

**DUAL ENERGY
HOT WATER BOILER**

HME SERIES

X00412

**Revised : 2 November 1993
© copyright : DETTSON industries Inc.
All rights reserved**

PART ONE

INTRODUCTION TO THE DUAL ENERGY BOILER

1) Operation in the OIL Mode

When the three-position selector is on the OIL setting, the boiler operates like a conventional oil-fired appliance. When the thermostat is set high enough, the burner comes on, followed by the circulating pump when the water reaches the preset temperature. Both shut off when the thermostat has been satisfied. The system is set up so that the water temperature is always above 150 degrees F (circulation is prevented below that temperature). A high-limit control protects against overheating the house and boiler damage should the circulating pump break down or line blockages occur. For more information, see Part Two.

2) Operation in the ELECTRICITY Mode

When the three-position selector is on the ELECTRICITY setting, the boiler operates like a conventional electric boiler. When the thermostat is set high enough, the circulating pump comes on, followed by each of the elements in sequence. When the call-for-heat has been met, the elements come off-line sequentially and the circulating pump stops. The circulation is prevented when water temperature is below 100 degrees F. Unlike in oil-fired appliances, the elements come on-line only when there is a call-for-heat; never between cycles. The electric elements are located in the boiler, easily accessible through the electric-compartment panel. For more information, see Part Three.

3) Operation in DUAL-ENERGY Mode

When the three-position selector is on the DUAL-ENERGY setting, the boiler's microprocessor is on-line with Hydro. When the call-for-heat comes through, the processor determines whether to heat with oil or electricity. The electronic control system can also switch the boiler from one mode to the other during a heating cycle. For more information, see Part Four.

4) Operation in AUTO-RELIEF Mode

When the AUTO-RELIEF indicator light comes on, the boiler has detected a problem with one energy source and has automatically shifted to the other. If the boiler is operating electrically, with both the AUTO-RELIEF and ELECTRIC lights on, there is a burner problem. If the boiler is in the oil mode, with both the AUTO-RELIEF and OIL lights on, there is a problem with the ELECTRICITY mode.

Twelve hours following such a switch, the boiler will try once again to operate with the power source indicated on the three-position switch: oil, electricity, or dual-energy, according to the signal from Hydro. The process will repeat every twelve hours. Obviously, if the problem has not been corrected, the boiler will remain in AUTO-RELIEF mode. The only way to leave this mode while the problem persists is to manually reset the boiler by cutting, then restoring the main power supply. Caution: prolonged operation in AUTO-RELIEF mode must be avoided and the appliance must be checked by a qualified technician. Part Four of this manual gives the most common causes of AUTO-RELIEF operation.

5) Operation in the EMERGENCY mode

The operation in the emergency mode enables, by using the emergency switch located near the low voltage terminal strip, the operation of the boiler in the OIL mode in the case of an electronic card breakdown or malfunction. On EMERGENCY mode the boiler operates exactly like a conventional oil fired boiler. When the thermostat calls for heat the burner and the circulator are activated until the demand is met.

The transfer to the emergency mode is not automatic and must be done manually upon demand. The EMERGENCY mode must be used only as a temporary mean of heating and the problem that caused the activation of this mode must be solved as soon as possible.

For further details see the fourth section of this manual.

PART TWO

OIL MODE - DUAL ENERGY BOILER



1) Installation - OIL mode

1.1) Delivery

Carefully inspect your boiler for shipping damages as soon as it arrives. Claims for damages or missing parts must be made to the shipping company.

1.2) Installation

Your boiler must be installed in accordance with the applicable regulations and codes. Consult CSA installation code B139.

1.2.1) Location

Your boiler must be installed as close as possible to a chimney in a clean, dry place. Series HME boilers have not been approved for installation on combustible floors.

1.2.2) Clearances

The following clearances from combustible surfaces must be maintained.

Top:	24 inches	Flue pipe:	9 inches
First side:	3 inches	Second side:	24 inches
Front:	24 inches	Back:	5 inches

1.3) Wiring and Regulators

The boiler has been factory-wired and requires no internal connections after delivery. Only the 240/120-volt, 60-Hz electrical main with ground wire needs to be connected (see Part Two: Electricity).

Please note the location of the boiler's main controls.

- Burner: located in the burner cabinet and accessible through a removable panel on the front of the appliance (see Figure 1).

- High-limit control: located in the electrical cabinet, accessible by removing the three screws on the front of the appliance as shown in Fig. 1. This control is factory-set and normally requires no adjustment after delivery. In any event, it should never be set above 195 degrees F.

- Circulating pump: Use the supplied connector to connect the pump through the left-hand panel; it should be wired to terminals 1 and 6 in the electrical compartment. See Figure 4A for electrical connections and Figure 1 to locate the circulating pump inlet.

- Burner operational control: A thermosensor in the boiler sends signals to the electronic board that controls boiler operation. The burner's set point can be adjusted from 170 to 190 degrees F using the potentiometer labelled "Water Temperature" on the board (see Figure 6). Below 150 degrees F the control prevent the circulator from operating to maintain the boiler temperature.

- Emergency mode switch: this double pole-double throw switch (DPDT) is located near the thermostat connection terminal strip (See figure no. 1). This switch has two positions : NORMAL and EMERGENCY. In the NORMAL position, the operation of the boiler is according to the instructions and specifications included in this manual. In the EMERGENCY position, the totality of the electronic card is by-passed to insure an operation completely independent of the printed circuit board. Obviously in this mode the boiler does not operate in dual-energy but as a conventional oil fired boiler. The burner and the circulator are started directly by the thermostat.

1.4) Tank Installation

The tank must be connected in accordance with local codes and regulations. We recommend installing a two-pipe burner system, although single-pipe installation is acceptable if the bottom of the tank is not more than eight feet below the burner level. The boiler's Beckett-Dettson burner has been factory-set to operate as a single-pipe system. To change to a two-pipe configuration, insert the by-pass plug in the bag attached to the oil line.

Make sure that the lines are free of blockages and leaks. We discourage using compressed fittings. Use the same diameter for suction and return lines, ensuring that the tank ends are submerged to the same depth. For more information, consult the burner installation manual provided with your boiler.

1.5) Exhausting Combustion Gases

1.5.1) Flue Pipe

Flue pipe draft must be strong enough to ensure that the appliance functions safely and properly.

1.5.1.1) Draft Specifications

The draft for HME models is $-0.035''$ W.C., but in no case shall it be less than $-0.020''$ W.C. The minimum and maximum dimensions for the vent pipe (chimney or chimney liner) for HME hot water boilers are the following : minimum diameter : 5" and maximum diameter : 6". The connecting pipe between the furnace and the vent pipe must be 6" in diameter.

1.5.1.3) Installation

The connecting pipe diameter should not exceed that of the flue pipe. Damper use in the connecting pipe is prohibited.

The diameter of the chimney must equal the sum of the area of the connecting pipes if more than one is connected to the same chimney.

A draft control must be used with HME boilers. Failure to do so voids your warranty.

NOTE: Hot water boilers may cause condensation on chimneys with three sides exposed to the outside air. Should this occur, a SWV side wall venting system must be installed to correct the problem.

1.5.2) SWV Side Wall Venting System

HME series boilers are approved for installation with DETTSON's SWV side wall venting system. A terminal strip (same as for the circulating pump) for connecting the various SWV components is provided in the electrical compartment as show in Figure 3. Should you opt for such a system, install it according to the instructions in the accompanying manual.

1.6) Burner Information

1.6.1) General Information

The burner is shipped in a separate box from the boiler and must be installed on the boiler as detailed below.

- Remove the burner from its box.
- The Beckett burners requires only assembling the retention head on the end of the blast tube with the screws supplied.
- Install the nozzle supplied by Dettson.
- Install the burner on the boiler using supplied nuts already on the studs. Don't forget the gasket supplied with the burner.
- Perform electrical connections in accordance with the appropriate diagram.

