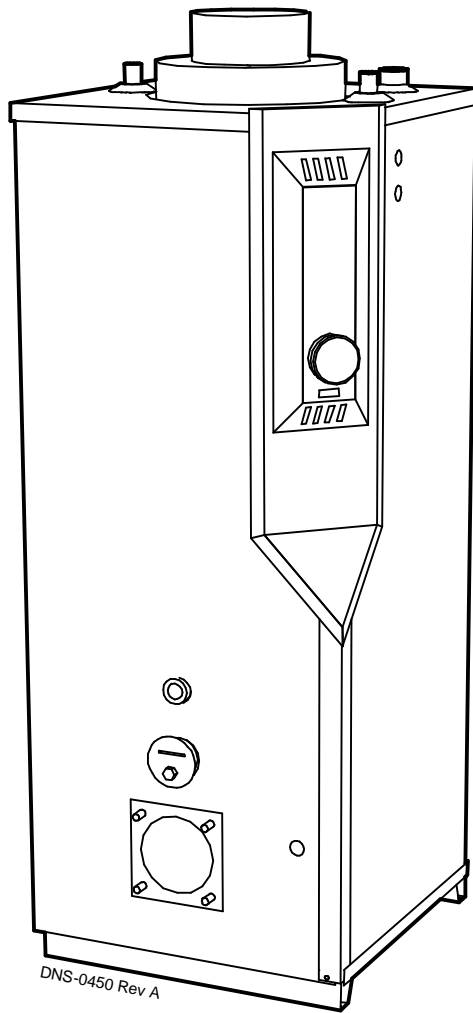


Installation instructions and homeowners manual



OIL FIRED HOT WATER BOILER

Save these instructions for future reference.

Models :

HMD

Manufactured by :

International Comfort Product
Division of UTC Canada Corporation
3400, Industriel blvd, Sherbrooke, Qc, Canada

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

PART 1 INSTALLATION

WARNING

- This boiler has been designed to provide you with comfort, savings and reliability for many years to come. Its performances, however, depends on the appliance being installed, brought on-line, and maintained correctly in accordance with the instructions provided in this manual.
- 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 has not to be used for 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 THE CONTROLS.

We recommend that you have a qualified technician install your boiler.

1) UNIT IDENTIFICATION

It is very important that you consult the figure 1 to recognise the characteristics of the "HMD" serie.

HMD boiler with potable hot water stainless steel tank-in-tank and with a flue-pipe of 7 inches diameter. The models are identified HMD-124, HMD-135, HMD-146, HMD-163 and HMD-179 and are available with Riello burner.

2) DELIVERY

Check carefully 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.

3) INSTALLATION

Your unit must be installed according to regulations set down by competent authorities. See CSA B139 installation code.

3.1) Location

Your boiler must be installed in a clean and dry area, as close as possible to a chimney. These boilers are not approved for installation on combustible floor.

3.2) Clearances

The following minimum clearances from combustible surfaces must be observed.

Top :	24 inches
Flue-pipe :	9 inches
First side :	3 inches
Other side :	24 inches
Front (from the cabinet):	24 inches
Rear :	24 inches

4) WIRING

The boiler must be connected to a 15 amp. @ 120 Vac protected circuit. The installer must wire the boiler according to the electrical diagram figure 2. All wiring must be done in accordance with the "Canadian Electrical Code CSA C22.1/ Part I".

WARNING

The use of a triple action / relay aquastat is necessary whit the « HMD » boiler.

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

5) OIL SUPPLY

The oil tank and lines must be installed in accordance with local codes and regulations. The burner can be hooked up with a one pipe system if the oil level in the tank is always over the burner level. For an outside aboveground fuel tank hook up, ideally use a one pipe system with nominal dimension of 12 mm (1/2") diameter, and be sure to have the oil filter and at least 3 meters (10 ft) of piping installed inside, to allow the fuel oil to warm up before reaching the burner in very cold weather. The following configurations must be respected regarding the oil pump by-pass plug. With Riello burner, remove the by-pass plug for one pipe system.

The installation must include an oil filter and shutoff valve. Make sure the piping has no leaks or stoppages. Oil lines shall include no couplings. Never use compression fittings. For a 2 pipes system, use the same diameter 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 brochure that came with your boiler.

