

# ROUND BENDING MACHINE

Model: RBM-50HV



*Operation Manual*

# Table of contents

<b>I SAFETY INSTRUCTIONS</b> -----	<b>3</b>
<b>II MAIN SPECIFICATION</b> -----	<b>4</b>
<b>III USE RANGE</b> -----	<b>4</b>
<b>IV. MAINTENANCE</b> -----	<b>6</b>
<b>V. ELECTRIC INSTALLATION</b> -----	<b>6</b>
<b>VI PARTS DRAWING AND PARTS LIST</b> -----	<b>12</b>

**SAVE THIS MANUAL:** You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Read all instructions before using this tool!

## **I SAFETY INSTRUCTIONS**

1. **Keep work area clean.** Cluttered areas invite injuries.
2. **Observe work area conditions.** Do not use machines or power tools in damp or wet locations. Don't expose to rain. Keep work area well lighted. Do not use electrically powered tools in the presence of flammable gases or liquids.
3. **Keep children away.** Children must never be allowed in the work area. Do not let them handle machines, tools, or extension cords.
4. **Store idle equipment.** When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep out of reach of children.
5. **Do not force tool.** It will do the job better and more safely at the rate for which it was intended. Do not use inappropriate attachments in an attempt to exceed the tool capacity.
6. **Use the right tool for the job.** Do not attempt to force a small tool or attachment to do the work of a large industrial tool. Do not use a tool for a purpose for which it was not intended.
7. **Dress properly.** Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, electrically non-conductive clothes and non-skid footwear are recommended when working. Wear restrictive hair covering to contain long hair.
8. **Use eye and ear protection.** Always wear ISO approved impact safety goggles. Wear a full-face shield if you are producing metal filings or wood chips. Wear an ISO approved dust mask or respirator when working around metal, and chemical dusts and mists.
9. **Do not overreach.** Keep proper footing and balance at all times. Do not reach over or across running machine.
10. **Maintain tools with care.** Keep tools sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. The handles must be kept clean, dry, and free from oil and grease at all times.
11. **Stay alert.** Watch what you are doing; use common sense. Do not operate any tool when you are tired.
12. **Check for damaged parts.** Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment and binding of moving parts; any broken parts or mounting fixtures; and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician.
13. **Guard against electric shock.** Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerator enclosures.
14. **Replacement parts and accessories.** When servicing, use only identical replacement parts. Use of any other parts will void the warranty. Only use accessories intended for use with this tool. Approved accessories are available from the distributor.
15. **Do not operate tool if under the influence of alcohol or drugs.** Read warning labels on prescriptions to determine if your judgment of reflexes are impaired while taking drugs. If there is any doubt, do not operate the tool.
16. **Don't leave machine** until it comes to a complete stop.
17. **Make sure machine is disconnected from power supply** while making maintenance, adjustment or repair
18. **Always keep hands and fingers away from the rollers.**
19. **Avoid accidental starting.** Make sure switch is in "OFF" position before plugging in power cord
20. **Ground all machines.** Always make sure your machine is well connected to the earth. It may reduce electric shock hazards.

21. **Don't use in dangerous environment** . Don't use power machine in damp or wet locations, or expose them to rain. Keep work area well lighted
22. **Stop machine** before servicing and when changing accessories such as rollers, etc
23. **General Electrical Cautions** :This machine should be grounded in accordance with the National Electrical Code and local codes and ordinances. This work should be done by a qualified electrician. The machine should be grounded to protect the user from electrical shock.
24. **LABOUR PROTECTION RULES for Round bending machine**
- Take the machine from the mains for any repair or intervention.
  - It is forbidden to intervene to the gears during operation. They are protected by guards.
  - Check the fastening of the bending rollers on the shafts before starting the machine.
  - Do not use pinched or cracked bending rollers.

**Note:** The warning and instructions contained in this instruction manual cannot cover all possible conditions and situations that may occur when using this product. It must be understood that common sense and caution are factors, which cannot be built into this product. These factors must be supplied by the person who operating this piece of equipment.

