 4;
8. Re-attach the assembly cover with the screws removed in step 2.
9. Re-establish power to the appliance.

3.8) BOILER PURGE

It is recommended to purge the boiler for about 1 minute at least once a year, to evacuate sludge and sediment that has accumulated at the bottom of the boiler. Proceed as follows:

1. Let the boiler cool down;
2. Hook-up a garden hose to the drain valve have a bucket ready;
3. Open the valve and drain the water into the bucket until it comes out clean.

3.9) SPARE PARTS

It is always recommended to replace a defective part with a genuine part, available from your supplier.

3.10) TROUBLESHOOTING

Note: It is normal to have to wait several hours after a cold start, before the house is well heated, because of the thermal inertia of the building.

PART 4
INFORMATION

Model: _____ Serial number: _____

Installation date of the boiler: _____

Service telephone # - Day: _____ Night : _____

Dealer name and address : _____

_____

_____

START-UP TEST RESULTS

Nozzle: _____ Pressure : _____ lb/in^2

Burner adjustments : Primary air _____

Fine air _____

Draw Assembly _____

CO_2 : _____ % Smoke scale : _____ (Bacharach)

Gross flue temperature: _____ °F

Ambient temperature: _____ °F

Chimney draft: _____ " W.C.

Overfire draft : _____ " W.C.

Test performed by : _____

TABLE 2 Technical specifications HMR

Beckett Burner AFG-F	HMR-80-B	HMR-92-B	HMR-103-B	HMR-121-B
Capacity (BTU/h)	79000	90000	101000	116000
Input (USGPH)	0.65	0.75	0.85	1.00
Retention head	F0	F3	F3	F3
LFRB*	Yes	Yes	Yes	No
Nozzle (Delavan)	0.65-80W	0.75-80W	0.85-80W	1.00-80A
Pressure (PSI)	100	100	100	100
Insertion tube (in.)	2 7/8	2 7/8	2 7/8	2 7/8
Adjustment main air band	0	0	0	1
Adjustment air shutter	8	9	9	9
AFUE%	84	83,5	80,9	80,6
Riello burner 40-F3	**HMR-80-R**	**HMR-92-R**	**HMR-103-R**	**N/A**
Capacity (BTU/h)	79000	91000	100000	-
Input (USGPH)	0.65	0.75	0.85	-
Nozzle (Delavan)	0.60-80A	0.65-70B	0.75-70B	-
Pressure (PSI)	120	135	130	-
Insertion tube (in.)	3 9/16	3 9/16	3 9/16	-
Adjtusment air shutter	3.8	4.1	6.1	-
Adjustment turbulator	0	0	0	-
AFUE%	84,9	84,4	81,8	-

* LFRB = Low Firing Rate Baffle (refer to the burner manual)

TABLE 3 Technical specifications HMT

Beckett Burner AFG-F (With chimney)	HMT-12-B	HMT-14-B	HMT-16-B	HMT-18-B
Capacity (BTU/h)	118000	141000	158000	175000
Input (USGPH)	1.00	1.20	1.35	1.50
Retention head	F6	F6	F6	F6
LFRB*	No	No	No	No
Nozzle (Delavan)	1.00-70A	1.20-70A	1.35-70A	1.50-70A
Pressure (PSI)	100	100	100	100
Insertion tube (in.)	2 7/8	2 7/8	2 7/8	2 7/8
Adjustment main air band	0	1	1	2
Adjustment air shutter	7	5	6	5
AFUE %	82,1	82,4	81,6	80,9
Riello Burner 40-F5 (With chimney)	**HMT-12-R**	**HMT-14-R**	**HMT-16-R**	**HMT-18-R**
Capacity (BTU/h)	120000	142000	159000	175000
Input (USGPH)	1.00	1.20	1.35	1.50
Nozzle (Delavan)	0.85-70B	1.00-70B	1.10-70B	1.25-70B
Pressure (PSI)	140	145	150	145
Insertion tube (in.)	3 9/16	3 9/16	3 9/16	3 9/16
Adjustment air shutter	2,5	2,75	3,5	4,5
Adjustment turbulator	0	1	2	3
AFUE %	85.7‡	84,6	83,4	82,4
Riello Burner 40-BF5 (Sealed combustion)	**HMT-12-R**	**HMT-14-R**	**HMT-16-R**	**N/A**
Capacity (BTU/h)	120000	142000	159000	-
Input (USGPH)	1.00	1.20	1.35	-
Nozzle (Delavan)	0.85-80B	1.00-80B	1.10-80B	-
Pressure (PSI)	140	145	150	-
Insertion tube (in.)	3 9/16	3 9/16	3 9/16	-
Adjustment air shutter	2	2	3	-
Adjustment turbulator	3	5	5	-
AFUE %	85.7‡	84,6	83,4	-

*** LFRB = Low Firing Rate Baffle (refer to the burner manual)**

‡ = ENERGY STAR

TABLE 4 Technical specifications HM2

Beckett Burner AFG-V1	HM-185-B	HM-212-B	HM-240-B	HM-266-B	HM-293-B
Capacity (BTU/h)	185000	215000	243000	270000	296000
Input (USGPH)	1.50	1.75	2.00	2.25	2.50
Retention head	MD-V1	MD-V1	MD-V1	MD-V1	MD-V1
LFRB*	No	No	No	No	No
Nozzle (Delavan)	1.50-70B	1.75-70B	2.00-70B	2.25-70B	2.50-70B
Pressure (PSI)	100	100	100	100	100
Insertion tube (in.)	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8
Adjustment main air band	6	7	4	6	5
Adjustment air shutter	4	4	3	4	4
Head adjustment V1	1	2	3	5	6
Riello Burner 40-F10	**HM-185-R**	**HM-212-R**	**HM-240-R**	**HM-266-R**	**HM-293-R**
Capacity (BTU/h)	185000	215000	243000	270000	296000
Input (USGPH)	1,50	1,75	2,00	2,25	2,50
Nozzle (Delavan)	1.25-60B	1.50-45B	1.65-45B	1.75-45B	2.25-60B
Pressure (PSI)	145	135	145	165	125
Insertion tube (in.)	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8
Adjustment air shutter	3,4	4,5	3,4	5,5	4,5
Adjustment turbulator	0,0	1,0	2,0	3,0	4,0

