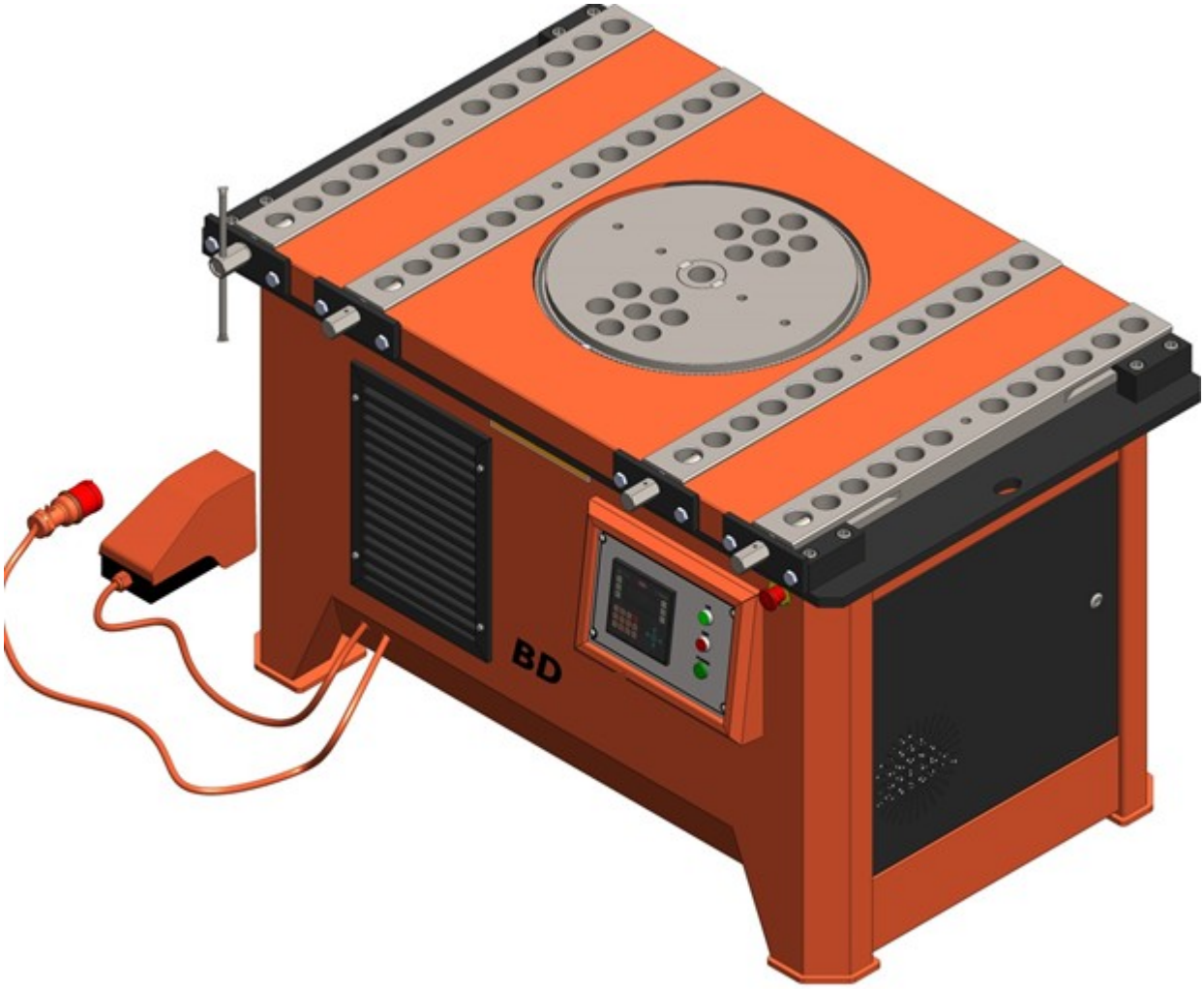

MECHANICAL DIGITAL REBAR BENDING MACHINE
OPERATING & MAINTENANCE MANUAL

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GMS

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CONTENTS

⚠ Important Warning !!!

- User's and maintenance manuals must be read.
- Machine should be operated by instructed workers.
- When adjustments such as controlling, maintaining, lubing are being made electricity of the machine must be cut off.
- All of the explanations given under user's and maintenance manual must be complied.

1. INTRODUCTION

Mechanical Rebar Bending Machine is made only with the purpose of steel material bending. Using other than the indicated purposes are prohibited. It is possible to mount various apparatuses on the machine optionally for bending in different shapes.
In order to obtain the best yield from the machine it should be in a situation so that it can be worked easily and in a position that more productivity might be obtained from the operator. Because of this the location where the machine is operated should be close to the iron stocks.