## II MAIN SPECIFICATION

MODEL		RBM50HV
Max capacity (mm)	Pipe steel	φ 70x2
	Square tube steel	35X35
	Round steel	φ 35
	Flat steel	100X15
Diameter of roller shaft		φ 50mm
Motor Power		2.2kW
Packing size (cm)		1000X820X1550mm
Weight		450kgs

## III USE RANGE

### A. OPERATION:

This machine can work both in the horizontal and the vertical position.

After you choose the desired working position, put the material to be bending between rollers. In order to get the desired bending act upon the leading roller in the bending direction by hand.

The desired profile bending is obtained by turning the upright driving shaft of slide war















gradually, as well as the position of the main roller shaft.

The guiding rollers are driven by the bending mechanism activated by the electric motor. It allows repeated travels in both directions.

Starting of the electric motor in the both direction is made using the double pedal.

**B. Standard and Optional rollers:**

The Round bending machine RBM50HV is used for bending steel profiles got by rolling. The machine is equipped with a set of standard rollers used for bending profiles of parallelepipedal section. For other type of profiles there are special set of rollers. These rollers are to be found in the table below and delivered on demand.

Profile	Size (mm)	Min∅ (mm)	Profile	Size (mm)	Min∅ (mm)
	33.7X2.65	350		60X60X3	600
	∅35	600		50X5	700
	35X35	600		50X5	500
	∅70X2	600		50X5	700
	100X15	920		50X5	500
	60X10	500		80X45X6	600
	70X50X3	1200		80X45X6	650

## IV. MAINTENANCE

Clean, grease and make the necessary adjustments before each operation.

Check the temperature of bearings(touching them by hand) during operation. The temperature must not exceed 50°.

## V. ELECTRIC INSTALLATION

### A. Technical conditions

1) Supply with electrical power is made according to EN 60204-1,§4.3. The machine is wired up to a three-phase supply network:3-50HZ; 400V; equipped with working earthing (PE). The feed circuit will be protected against short-circuit and amperages exceeding the permitted values.

2) Electric installation is made under IP44 protection degree.

3) Electric installation works under the following conditions:

- maximum altitude 1000mm
- environment temperature 15°C up to +40°C
- relative humidity of environment 40% up to 80% at 25°C

4) Electric installation works normally at:

- voltage between (0.9-1.1) Un
- frequency between (0.99-1.01)Fn

### B. The main parts of the electric installation

- instruments plate for control and driving
- three-phase induction motor M for machine driving
- pedal(with micro-switch JK1,JK2)-for START/STOP control

SYMB	DENOMINATION	PART INSIDE EL.INST
QF2	Circuit Breaker2A	Protection of transformer primary circuit
QF3	Circuit Breaker1A	Protection of transformer primary circuit
FR	Thermal Relay	Protection against overload of M motor
KM1,KM2	Contactor	Driving of M motor
M	Three-phase induction Motor	Rollers driving
SA	OF-ON cam switch	Closing/opening of supply circuit
TA	Mushroom push-button Support Contact block:1 O	Emergency stop
JK1	Foot switch	M start control sense to the right
JK2	Foot switch	M start control sense to the left
T	Transformer	Supply,24V, of control circuit
PE		Connections for earth circuit
SB1	Pushbutton Switch	Control start power on
KA	Relay	Control start power on

### C. Operation instruments

After machine is assembled and fixed on its place, make the operations below in the order prescribed.

1) Check if all metallic parts of machine are well earthed, according to electric diagram. Checking is made visually for the beginning, then use an ohmmeter to measure the resistance of earthing circuit. Inside, the earthings must have a resistance of  $< 0.1\Omega$  and between machine and the ground clamp of power unit it is  $< 0.4\Omega$ .

2) Check condition of electric instruments, junction wires, cables and electrical connections.

3) After all checkings are made, connect the machine to the mains:

- supply is made respecting all conditions in §1.
- in order to protect the feed circuit it is recommended to equip the power unit with

fusible:3 X 10A for the 3 phases(L1,L2,L3);

4) Check if machine is correctly supplied after it is connected to the mains.

5) After all checkings are made and machine is connected to the mains, start the machine on idle running in order to determine the correct sense of rotation of the roller: when pushing the pedal on the right side, the sense of rotation is to the right and when push the left pedal, it is to the left.

6) Let the machine on idle running for one hour. Meanwhile check if abnormal noises to the electric motor, overheatings to the electric motor or electric instruments do not appear.