FIGURE 1 HMR Boiler

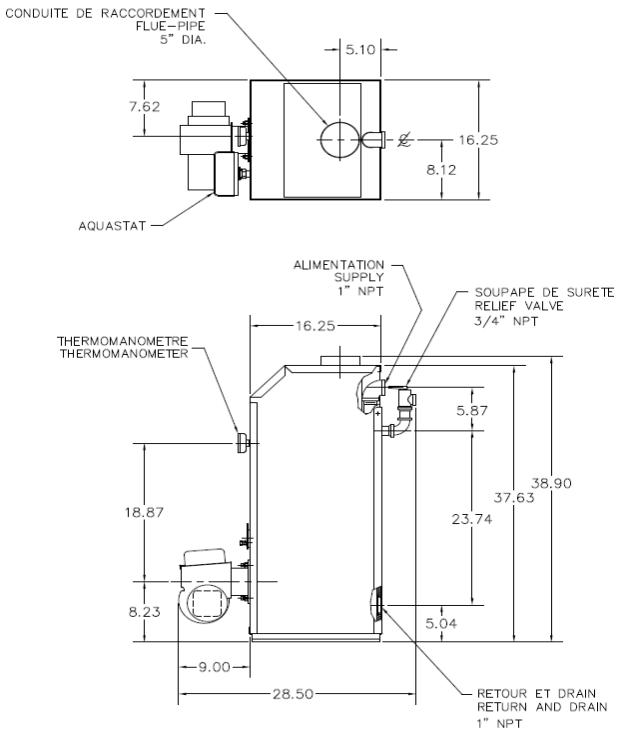


FIGURE 2 HMT boiler with or without coil

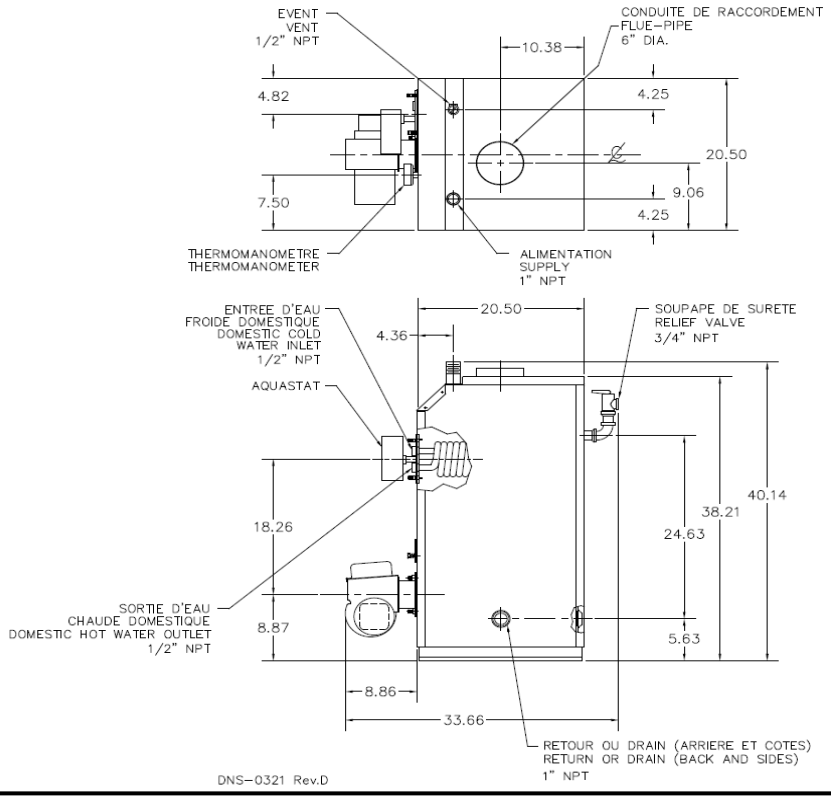


FIGURE 3 HM2 boiler with or without coil

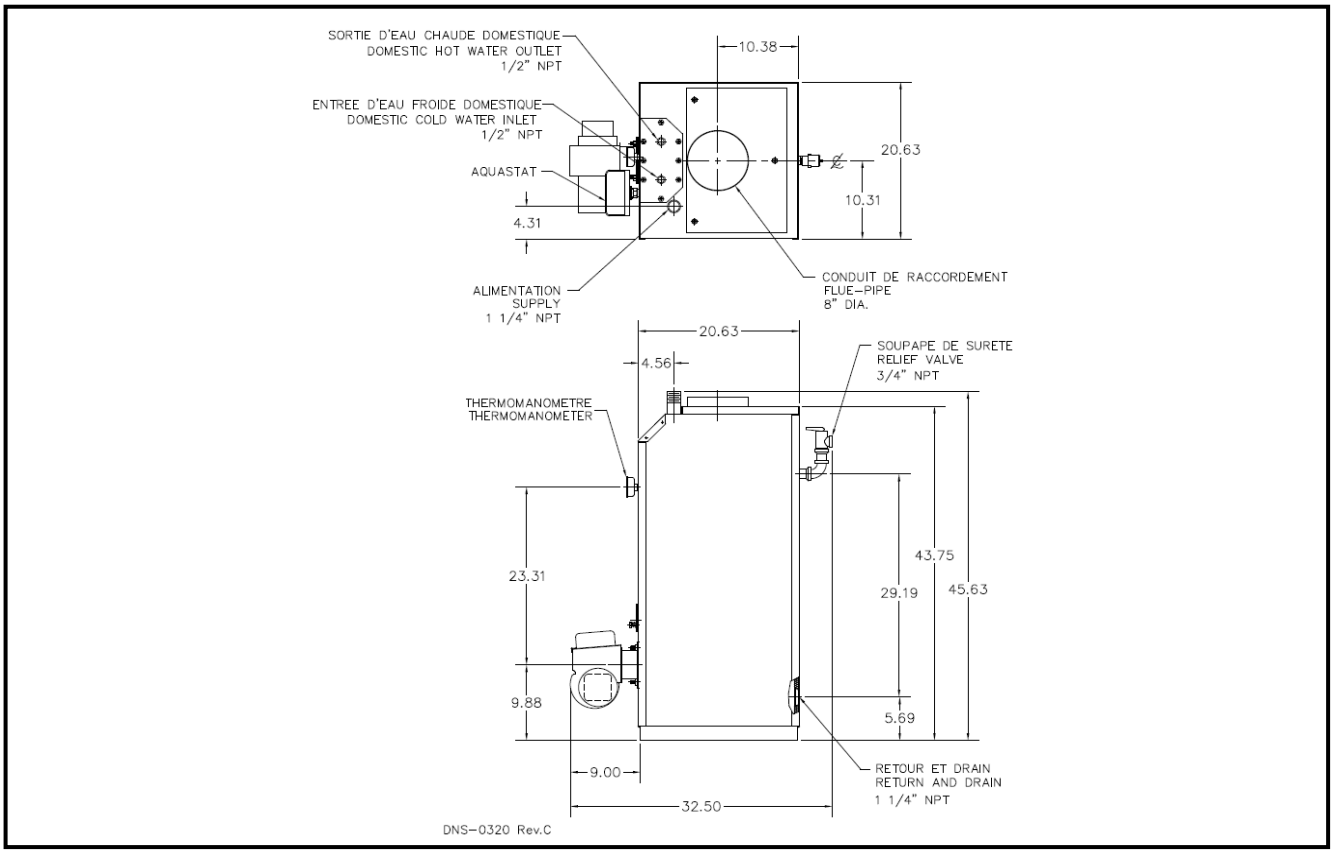


FIGURE 4 General piping installation diagram

