



**NÜVE SANAYİ MALZEMELERİ İMALAT VE TİCARET A.Ş.**

**NF 048**

**BENCH TOP CENTRIFUGE**

**SERVICE MANUAL**



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# **SECTION 1**

## **INTRODUCTION**

### **1.1. PURPOSE OF THE SERVICE MANUAL**

This manual includes servicing and maintenance information of NF 048. It is only to be used by technicians who were formerly trained by Nuve. This manual includes operating principles, diagnosing and repairing methods and the spare part replacing information.

In the case that any problem which is not identified in this manual arises, please contact Nuve Servicing Team.

### **1.2. GENERAL PRESENTATION**

The NF 048 bench top centrifuges are microprocessor controlled units. The microprocessor controlled PCB is located on the bottom sheet and display PCB is located on the front panel. The centrifuges are equipped with the locking system which prevents the lid from opening while the rotor is spinning.

## **SECTION 2**

### **OPERATING PRINCIPLES**

#### **2.1. GENERAL OVERVIEW**

The NF 048 centrifuges are split into two main components,

- Power supply
- Control unit

#### **2.2. EXPLANATIONS OF THE FUNCTIONS**

##### **2.2.1. Power Supply**

The fuse and power consumption values of the centrifuge are listed below,

	<b>Glass Fuse</b>	<b>Power Consumption</b>	<b>Power Inlet</b>
<b>NF 048</b>	5 A	450 W	230 Vac, 50 Hz

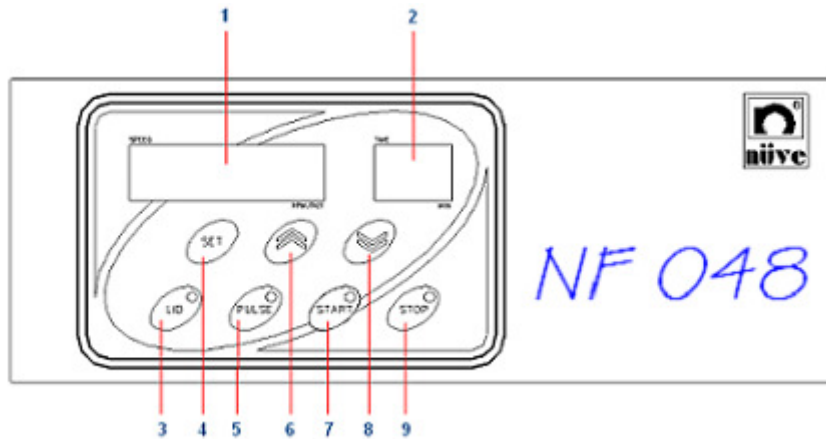
##### **2.2.2. Display and Main PCB, Motor driver PCB**

The main function of the microprocessor controlled main PCB is to control the speed of the motor. It regulates the frequency of the motor and the motor driver PCB increases or decreases the speed according to that frequency.

The centrifuge does not operate if the lid remains open. The signal sent to the main PCB by the lid switch helps to inform the user that the lid is open or close. The lid remains locked during the spinning of the rotor.

### 2.2.3. Control Panel

The figure below shows the keys and leds of the display. Please refer to user's manual for further information about the functions of the keys and leds.



1. Speed display
2. Time display
3. Lid button and led
4. Set button
5. Pulse button

6. Value increase key
7. Start button and led
8. Value decrease key
9. Stop button and led

## **SECTION 3**

### **SERVICING**

**ATTENTION : Before servicing, please take all necessary precautions both for your own and for environment's safety. Please respect to the warnings on the centrifuge!!**

#### **3.1. General View**

The failures can be diagnosed easily with the following tables.

Most of the arising problems can be confirmed by a multimeter.

The components on the display & main PCB and motor driver PCB must not be replaced even the failure is caused by one of the components on the PCBs. In this case, please send the failed PCB to factory service along with a note on which the failure explanations are written.

Before replacing the PCB or any control element, please make sure that the failure is not caused by loose wire and terminal connections.