Model	Capacity (Btu/H)	Input (USGPH)	Burner	Retention head	LFRB*	Nozzle (Capac. & pattern)	Pressure (PSI)
HME-15-79	80000	0.65	Beckett AFG	F0	Yes	0.65-80W	100
HME-18-79	80000	0.65	Beckett AFG	F0	Yes	0.65-80W	100
HME-20-90	92000	0.75	Beckett AFG	F3	Yes	0.75-80W	100
HME-23-102	103000	0.85	Beckett AFG	F3	Yes	0.85-80W	100
HME-25-102	103000	0.85	Beckett AFG	F3	Yes	0.85-80W	100
HME-25-118	118000	1.00	Beckett AFG	F3	No	1.00-80A	100
HME-25-128	128000	1.10	Beckett AFG	F6	No	1.10-80A	100

* LFRB = Low firing rate baffle (see burner's manual)

TABLE 1 - Burner Characteristics

1.7) Source of Combustion Air

In order to operate correctly, all oil-fired boilers require adequate combustion air. Air for your boiler is supplied through holes in the floor of the burner compartment which must be kept clear at all times. In addition, small boiler rooms should have two fresh air vents to ensure an adequate air supply. One should be located near the ceiling, the other near the floor, in order to provide adequate circulation. Size each opening so that it has 1 sq in of area per 1000 Btu/h of output.

1.8) Piping

A pressure-reducing valve must be installed on the boiler cold water supply. Failure to do so voids your warranty. Wrap all joints with Teflon tape and tighten adequately. See Figures 5A and 5B for installation of expansion tank, pressure-reducing valve, and the like.

The HME boilers with integrated by-pass are designed for installation on any kind of distribution (piping) system that is equipped with a circulating pump. For finned tube baseboard system see fig. no. 5A and for cast iron radiators see fig. no. 5B. This integrated by-pass permits a stabilization of the temperature rise between the return and supply pipes to approximately 20 degrees F, whatever the return temperature. Besides, the integrated by-pass prevents condensation in the boiler with the circulating pump control integrated in the dual-energy electronic control.

1.9) Thermostat

See Part Three of this manual.

1.10) Draft control

A draft control must be installed in the flue connecting the boiler to the chimney whether or not a SWV side wall venting system is used. In addition, it should be easily accessible. See the accompanying installation instructions.

2) Maintenance and Operation - OIL mode

2.1) Fuel

Use only No. 2 fuel oil. Never use heavier fuel oil, gasoline, motor oil, or any other combustible.

2.2) Boiler Start-up

2.2.0) Important notice concerning the initial start-up

On the initial start-up of the unit, or after a power failure, the first heating cycle is always on oil mode and this, even in the 3 positions selector or the Hydro signal tend to indicate otherwise. If there is a call for heat on power up, the heating mode will always oil for the first heating cycle. Once the thermostat is satisfied and the first heating cycle is over, the boiler electronic computer will evaluate the heating factors (position of the selector and Hydro signal) and will decide what heating mode should be operational. If the thermostat is not calling for heat on power up, this first cycle particularity will be inoperative and the boiler will function normally later during the first heating cycle.

2.2.1) Test Start

To test start your boiler in the oil mode, set the three-position switch to the oil position and turn the thermostat all the way up. Afterwards, remember to lower the thermostat and set the switch back to the dual-energy position.

2.2.2) Start-up Preliminaries

- Ensure that the emergency switch is in the NORMAL position.
- Ensure that there is oil in the tank and that the oil shutoff valve is open.
- Turn the power on. Bleed air from the oil lines (bleed valve). If the burner doesn't light and the burner control resets, see Section 2.3.
- Set chimney draft as specified in Section 1.5.1.1.
- Set the burner so that it gives a smoke-test reading of 0 or less on the Bacharrach scale. Analyze the combustion products. The flue gas temperature should be less than 575 degrees F.

Note: Table 2 contains information regarding burner adjustment. Note that Beckett-Dettson model AFG burners require only air band adjustments: drawer assembly adjustment is factory-set and not adjustable. The burner manual gives an overview of burner operation; refer to Table 2 of this manual for the necessary settings. Please note also that the adjustments specified in table 2 are only start-up guidelines and the final values of the adjustments to ensure proper operation might be different from the ones specified in this table.

Model	Capacity (Btu/H)	Adjustment Air shutter	Adjustment Draw band	LFRB*	Pressure (PSI)
HME-15-79	80000	0	8	Yes	100
HME-18-79	80000	0	8	Yes	100
HME-20-90	92000	0	7	Yes	100
HME-23-102	103000	0	10	Yes	100
HME-25-102	103000	0	10	Yes	100
HME-25-118	118000	1	7.5	No	100
HME-25-128	128000	1	8.5	No	100

* LFRB = Low firing rate baffle (See burner's manual)

TABLE 2 - Burner adjustments

2.3) Troubleshooting after ignition failure

If the burner control trips, you may attempt to reset it by pressing the red reset button once. Should this fail, check the following items.

- Make sure there is a "call-for-heat" signal.
- Check the oil level in the tank.
- Make sure the oil shutoff valve is open.
- Make sure the oil filter isn't clogged.
- Check the main circuit breakers or fuses.
- Check the low-voltage electronic fuse in the electrical compartment (see Part Three).
- Check burner electrodes as specified in the burner manual.
- Check for air in the burner oil inlet line.
- Check burner adjustment.

If the burner refuses to ignite after checking all the above points and after attempting to reset the burner one last time, call your technician. Never attempt to light the burner if there is excess oil or oil fumes in the combustion chamber.

2.4) Summer Season

Make sure that the fuel shutoff valve is closed whenever the appliance is idle for extended periods.

2.5) Heating Season Checklist

- Have the chimney and the connecting pipe cleaned, if deemed necessary after visual inspection.
- Clean all heating surfaces, if necessary (see Section 2.5.1).
- Replace the oil filter.
- Inspect the burner.
- Make sure the burner relay and high-limit control are in good working order.
- Check the circulating pump controls.
- Check the circulating pump.

2.5.1) Cleaning Heating Surfaces

Follow the steps below to clean heating surfaces (combustion chamber and heat exchanger).

2.5.1.1) Heat Exchanger

To clean the heat exchanger (12 vertical tubes), simply remove the connecting pipe and the smoke box (three nuts) under the upper outside panel. The tubes can be cleaned with a 2-inch-diameter tube brush. Since dirt can fall down into the combustion chamber, we recommend cleaning the exchanger tubes first. Furthermore, since the boiler is equipped with a sound trap, be careful when removing the smoke box, not to deteriorate the acoustical insulation. The use of a flexible brush is recommended.

2.5.1.2) Combustion Chamber

To clean the combustion chamber, just remove the burner and vacuum away the dirt (Section 1.6.1).

2.6) Periodic Maintenance

2.6.1) Nozzle

A dirty or clogged nozzle (both produce distinctive odours) can prevent lighting or cause poor combustion. In either case, the nozzle must be replaced.

2.6.2) Oil Tank

Check the oil level regularly. Should the tank ever run dry, the oil line must be bled.

2.6.3) Oil Filter

The oil filter should be changed yearly.

2.6.4) Circulator and Burner Motors

Lubricate the motors at least once during the heating season with SAE 20 weight oil.

2.7) Precautions

Never burn garbage or paper in your boiler. Never store or pile garbage or paper near your boiler.

PART THREE

ELECTRICITY MODE - DUAL ENERGY BOILER



1) Installation - ELECTRICITY mode

All main electrical components, the main power block, and the microprocessor can be accessed by opening the panel located on the front of the boiler just above the fan compartment. Figure 1 shows its exact location.