6) CHIMNEY

6.1) Chimney draft

Chimney draft must be strong enough to ensure safe, reliable operation of your unit.

6.2) Installation

The connecting flue pipe diameter should never exceed that of the chimney and its horizontal runs should have a minimum slope of 1/4" (6.4 mm) per foot (300 mm) of run upward toward the chimney. The use of a damper in the connecting flue pipe is strictly prohibited. If more than one pipe are to be connected to the same chimney, the sectional area of the chimney must be equal to the total of individual

sectional areas. The usage of a draft control is compulsory. His omission constitutes sufficient grounds for voiding your warranty.

NOTICE

The formation of condensation on the three outer sides of an outside chimney is a possibility with efficient hot water boilers. Should this happen, a chimney liner or a "SMH" sidewall venting system should be installed.

7) BURNER INFORMATIONS

The burner is shipped in a separate box from the boiler and must be installed following the next steps :

1. Verify the model number on burner box to be match with the one on the boiler nameplate;
2. Install the nozzle supplied and verify the electrodes setting;
3. Install the burner on the boiler using supplied nuts already on the studs. Do not forget the fireproof gasket supplied with the burner. For the Riello burners with an adjustable flange, make sure that the end of the blast tube is flush with the inside surface of the combustion chamber;
4. Connect the oil pipe(s) to the burner pump;
5. Perform electrical connections in accordance with the appropriate diagram (See paragraph 4).

TABLE 1
Chimney draft

Models	Chimney size inches (mm)		Connecting pipe inches (mm)	Recommended draft inches (mm) W.C.
	Minimum	Maximum		
HMD-124 @ 146	5 (127)	6 (152)	7 (178)	0.035 (0.9)
HMD-163 @ 179	6 (152)	8 (203)	7 (178)	0.05 (1.3)

TABLE 2
Burner characteristics - "HMD" boilers

Model	Capacity (Btu/hr)	Input (USGPH)	Burner	Nozzle Delavan	Pressure (psi)
HMD-124	124000	1.00	Riello F-5	0.85-70B	140
HMD-135	135000	1.10	Riello F-5	1.00-70B	125
HMD-146	146000	1.20	Riello F-5	1.00-70B	145
HMD-163	163000	1.35	Riello F-5	1.20-70B	130
HMD-179	179000	1.50	Riello F-5	1.35-70B	125

8) COMBUSTION AIR SUPPLY

For a good and reliable operation, every oil heating system must have an adequate and functional air supply. If the boiler must be installed in a confined area, 2 permanent air openings must be provided. Both openings must be sized by allowing 1 ft² per U.S. gallon of oil to burn (240 cm²/l) per hour. One opening should be located near the ceiling, the other near the floor.

9) GENERAL PLUMBING INFORMATIONS

Satisfying operation of your system greatly depend on your plumbing arrangement. Refer to figures 3 and 4.

In all cases, your installation must include:

- a. A pressure reducing valve, set at 12 psi (83 kPa), installed in the boiler cold water supply;
- b. An expansion tank pressurised to 12 psi (83 kPa), present on the piping;
- c. An automatic air vent, to eliminate trapped air in the boiler;
- d. A correctly sized water circulator, installed on the heating loop;
- e. Stop valves and threaded unions, installed on return and supply boiler pipes.

Always use quality pipe sealant on all threaded connections and make sure that these connections are well tightened. Avoid flushing the system when this boiler is a replacement for an existing one, to limit oxygen to come in the system.

10) POTABLE HOT WATER SUPPLY

Before attempting to proceed with the potable hot water supply connections, always check the water quality to avoid premature scaling, which quickly put your installation inefficient. Refer to a specialist and install a water softener if need. Locate the left tapping to use as the potable cold water inlet. The use of the thermostatic mixing valve (provided) is a necessity to get safety and optimum of your installation.

11) THERMOSTAT

The thermostat must be mounted on an inside wall approximately five feet high on the main floor. The location should allow the thermostat to detect temperature variations without exposing it to air currents and sunrays.