5) Start the machine under load and repeat all checkings.

#### **D. Operation of electric equipment**

In order to start the machine switch the SA power switch, which is to be found on machine frame, on "I" position (shut):

–the SA on position: "O"- machine uncoupled

"I" – machine coupled

Push the pedal R.H. for starting with the sense of direction to the right. The pedal acts the JK1 micro-switch making its contact; it controls connection of KM1 contactor which supplies the M motor. The motor starts with the sense of rotation to the left.

Push the pedal L.H. for starting with the sense of direction to the left. The pedal acts the JK2 micro-switch making its contact; it controls connection of KM2 contactor which supplies the M motor. The motor starts with the sense of rotation to the left.

When the pedal is not pushed, the contract of the micro-switch(JK1 or JK2) opens, the contactor (KM1 or KM2) turns of rotation to the left.

The motor runs as long as one of the pedals is pushed.

Machine is equipped with TA stop button, which can be used for emergency situation or when repairs, adjustments etc. take place. After the TA2 stop button was pushed, it is necessary to pull it out when you want to restart the machine, because it is as retaining button and stays pushed.

#### **E. Maintenance and repair of electric installation**

##### **1.Trouble and remedies:**

1) In case all those indicated at the previous chapters were respected and machine does not start when pressing one of the pedals and KMcontactor (KM1 or KM2) does not connect, make the following operations:

a. Check if machine is correctly supplied:3-50Hz;400V

b. Check if thermal protection of M motor (FR thermal relay) was activated and look for the cause which determined it.

Reasons could be:

–supply of M electric motor is made only in two phases or with lower voltage than 360V/50Hz

–thermal relay is not correctly set- at 2.3A.

–M electric is locked or turns hardly owing to frictions

–M electric motor out of order

–FR thermal relay out of order

Make corrections and reset the thermal relay with the help of resetting lever.

c. Check the breaker: QF2 in transformer primary circuit and QF3 in the control circuit. In case one of the breaker is broken, remove the fault and change the replacing piece.

Attention: Use only calibrated replacing pieces and at the parameters indicated.

d. Check if the TC transformer for 24V supply voltage of control circuit is in order:

–check if T transformer is fed correctly in primary with a 400V voltage.

- check if in secondary the transformer supplies the 24V voltage
  - e. Check if the control circuit has continuity:
    - screws for connections to be well tighten.
    - contacts of instruments (JK1,JK2,SB,FR) in the control circuit to close correctly.
  - f. Check if KM contactor is in order.
- 2) If pressing the pedal contactor makes connection, but the M electric motor does not start. There should be two situations.
- a. If M motor is correctly fed from 3-50Hz,400V voltage.
    - check if the electric motor is in order: stator winding not to be broken, connections at the terminal box to be perfect etc.
  - b. If M motor is not correctly fed from 3-50Hz;400V voltage, check motor force circuit:
    - Attention: Use only calibrated replacing pieces and at the parameters indicated.
    - check if electric stress circuit of the FR thermal relay is not broken.
    - check all junction wires and cable of electric stress circuit not to be broken.
    - All necessary checks can be made with a general instrument (multi-meter) which measures: V, A,  $\Omega$ .

## 2. Maintenance operations :Weekly checking:

- make visual checking of electric apparata condition and in case they are damaged will be replaced with others at the same parameters;
- tighten the screws of electric connections and the holdings screws of electric apparata;
- check condition of feeder cable, jack and connection socket to the mains and in case they are damaged will be replaced with others at the same parameters;
- check if earthing circuit has continuity and its ohmic resistance;
- wipe the dust on the electric apparata and connecting elements. Cleaning can be made with an air jet of maximum 2 atm. or with a brush.

## F. Labor protection rules

Respect all instructions and norms in force when mount, put into service, repair and maintain the electric installation.

Stop the machine and release it from the mains before any intervention to the electric installation to before periodical checking of electric equipment and motor.

All operations which ask the electric installation under voltage (measuring the energy, voltage, determining succession of phases) will be effected only by skilled people with legal authority. They must have proper tools equipped with non-conducting handles and non-conductive protection equipment.