1.1) Installation

Installation must be in accordance with all applicable codes and regulations. If necessary, refer to CSA Code C22.1 or C22.10 (Quebec amendments) or to the Canadian Electrical Code.

1.1.1) Location

See Section 1.2.1

1.1.2) Clearances

See Section 1.2.2. The clearances for use with oil are the minimum for the appliance and must be respected.

1.2) Electrical Connection

All wiring must conform to local codes and regulations, which may take precedence over the instructions below.

The boiler's electrical panel should be used solely for the appliance, its various electrical components, and the side wall venting system, if installed.

1.2.1) Power Supply

Check your boiler's power and nominal amperage in order to select the correct breaker. The appliance requires a 240/120-VAC, 60-Hz power supply connected with a three-wire cable plus ground to the terminal block provided in the upper left-hand corner of the electrical panel. The block is designed for wires ranging in size from #6 to #3/0; the ground wire must be connected to the appropriate screw on the block (see Fig. 3). Use only copper-wire cables listed for temperatures not less than 90 degrees C. To determine the size of wire, consult Code C22.1. Table 3 gives electrical information for your boiler.

1.2.2) Thermostat

The thermostat must be connected to the low voltage terminal strip as shown in Figure 1. The wires must be connected to terminals W R.

1.2.3) Hydro Signal

This appliance is designed to operate in dual-energy mode in response to a dry contact from a sensor installed by Hydro. The sensor must be connected to H Q on the terminal strip (see Fig. 1).

Model	Electrical power (Kwatt)	Number of elements	Amperage (A)
HME-15-79	15	3	63.0
HME-18-79	18	4	75.5
HME-20-90	20	4	83.8
HME-23-102	23	5	96.3
HME-25-102	25	5	104.7
HME-25-118	25	5	104.7
HME-25-128	25	5	104.7

TABLE 3 - Electrical Characteristics

1.2.4) Low-voltage Transformer Fuse

A 1-amp fuse, located near the low-voltage strip on the outside of the electrical panel, protects the electronic board (low-voltage circuit) (see Fig. 1).

1.2.5) Internal Wiring

All other wiring for the electronic board, components, terminals, supply terminal strip, burner, and fan is carried out by DETTSON in our factory: no additional wiring or modifications are necessary. See Figure 4.

1.2.6) Components

1.2.6.1) Transformer

The electronic board is connected to a low-voltage transformer (120/24 VAC, CSA-listed, Class II) with a 1-amp fuse protecting the load side. See Figure 3 and Section 1.2.4

1.2.6.2) Relays

All loads (burner, circulating pump, and elements) are directly connected to relays (contacts approved for 25 resistive amperes) whose 24 Volts DC coils are actuated by the board's microprocessor. These relays are CSA-listed for 100,000 cycles.

1.2.7) Electronic Board

The electronic board, located in the electrical compartment (see Figure 1), acts as the boiler's "brain", controlling all its functions. For more information, see Part Four.

1.2.8) Emergency switch

The boiler is equipped with a double pole-double throw switch that permits the operation independantly of the electronic board. To activate this operation, place the switch in the EMERGENCY position. The operation of the ELECTRIC mode is not possible in the EMERGENCY operation.

1.2.9) Electrical Elements

Electric heat is generated by elements located over the combustion chamber. This location resulted from extensive research and development in order to provide infinite life under normal operating conditions and

easy access for maintenance. The elements, mounted near the front of the boiler, are accessible through the electrical compartment. Element replacement is discussed in Section 2.2.

1.2.9.1) Element Characteristics

Each electrical element consists of a special alloy wire covered with a special insulator and mounted on standard boiler flanges as shown in Figure 3. Damaged or defective elements and components must be replaced only with equivalent DETTSON parts. Replacement by parts from other sources is dangerous and automatically voids your warranty. Heating elements cannot be repaired or adjusted: if defective, they must be replaced.

2) Maintenance and Operation - ELECTRICITY Mode

2.0) Important notice concerning the initial start-up

On the initial start-up of the unit, or after a power failure, the first heating cycle is always on oil mode and this, even in the 3 positions selector or the Hydro signal tend to indicate otherwise. If there is a call for heat on power up, the heating mode will always oil for the first heating cycle. Once the thermostat is satisfied and the first heating cycle is over, the boiler electronic computer will evaluate the heating factors (position of the selector and Hydro signal) and will decide what heating mode should be operational. If the thermostat is not calling on power up, this first cycle particularity will be inoperative and the boiler will function normally later during the first heating cycle.

2.1) Boiler Start-up

To start up and test your boiler in the ELECTRICITY mode, set the three-position switch to the electricity setting position, insure that the emergency switch is in the NORMAL position and turn the thermostat all the way down (no demand). Wait approximately 1 minute and then turn the thermostat all the way up (full demand). During cold starts, the elements should come on sequentially after the thermostat is turned up. The circulating pump will not come on unless the water is hotter than 120 degrees F and there is a call-for-heat. During a cold start, it is therefore normal for the circulator not to start operating at once. Once the thermostat circuit opens, the pump stops and the elements come off-line sequentially.

2.2) Element Access

Follow the procedure outlined below to remove the one or more elements to investigate suspected problems.

- Turn off the 240-VAC power supply.
- Drain the boiler, not the entire system. This one example of why drain valves are practical and necessary.
- Remove the electrical compartment access panel.
- Disconnect the element you want to remove.
- Unscrew the element taking great care to avoid damaging the porcelain electrical connectors.

You can now visually inspect the element or test it with a voltmeter. Only DETTSON replacement elements may be used. Figure 7 shows the disassembly procedure. Reverse the procedure to install the replacement part.

Observe the following whenever you replace an element.

- Wrap Teflon tape on the replacement element threads.
 - Before putting the electrical compartment panel back in place, make sure water is not leaking around the flange.
 - Bleed air from the boiler with the relief valve after replenishing the water.
-

2.3) Maintenance

The electrical part of the boiler requires no maintenance except periodically checking for excessive accumulation of dust or dirt in the electrical compartment.

PART FOUR

BI-ENERGY MODE - DUAL ENERGY BOILER



1) Installation - DUAL-ENERGY mode

Since nearly all information relevant to installing the appliance has been covered in Parts Two and Three, this chapter deals with the main components of the dual-energy system.

1.1) Electronic Board

The main functions of your dual-energy boiler are controlled by the electronic card, which is located in the back of the electrical compartment door. Actually, there are main and secondary cards; the three-position selector and monitor lights are mounted on the latter.

1.1.1) Selecting the Heating Mode

The board's main function is determining which heating mode should be used at a given time. The decision is based on three factors: the thermostat, Hydro signals, and whether there is an auto-relief situation. For example, if there is a call-for-heat when the Hydro contact is closed and there is no auto-relief, the board will opt for electric heat.

1.1.1.0) First heating cycle on power up

On a power up, if the thermostat is calling for heat, the first heating cycle is always done using the oil mode (independent of the position of the selector and the Hydro signal).

1.1.1.1) Thermostat

When the thermostat demands, there is a call-for-heat that the board interprets as a signal to start up the system.

1.1.1.2) HYDRO Signal

The board interprets a closed Hydro circuit as a priority signal to switch to electric heating.

1.1.1.3) AUTO-RELIEF Diagnostics

A factory-installed thermosensor, located next to the high-limit control, relays temperature readings to the board. The sensor requires no adjustment or modification. If, during a period of 30 consecutive minutes, the sensor records temperatures under 100 degrees F while the thermostat circuit is calling for heat, the board will assess abnormal operation and implement auto-relief. In basic terms, this is simply changing the heating mode. For example, in the case discussed in Section 1.1.1, the board will opt for OIL heat even if the Hydro circuit is closed. The last chapter discusses auto-relief and related procedures.