12) DRAFT-REGULATOR

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

1) FUEL

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

2) START-UP

1. Make sure that the tank contains fuel oil and that the fuel and water valves are opened;
2. The electrical main switch must be "OFF";
3. Adjust the boiler operation control limit set point to the desired temperature, example 180°F (82°C);
4. Install a 0 - 200 psi (0 - 1400 kPa) pressure gage on the appropriate oil pump tapping. The use of a suction gage may be planned at the oil pump inlet, if a suction over 3 psi (20.7 kPa) may be encountered;
5. Pre-adjust the burner according to specifications of table 4. These specifications should only be used as a reference for initial start-up. Refer to the manual provided with the burner to locate referred settings;
6. Put the main switch "ON" to start the burner;
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 falls in safety mode, see paragraph 3 below;
8. Adjust the oil pressure at the specified value in table 4;
9. Adjust the chimney draft as specified on table 2. Take this reading midway between the draft regulator and the outlet of the boiler.
10. Adjust the burner air intake 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 adjustments screws once the burner is adjusted before putting back the burner cabinet definitively.

12. Verify the correct operation of temperature controls and burner combustion relay;
13. Adjust the limits and the thermostat to the desired set points. Take care to avoid operation settings resulting with boiler water temperature at a level under 140°F (60°C).

TABLE 3
Adjustments Riello burner

Model	Capacity (Btu/hr)	Air band Adjustment	Draw assembly Adjustment	Pressure (psi)
HMD-124	124000	3.8	0	140
HMD-135	135000	4.4	0	125
HMD-146	146000	4.7	0	145
HMD-163	163000	5.8	1	130
HMD-179	179000	6	2	125

3) RESTARTING AFTER IGNITION FAILURE

1. Check the oil level in the fuel tank;
2. Make sure the supply fuel valve is open;
3. Make sure the oil filter is not clogged;
4. Check the electrical supply circuit (fuse or breaker);
5. Check the burner electrodes adjustment. Refer to the burner instruction manual;
6. Check if there is a call 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 not light, call a qualified repairman. Never attempt to relight the burner if there is excess fuel oil or oil fumes in the combustion chamber.

4) SUMMER SEASON

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

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

1. Clean the chimney, the connecting flue pipes and the boiler. Follow steps in section 3, paragraph 6 to proceed;

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 control limit;
5. Check the operation of the circulating pump.

PART 3 MAINTENANCE

1) MAINTENANCE

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

2) NOZZLE

A dirty or clogged nozzle can prevent ignition or cause odours. It must be replaced.

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.

4) OIL FILTER

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

5) BURNER AND CIRCULATING PUMP MOTORS

Motors should be lubricated at least once a year (except life time lubricated motors), with 2 to 3 drops of SAE 20 non-detergent oil, put in the appropriate access.

6) CLEANING THE BOILER

1. Put the main switch "OFF" before any cleaning works;
2. Remove and clean the connecting flue pipe and, sweep and check the chimney;
3. Remove the smoke box and the fire tube baffles and, with the help of a 2 inches diameter steel brush, clean the fire tubes;
4. Remove the burner and clean the combustion chamber. Take care to not damage the ceramic bottom pad;
5. Examine the cleaned surfaces for corrosion and correct the cause, if need;
6. Reinstall all components in their original position and re-adjust the unit.

7) BOILER PURGE

It is recommended to purge the boiler about 1 minute at least once a year, to evacuate mud and sediments accumulated at the bottom of the boiler.

Proceed as follows :

1. Let the boiler cool down;
2. Hook-up a garden hose from the drain valve to an open bucket;
3. Open the drain valve until the water is clear.

8) SPARE PARTS

It is always recommend to replace a defective part by a genuine part, available at your supplier.

PART 4 INFORMATION

Model : _____ Serial number : _____

Date of installation of the boiler : _____

Service telephones - day : _____ Night : _____

Dealer's name and address : _____

RESULT OF START-UP TEST

Nozzle: _____ Pressure : _____ lbsi

Burner adjustments : Primary air _____

 Fine air _____

 Draw Assembly _____

CO₂ : _____ % Smoke scale : _____ (Bacharach)

Gross stack temperature: _____ ° F

Ambient temperature: _____ ° F

Chimney draft: _____ " C.E.

Overfire draft : _____ " C.E.