It is forbidden any modification, of the electric installation if it is certificated by the manufacturer. It could be dangerous. Measures indicated by the manufacturer in order to protect people against electric shock.

- a. All active metallic parts are inside cases. In this way people are protected against dangers which can exist by touching the parts directly according to EN60204§6.2.1
- b. All active metallic parts are insulated against inactive metallic parts which the people could come in touch with, according to EN60204§6.2.2
- c. External connecting elements, which the people could come in touch with have the active parts entirely insulated, according to EN60204,§6.2.2
- d. Galvanic separation of control circuit by transformer, according to EN60204§6.3.3
- e. Use of reduced voltage(PELV) OF 24 V for supply of control circuit, according to EN20204§6.4
- f. In order to avoid undesired acting owing to insulation damage, broaking or detaching of connections of conductors in the control circuit, a branch o this circuit is connected to the protection circuit, according to EN60204§60204§8.4



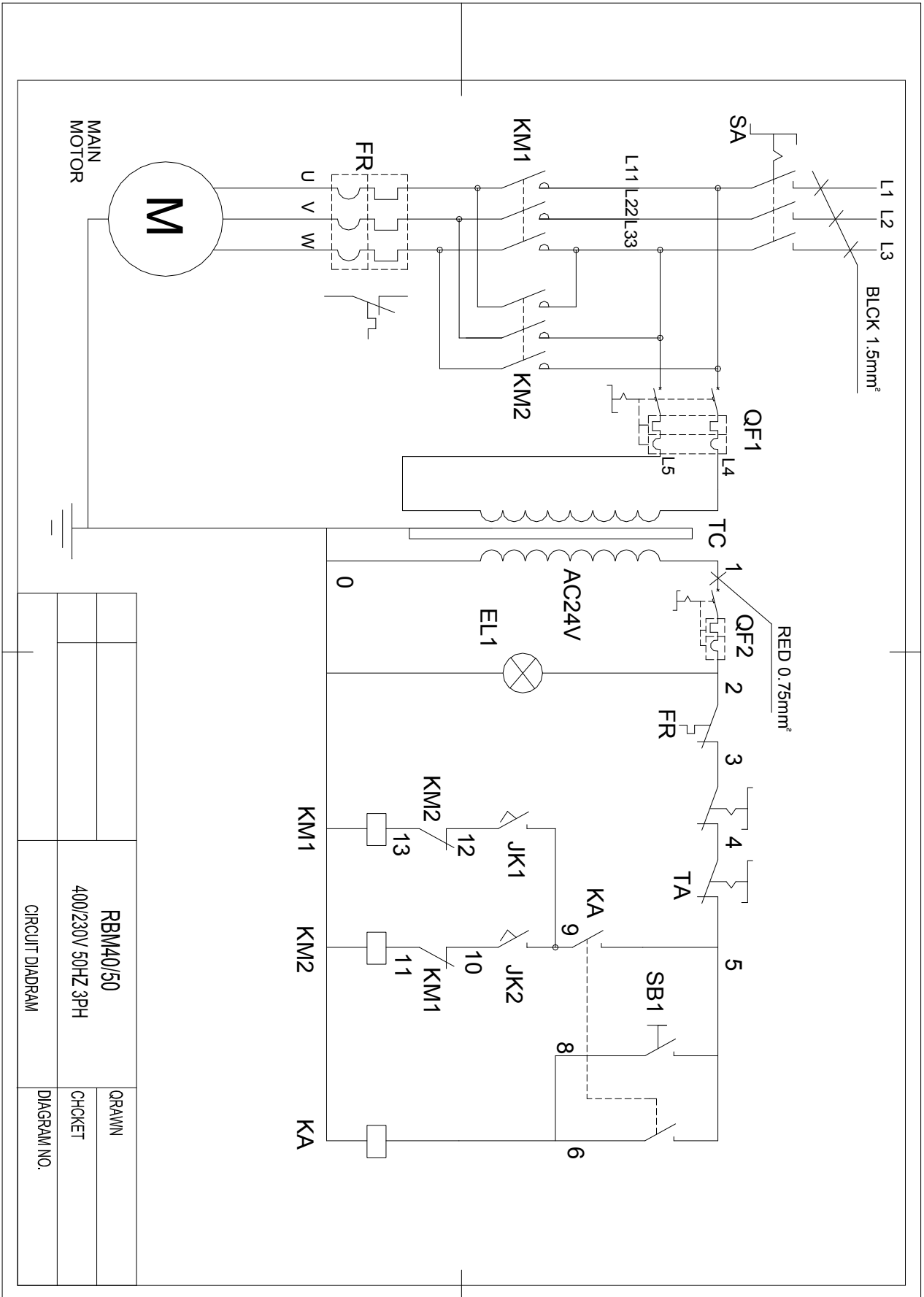
All inactive metallic parts of machine are earthed according to EN60204-1§5.2,§8.2 and EN 60445 in order to protect people against dangers caused by fault of insulation or accidental touching between active and inactive metallic parts.