1.2) Three-position Selector

This selector, often referred to in this manual, is located on the outside of the electrical compartment door as depicted in Figure 1. It is a three-position switch that allows you to select a single mode of control: OIL, ELECTRICITY, or DUAL-ENERGY.

1.3) Monitor Lights

These lights, which indicate the operating state of the boiler, are located just below the three-position selector on the outside of the electrical compartment door as shown in Figure 1.

1.3.1) DUAL-ENERGY Light

This light comes on when the selector is in the dual-energy position and is always accompanied by either the OIL or ELECTRICITY light, indicating that the boiler is receiving Hydro's signal. This light cannot be alone by itself.

1.3.2) OIL Light

The OIL light may come on under two different conditions.

1.3.2.1) OIL Light Alone

This indicates that the boiler is operating on OIL solely and is not in the dual-energy mode.

1.3.2.2) OIL Light with DUAL-ENERGY Light

This indicates that the appliance is in the DUAL-ENERGY mode, but operating on OIL at the current moment.

1.3.3) ELECTRICITY Light

The ELECTRICITY light may come on under two different conditions.

1.3.3.1) ELECTRICITY Light Alone

This indicates that the boiler is operating on ELECTRICITY solely and is not in the dual-energy mode.

1.3.3.2) ELECTRICITY light with DUAL-ENERGY light

This indicates that the appliance is in the DUAL=ENERGY mode, but operating on ELECTRICITY at the current moment.

1.3.3) AUTO-RELIEF Light

This light comes on whenever there is a problem with one of the energy systems.

1.3.3.1) AUTO-RELIEF and OIL Lights

When both these lights are on, there is a problem with the ELECTRICITY mode. The DUAL- ENERGY light may or may not be on.

1.3.3.2) AUTO-RELIEF and ELECTRICITY Lights

When both these lights are on, there is a problem with the OIL mode. The DUAL-ENERGY light may or may not be on.

1.4) Energy Source Transfer

Your boiler may switch energy sources for two reasons: a signal from Hydro or auto-relief, regardless of the heating mode or position of the three-position selector.

2) AUTO-RELIEF Mode

2.1) Information

Your boiler's control system uses a 12-hour recycling auto-relief system with manual reset. This means simply that when the controller's thermosensor detects an auto-relief condition, the system attempts to return to the problem energy source 12 hours later. If successful, the auto-relief light goes out and normal operation continues. If unsuccessful, the auto-relief light will stay on until the boiler is manually reset by cutting, then restoring power.

The light indicates that the boiler is not operating normally. While the boiler will continue to provide heat under these conditions, the problem must be corrected.

2.2) How to Handle AUTO-RELIEF Conditions

2.2.1) AUTO-RELIEF and ELECTRICITY Lights

The OIL system is not working properly. Follow the procedure in Section 2.3, Troubleshooting.

2.2.2) AUTO-RELIEF and OIL Lights

There is a problem with the ELECTRICITY mode, almost always one or more faulty elements. Follow the procedure outlined in Section 2.2, part three.

2.3) Electrical Outages

A power outage has the same effect on the control system as manual reset: the memory is cleared and the boiler operates as if on a power-up, meaning that if the thermostat is calling for heat at that moment, the first heating cycle will be with oil and normal operation will resume afterwards.

3) Operation in the EMERGENCY mode

It is possible to operate the boiler during an electronic board breakdown. This is called the EMERGENCY mode and the boiler can be safely operated in the OIL mode until the problem is fixed. To activate this mode place the emergency switch in the EMERGENCY position. This switch is located in the upper portion of the burner cabinet near the thermostat connection terminal strip. In emergency mode, the thermostat is directly operating the burner and the circulator. The emergency circuit is protected by a separate contact on the mechanical high-limit of the boiler.

The EMERGENCY mode must be used only as a last solution because the operation in this mode is not of the dual-energy type. Do not forget to place the switch in the NORMAL position once the problem is fixed.

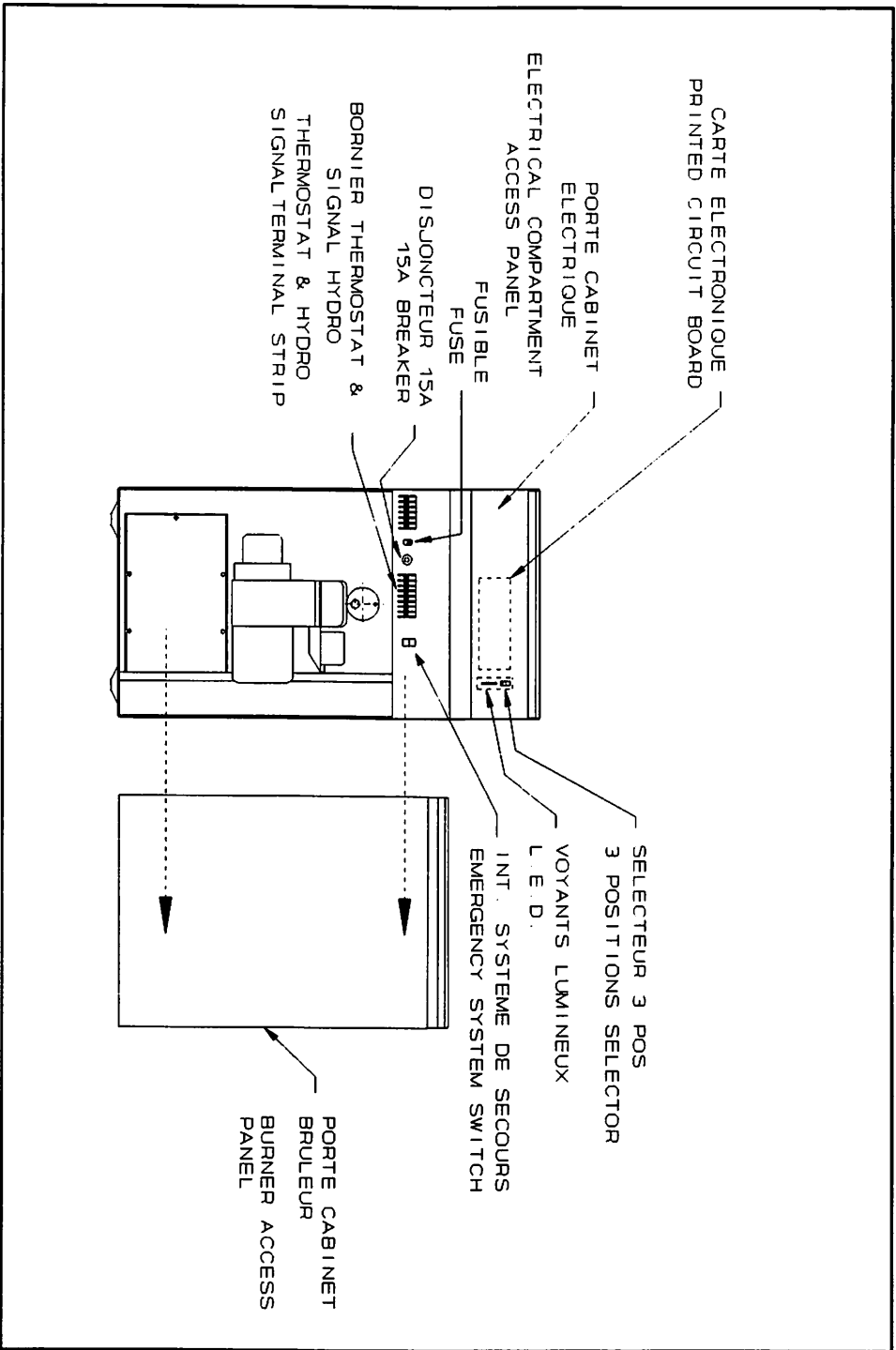


Figure no. 1 **Emplacement des composantes principales**
Location of main components

