



Diablo ELECTRIC FURNACE

⚠ WARNING

- Never tamper with the unit or its controls. User **MUST** contact a specialized contractor when a failure occurs. **DO NOT ATTEMPT** to repair.
- When using a humidifier make sure not to damage the heating element bank.
- We recommend that your unit be inspected by a specialized technician once a year.
- Poor maintenance of air filters OR an unbalanced static pressure may result in a performance decrease.
- Always use genuine parts for maintenance or service call. The use of unbranded parts will void the warranty.
- The use of this unit without an air distribution duct will void the warranty.
- It is strictly forbidden to use jumpers to simulate heat demand.
- Risk of electrical shock. Disconnect power before installation, servicing, maintenance or field wiring. Replace all panels before operating. Failure to do so can result in electrical shock causing severe injuries or death.
- When performing installation, servicing or cleaning the unit, it is recommended to wear safety glasses and gloves.
- To assure a proper performance of your furnace, we recommend that you use high quality name brand thermostats.
- When applicable local regulation comprises more restrictive installation and/or certification requirements, the aforementioned requirements prevail on those of this document and the installer agrees to conform to these at his own expenses.
- For your safety, do not store or use gasoline or other flammable liquids and vapors in the vicinity of this unit or any other appliance.
- These instructions are intended to be use by qualified personnel who have been trained in installing this type of furnace. Installation of this furnace by an unqualified person may lead to equipment damage and/or hazardous condition which may lead to bodily harm.
- This furnace is not watertight and is not designed for outdoor installation. This furnace shall be installed in such a manner as to protect its electrical components from water. Outdoor installation leads to a hazardous electrical condition and to premature furnace failure, thus voiding the warranty.
- Do not block the combustion air openings in the furnace. Any blockage will result in improper overheat situation and may result in a fire hazard and/or cause bodily harm.
- The unit must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. When performing electrical connection, the ground conductor must be firmly attached to the ground lug in the furnace.
- Do not use this furnace as a construction heater. Use of this furnace as a construction heater exposes the furnace to abnormal conditions, contaminated combustion air and the lack of air filters. Failure to follow this warning can lead to premature furnace failure and/or vent failure which could result in a fire hazard and/or bodily harm.
- The owner and/or the user is responsible of the following: Always maintain the immediate surrounding of the furnace free from combustible and highly flammables materials. The furnace ambient air should not have an excessive dust concentration and humidity. Never operate this central heating appliance without an air filter.
- Before performing any service functions, unless operations specifically require the power to be on, make sure all utilities are turned "OFF" upstream of the appliance. Failure to comply with this warning will cause a fire hazard and/or bodily harm.
- All questions regarding the operation, maintenance or warranty of this unit should be addressed to the company where this product has been sold from.

CAUTION

- Never burn garbage or paper in the heating system and never leave rags or paper around the unit.
- Return air grilles and warm air registers must not be obstructed.

IMPORTANT: All local and national code requirements governing the electrical installation heating equipment, wiring and flue connections must be followed. Some of the codes that may be applicable are:

ANSI/NFPA 70 NATIONAL ELECTRICAL CODE

CSA C22.1 CANADIAN ELECTRICAL CODE

Only the latest issues of the above codes should be used, and are available from either:

The National Fire Protection Agency
Batterymarch Park
Quincy, MA 02269

or

The Canadian Standards Association
178 Rexdale Blvd.
Rexdale, Ontario M9W 1R3

IMPORTANT: READ AND SAVE THESE INSTRUCTIONS.

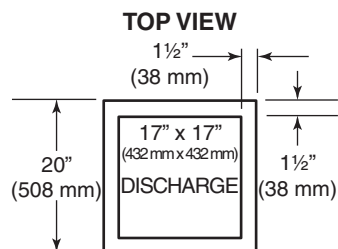
180, 3^e Avenue, L'Islet (Québec) G0R 2C0 CANADA
Tel.: 418-247-3947 • Fax: 418-247-7801
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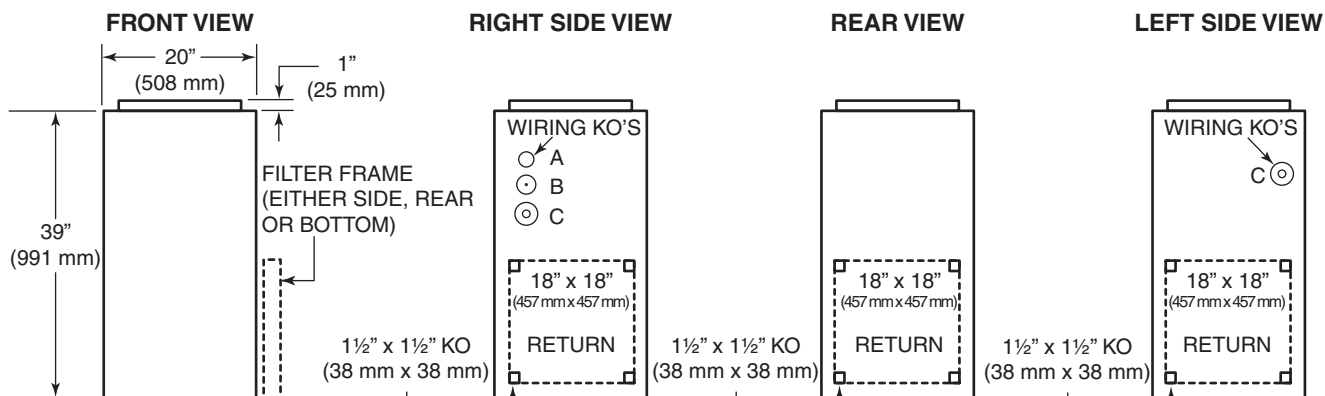
INSTALLATION AND OPERATING INSTRUCTIONS

