BURN-OUT FURNACE

CF-2

🕮 USER AND MAINTENANCE MANUAL

dentalfarm

DENTAL EQUIPMENT SINCE 1972

1 – GENERAL INFORMATION

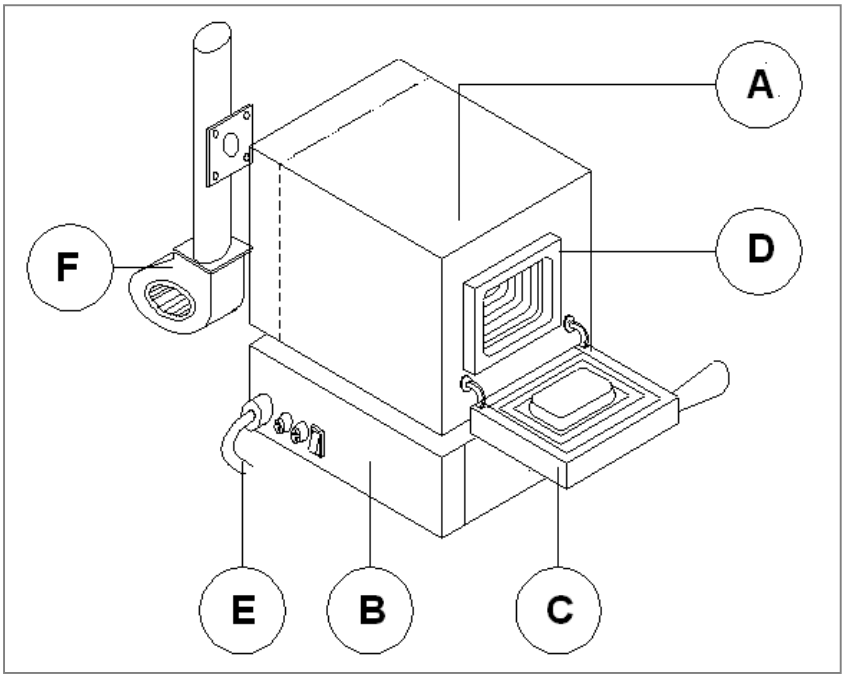
1.1 – PURPOSE OF THE MANUAL

This instruction manual is an integral part of the machine and must follow it whenever it is moved. The manual must be kept carefully during the machine lifetime and must in all cases be available for at least 10 years, it must therefore be stored in a known location and be made available to all the personnel concerned.

Do not connect or start up the furnace before reading through this manual.

1.2 – TECHNICAL INFORMATION

CF-2 is managed and operated by a microprocessor control and has been designed to heat up investments used in the Dental and Jewellery labs.
CF-2 can operate with 2 heating cycles (or programs): a fast program and a normal program. Both are stored in memory as long as the user decides to modify them. The Normal program can consist of up to three stages, and for each of them the following parameters can be set: temperature, gradient, stabilization time.
Also, the following functions are available:
- delayed startup of the unit (scheduling up to 100h from setting)
- temperature stabilization time at the end of the cycle.



Symbols

A	Muffle	D	Refractory chamber
B	Electronic control	E	Power supply 220/240V – 50/60Hz
C	Door	F	Fume exhaust (optional)

1.3 – SAFETY DEVICE

Electronically fed parts are shielded by means of fixed protective coverings to prevent any access by the operator. Access to these parts is allowed only to skilled and authorized technician, properly trained about extraordinary maintenance and repair operations.

1.4 – TECHNICAL REFERENCES AND WASTE DISPOSAL

According to International regulations, this unit has been classified as AEE (electric and electronic device, whose correct operation depends on electric currents and electromagnetic fields) and as a consequence, at the end of its lifetime, it can not be treated as normal waste material but it must be disposed separately, complying with the Directive 2002/96/CE.

1.5 – TECHNICAL FEATURES

	CF-2 S	CF-2 M	CF-2 L
Tension Frequency	230V-50/60Hz	230V - 50/60Hz	230V - 50/60Hz
Heating resistances	1600W	2200W	2800W
Max Temperature	1100°C	1100°C	1100°C
Chamber dimensions mm	150 x 150 x 100	180 x 230 x 115	230 x 300 x 150
External dimensions LxWxH mm	320 x 400 x 470	360 x 460 x 490	420 x 530 x 520
Weight – Kg	32	37	49
Number of programs	2	2	2
Number of Normal programs	1	1	1
Number of Fast programs	1	1	1
Number of stages - Normal Program	3	3	3
Delayed start - up to 100 hours	Si	Si	Si
Fuses	16A	16A	16A

2 – HANDLING AND INSTALLATION

2.1 – PACKING AND UNPACKING

Packing consists of polyurethane foam, polyethylene sheet, rigid carton cover and nylon protection.
Disposal of the packing materials is subject to local regulations and must be carried out considering the environment.