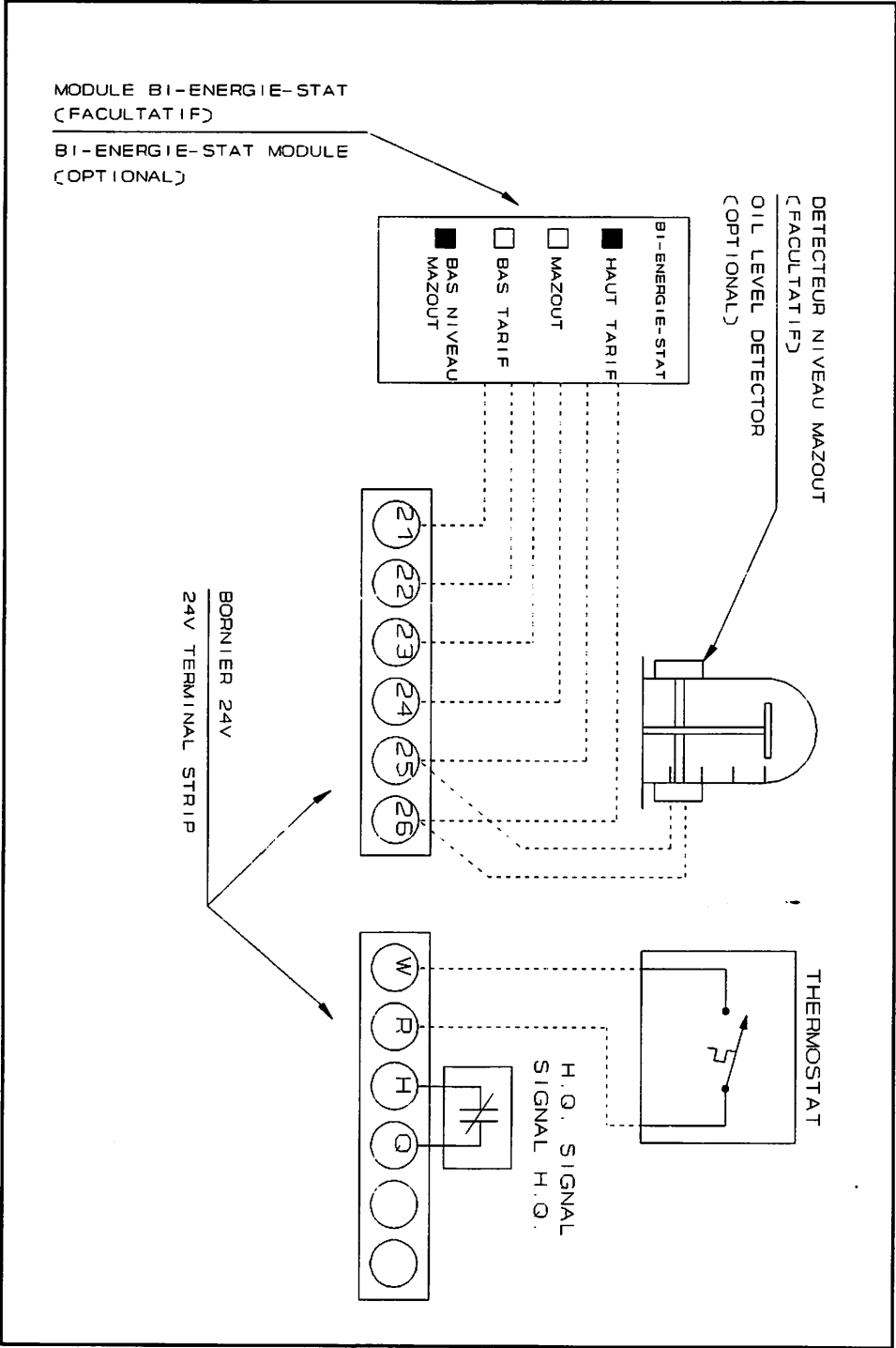


Figure no. 2 Branchement électrique standard
Standard electrical wiring

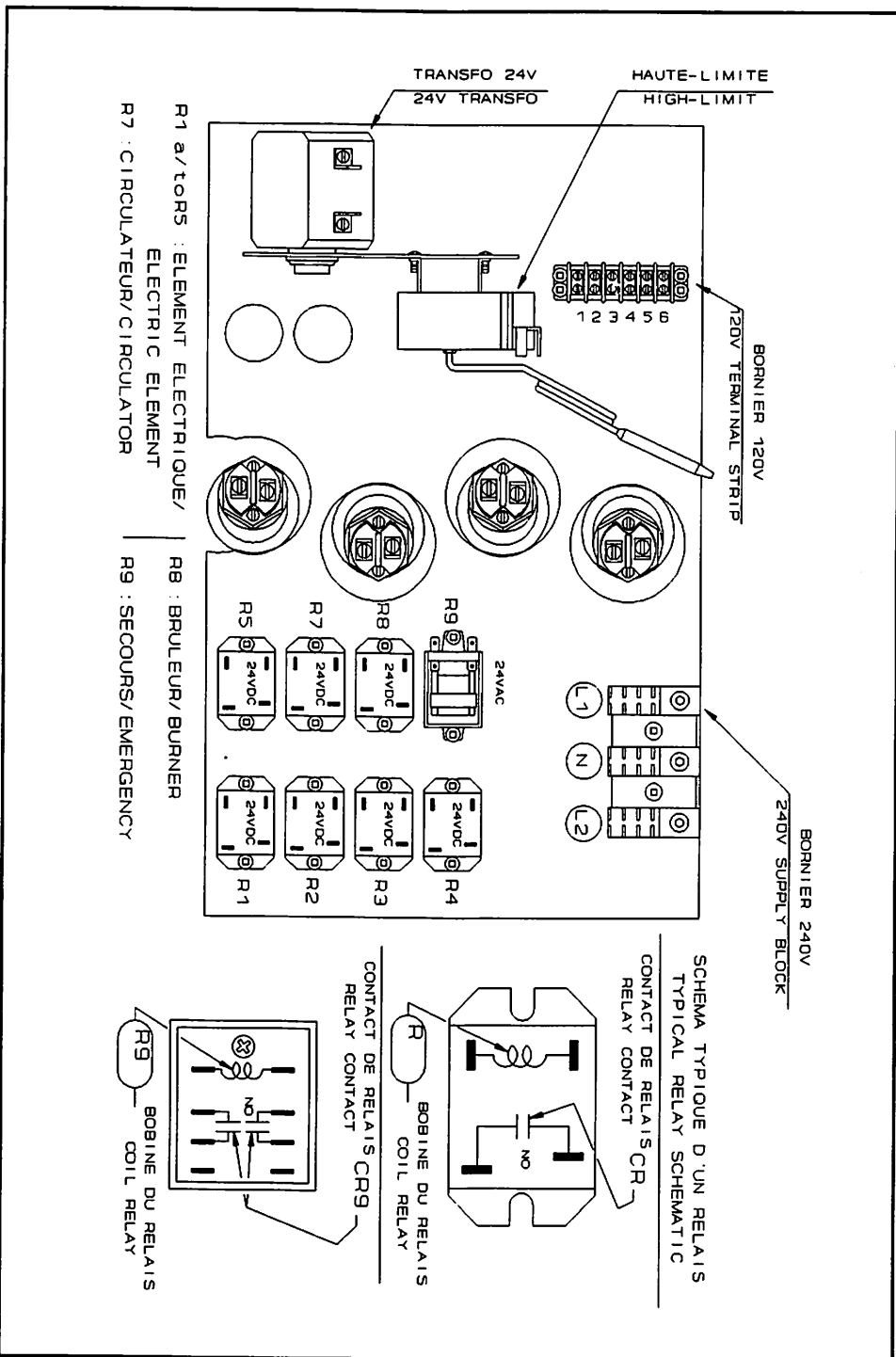


Figure no. 3 Disposition de l'équipement électrique
Electrical panel layout

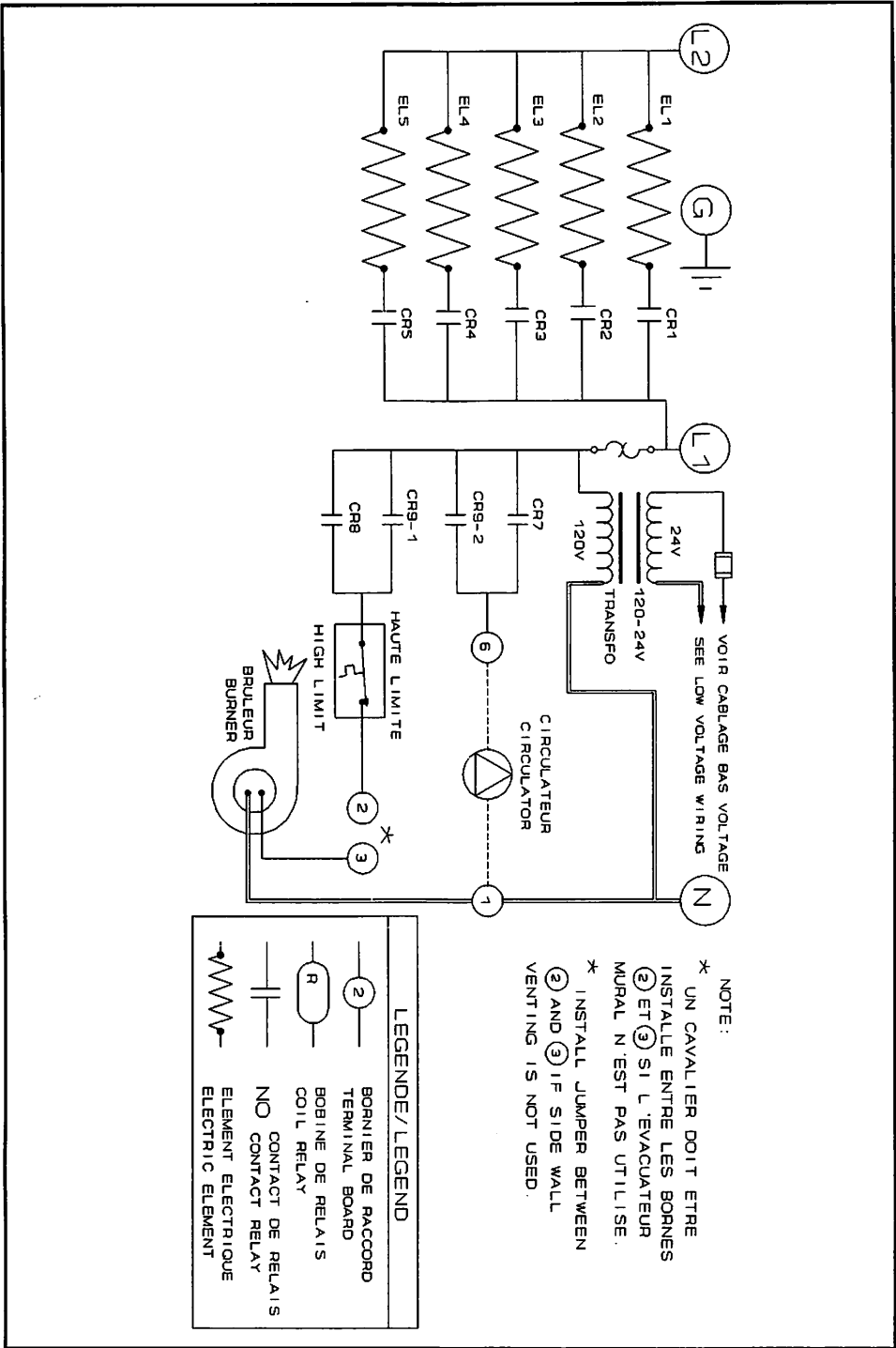