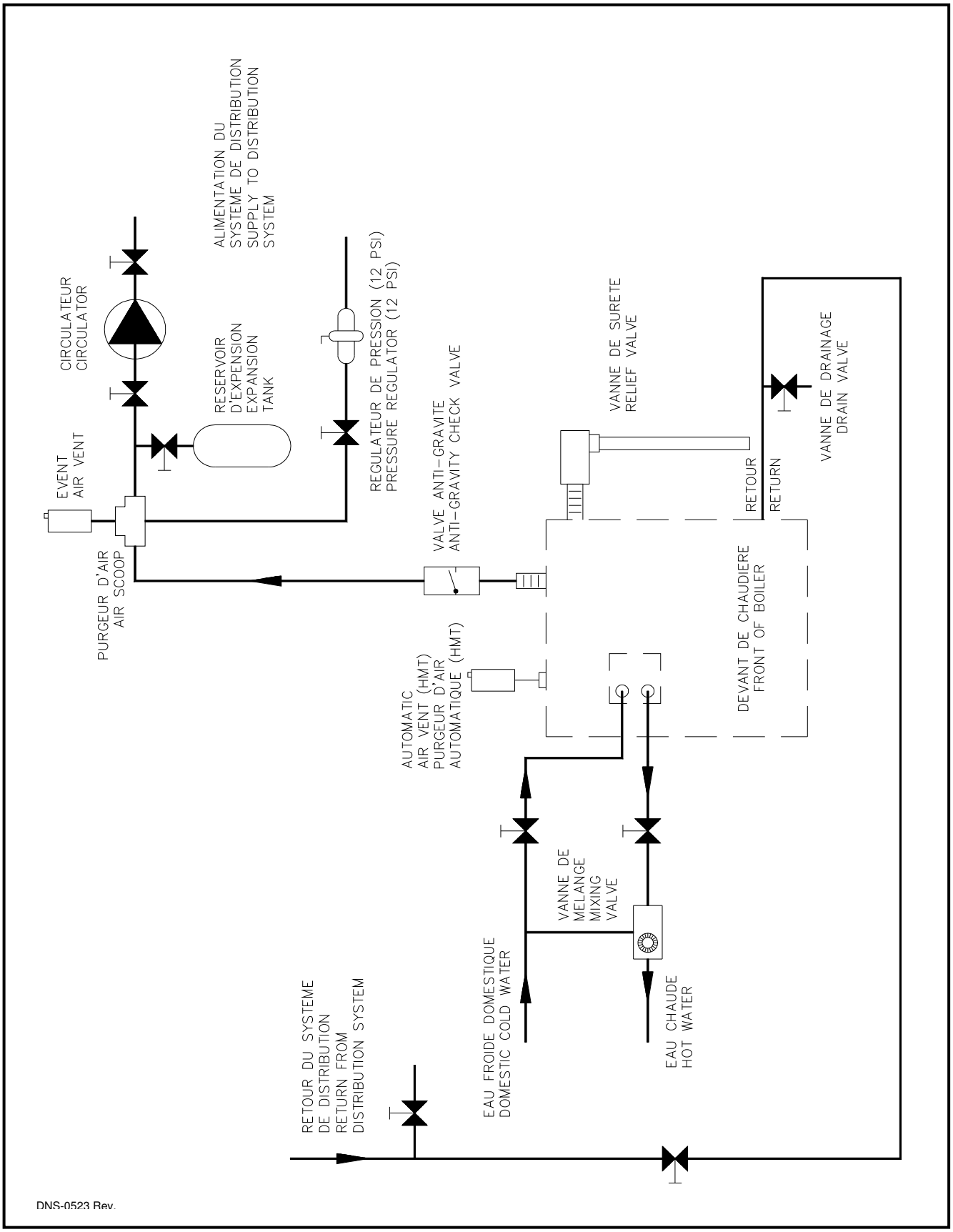
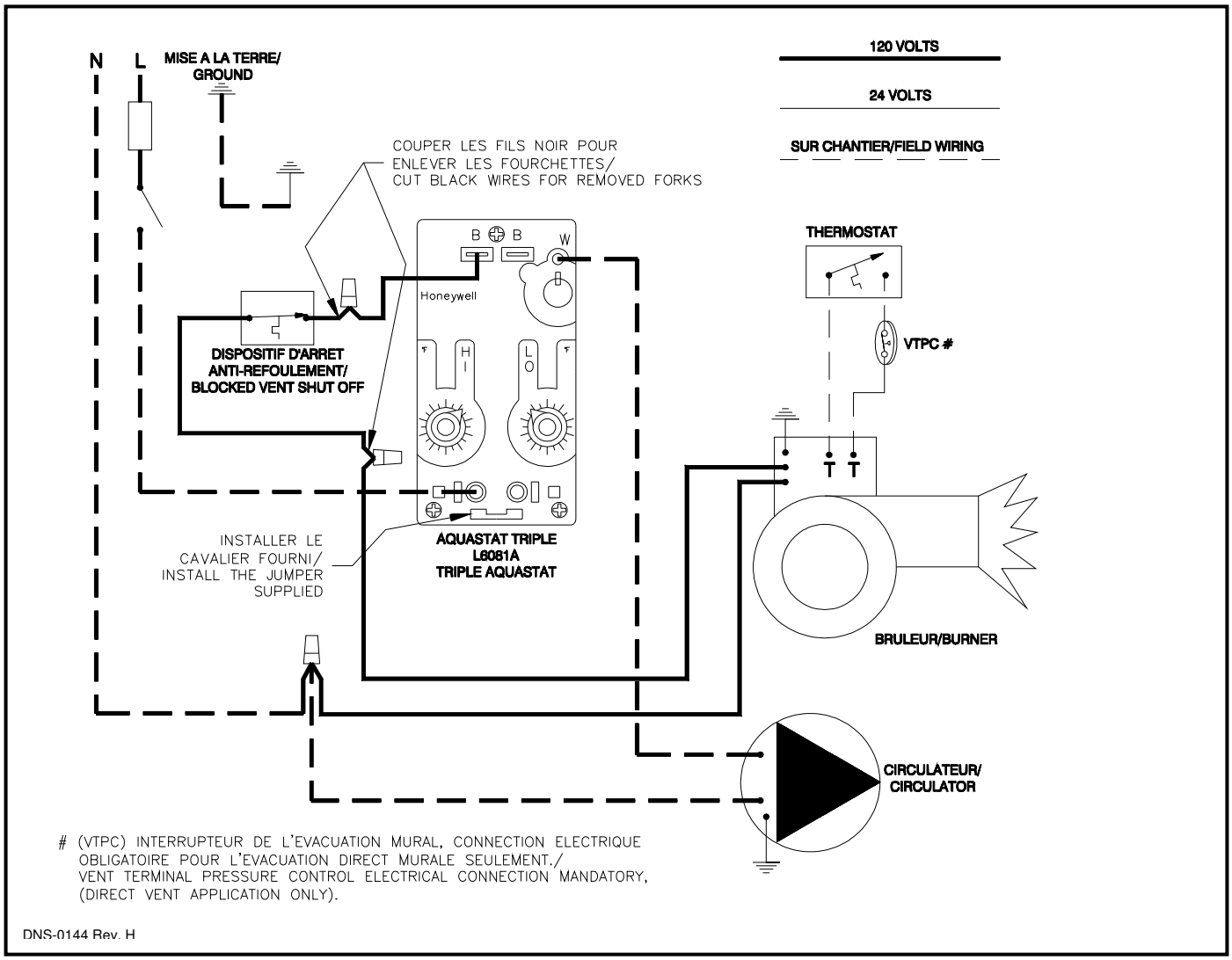


FIGURE 5.1 Typical connection without sanitary water coil

Control used:

“Triple action” temperature control - Honeywell # L6081A or White Rodgers # 11C61 (Aquastat Triple, Hi-Lo/Circ)