Earth link between machine and ground clamp of the mains is made by means of feeder cable and must be checked to be correctly executed.

It is forbidden to put the machine under voltage before connecting it to the ground clamp of the mains and before verifying the earth circuit according to instructions from §8.2.1

From time to time it is necessary to check if continuity of earthings is assured and all instructions from §8.2.1 are respected.

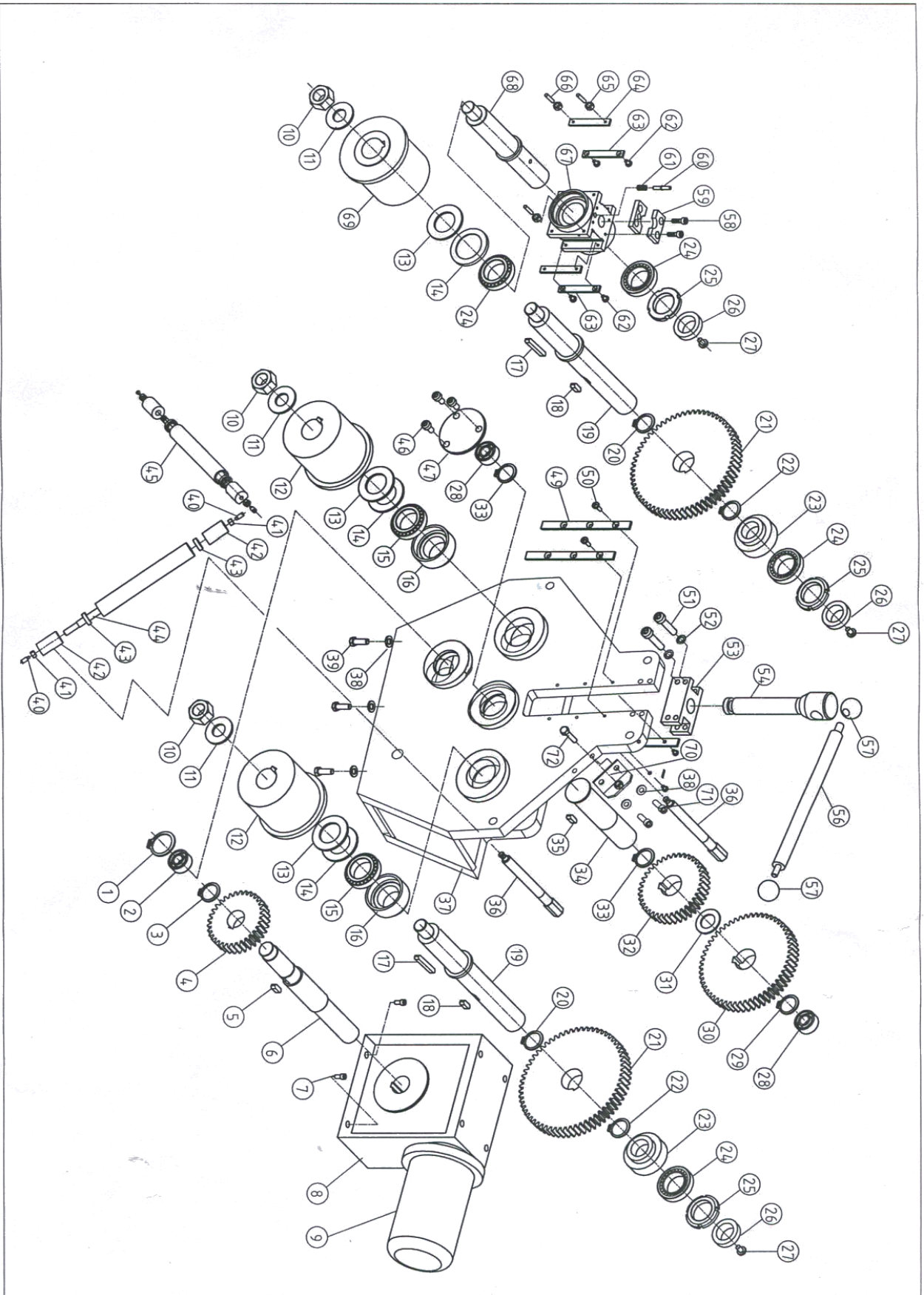