Figure no. 4A Cablage des composantes internes - 120 Volts
 Wiring of internal components - 120 Volts

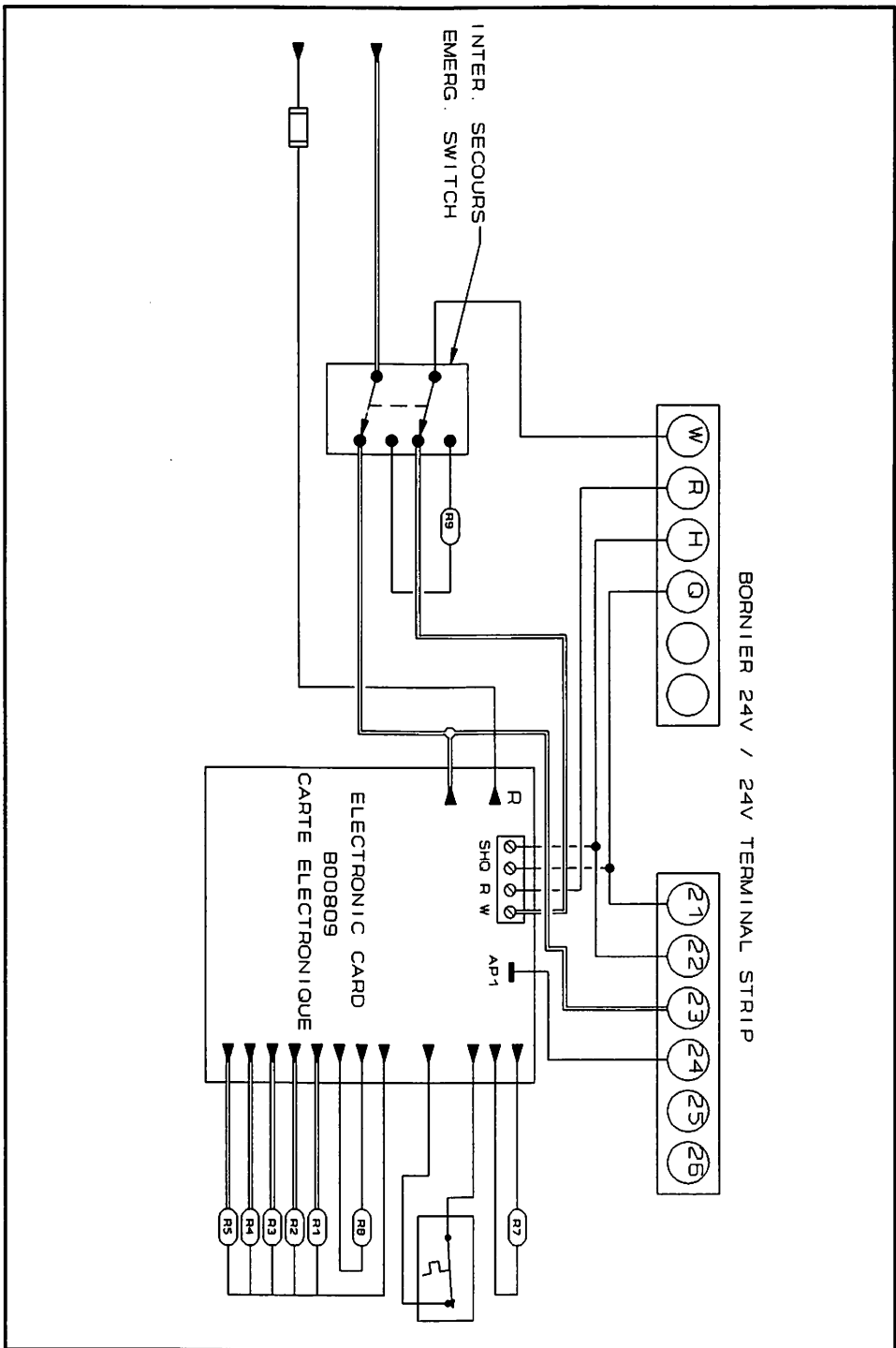


Figure no. 4B Cablage - carte électronique - Basse tension
 Wiring - electronic board - Low voltage