### 3.2. GENERAL FAILURES

FAILURE	PROBABLE CAUSES	SOLUTIONS
1. The on/off switch is on but the led is not on and the display is blank.	Power inlet failure.	Check the mains supply. Check for weak connection in the socket and in the other terminal connections.
	Glass fuse has blown.	Replace the glass fuse(s) on the main PCB and check all parts of the centrifuge for short circuit.
	On/off switch is defective.	Replace the on/off switch.
2. The on/off switch and its led are on but the display is blank or some segments of the displays are not on.	The main PCB/display PCB connection cable is not fitted well or it is loose.	Disconnect the cable and re-connect it carefully.
	The cable is defective.	Replace the cable.
	The display board is defective.	Replace the display board.
	The main PCB is defective.	Replace main PCB.
3. The on/off switch is off but its led is on.	The cables of the switch is connected in reverse.	Check the connections and correct them.
4. The fuses blow frequently.	Short-circuit exits.	Check the electrical terminals, their cables and the components for a possible short circuit.
	The main PCB is defective.	Replace the main PCB.
5. The lid cannot be opened.	Locking system failure	Check the whole system if necessary replace the lock.
	The locking bobbin is defective.	Check it and replace if necessary.
6. The centrifuge does not spin the rotor after the START has been pushed.	The "Lid" led does not lighten.	Check the locking switch, replace it if it is defective.
	The locking bolt does not press on the locking switch tightly.	Check the locking system. If the bolt does not press on the switch tightly, adjust the switch.
7. "Err 3" appears on the display during the operation.	The communication between the display & main PCB and the motor driver PCB fails.	Check the connection cable between main PCB and display PCB if it is loose or broken.  Replace the connection cable.



FAILURE	PROBABLE CAUSES	SOLUTIONS
8. "Err 4" appears on the display during the operation.	Motor overheat failure.  Cooling fan motor is defective.	Wait for the motor to cool down and start the centrifuge again.  Replace the cooling fan.  If the problem continues, replace the motor.
9. "Err 6" appears on the display during the operation.	The rotor selection is wrong.  Motor driver PCB is defective.	Check the selection of the rotor type if it matches the rotor used.  Replace the motor driver PCB.
10. "Lid open" occurs on the display during the operation.	The lid is opened during centrifugation.	Close the lid and re-start the centrifuge.  If the problem continues, check that the locking pin presses on the lock switch tightly while the lid remains closed.  Check the lid switch and replace it if it is defective.
11. "Eoff" occurs on the display.	It occurs in case of a power failure during the run.	It disappears if you wait for 2 minutes or open and close the lid again.

## SECTION 4

### REPLACEMENT OF SPARE PARTS

**Attention: Disconnect the centrifuge from the mains before replacing any part!!**

#### 4.1. Access to the Control Units

- Remove 8 screws that connects the bottom sheet to the body and hold the body up. Disconnect the hindering connections.

#### 4.2. Replacing Motor Driver PCB

- Disconnect all terminals on the motor driver PCB (6) which are connected to the clamps.
- Disconnect the driver PCB ending of the driver PCB (6) / display and main PCB (2) connection cable.
- Remove the screws of the motor driver PCB (6).
- Place the new PCB and fix it with screws.
- Make the connections according to the electrical circuit diagram.
- Connect the driver PCB / display and main PCB connection cable.

### **4.3. Replacing Display and main PCB**

- Disconnect the display and main PCB ending of the motor driver PCB (6) / display and main PCB (2) connection cable.
- Remove the four screws of the display and main PCB and take the PCB out.
- Place the new PCB on the front panel. Fix it with the screws.
- Check that the keys and the leds meet their places on the plastic panel
- Connect the motor driver PCB/ display and main PCB connection cable.

### **4.4. Replacing Plastic Panel**

- Remove the plastic panel (12) from the front panel.
- Clean the panel surface with alcohol.
- Paste the new panel, make sure that the displays meet their places.

### **4.5. Replacing Locking Bobbin**

- Disconnect the locking bobbin (4) and lid switch terminals from the main PCB (2).
- Remove the screws at the locking side of the body from the front side.
- Take the locking mechanism (3) out.
- Disconnect the locking bobbin terminal from the bridge rectifier (5) by cutting.
- Connect the bridge rectifier to the terminals of the locking bobbin by paying attention to the terminal directions of the rectifier.
- Place the locking mechanism and screw it.
- Make the locking bobbin-main PCB and lid switch-main PCB connections.

### **4.6. Replacing Locking Mechanism**

- Disconnect the locking bobbin (4) and lid switch terminals from the main PCB (2).
- Remove the screws at the locking side of the body from the front side.
- Take the locking mechanism (3) out.
- Carry the locking bobbin, the bridge rectifier (5) and the switch to the new mechanism.
- Place the whole locking mechanism and screw it.
- Make the locking bobbin-main PCB and lid switch-main PCB connections.

