CAUTION:

Sulphur ores should not to be treated in the Type FD furnace as the sulphur fumes penetrate the muffle walls and reduce the life of the heating elements. When working with salts (common salt, potassium cyanide, saltpeter, etc.), which fuse below the working temperature of the furnace, care should be taken not to spill any on the floor of the muffle. The fused salt penetrates the muffle wall and injures and/or contaminates the heating element. When working with such material, it is advisable to use a metal tray on the floor of the furnace.

Examine the muffle in case of burnout, If there is any sign of corrosion or attack on the muffle by chemicals, spilled materials, salts, it is very likely that this has caused the burnout.

KEEP ELECTRICITY SAFE, ALWAYS LOCKOUT POWER BEFORE WORKING ON CONNECTIONS OR REMOVING SAFETY COVERS. WEAR SAFETY GLASSES AND INSULATING GLOVES AT ALL TIMES

Controller Configuration:

See Eurotherm Controls "Installation and Operation Manual". Controller is configured for your furnace before shipment. You can easily change configuration to better suit your particular needs as indicated in Eurotherm Controls "Installation and Operation Manual".

Control Base Serial No: _____

Order Code No: 3216/CC/VH/LRXX/R/XXX/G/ENG

Furnace Model: _____

Furnace Serial: _____

Set 1	Set 2
Input Type K-Type K Thermocouple	Input CT Scaling X - Unconfigured
Range M- ABIENT°F to 1832°F	Digital Input A X - Unconfigured
Input/Output 1 H - PID Heating	Digital Input B X - Unconfigured
Output 2 X - Unconfigured	Output 3 X - Unconfigured
Output 4 X - Unconfigured	Lower Display T - Setpoint (Std.)

PID Tuning:

Controller has been pre-tuned for this model furnace. Customer can easily change this tuning if desired to exactly suit operating temperature and workloads. Use either the PID self tuning or the PID manual tuning procedure in the Eurotherm Controls "Installation and Operation Manual".

NATIONAL ELEMENT, INC. 7939 Lochlin Dr. Brighton, MI 48084
(248)-486-1810 (800)-600-5511 FAX No. (248)-486-1649

INSTRUCTIONS

For Installation and use of

National Element

Electric Furnaces

Type FD-204-CB

NATIONAL ELEMENT, INC. 7939 Lochlin Dr. Brighton, MI 48084
(248)-486-1810 (800)-600-5511 FAX No. (248)-486-1649

Installation & Wiring for CB 204

Location: Provide 12 inches at rear of furnace for thermocouple installation.

Removal of Furnace from Control Base:
1. Disconnect or lock out power supply.
2. Remove Thermocouple.
3. Remove terminal cover, (under furnace door sill.)
4. Disconnect terminal wires.
5. Remove control panel, (6 small screws at sides of control base, (3 on each side)
Control panel may now be removed. Be careful not to damage or scratch the front.
6. Working inside of the control base through the control panel opening, remove the 4 nuts from the furnace mounting studs, one near each corner.
7. The furnace may now be lifted off. Support furnace on blocks: do not support on furnace mounting studs.

Laying Furnace & Control Base on the back:
This is the recommended access method for wiring.
1. Disconnect or lock out power supply.
2. Remove Thermocouple.
3. Tip the assembly onto its back using blocks to support the furnace. Be careful not to pinch the thermocouple extension wire.

Wiring:

Model FD204CB Full Load Amperage Table			
FD204 120 V	30.9 Amps	No. 8	40 Amp Fuse
FD204 240 V	15.5 Amps	No. 12	20 Amp Fuse

1. With furnace and control base assembly laying on the back, locate the left hand rear corner where service wiring connects over the edge of the table if required for access to power service hole.
2. Remove bottom grid.
3. Connect power to L1 and L2.
Note: There are 2 wires labeled L2: a 20 gauge instrument wire and a high temperature glass insulated power lead. Make sure that both wires are connected.
If the circuit is 120 volt, or other type of supply having a white, or a current carrying ground, or an unfused line wire, connect that wire only to L2.
4. Ground: Furnace and control base must be properly grounded. Connect ground wire (Green or Bare copper) to wire provided.

Maximum Temperature:

The FD furnace should not operate above 1000°C (1832°F), it's safe maximum temperature, even for a short time. If Temperature is allowed to exceed 1000°C even once, the life of the heating element will be materially reduced. If higher temperatures are desired, see FH model in our catalog.

Repairs:

In case of a burnout, the operator can rewind the furnace himself. New heating element coils are furnished of definite length and resistance for each type of furnace.

When ordering heating elements or other parts of the furnace always state the Type, Serial No., Voltage, and Current, this data being given on the name plate of the furnace case.

The heating element of the FD furnace is easily accessible for repair. In the muffle design, remove the nut that holds the terminal cover in place and disconnect the heating units from the large brass screws, and ground center connection. Remove the screws that hold the front head to the steel case and the front head, including throat brick. Door guides and shelf may then be removed. The muffle, including the heating unit, can now be withdrawn.

The procedure in rewinding the muffle is a simple task. Pass one end of the heating element through the small hole at one end of the muffle groove, wind the coil element in the grooves and fasten the other end of the wire in a similar way.

NATIONAL 2000 FURNACES

Preparation of furnace for mounting:

1. Remove the 4 cast furnace feet.
2. Remove mounting screws for the feet. If they are the stud type, they may be unscrewed and discarded. Other types may have to be cut off and ground flush with furnace bottom. Screw heads or nuts may be left loose inside the steel shell, thus it is not necessary to disassemble the furnace.
3. It may be necessary to trim the bottom of the front insulation board on some older models if it extends more than 1/4" below the bottom of the furnace.
4. Remove the terminal cover from below the furnace door sill. Also remove the power cord.
5. Mark the furnace bottom for locating the spacer stud plates by:

a) temporarily Installing the 4 spacer stud plates on top of the Control Base, (with bottom grid removed for access). Studs should be centered in the holes.

b) locate the control base in position against the bottom of the furnace, (while both are laying on their back). The furnace should be centered left and right, and square with the control base. Furnace should just be lightly against the ceramic insulator on the top of the control base.

c) mark the furnace bottom around the outside corners of each spacer stud plate.

6. Remove the spacer stud plates from the control base, and position them by the marks against the bottom of the furnace. Mark the center locations for the mounting screw holes. Rotate the spacer stud plates 90 degrees if necessary to avoid any existing holes or screws.
7. Drill 9/64" dia. holes through the sheet metal bottom of the furnace for the self tapping screws provided. 8 holes needed.
8. Mount the spacer stud plates to the bottom of the furnace using the self tapping screws provided.

Mounting the Furnace onto the Control Base:

1. Place the furnace with spacer stud plates installed against the control base, (while both are laying on their back, with bottom screen removed for access).
2. Line up and tighten nuts onto the studs.
3. Connect the power leads to the furnace element terminals, and the bared ground line to the center terminal. Make sure that all terminal and ground lug nuts are tight.
4. Install the larger terminal cover supplied with the control base. Some models have a short grounding stud. They will require a coupling nut and extension stud, (not supplied), for mounting the wiring cover.

Do Not Operate Furnace Unless Terminal cover is installed!

5. Connect the power as indicated in the "Wiring:" section of the "Instructions" sheet.

Do Not Operate Furnace Unless Bottom Grid is Installed!

INSTRUCTIONS

For Mounting

Control Base

Type FD-204-CB

To Model FD 204 Furnace

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