2.2 – LOADING AND UNLOADING

This machine must be moved by means of trolleys or manually by at least 2 people. While moving the machine avoid absolutely any kind of bumping, dropping or tilting: they could seriously damage it. In any case, the manufacturer is not responsible for damages caused by droppings, improper use and maintenance which are not strictly in accordance with the manufacturer's instructions illustrated in this manual.

2.3 - INSTALLATION

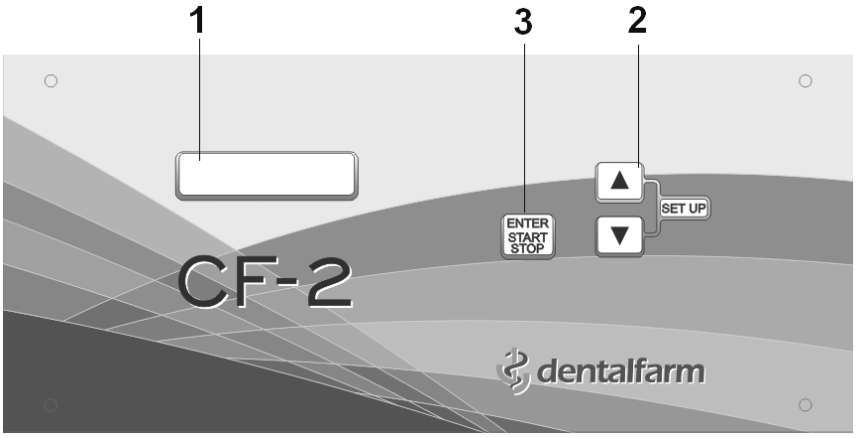
The machine must be located on a safe place and in horizontal position. It is up to the user to ensure that the electric network is in accordance with the safety regulations in force.
It is particular important to make sure that the grounding connection works properly. Furthermore, it is important to verify the network voltage: in case the voltage is too low (lower than 210V), this could lead to inconveniences and it might be necessary to install a voltage stabilizer.
After having placed the furnace and gone through the above checklist, follow these instructions:

- The general switch must be in the OFF (0) position.
- Use the supplied cable to connect the power supply plug to a 220-230 V AC outlet.
- Plug the vacuum pump cable into the corresponding socket.

3 – INFORMATION FOR USE

3.1 - PANEL

The panel consists of the following elements:
1 – **LCD display**: showig times and temperatures
2 - **SET UP keys**: (▲ and ▼) to modify parameters or to select cycles
3 – three-function **START / STOP / ENTER key**: this key activates a program (START) starting from the stand-by position; similarly, it ends a program whenever this is in use (STOP), or confirms shown values (ENTER).



3.2 – PERFORMANCE AND USE

CF-2 can operate under two programming modes (P1 “Normal program” and P2 “Fast program”) which keep stored in a permanent memory till their modification. Program P1 can consist of up to 3 stages, i.e. it can be adjusted to have a maximum number of stages equal to 3 (it is always possible to set cycles with less than 3 stages). For each stage, the following parameters can be set: target temperature, gradient and temperature holding time. It is also possible to set a scheduled start time. Also, a stabilization time at the end of the cycle (**F**) can be set to preserve the casting rings at the correct temperature and to give the operator time to prepare for the forthcoming work.

3.3 – START

"**STAND- BY**" display:

P1 or P2 on the left part of the display indicate the last modified program. On the right side, the internal temperature is shown.

3.4 – PROGRAM SETTINGS

By using the arrows (▲ or ▼) you can switch from one program to another from P1 to P2 and vice-versa.

A – Normal Program P1 (for traditional investments)

In STAND-BY choose P1.
To start programming, PRESS **both arrows** ▲ and ▼ SIMULTANEOUSLY:
Choose the number of available stages: 1 or 2 or 3.

Confirm by ENTER; in this case the cycle will have 3 stages. The following screen is:

Set by ▲ and ▼ the temperature **T1** of the first stage, then confirm by ENTER

Set gradient **V1** in °C/min, confirm by ENTER

Define temperature holding time **t1** of the first stage, set hours and confirm by ENTER, set minutes and confirm by ENTER. Proceed similarly for the next stages. After setting the temperature holding time for the last stage, when confirming by ENTER, the following screen will be shown:

The **F** parameter is the additional time for temperature holding at the end of the cycle. This is an extra time to allow burning in case of more rings, or should the operator neither be present nor ready. Their value is expressed in hours, minimum is 1 hour. By pressing ENTER the user goes back to STAND-BY screen.