### **4.7. Replacing Lid Switch**

- Disconnect the locking bobbin (4) and lid switch terminals from the main PCB (2).
- Remove the screws at the locking side of the body from the front side.
- Take the locking mechanism (3) out.
- Remove 2 screws that connect the lid switch.
- Screw the lid switch to its place.
- Place the whole locking mechanism and screw it.
- Make the locking bobbin-main PCB and lid switch-main PCB connections.

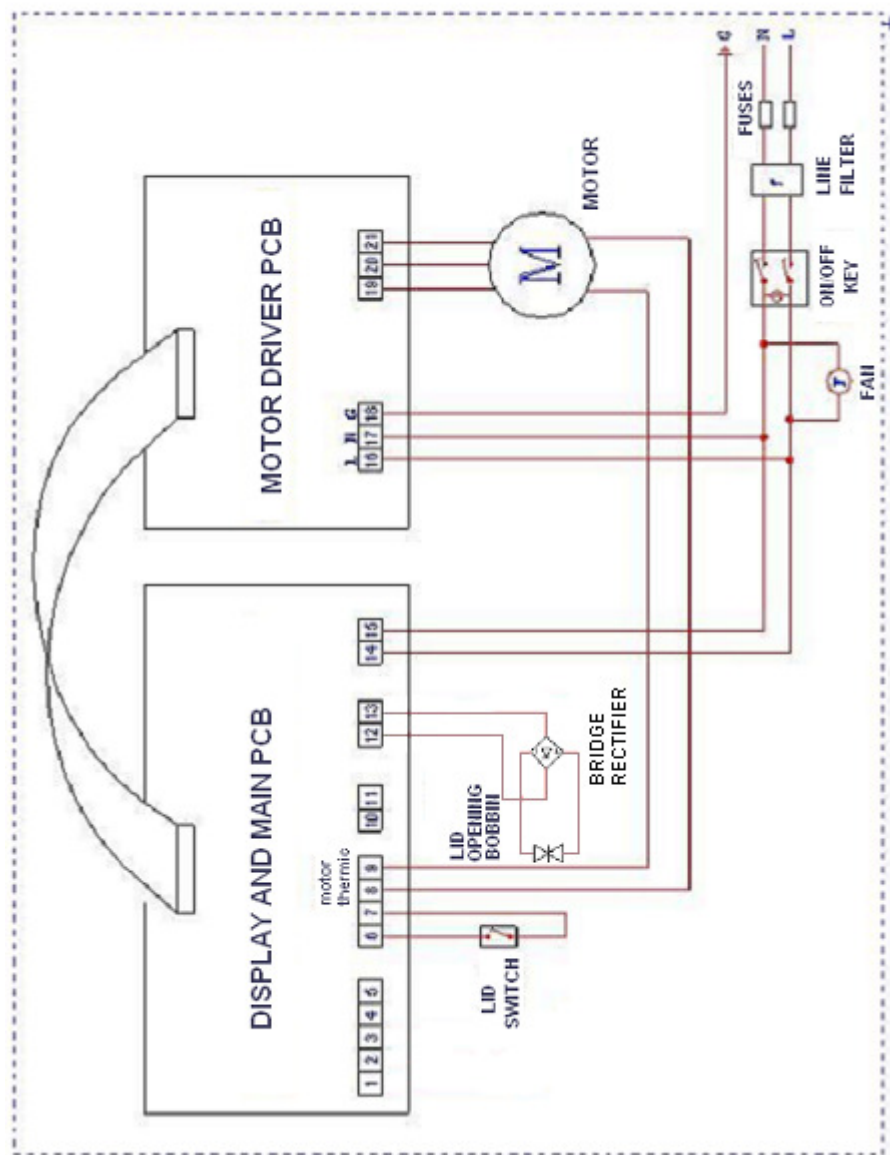
#### **4.8. Replacing Motor**

- Remove 8 screws that connects the bottom sheet to the body and hold the body up. Disconnect the hindering connections.
- Disconnect the thermal switch from the main PCB (2).
- Disconnect the motor terminals from the motor driver PCB (6).
- Take the complete motor (9) by removing 3 motor connection nuts.
- Assemble the new motor and make the necessary connections.