# F. ELECTRIC DRAWING



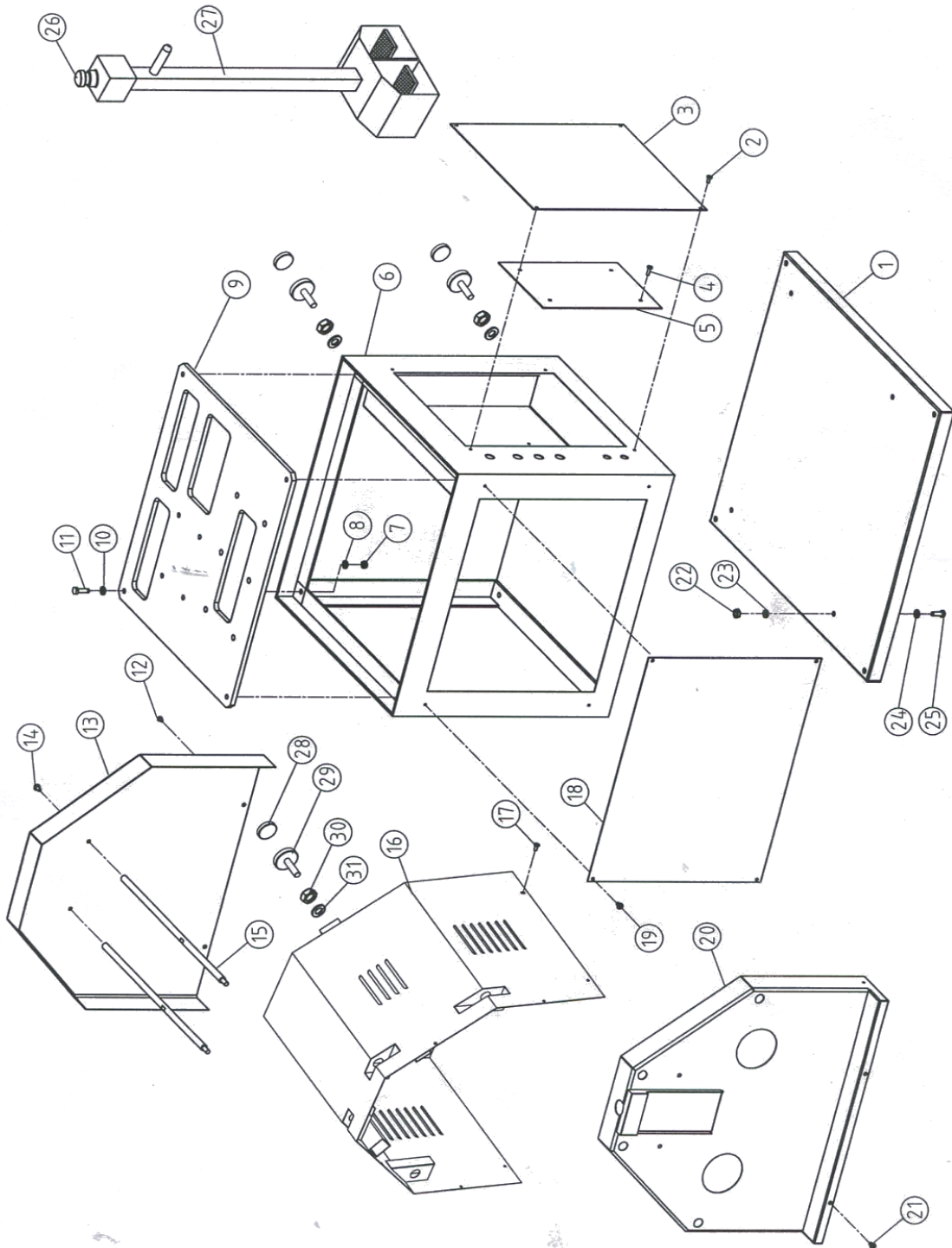
NO.	NAME	DESIGNLICN	TYPE SPECIFICATONS	QUANTITY
1	MAIN MOTOR	M1	400/230V 50HZ 3PH 1.5KW	1
2	TRANSFORMER	TC	JBK5-60VA 400 230V/24V 50/60HZ	1
3	CURRENT BREAKER	QF	DZ47-63 1P1A DZ47-63 2P2A	1
4	E.S.P	TA	XB2-ES542	1
5	INDICATOR LIGHT	EL	XB2-BVB3C 24V	1
6	CONTACTOR	KM	CN-6 3ALLA AC24V	2
7	HEAT RELAY	FR	RHN-5M 3.6-5.5A	1
8	START	SB1	XB2-BE101	1
9	FOOT SWITCH	JK	MD-16H	1
10	RELAY	KA	HH52P-FL AC24V	1
11				
12				
13				
14				