This furnace has been designed and manufactured to give the most reliable performance possible. Each unit has been given a running inspection before shipment to assure that every component is operating efficiently.

The safe and dependable operation of the furnace depends upon proper installation and compliance with all national and local codes and standards.



WIRING KO'S VALUES	
A	= 1" (25 mm)
B	= 1/4" (6 mm) & 1 1/4" (32 mm)
C	= 1/2" (13 mm) & 1 1/2" (38 mm)



GENERAL REQUIREMENTS AND SPECIFICATIONS

CAUTION

This unit must be installed in a dry place, in a non-corrosive, well-ventilated environment, without excessive dust. The ambient temperature must be over 10°C and under 27°C. If the ambient temperature is 10°C or less, the plenum must be insulated on 10 ft linear minimum length.

- 1. LOCATION** – The furnace should be centrally located to the heating area.
- 2. POSITIONS** – It can be installed for vertical, horizontal or downflow operation. When installed horizontally, the furnace should be positioned such as the door will not end up being on the top. The door should be on the side of the furnace, to ensure that the motor bearings are in their designed position. In vertical downflow installations, use only "L"- or "T"-shaped plenum with no openings or registers directly below furnace.
- 3. INSTALLATION CLEARANCES** – As shipped from the factory, each unit is approved for "zero inch" clearance. If additional clearance is required, it will be indicated on the data label attached to the furnace.
- 4. TEMPERATURE RISE** – Furnaces are shipped to operate at 0.20" (5 mm) W.C. (50 Pa) external static pressure. They are certified for operation up to 0.50" (13 mm) W.C. (125 Pa). Check the following page for temperature rise table on specification chart and, if necessary, adjust the unit to match.
- 5. SERVICE CLEARANCE** – Units are serviced from the FRONT. Leave at least 24" (610 mm) clearance in front of the door.

GENERAL REQUIREMENTS AND SPECIFICATIONS (CONT'D)

240 VOLTS – SINGLE PHASE						TEMP. RISE @ 0.20 in. W.C.			
MODEL NO.	KW	BTUH	AMPS INCL. MOTOR	HP	BLOWER	°C	°F	*SPEED	RPM
OFR15000	15	51180	64	1/3	10" x 8" (254 mm x 203 mm)	22	72	MEDIUM	903
OFR18000	18	61420	76	1/3		26	79	MEDIUM	903
OFR20000	20	68240	84	1/3		29	84	MEDIUM	903
OFR23000	22.5	76770	94	1/3		36	97	MEDIUM	903

*FACTORY SETTINGS. SUBJECT TO CHANGE WITHOUT NOTICE.

10" x 8" (254 mm x 203 mm) BLOWER						
SPEED	FLOW RATE	STATIC PRESSURE (INCHES OF WATER COLUMN)				
		0.2	0.3	0.4	0.5	0.6
LOW**	CFM L/s	684	582	535	481	429
		323	275	252	227	202
MEDIUM	CFM L/s	1149	1104	1064	1016	977
		542	521	502	479	461
HIGH	CFM L/s	1238	1203	1174	1139	1106
		584	568	554	538	522

WARNING: **This speed can only be run with heater off, for cooling/ventilation purposes only.

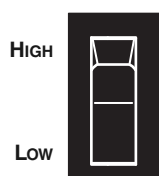
OPERATING OPTIONS

The furnace is shipped from the factory in a "Standard Heating Mode" (narrow switches in the Down position, wide switch in the Middle—or Off—position). When the thermostat calls for heat, the automatic controls will be activated and the furnace turns "ON".