Test made by : _____

FIGURE 1
HMD Boiler

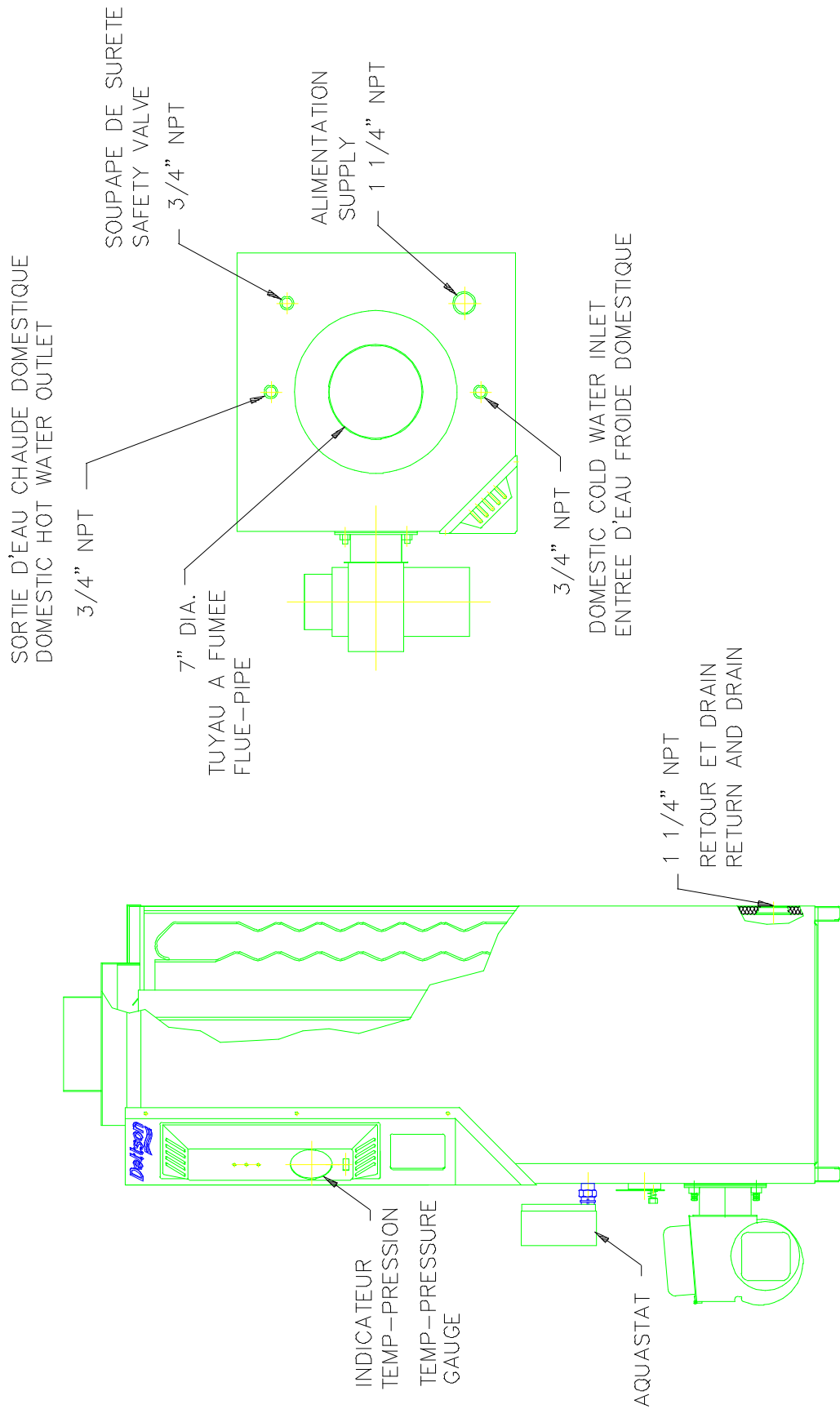