B – Fast Program P2 (for quick investments)
In STAND BY choose P2.
To start programming, PRESS **both arrows** ⮝ and ⮟ at the same time:

Set Temperature **T** then confirm by ENTER:

Set gradient **V** in °C/min, then confirm by ENTER:

Set temperature holding time **t**: set hours, confim by ENTER set minutes, confirm by ENTER

Set the temperature holding time for the final temperature (during this time, sub-cycles specific for any casting ring can be set), then confirm by ENTER and return to STAND-BY screen.

3.5 – EXECUTION OF A PROGRAM

A – Carrying out normal program P1

Proceed as follows:

From STAND-BY position, select program P1 then press START/STOP and the following display will appear:

At this stage, **scheduled delayed time (in hours and minutes) can be inserted**. To start immediately, confirm by ENTER the 0 value. To schedule a switch-on time, insert by means of the arrows both parameters and confirm by ENTER. The display shows a countdown to cycle start, when this will be 0 the furnace will start.

IMPORTANT NOTICE: to set a schedule switch-on time, the remaining time to the cycle start will be considered. So, if the work has to be ready for the following day at 8:00am supposing it is 6:00pm , considering the fact that a cycle lasts about 1.30 hours, we will have to program the furnace to start at 6:30am, i.e. we will have to insert a delay of 12 hours and 30 minutes.

When the furnace switches on (immediately when pressing last ENTER key, or after the remaining time has expired) the following screen will appear:

The lines on the left part represent the burning cycle graph: during raise in temperature, the curved portion will blink; on the right part of the display the target temperature is shown; in the middle, the detected temperature is shown. During stabilization stages, the horizontal portion of the graph will blink. In the middle of the display, the remaining time will be shown, while on the right side the actual temperature is displayed.

B – Start of P2 fast program
Set P2 and execute the same procedure as for P1.
When the desired burning temperature has been attained, the furnace enters into stabilization stage showing the following display:

At this stage, burning sub-cycles can be activated. These will be started automatically by opening the furnace door while inserting rings of quick investment. This action initiates a timer control, while the display shows editable values. Put the casting ring into the furnace, close the door, correct the shown values by means of the arrows and press START: the furnace will calculate the remaining time, at the end of which a buzzer will warn the user. At this stage, the casting ring can be taken out and eventually replaced with a new one, thus restarting the same burning program as a sub-cycle, correcting or confirming times by means of the ENTER key. During the whole stage, the temperature will remain unaltered.
The furnace switches off automatically after the final stabilization time or can be switched off by pressing and holding for at least two seconds the START/STOP key.

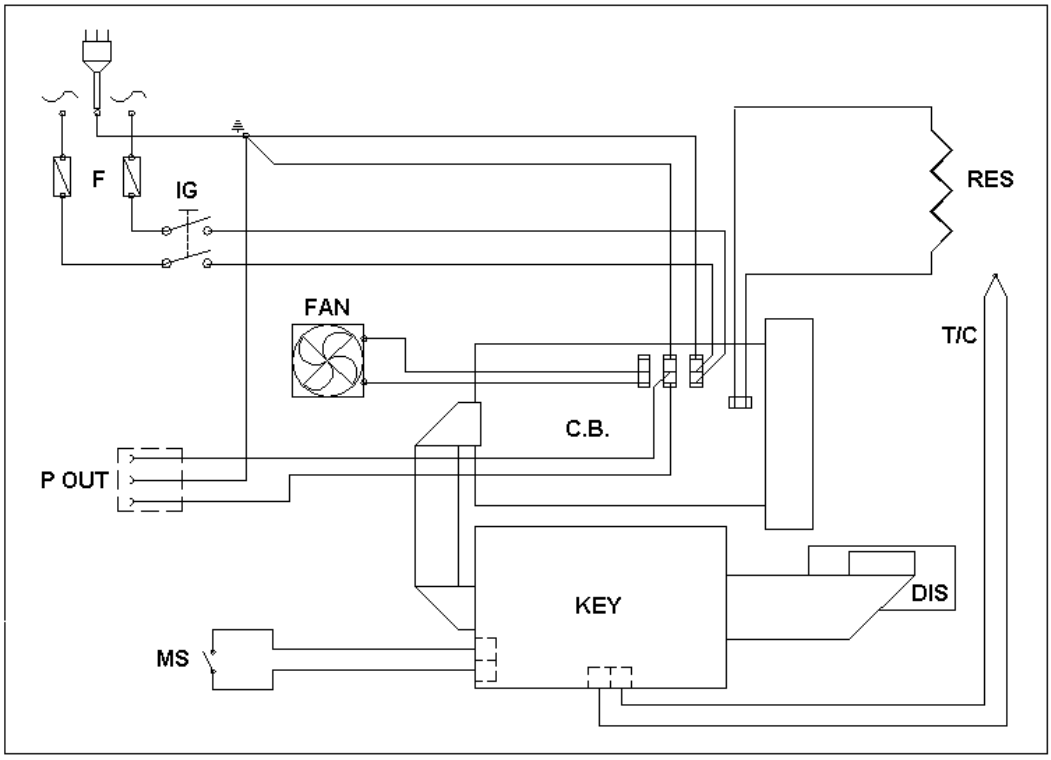
3.6 – CHIMNEY FAN
This furnace can support the A1211 fume exhaust extractor.
In P1, the chimney fan starts at the beginning of the cycle and switches off at 400°C. In P2, the chimney fan starts at the beginning of the sub-cycles and keeps operating for their entire duration.