The blower will run at low speed or higher speed (as selected by Speed Selector switch).

As the furnace heats up, it automatically switches to a medium speed when additional elements are activated by the electronic control, if it was initially set to run at low speed. The timing of this blower speed change will depend on whether "Cold" or "Mild" is selected on the Season Select switch.

You may, however, change from the Standard Heating Mode by using the controls built into your furnace.



SPEED SELECTOR

The Speed Selector switch is used to control the fan speed. It is also used in conjunction with the Continuous Speed switch.

"Low" – The blower motor will operate at low speed.

"High" – The blower motor will operate at a high speed.



SEASON SELECT

During spring or fall, you may require less rapid response when the thermostat calls for heat.

When "Mild" is selected, it takes more time to bring all the elements online.

When "Cold" is selected, the heating elements come online faster.



CONTINUOUS SPEED

When the "Low Heat" switch is selected only one element will offer continuous warmth. The blower will run continuously at either Low or High speed as selected by the Speed Selector switch.

When "No Heat" is selected the blower will run continuously at either Low or High speed as selected by the Speed Selector switch.

When "OFF" is selected the blower is not engaged.

INSTALLATION NOTES

1. COLD AIR RETURN

The duct can be attached to either side, rear or the bottom of the furnace.

For side return there are four 1½" (38 mm) knockouts which can be removed and used as an outline for cutting a 18" x 18" (457 mm x 457 mm) return air opening in the furnace left or right side. Mount the filter frame to the furnace over the opening with the open side of the frame facing front. Then attach the 19" x 19" (483 mm x 483 mm) air duct to the flanges on the filter frame. For bottom mounting, remove the screws holding the bottom plate to the furnace, discard the bottom plate and attach the filter frame to the bottom flanges with the open side of the frame facing front.

2. ELECTRICAL WIRING - POWER SUPPLY

The furnaces are completely factory wired. From a separate breaker, a two-wire plus ground supply wire is required. The ground conductor must be firmly attached to the ground lug in the furnace and the supply wires to the terminal block in the furnace.

NOTE: If a OFR-120 kit will be used to supply an air cleaner and/or humidifier, a third (neutral) conductor must be brought into the furnace.

All wiring must conform to the latest editions of the Canadian Electrical Code and local codes. Copper or aluminum wire of the appropriate size may be used.

3. CONNECTING AND ADJUSTING

THE LOW VOLTAGE THERMOSTAT

(Use only class 1 wires inside furnace compartments.)

Attach thermostat wires to the low voltage terminal connections located on the printed circuit board inside the furnace. Follow the diagrams supplied with the thermostat. As a general guide, remember that the R & W terminals control single stage heating; the R & Y terminals control cooling. Single stage cooling uses "Y/Y2" as first and only stage.

Two-stage cooling uses "Y1" as first stage and "Y/Y2" as second stage. Make sure the thermostat is levelled on the wall and in appropriate location as per instructions supplied with the thermostat.

CAUTION

Before turning the furnace on, the heat anticipator in the thermostat must be properly set to prevent its failure and to assure comfortable, economical heating.

Because each installation is different an accurate reading of the current draw should be made with an AC meter. Set the meter at a 2 A range.

- A. Set the anticipator at its highest setting.
- B. Disconnect the "W1" thermostat wire from the furnace low voltage terminal connections.
- C. Connect the AC meter between the "W1" terminal on the board and the loose "W1" wire.
- D. Turn the thermostat up to start the furnace and allow it to run, with all elements on, for three or four minutes.
- E. Read the current draw on the meter and reset the anticipator to match the meter reading.

FOR USE IN MOBILE HOMES

Diablo furnaces 15, 18 and 20 kW models are certified for "L"-shape and "T"-shape shallow duct installation with model OFYOR-SO sub-base in downflow applications when the supply air ducts pass through the floor of the structure. Recommended size of a floor opening: 14¼" x 14¼" (362 mm x 362 mm). The duct system must be designed so that the external static pressure of the system does not exceed the maximum external static pressure of 0.50" (13 mm) W.C. (125 Pa).

SHALLOW DUCT AREA REQUIREMENTS

Duct Depth	Duct Width
4" (102 mm)	16" (406 mm)
5" (127 mm)	13" (330 mm)
6" (152 mm)	10" (254 mm)

USING OPTIONAL EQUIPMENT

1. TWO-STAGE OR OUTDOOR THERMOSTAT

(The "Season Select" switch must be in the "Mild" position). Follow the directions supplied with the two-stage or outdoor thermostat in conjunction with the furnace wiring diagram. When used, the furnace will supply heat as follows:

Mild "ON" (First Stage) Slow Response Sequence	Cold "ON" (Second Stage) Rapid Response Sequence
Element 1 - Heat on instantly	Element 1 - Heat on instantly
Blower on after 3 seconds delay	Blower on after a 3 seconds delay
Elements 3 and 5 after 1 minute delay	Elements 3 and 5 after 10 seconds delay
Element 2 after 2 minutes delay	Element 2 after 20 seconds delay
Element 4 after 3-minute delay	Element 4 after 30 seconds delay

NOTE: Elements 4 and 5 only where applicable.