Operation and typical settings

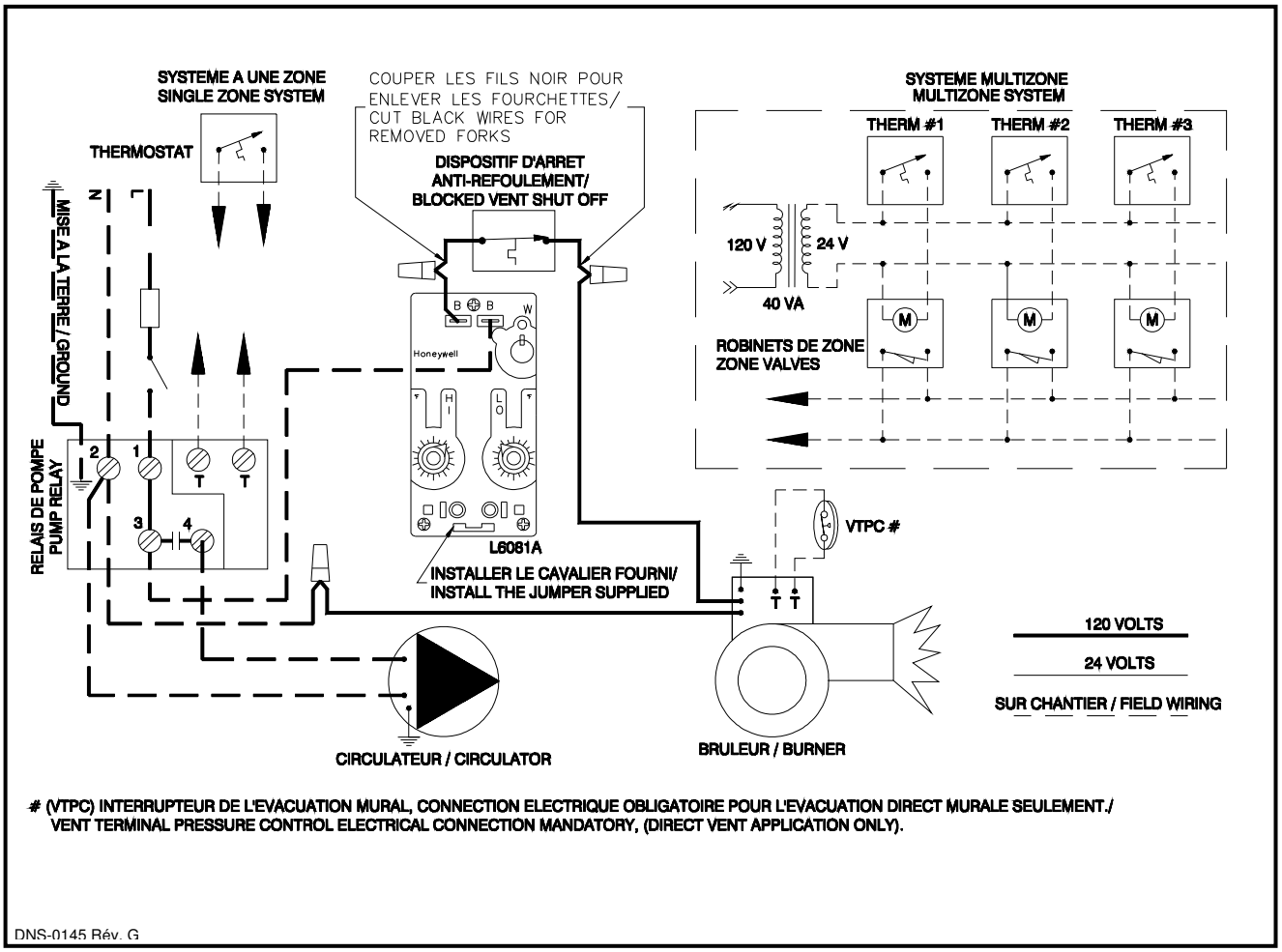
Burner	Stop	Thermostat ope
	Start	Thermostat clos
Circulator	Stop	“Circ” contact o
	Start	“Circ” contact cl

Maximum High-Limit setting = 210°F

FIGURE 5.2 Typical connection for system with finned tube radiators and without sanitary water coil

Control used:

- "Triple action" temperature control Honeywell # L6081A or White Rodgers # 11C61 (Aquastat Triple, Hi-Lo/Circ)
- Pump relay Honeywell # RA89A or White Rodgers # 809A

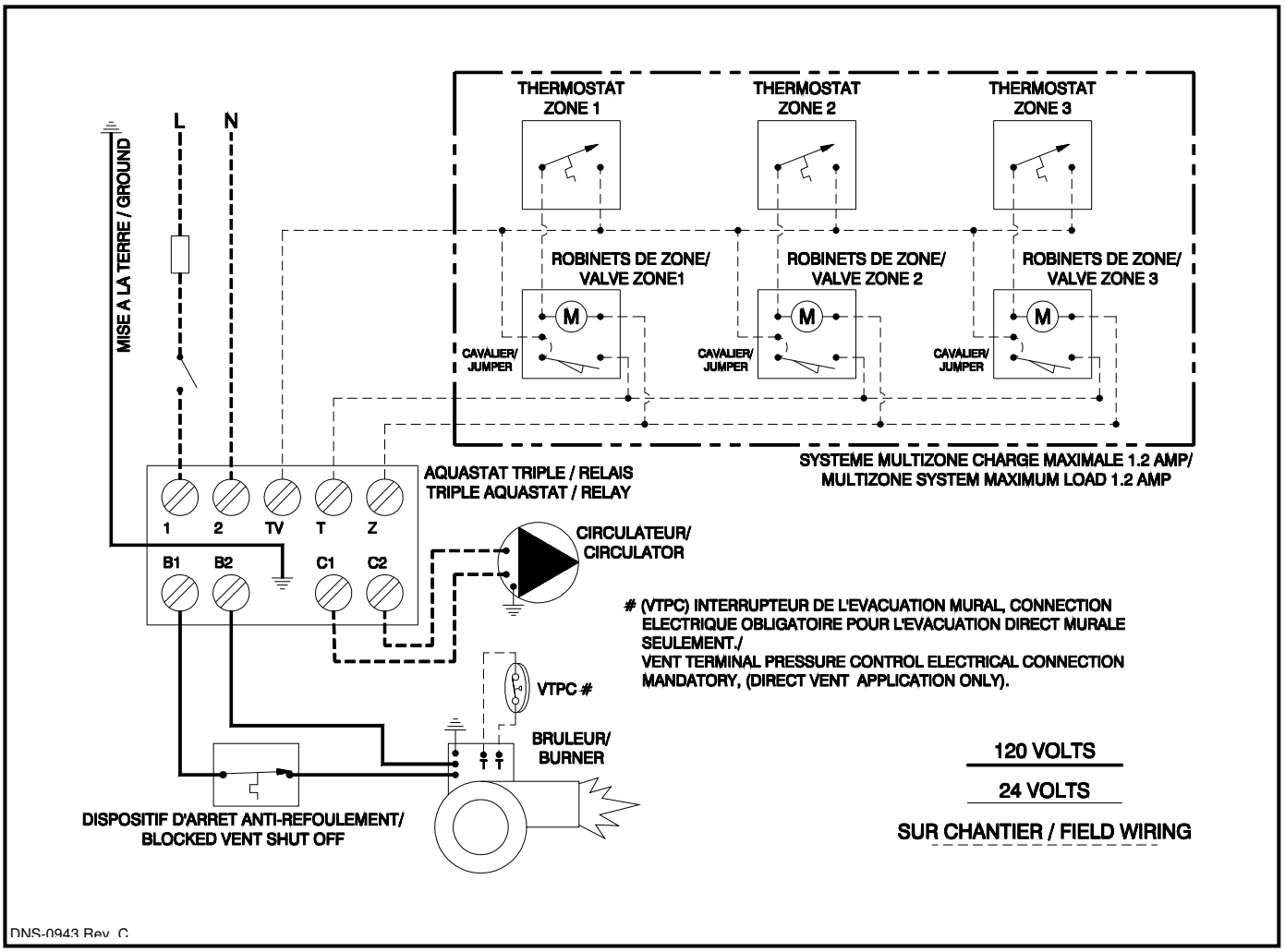


Operation and typical settings

Operation: (the boiler is maintained warm)							
Burner	Stop	"Lo" contact opened					
	Start	"Lo" contact close					
Circulator	Stop	Thermostat opened -or- All zone valves closed					
	Start	Thermostat closed -or- One zone valves opened					
Settings:							
"Hi"				"Lo / Circ"			
Set		Diff.		Set		Diff.	
°F	°C	°F	°C	°F	°C	°F	°C
200	93	10	5.6	180	82	10	5.6