4 – MAINTENANCE INFORMATION

4.1 – ORDINARY CLEANING AND MAINTENANCE
It is recommended to clean the firing chamber from the residues left by wax combustion. These can cause the deposits to sediment which might be detrimental to the correct functioning of door springs and joints. Utilize a humid tissue and do not switch on the furnace before it is completely dry. All cleaning operations are to be performed when the unit is OFF and disconnected from the power network.
To clean the furnace do not use diluting agents, petrol, or other inflammable liquids or corrosive agents: these could damage external varnish and be absorbed by the refractory materials, thus originating toxic gases when switching on the furnace. Besides the considerations stated above, the unit does not require any further maintenance operations.

4.2 – EXTRAORDINARY MAINTENANCE
For parts replacement or repair, contact qualified and well-trained technical staff only.
Do not open protections on the machine without undertaking all necessary precautions.
Before any operation disconnect the unit from power supply.

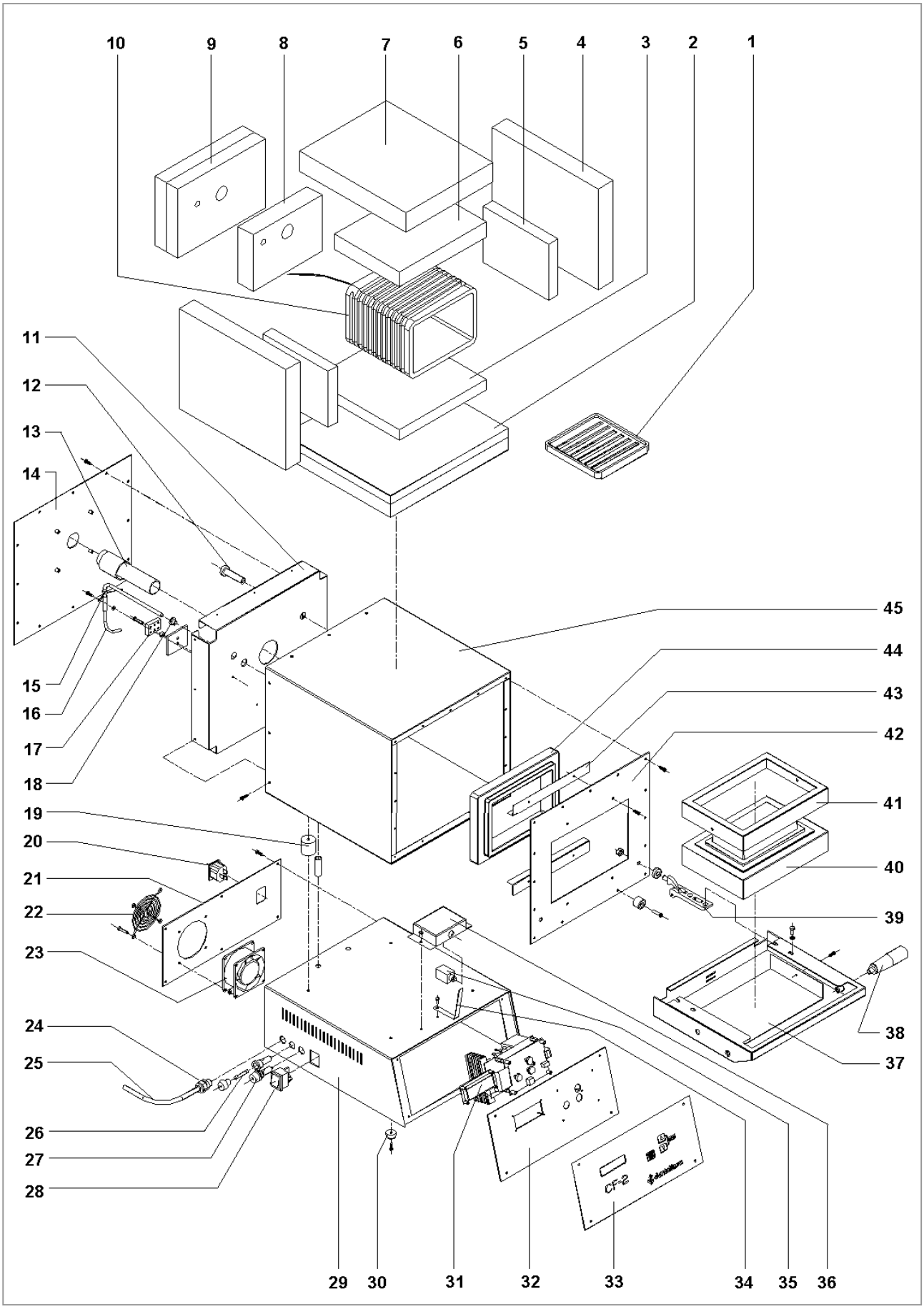
5.0 – WIRING DIAGRAM



POS.	DESCRIPTION
F	16 Amp.FUSE
IG	MAIN SWITCH
C.B.	CONTROL BOARD
KEY	KEYBOARD
DIS	DISPLAY BOARD
RES	RESISTANCE
T/C	TERMOCOUPLE
MS	DOOR MICROSWITCH
P OUT	SOCKET FOR FUME EXTRACTOR
FAN	COOLING FAN

6.0 – EXPLODED DRAWING AND SPARE PART LIST

N°	CF-2 S	CF-2 M	CF-2 L	DESCRIPTION
1	**4014S005**	**4014M005**	**4014L005**	Wax collection plate
2	**4014S015**	**4014M015**	**4014L015**	Lower secondary insulation panel
3	**4014S011**	**4014M011**	**4014L011**	Lower primary insulation panel
4	**4014S017**	**4014M017**	**4014L017**	Side secondary insulation panel
5	**4014S013**	**4014M013**	**4014L013**	Side primary insulation panel