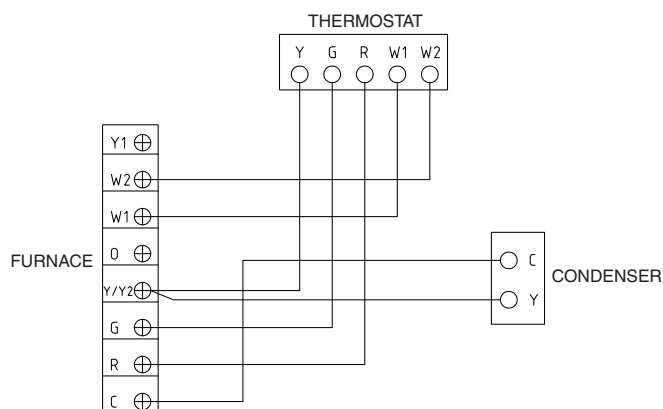
2. AIR CONDITIONING

Your furnace is equipped with all the controls required for the addition of air conditioning (except the heat-cool thermostat).

The evaporator coil may be installed by a local contractor in sheet metal plenum of his own manufacture. The coil should be located: Centered over the "chimney" of the furnace 4" (102 mm) to 6" (152 mm) above the top of the furnace.

Make sure no air is allowed to bypass the cooling coil during cooling operation. If the discharge opening is a great deal larger than the coil, and the ductwork is correspondingly larger than the coil, you may want to use a bypass damper for heating. The damper would be closed in summer, directing all air flow through the coil. In winter the damper would be open to allow air to bypass the coil.

Typical air-conditioning field wiring connections are shown in the following diagram:



WIRING COLOR CODES					
C	G	R	W1	W2	Y
COMMON	GREEN	RED	WHITE	WHITE (BLUE OPTIONAL)	YELLOW

3. ELECTRONIC AIR CLEANERS AND/OR POWERED FURNACE HUMIDIFIERS

These units operate at 120 V. Your 240 V furnace is designed so that Model OFR-120 adaptor kit can be mounted inside the furnace to supply the required 120 V. Instructions for mounting and wiring are included with the kit.

4. WOOD ELECTRIC COMBINATION

When the electric furnace is used in combination with a wood burning furnace, connect the thermostat of the wood burning furnace across LOW VOLTAGE TERMINALS R and G. The thermostat in the wood burning furnace will then turn on automatically the blower in the electric furnace.

MAINTENANCE

MOTOR: The motor is lubricated for life and needs no oiling.