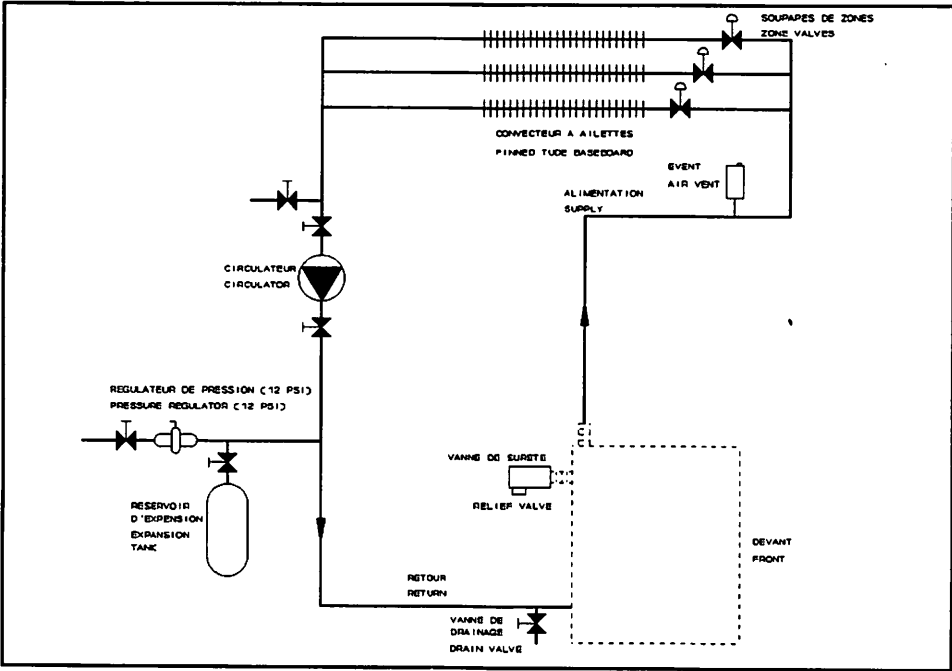


Figure no. 5A Tuyauterie pour CONVECTEURS A AILETTES
FINNED TUBE BASEBOARD piping

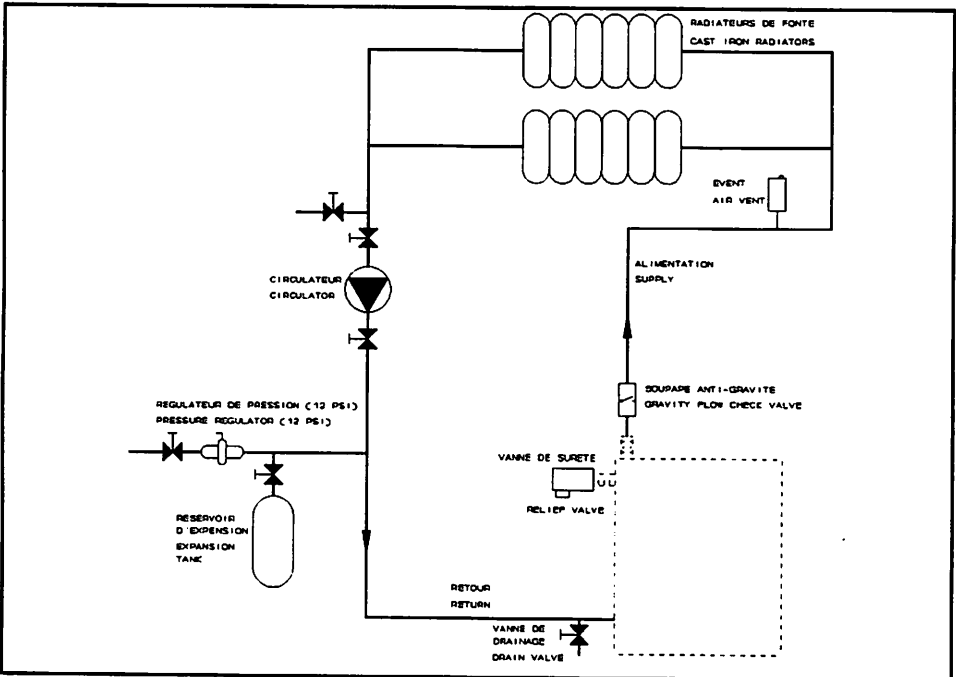


Figure no. 5B Tuyauterie pour RADIATEURS DE FONTE
CAST IRON RADIATORS piping

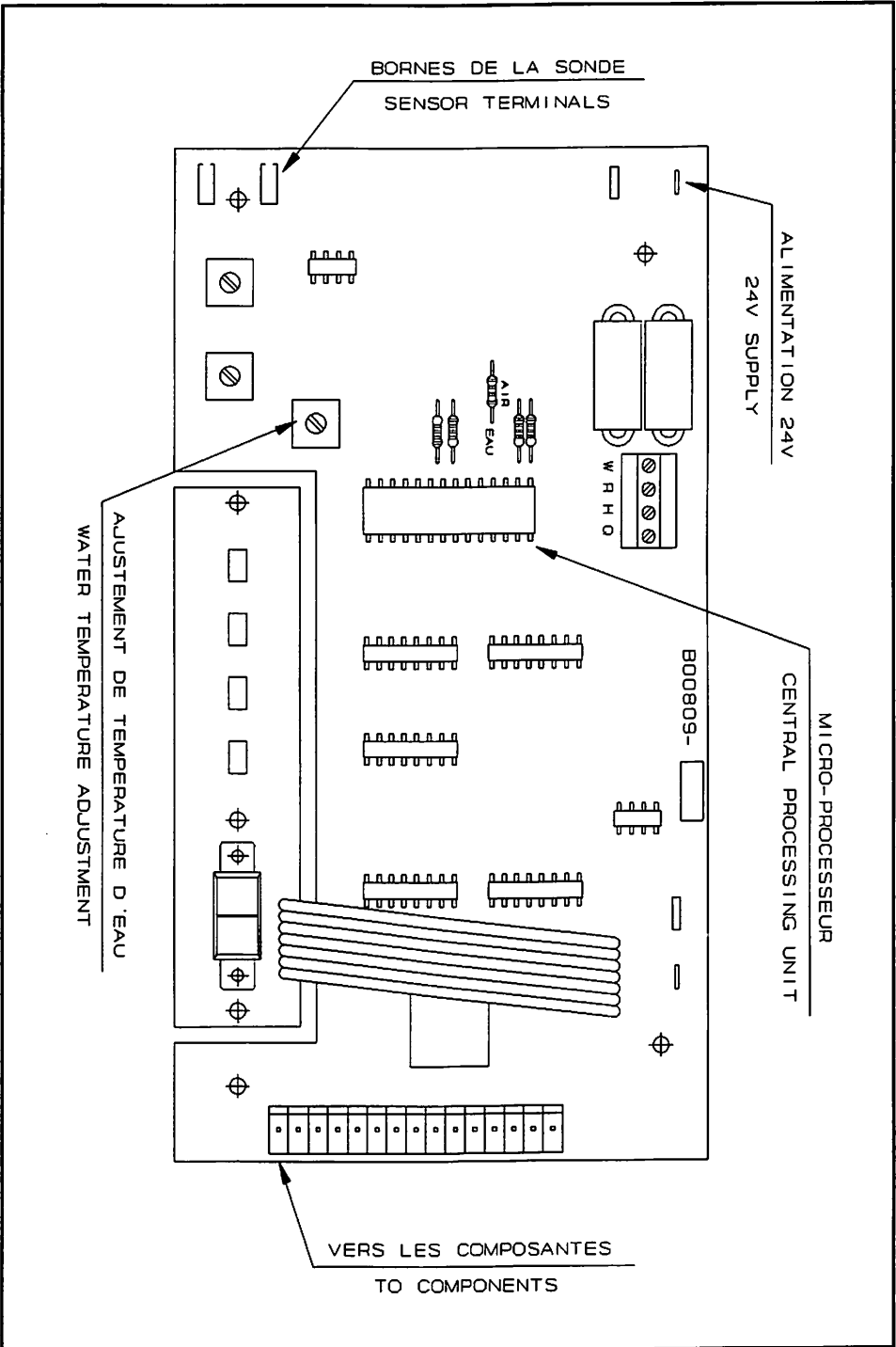
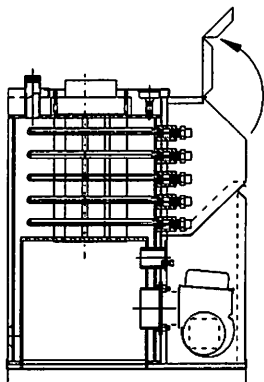
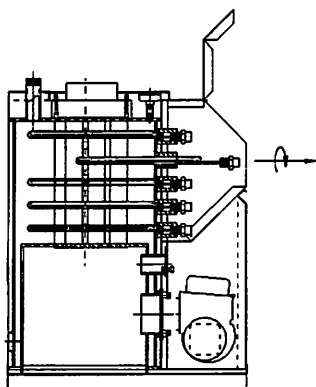