Maximum High-Limit setting = 210°F

FIGURE 5.3 Typical connection with or without sanitary water coil
Control used:
"Triple relay Multizone" temperature control Honeywell # L8124L1029B

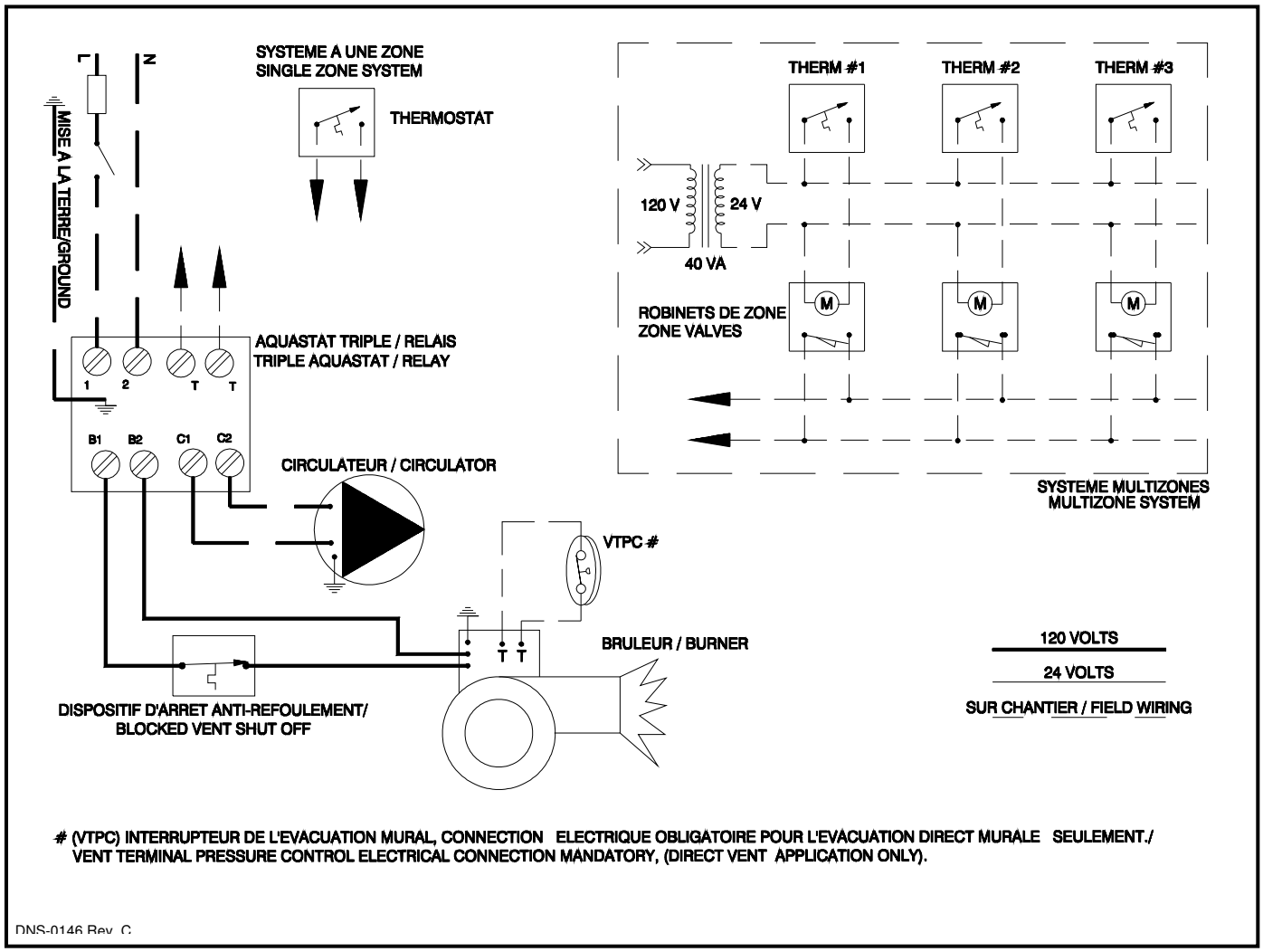


Operation and typical settings

Operation:							
Burner	Stop	"Hi" contact opened -or- if Thermostat opened, "Lo" contact opened					
	Start	"Hi" contact closed and Therm. closed -or- if Therm. opened, "Lo" contact closed					
Circulator	Stop	Thermostat opened -or- "Circ" contact opened					
	Start	Thermostat closed -and- "Circ" conctact closed					
Typical settings with coil:							
"Hi"				"Lo"			
Set		Diff.		Set		Diff.	
°F	°C	°F	°C	°F	°C	°F	°C
200	93	10	5.6	180	82	10	5.6
Typical settings without coil :							
See "Typical settings without coil" in table on page 18							

Maximum High-Limit setting = 210°F

FIGURE 5.4 Typical connection with or without sanitary water coil
Control used:
Triple relay temperature control Honeywell # L8124L1102B