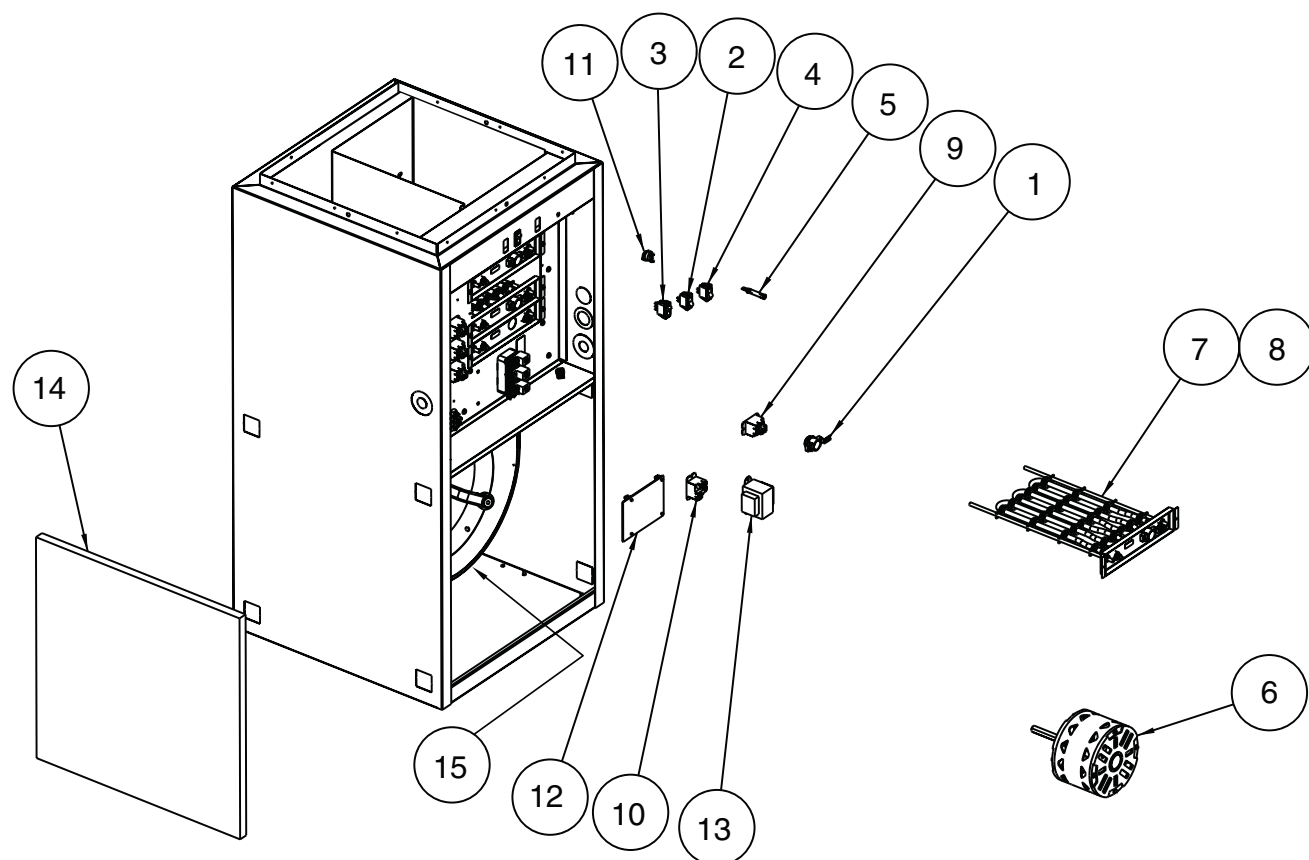
FILTERS: Size is 20" x 20" x 1" (508 mm x 508 mm x 25 mm). Should be inspected and replaced when dirty. Ordinarily replacement is required twice per heating season and, perhaps, a third time if continuous blower operation is used.

NOTE: Each element has an automatic reset thermal cut-out which is set to open at 160°F (71°C). If it opens, the element will be de-energized until the cut-out resets itself. In addition to that, there are 2 manual reset thermal cut-outs that open at 200°F (93°C). If any of them open, a front panel needs to be removed so the cut-out can be manually reset.

⚠ WARNING

Cut 240 V supply before removing the front panel!

The reason for the failure should be investigated before re-starting the furnace. The limit usually opens when airflow is reduced because of blocked ductwork or very dirty filters.