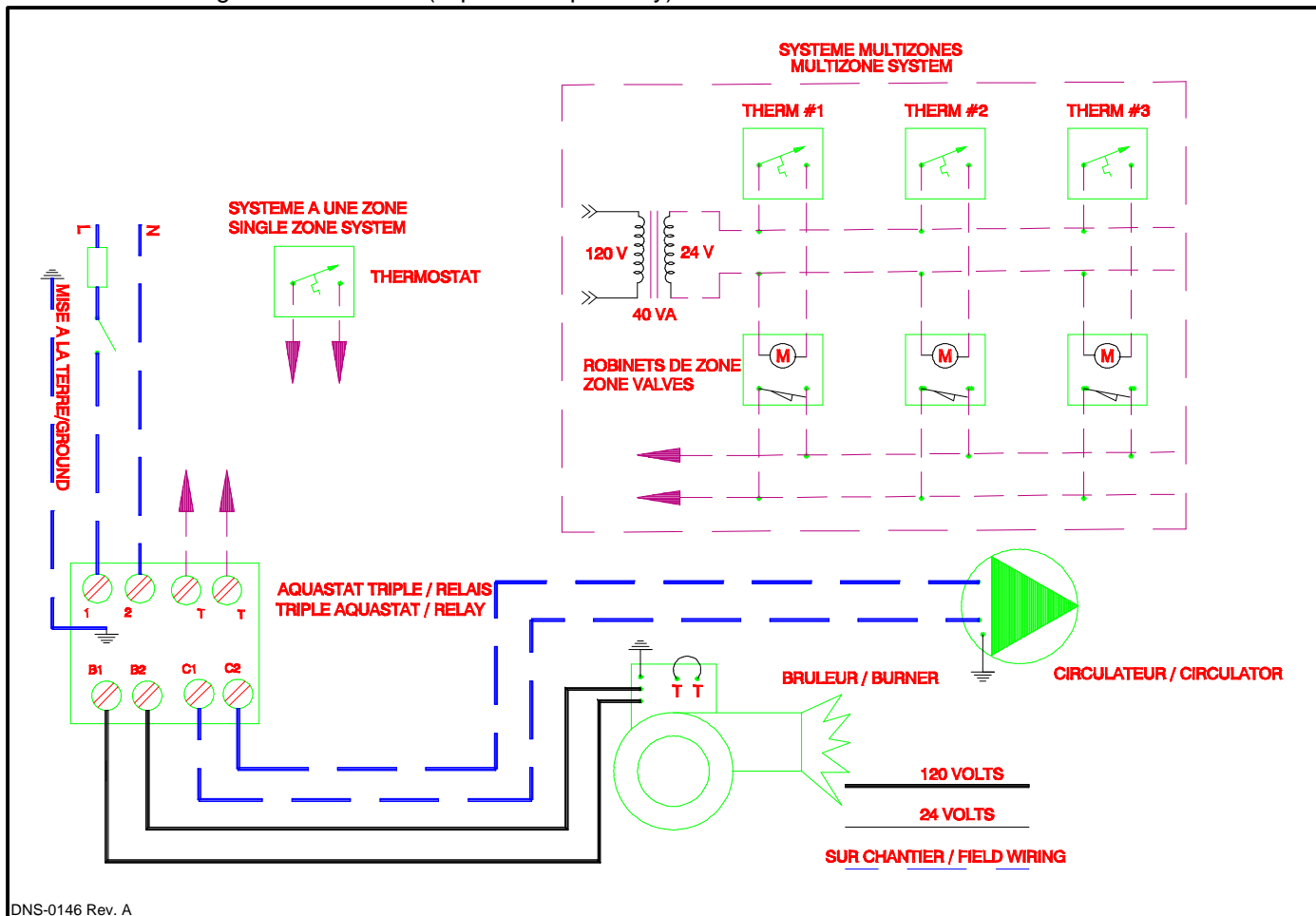