Operation and typical settings

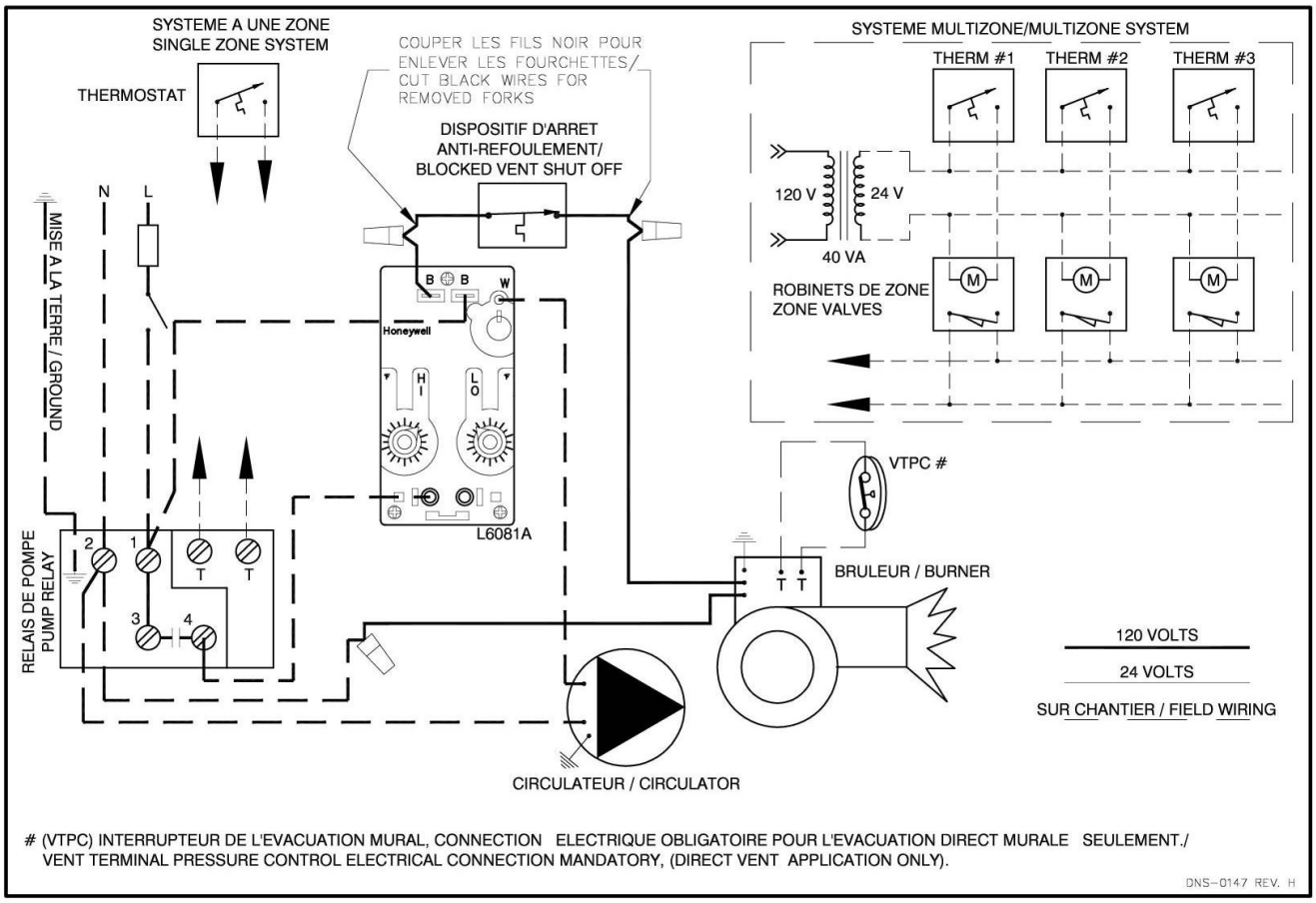
Operation:								
Burner	Stop	"Hi" contact opened -or- if Thermostat opened, "Lo" contact opened						
	Start	"Hi" contact closed and Therm. closed -or- if Therm. opened, "Lo" contact closed						
Circulator	Stop	Thermostat opened -or- "Circ" contact opened						
	Start	Thermostat closed -and- "Circ" conctact closed						
Typical settings with coil:								
"Hi"				"Lo"				
Set		Diff.		Set		Diff.		
°F	°C	°F	°C	°F	°C	°F	°C	
200	93	10	5.6	180	82	10	5.6	
Typical settings without coil :								
See "Typical settings without coil" in table on page 18								

Maximum High-Limit setting = 210°F

FIGURE 5.5 Typical connection with or without sanitary water coil

Control used:

- "Triple action" temperature control Honeywell # L6081A or White Rodgers # 11C61 (Aquastat Triple, Hi-Lo/Circ)
- Pump relay Honeywell # RA89A or White Rodgers # 809A



Operation and typical settings

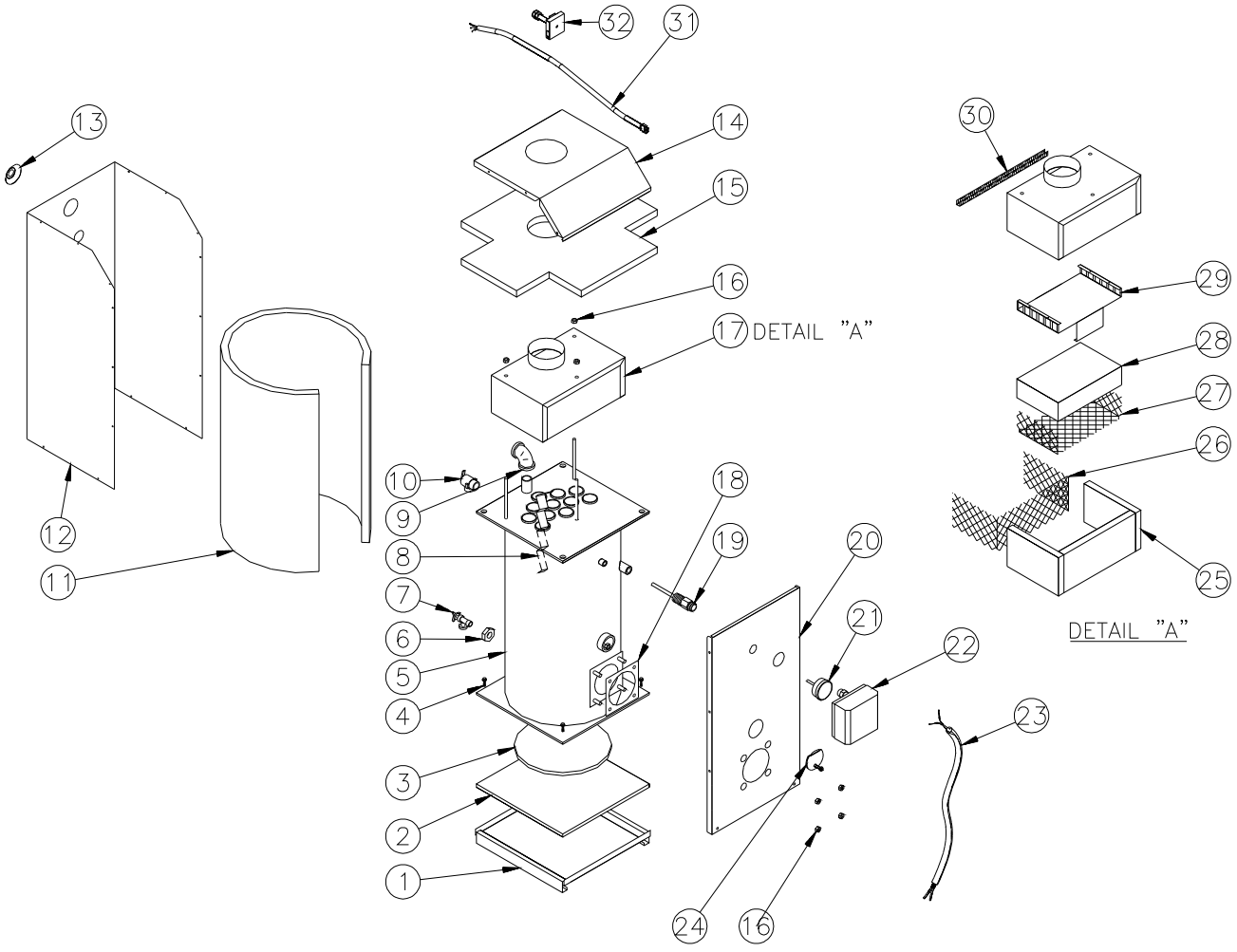
Operation:		
Burner	Stop	Hi" contact opened -ou- if Thermostat opened, "Lo" contact opened
	Start	"Hi" contact closed and Therm. closed -or- if Therm. opened, "Lo" contact closed
Circulator	Stop	Thermostat opened -or- "Circ" contact opened
	Start	Thermostat closed -and- "Circ" contact closed

Typical settings without coil:

"Hi"				"Lo / Circ"			
Set		Diff.		Set		Diff.	
°F	°C	°F	°C	°F	°C	°F	°C
180	82	10	5.6	140	60	10	5.6

Typical settings with coil :