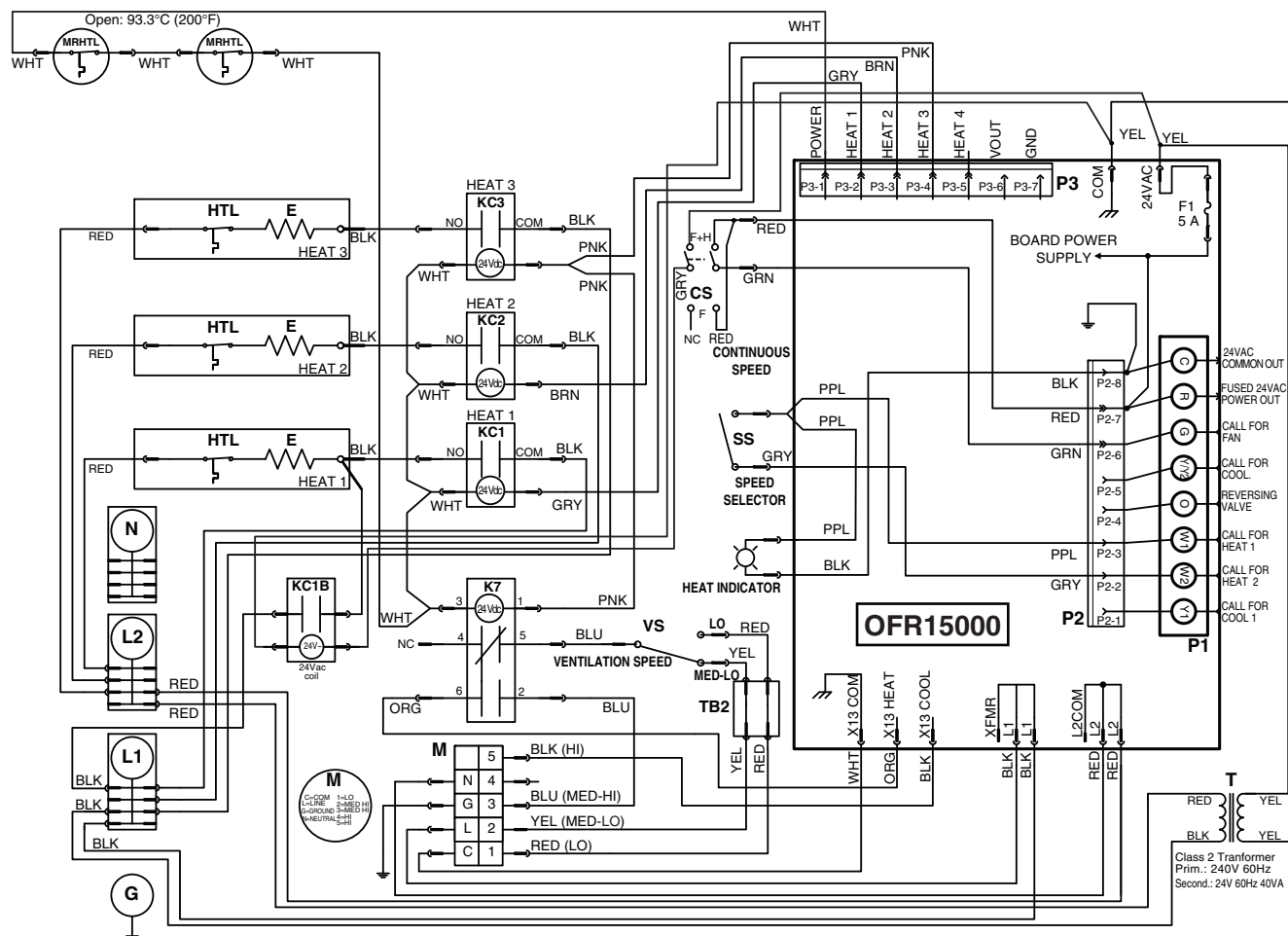
REPLACEMENT PARTS		
KEY NO.	PART NO.	DESCRIPTION
1	30270032	Automatic Limit
2	30030006	Season Select Switch
3	30030025	Speed Selector Switch
4	30030368	Continuous Speed Switch
5	30280021	Thermostat Indicator Light
6a	10941289	Motor 1/3 HP 208/230 V for OFR15000
6b	10941290	Motor 1/3 HP 208/230 V for OFR18/20/23000
7	10940080	Element Assembly 5000 W, 240 V
8	10940081	Element Assembly 4500 W, 240 V
9	30274131	20 A Relay
10	30274132	30 A Relay
11	30280020	Manual Reset Limit
12	624665	Electronic Control (PC Board)
13	30300022	Transformer 240 V
14	30010010	Fiberglass Filter 20" x 20" x 1" (508 mm x 508 mm x 25 mm)
15a	10941291	Service Blower Assembly for OFR15000
15b	10941292	Service Blower Assembly for OFR18/20/23000
16*	624664	Daughterboard (22.5 kW model)
17*	30274183	24 VAC, Relay, 30 A

* Item not shown.

WIRINGS DIAGRAMS

⚠ WARNING

Risk of electrical shock. Disconnect power before installation, servicing, maintenance or field wiring. Replace all panels before operating. Failure to do so can result in electrical shock causing severe injuries or death.



Critical Characteristic

1. If any of the original wire, as supplied, must be replaced, use the same equivalent wire. Wiring must comply with applicable codes, ordinances and regulations.
2. Field wiring must comply with applicable codes, ordinances and regulations. Use only Class 1 wiring inside furnace compartments.

Line voltage wiring:

UL AWM 1015/1230, 600V, 105°C,
VW-1, 12AWG;
CSA TEW 600V, 105°C, FT1, 12AWG.

Low voltage wiring: same ratings as
high voltage except 18AWG.

WIRING COLOR CODE

BLK	BLACK
BLU	BLUE
BRN	BROWN
GRN	GREEN
GRY	GREY
ORG	ORANGE
PNK	PINK
PPL	PURPLE
RED	RED
WHT	WHITE
YEL	YELLOW

For the use of a two-stage heat thermostat or an outdoor thermostat, connect between W1 and W2. Make sure that the Season Select switch is set to the Mild Position.