FIGURE 2
Typical connection

Control used:

? "Triple actions + pump relay" temperature control Honeywell # L8124C1102B
or White Rodgers # 8B43A-102 (Aquistat Triple/relay)

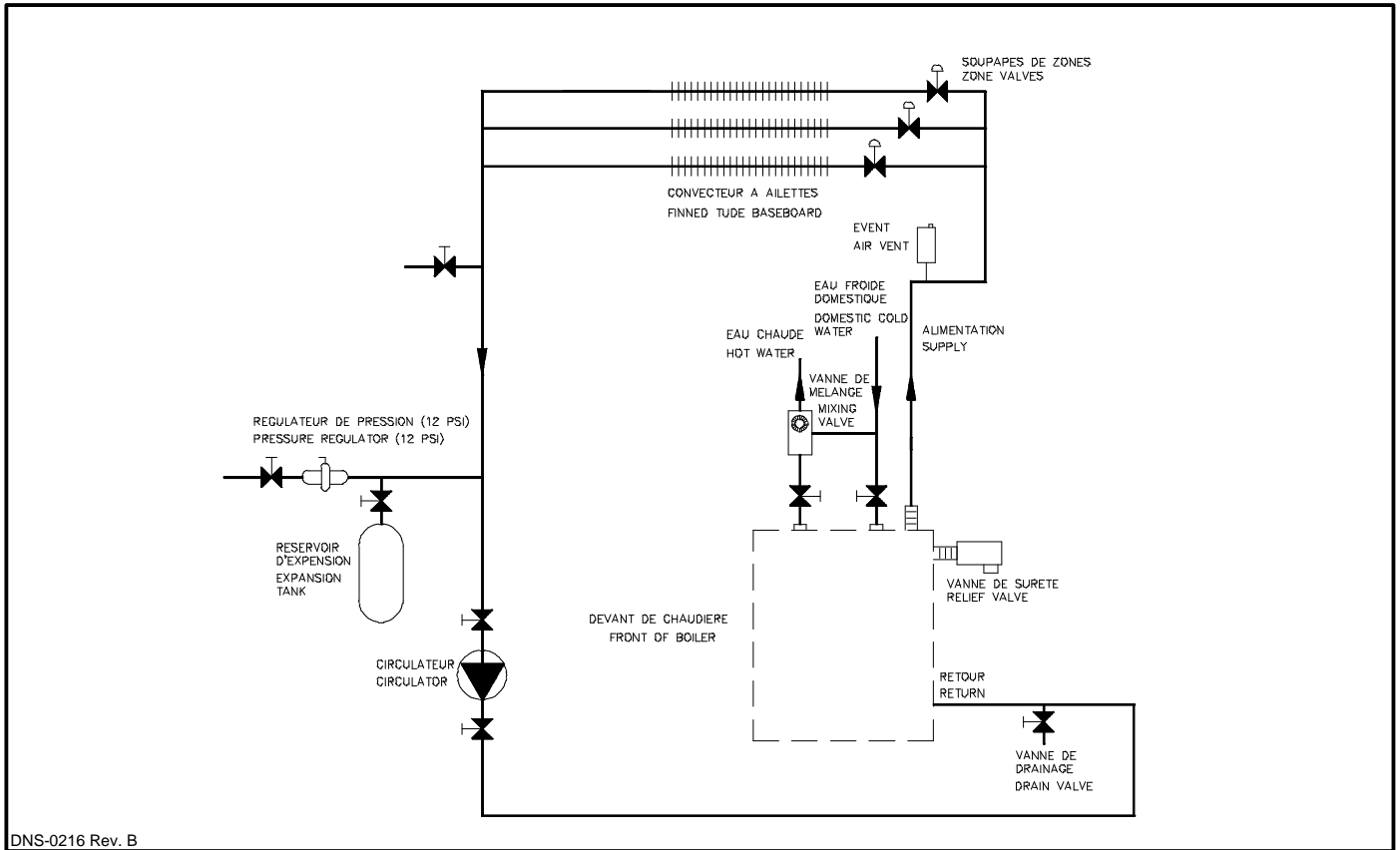


DNS-0146 Rev. A

TABLE 4
Operation and typical settings

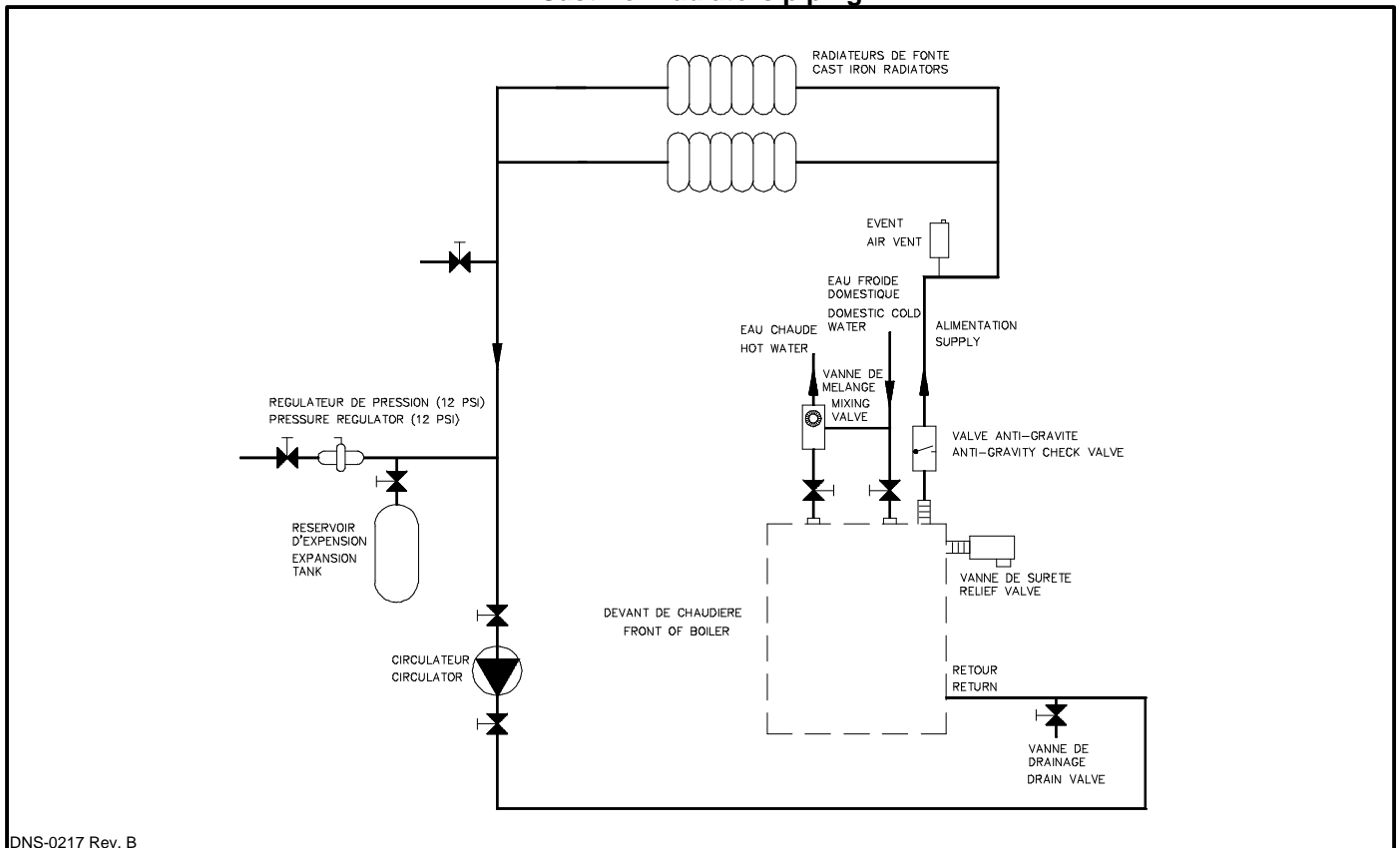
Operation :							
Burner	Stop	"Hi" Contact open -or- , if thermostat opened, "Lo" contact opened					
	Start	"Hi" Contact closed and therm. closed -or-, if therm. opened, "Lo" contact closed					
Circulator	Stop	Thermostat opened -or- "Circ" contact opened					
	Start	Thermostat closed -and- "Circ" contact closed					
Settings :							
"Hi"				"Lo"			
Set		Diff.		Set		Diff.	
^o F	^o C	^o F	^o C	^o F	^o C	^o F	^o C
200	93	10	5.6	180	82	10	5.6