		RBM40	QRAWN
		400/230V 50HZ 3PH	CHCKET
		CIRCUIT LISTING	DIAGRAM NO.

# VI Parts drawing and Parts list



Part #	Description	Q'ty	Part #	Description	Q'ty
1	Check ring	1	37	Frame	1
2	Bearing	1	38	Washer	10
3	Check ring	1	39	Bolt	6
4	Gear	1	40	Screw	4
5	Key	1	41	Bolt	4
6	Shaft	1	42	Rotating shaft stand	4
7	Bolt	4	43	Shaft	4
8	Reducer	1	44	Rotating shaft	2
9	Motor	1	45	Rotating shaft cover	2
10	Nut	3	46	Screw	3
11	Pressure Pad	3	47	Cover	1
12	Roller	2	49	Plate	4
13	Adjusting gasket	3	50	Screw	12
14	Protecting cover	3	51	Screw	4
15	Conical bearing	2	52	Washer	4
16	Bearing bushing	2	53	Nut	1
17	Key	2	54	Screw Rod	1
18	Key	2	56	Rod	1
19	Shaft	2	57	Handle ball	2
20	Check ring	2	58	Screw	4
21	Gear	2	59	Pallet	1
22	Check ring	2	60	Pin roll	1
23	Bearing bushing	2	61	Spring	1
24	Conical bearing	4	62	Screw	4
25	Nut	3	63	Plate	2
26	End cover	3	64	Plate	2
27	Screw	3	65	Nut	4
28	Shaft	2	66	Screw	4
29	Check ring	1	67	Silding base	1
30	Gear	1	68	Shaft	1
31	Shock insulator	1	69	Roller	1
32	Gear	1	70	Angle iron	2
33	Check ring	1	71	Screw	4
34	Middle shaft	1	72	Bolt	2
35	key	1			
36	Gear	4			



<b>Part #</b>	<b>Description</b>	<b>Q'ty</b>	<b>Part #</b>	<b>Description</b>	<b>Q'ty</b>
1	Underpan	1	17	Screw	4
2	Screw	4	18	Plate	1
3	Side plate	1	19	Screw	4
4	Screw	4	20	Protective cover	1
5	Electroplate	1	21	Screw	6
6	Base	1	22	Nut	4
7	Nut	4	23	Washer	4
8	Washer	4	24	Washer	4
9	Bottom Plate	1	25	Bolt	4
10	Washer	4	26	Emergency Stop Switch	1
11	Bolt	4	27	Foot switch	1
12	Screw	2	28	Damping iron	6
13	Protective cover	1	29	Iron mat	6
14	Screw	2	30	Nut	6
15	Support bor	2	31	Washer	6
16	Protective cover	1			

**Note:** This manual is only for your reference. Owing to the continuous improvement of the machine, changes may be made at any time without obligation on notice. And please note the local voltage while operating this electric machine.