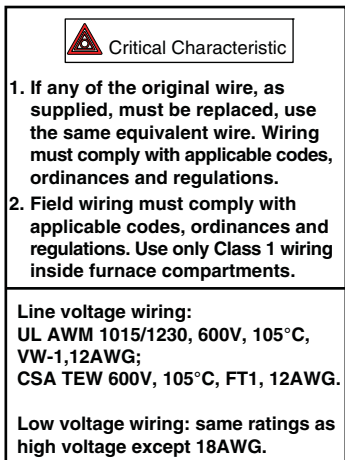
FAN MOTOR SPEED	COLOR
HI	BLACK
MED-HIGH	BLUE
MED-LOW	YELLOW
LOW	RED

LEGEND

F1	Fuse
E	Heating Element
KC	Heating Element Relay
K	Fan Relay
HTL	Auto-Reset Thermal Protector
MRHTL	Manual Reset Thermal Protector
M	Fan Motor
TB2	Terminal Block
T	Transformer Class 2
HEAT	Heat
L1, L2	240V Line Supply
N	Neutral

WARNING

Risk of electrical shock. Disconnect power before installation, servicing, maintenance or field wiring. Replace all panels before operating. Failure to do so can result in electrical shock causing severe injuries or death.



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GRN	GREEN
GRY	GRAY
ORG	ORANGE
PNK	PINK
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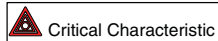
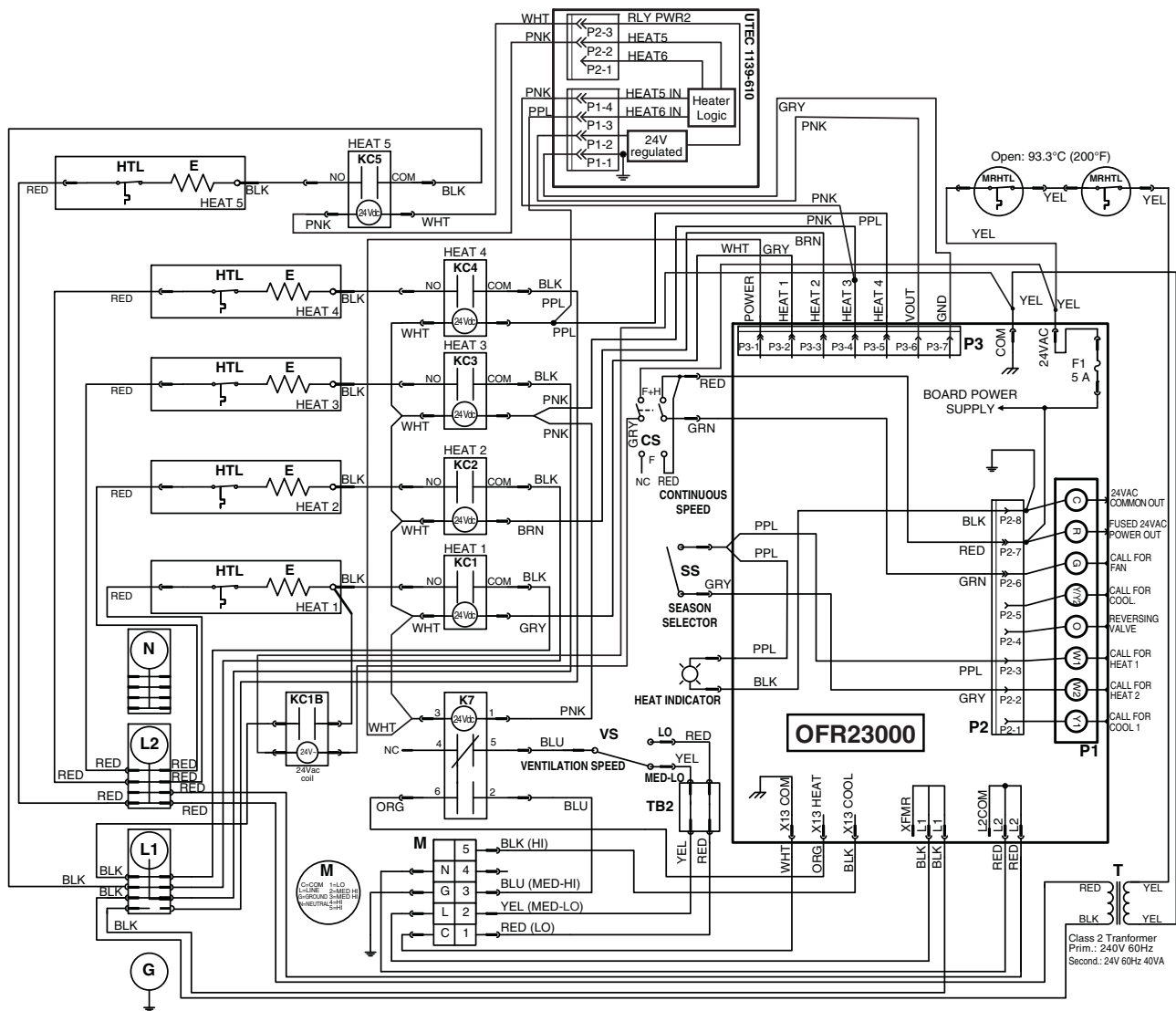
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E	Heating Element
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MRHTL	Manual Reset Thermal Protector
M	Fan Motor
TB2	Terminal Block
T	Transformer Class 2
HEAT	Heat
L1, L2	240V Line Supply
N	Neutral

WIRINGS DIAGRAMS (CONT'D)

⚠ WARNING

Risk of electrical shock. Disconnect power before installation, servicing, maintenance or field wiring. Replace all panels before operating. Failure to do so can result in electrical shock causing severe injuries or death.