See "Typical settings with coil" in table on page 16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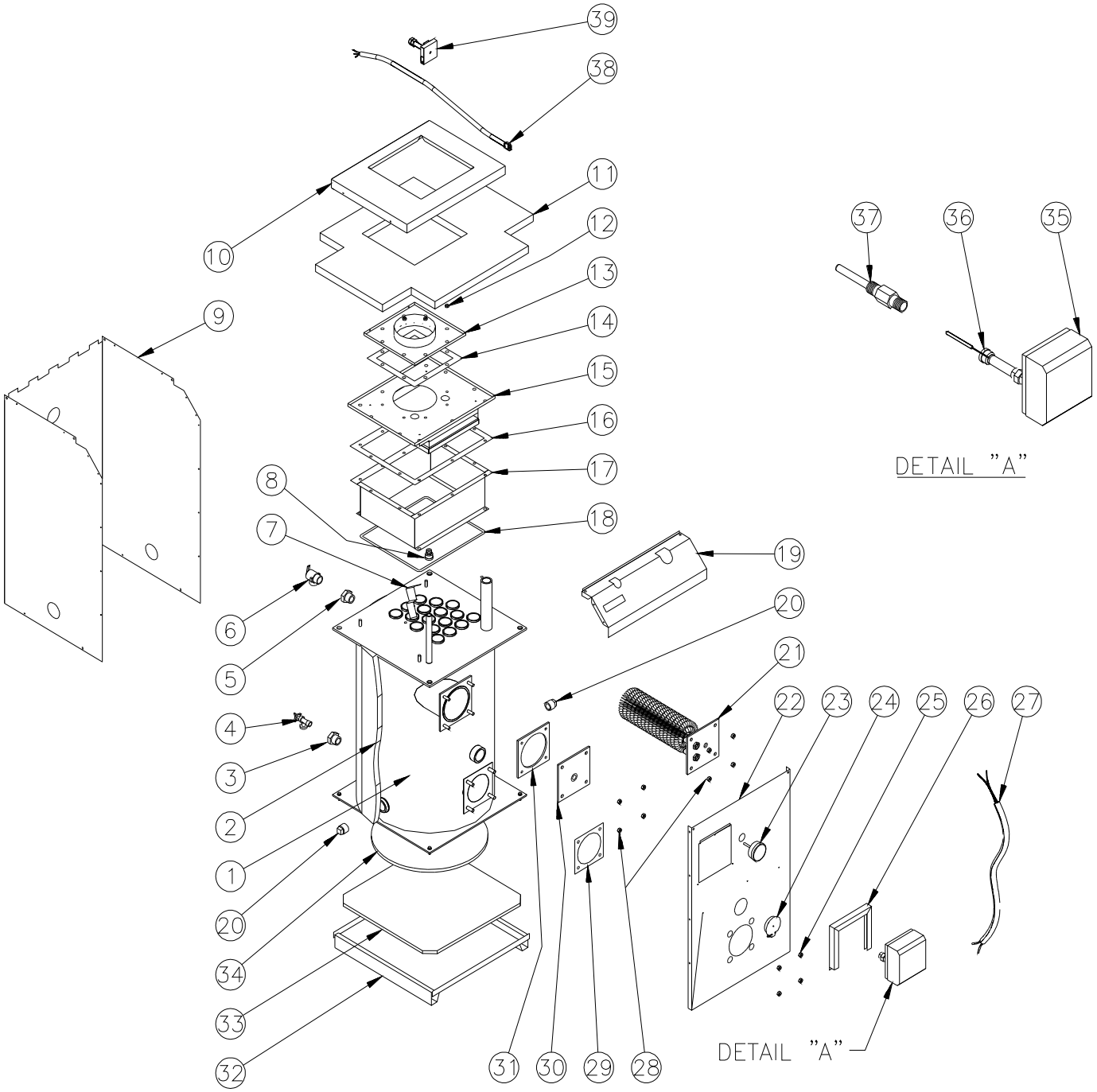
B50019B

ITEM	PART #	DESCRIPTION
1	B00472-01	FLOOR
2	B00619-01	FLOOR INSULATION
3	B00618-01	COMBUSTION CHAMBER BOTTOM INSULATION
4	F03F004	FLOOR SCREW (Quantity: 4)
5	B00909	HEAT EXCHANGER
6	G08F004	REDUCER BUSHING 1" NPT x 1/2" NPT
7	G11Z001	DRAIN FAUCET 1/2"NPT
8	B00864-02	FLUE BAFFLE (Quantity: 11)
9	G04F002	OUTLET PIPE FITTING
10	G11F012	RELIEF VALVE 30 PSI 3/4" x 3/4"
11	B01651	HEAT EXCHANGER OUTSIDE INSULATION
12	B02904	"U" SHAPED CASING
13	G14G001	FLANGE 2-7/8" OD 1" ID LDPE WHITE
14	B00929	TOP PANEL (Without well)
15	B00701-01	TOP INSULATION
16	F07F011	HEX NUT 3/8"-16NC ZINC (Quantity: 7)
17	B00946	SOUND TRAP ASSEMBLY (with shield & insulation)
18	B00419	GASKET, BURNER
19	R02J003	WELL 3/4" NPT
20	B00927	FRONT PANEL
21	R02L001	TRIDICATOR 0-75 PSI 1/4" NPT
22A	R02H005	TRIPLE ACTION AQUASTAT L6081A
22B	R02H006	TRIPLE ACTION AQUASTAT MULTIZONE L8124L
23	B00964	ELECTRICAL KIT
24A	K02014	OBSERVATION DOOR KIT (before 99/09)
24B	B01842	OBSERVATION DOOR ASSEMBLY (after 99/09)
25	K08006	SOUND TRAP INSULATION KIT
26	B00834-09	SOUND TRAP INSULATION SHIELD
27	B00834-10	SOUND TRAP BAFFLE INSULATION SHIELD
28	B00621-24	SOUND TRAP BAFFLE INSULATION
29	B00892	SOUND TRAP BAFFLE
30	B00702-12	GASKET, SOUND TRAP (25 foot roll)
31	B03029	ELECTRICAL KIT, BVSO
32	Z06G001	BLOCKED VENT SHUT-OFF BVSO-225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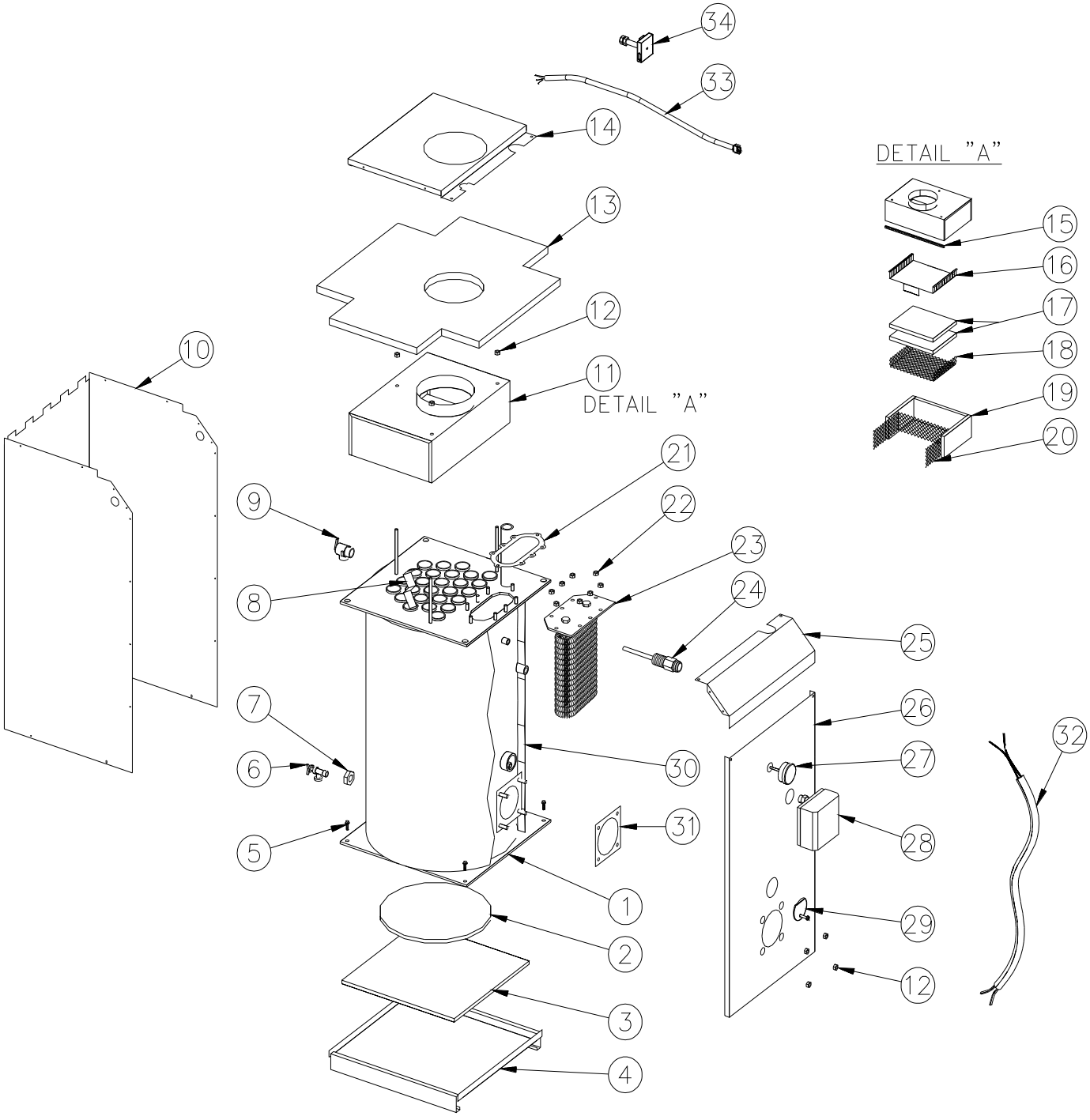
DETAIL "A"