Figure no. 6 Ajustement de température d'eau
Water temperature adjustment



ETAPE #1 SOULEVER LE PANNEAU
D'ACCES AU CABINET ELECTRIQUE

STEP #1 LIFT ACCESS PANEL



ETAPE #2 DEVISSER LA BRIDE
DE L'ELEMENT A CHANGER
ET SORTIR L'ELEMENT DE LA
CHAUDIERE

STEP #2 UNSCREW ELEMENT
AND REMOVE FROM BOILER

Figure no. 7 Remplacement des éléments électriques
Replacement of electric elements

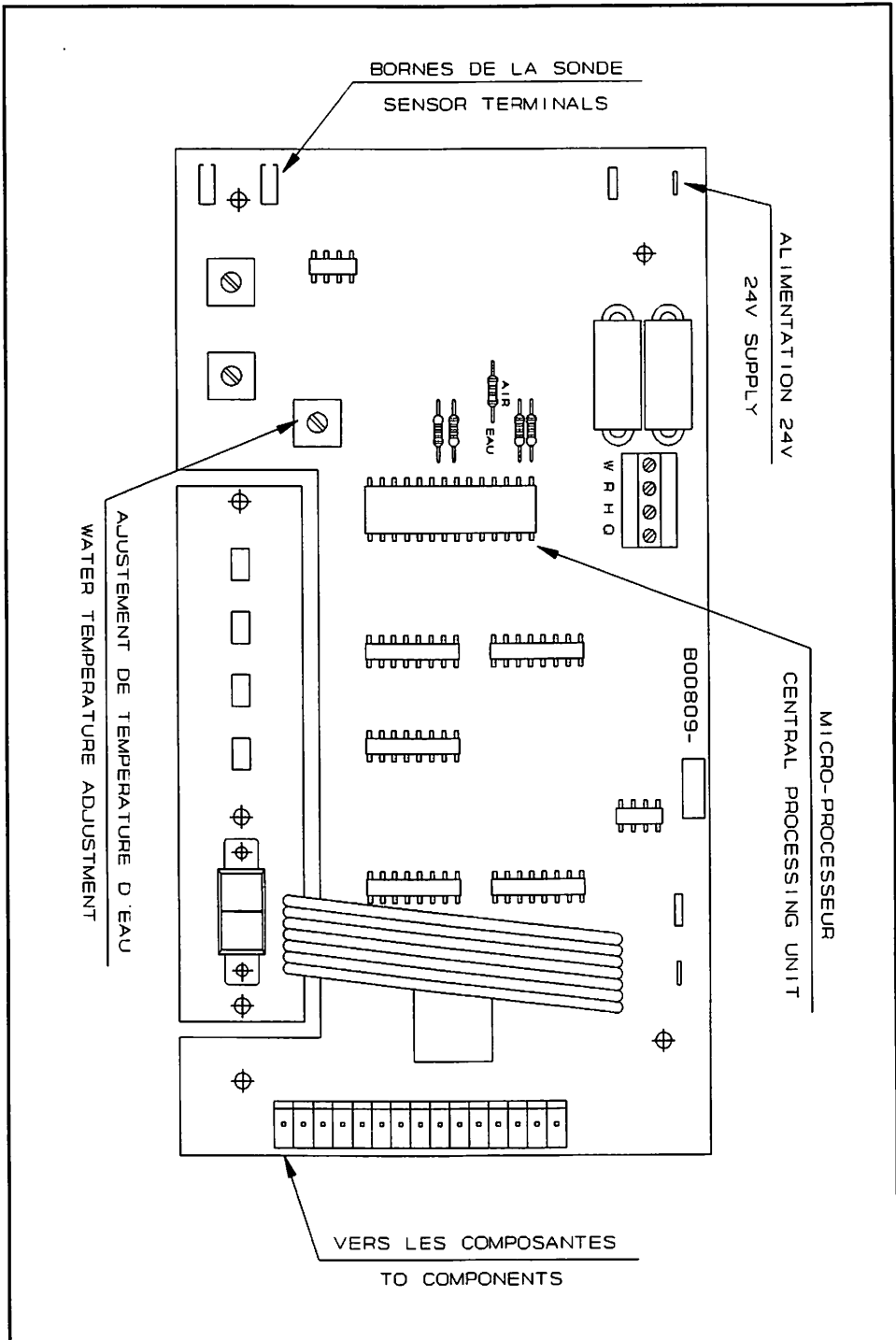
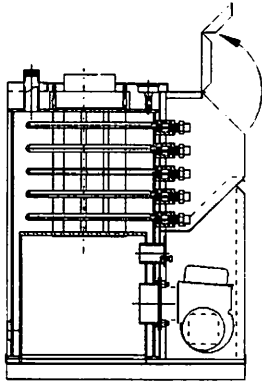
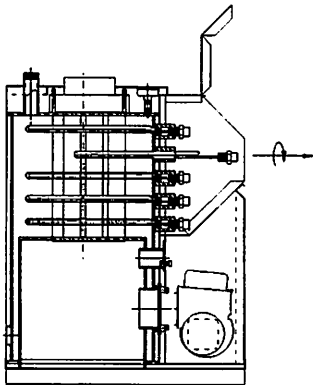


Figure no. 7 Ajustement de température d'eau
Water temperature adjustment



ETAPE #1 SOULEVER LE PANNEAU
D'ACCES AU CABINET ELECTRIQUE

STEP #1 LIFT ACCESS PANEL



ETAPE #2 DEVISSER LA BRIDE
DE L'ELEMENT A CHANGER
ET SORTIR L'ELEMENT DE LA
CHAUDIERE

STEP #2 UNSCREW ELEMENT
AND REMOVE FROM BOILER

Figure no. 8 Remplacement des éléments électriques
Replacement of electric elements