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GRY	GREY
ORG	ORANGE
PNK	PINK
PPL	PURPLE
RED	RED
WHT	WHITE
YEL	YELLOW

For the use of a two-stage heat thermostat or an outdoor thermostat, connect between W1 and W2. Make sure that the Season Select switch is set to the Mild Position.

FAN MOTOR SPEED	COLOR
HI	BLACK
MED-HIGH	BLUE
MED-LOW	YELLOW
LOW	RED

LEGEND

F1	Fuse
E	Heating Element
KC	Heating Element Relay
K	Fan Relay
HTL	Auto-Reset Thermal Protector
MRHTL	Manual Reset Thermal Protector
M	Fan Motor
TB2	Terminal Block
T	Transformer Class 2
HEAT	Heat
L1, L2	240V Line Supply
N	Neutral

TROUBLESHOOTING

The first step in identifying an operational problem is to determine whether the fault is in the furnace or in the thermostat and/or its connecting wiring.

To help make this determination, the furnace is equipped with a "Thermostat ON" diagnostic light. If the light is "ON", it indicates the thermostat has closed and is calling for heat; the blower should be running. If the light is "OFF", the furnace should not be operating (unless the Continuous Speed switch is set to run the motor continuously).

1. If the furnace will not start:

Turn the thermostat to its highest setting. If the light goes on, the thermostat has closed, so the fault is in the furnace. If the light does not go on, the thermostat or its connecting wiring is the problem.

2. If the furnace will not turn off:

Turn the thermostat to its lowest setting. If the light goes off and the furnace continues to run, the thermostat has opened properly and the fault is in the furnace. If the light stays on, the fault is in the thermostat or its connecting wiring.

After the fault area is isolated by use of the diagnostic light, a check of the following components can be made more efficiently.

PROBLEM	POSSIBLE DEFECTIVE PARTS OR COMPONENTS
1. The furnace will not turn on	<ul style="list-style-type: none">• Thermostat• Circuit breaker or fuse is open• Motor• Fan control switch• Electronic control• Transformer
2. Motor runs continuously	<ul style="list-style-type: none">• Continuous Speed switch is not on "Off" position• Thermostat wires incorrectly attached to furnace
3. Elements on, but motor does not run	<ul style="list-style-type: none">• Motor• Electronic control
4. Motor going on and off in short cycles (or in too long cycles)	<ul style="list-style-type: none">• Heat anticipator in thermostat incorrectly set or may be defective
5. Must set thermostat much higher (or lower) than the desired house temperature	<ul style="list-style-type: none">• Thermostat is not leveled or out of calibration
6. Not enough heat	<ul style="list-style-type: none">• One or more defective elements or relays• Season Select switch in "Mild" position• Safety limits opening because duct obstruction or dirty filters are restricting air flow• Defective or incorrectly wired two-stage or outdoor thermostat• Lack of enough cold air returns in house
7. Two-stage or outdoor thermostat not operating properly	<ul style="list-style-type: none">• Season Select switch not in "Mild" position

LIMITED WARRANTY TO OWNER

The warranties herein set forth are in lieu of all other warranties expressed or implied and shall not apply to any accessory not part of the product. Ouellet Canada Inc., warrants its products to the owner against defects in material and workmanship for a sixty (60) month period under normal use and services following date of purchase when proof of such is provided to seller.

The obligation of Ouellet Canada Inc., under the terms of this warranty, shall be to supply a new part, or the repair of a defective part at the company's option with no cost to owner for the new or repaired part. Such parts are to be returned to the factory, or such other location as the company may designate at the owner's expense. This warranty does not obligate Ouellet Canada Inc. to bear the cost of labor in replacing any assembly, unit or component part thereof, nor does the company assume any liability for secondary charges, expenses for installing or removal, or any other consequential losses, freight or damages.

IN CASE OF PRODUCT FAILURE

It shall be the obligation of the owner or contractor to furnish to the company, within the designated warranty period the following information :

1. Model Number and serial number of product involved.
2. Complete description of the problem encountered with product.