FIGURE 3
Finned tube baseboard piping



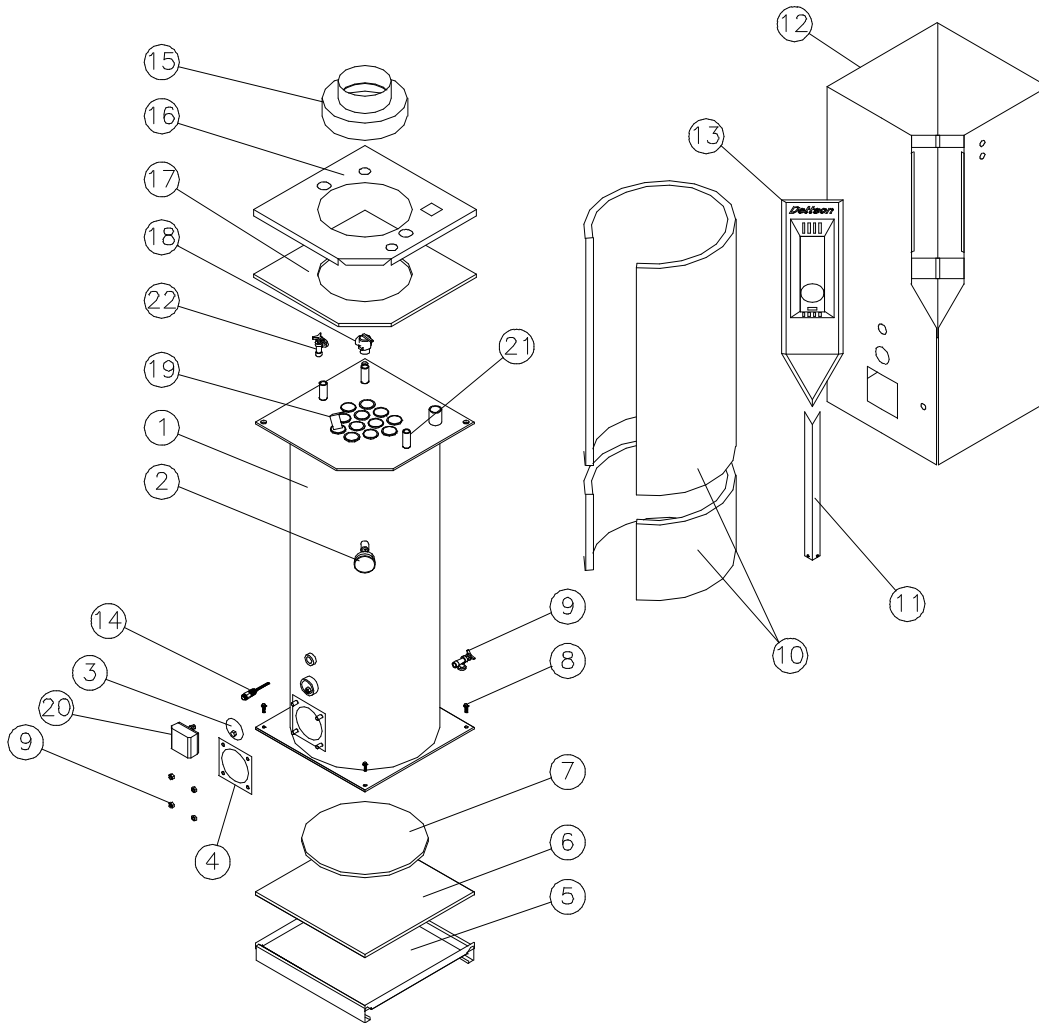
DNS-0216 Rev. B

FIGURE 4
Cast iron radiators piping



DNS-0217 Rev. B

→ PARTS LIST
Model : HMD



DNS-0390 Rev. C

ITEM	DESCRIPTION	PARTS	COMMENTS
1	Heat exchanger	C00139	
2	Tri-gauge	R02L001	
3	Observation door kit	K02014	Includes door, spring and bolt
4	Burner gasket	B00419	
5	Floor	B00584	
6	Floor insulation	B00619-03	
7	Combustion chamber bottom insulation	B00618-03	
8	Floor screws kit	K08003	Kit of 4
9	Drain valve	G11Z002	
10	Heat exchanger insulation	K09001	Includes 2 parts
11	Casing closure angle	B00820	
12	Casing	C00157	
13	Control panel	B00683	
14	Well 1/2" NPT	R02J001	
15	Smoke box	B00635	
16	Top panel	C00156	
17	Top panel insulation	B00622	
18	Pressure relief valve	G11F012	
19	Flue baffle kit	K08024	Kit of 12
20	Triple relay aquastat	R02H001	
21	Deep tube	G99Z001	
22	Thermostatic mixing valve	G11Z017	