B50020B

PARTS LIST
Model : HMT (HMT-12 @ HMT-18) S/N greater than D010408972

ITEM	PART #	DESCRIPTION
1	B02349-01	HEAT EXCHANGER (Without coil)
2	B01910	HEAT EXCHANGER OUTER INSULATION
3	G08F004	REDUCER BUSHING 1" x 1/2" BLACK
4	G11Z001	DRAIN FAUCET 1/2"
5	G01J002	NIPPLE STD 3/4" NPT x 2" BLACK
6	G11F012	RELIEF VALVE 30 PSI 3/4" x 3/4"
7	B00864-02	FLUE BAFFLE (Quantity: 17)
8	G03J011	REDUCER COUPLING 1/2"NPT @ 1/8" NPT STEEL
9	B02546	CASING
10	B02342	REAR TOP PANEL ASSEMBLY
11	B01938	TOP INSULATION
12	F07O001	HEXAGONAL FLANGE NUT 3/8"-16NC BRASS
13	B01747	SMOKE OUTLET ASSEMBLY
14	B00205	OUTLET COVER GASKET
15	B01955	SOUND TRAP ASSEMBLY
16	B01937	GASKET, SOUND TRAP
17	B01954	SOUND TRAP BOX ASSEMBLY
18	J06L001	SEAL STRIP 1/2" x 1/8" (25 foot roll)
19	B02345	FRONT TOP PANEL
20	G06F003	SQAURE HEAD PLUG 1" NPT BLACK
21A	K14007	COIL, 5 USGPM 1/2"NPT SQUARE
21B	K14008	COIL, 5 USGPM 1-1/4" NPT SQUARE
22	B02340	FRONT PANEL ASSEMBLY
23	R02L001	TRIDICATOR 0-75 PSI 1/4" NPT
24	B02111	OBSERVATION DOOR ASSEMBLY
25	F07F011	HEX NUT 3/8"-16NC ZINC
26	B01634	COIL FLANGE COVER PANEL
27	B00964	ELECTRICAL KIT, BURNER
28	F07F021	HEXAGONAL NUT 7/16"-20NF ZINC (For coil cover)
29	B00419	BURNER GASKET
30	B20090	COIL COVER ASSEMBLY
31	B20060	COIL GASKET
32	B00472-03	FLOOR
33	B00619-03	FLOOR INSULATION
34	B00618-04	COMBUSTION CHAMBER BOTTOM INSULATION
35A	R02H005	TRIPLE ACTION AQUASTAT L6081A
35B	R02H006	TRIPLE ACTION AQUASTAT MULTIZONE L8124L
36	R02J006	WELL PACKING NUT (Use with coil)
37	R02J001	WELL 1/2" NPT (Use without coil)
38	B03029-01	BVSO ELECTRICAL KIT
39	Z06G001	BLOCKED VENT SHUT-OFF BVSO-225

L50020B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B50021B

ITEM	PART #	DESCRIPTION
1	B00989	HEAT EXCHANGER
2	B00618-04	COMBUSTION CHAMBER BOTTOM INSULATION
3	B00619-03	FLOOR INSULATION
4	B00472-03	FLOOR
5	F03F004	FLOOR SCREW (Quantity: 4)
6	G11Z001	DRAIN FAUCET 1/2" NPT
7	G08F006	REDUCER BUSHING 1-1/4" NPT x 1/2" BLACK
8	B00864-02	FLUE BAFFLE (Quantity: 26)
9	G11F012	RELIEF VALVE 30 PSI 3/4" x 3/4"
10	B02918	"U" SHAPED CASING
11	B00945	SOUND TRAP ASSEMBLY (Insulation and shield included)
12	F07F011	HEX NUT 3/8"-16NC ZINC (Quantity: 7)
13	B00808-01	TOP INSULATION
14	B01917-01	REAR TOP PANEL ASSEMBLY
15	B00702-11	GASKETY, SOUND TRAP
16	B00893	SOUND TRAP BAFFLE
17	B00621-21	INSULATION (Quantity: 2)
18	B00834-08	SOUND TRAP INSULATION SHIELD
19	K08012	SOUND TRAP INSULATION KIT
20	B00834-07	SOUND TRAP INSULATION
21	A00083	GASKET, VERTICAL COIL
22	F07O001	HEX NUT 3/8"-16NC BRASS
23A	K02019	COIL KIT (optional)
23B	K14023	COIL COVER (Items 21& 22 included)
24A	R02J003	WELL, 3/4" NPT (serial # < 124000)
24B	R02J001	WELL, 1/2" NPT (serial # > 124000)
25	B00910	FRONT TOP PANEL
26	B00904	FRONT PANEL
27	R02L001	TRIDICATOR 0-75 PSI 1/4" NPT
28A	R02H005	TRIPLE ACTION AQUASTAT L6081A
28B	R02H006	TRIPLE ACTION AQUASTAT, MULTIZONE L8124L
29A	K02014	OBSERVATION DOOR KIT (before 99/09)
29B	B01842	OBSERVATION DOOR ASSEMBLY (after 99/09)
30	B01476	INSULATION, CASING
31	B00419	BURNER FLANGE GASKET
32	B00964	ELECTRICAL KIT, BURNER
33	B03029-01	ELECTRICAL KIT, BVSO
34	Z06G001	BLOCKED VENT SHUT-OFF BVSO-225