6	**4014S012**	**4014M012**	**4014L012**	Upper primary insulation panel
7	**4014S016**	**4014M016**	**4014L016**	Upper secondary insulation panel
8	**4014S014**	**4014M014**	**4014L014**	Rear primary insulation panel
9	**4014S018**	**4014M018**	**4014L018**	Rear secondary insulation panel
10	**4014SR007**	**4014MR007**	**4014LR007**	Heating chamber compl. with resistance
11	**4014021**			Heating chamber compartment plate
12	**4014030**			Insulating bush for resistance
13	**4014107**			Chimney pipe
14	**4014022**			Rear panel
15	**4014109**			Thermocouple fixing spring
16	**4014003**			Thermocouple
17	**4014032**			Ceramic terminal block for resistance
18	**4014031**			Insulating bush for thermocouple
19	**4014033**			Spacer
20	**4014110**			Socket for fume extractor
21	**4014026**			Equipment case rear panel
22	**4014114**			Fan grate
23	**4014113**			Cooling fan
24	**4014100**			Cable locking ring
25	**4014101**			Feeding cable
26	**4014115**			16A fuse
27	**4014102**			Fuse holder
28	**4014103**			Main switch
29	**4014025**			Equipment case
30	**4014111**			Rubber foot
31	**4014050**			Electronic card set
32	**4014027**			Control panel
33	**4014002**			Polycarbonate panel
-	**4014001**			Electronic control board complete (31-32-33)
34	**4014105**			Microswitch spring
35	**4014104**			Door microswitch
36	**4014028**			Microswitch case
37	**4014023**			Sheet metal door
38	**4014106**			Door handle
39	**4014108**			Door hinge
40	**4014S004**	**4014M004**	**4014L004**	Door refractory
41	**4014024**			Frame for refractory door
42	**4014009**			Front closing panel
43	**4014020**			Front refractory support
44	**4014S006**	**4014M006**	**4014L006**	Front refractory plate
45	**4014008**			Heating chamber case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