## **SECTION 5**

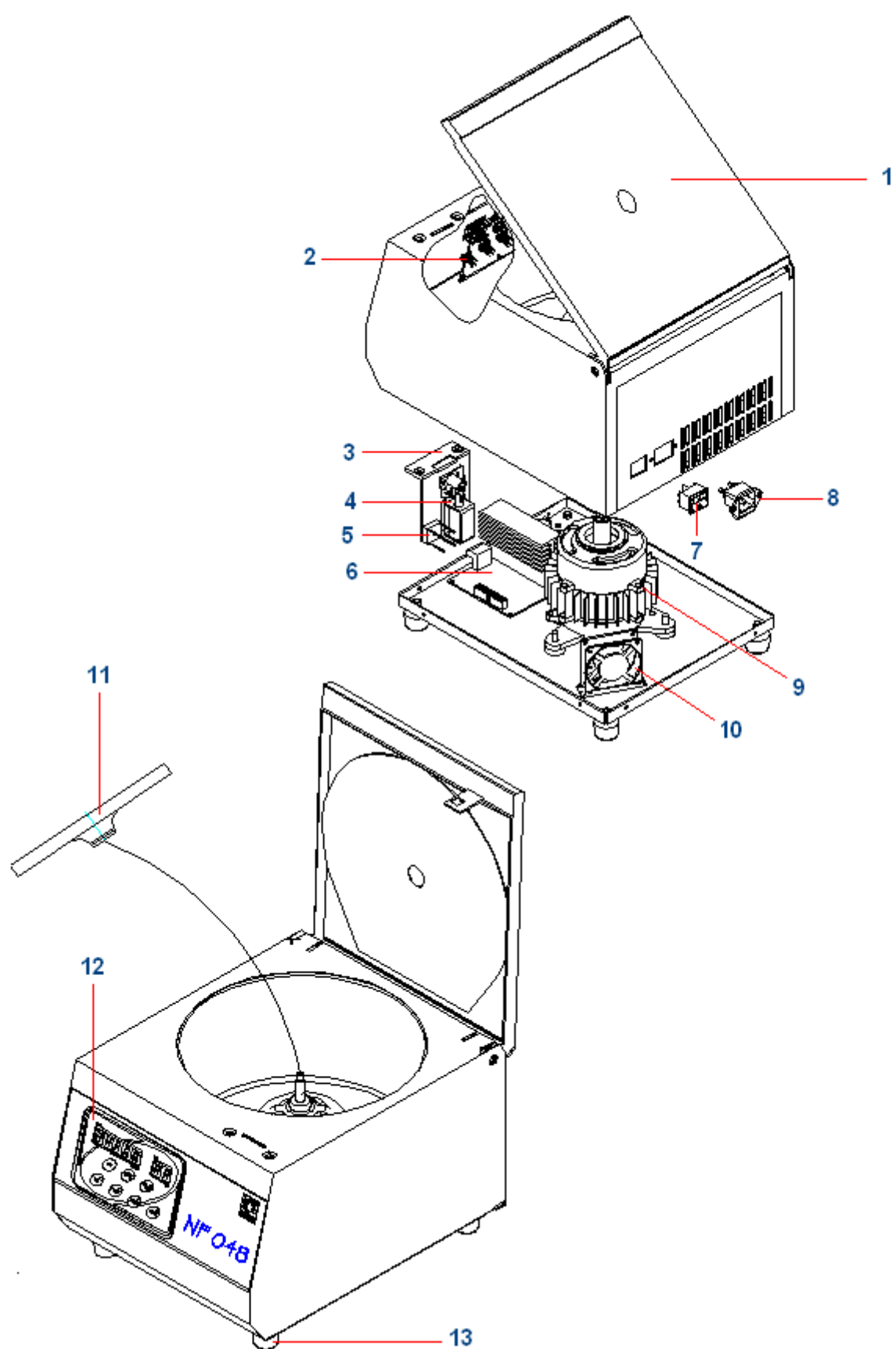
### **DRAWINGS AND DIAGRAMS**

## ELECTRICAL CIRCUIT DIAGRAM



## **SECTION 6**

### **SPARE PARTS**



## 6.1 Spare Part List

NO	PART NAME	PART CODE
1	Lid	Z11.K 50 051
2	Display and Main PCB	Z15.G 05 026
3	Locking mechanism complete	Z11.K 51 006
4	Locking bobbin	Z15.B 06 017
5	Bridge rectifier	Z12.D 05 016
6	Motor Driver PCB	Z15.E 05 072
7	On/off switch	Z12.A 03 018
8	Power inlet	Z12.S 13 004
9	Motor	Z19.M 06 087
10	Cooling fan	Z12.F 04 011
11	Rotor (micro)	Z11.B 50 019
	Rotor (haematocrit)	Z11.B 50 020
12	Plastic panel	Z15.P 15 201
13	Fitting pads	Z15.A 07 042
	Lid switch	Z12.A 03 045
	Lid gasket	Z11.C 03 153
	Rubber buffer	Z12.T 03 016
	Outer body complete	Z11.G 04 265
	Line filter	Z15.F 06 020