1.1. Main Parts of Bending Machine

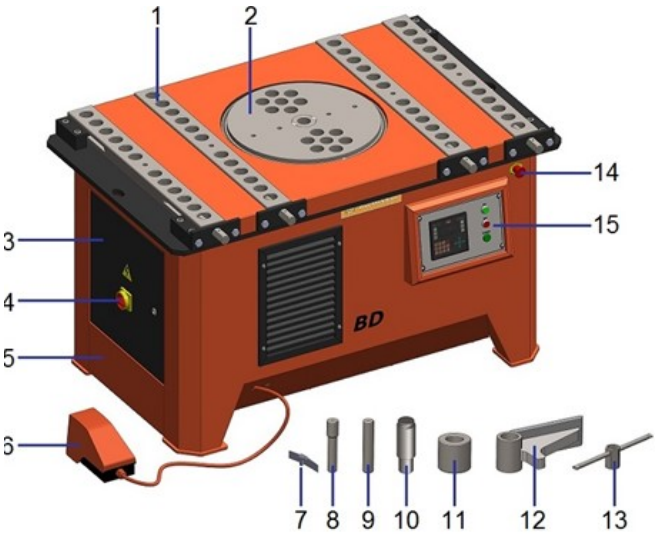


Figure 1. Main Parts

1	Bracket Thrust	6	Foot Pedal	11	Bending Sleeve
2	Bending Disc	7	Zero Adjustment Pin	12	Retainer
3	Electric Panel Door	8	Stirrup Pin	13	Adjustment Key
4	Main Switch	9	Center Pin	14	Emergency Stop
5	Machine Body	10	Pin	15	Digital Screen

BD36	1	1	5	70,90,110,130,160	1	6	1	1	1
BD45	1	1	5	60,80,110,150,180	1	6	1	1	1
BD46	1	1	5	60,80,110,150,200	1	6	1	1	1
BD60	1	1	5	70,90,130,200,250	1	6	1	1	1

2. MACHINE ASSEMBLY

Machine should be leveled on a solid ground.
Electricity connection of the machine should be made by competent technicians.

Electricity Connection
For main electricity connection plug should be connected to supply line with a 5x4 mm² isolated cable and then plugged into power outlet. Grounding connection should be made for safety. Machine shouldn't be operated without making grounding connection.

Connection of grounding line
The following procedures should be followed for this system.
Connect one end of the grounding to a copper wire (minimum 16 mm²) as it will enable electrical conductivity. The other end should be either connected with a pipe that has a conductivity capacity immerged into the ground (preferably into a humid ground) or the copper plate should be buried into the ground as much as deep.

⚠ ***WARNING!!!*** Machine should be moved without any vibration. Machine shouldn't be run in a wet environment. If there are any lost or damaged parts during the handling, they should be reported to the manufacturer.

- When using the lifting and carrying equipment their maximum loading capacities should be taken into consideration.
- During the lifting equipment's center of gravity should be taken into consideration.

⚠ ***WARNING!!!*** Warning signs on the carrier equipment should be taken into consideration.
In order to carry the machine forklift, mobile crane or a hoist should be used. When lifting the machine steel cable, chain or fiber sling should be used. When lifting out of the chest lifting lugs on the machine should be used. During the lifting operations experienced expert staff and subcontractors should be assigned.

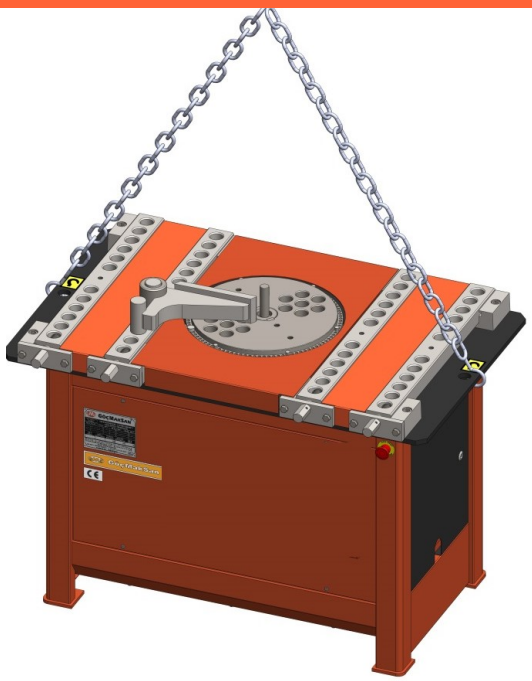


Figure 2: Handling the machine

3. MACHINE WORKS

Be sure that the machine is assembled in conformance with the Machine Assembly procedures.
If there is any object on the machine (including the bending apparatus) they must be removed.
LEFT-RIGHT switch on the control panel of the machine is turned to LEFT or RIGHT position, MAN AUTO switch is turned to MAN position and machine turning direction is confirmed by pressing on the foot pedal.
Rotation direction is approved by taking the front of the machine as reference (Control pane side) the clockwise as right and counter-clockwise as left. If the machine is rotating reverse of the switch it means phases of the electricity supply are feeding reversely. This situation doesn't affect the running system of the machine. In such case LEFT-RIGHT switch might be turned to the other side or competent electricians might change the directions of the phases. After fixing the direction of rotation bending adjustments should start.

3.1. Control Buttons

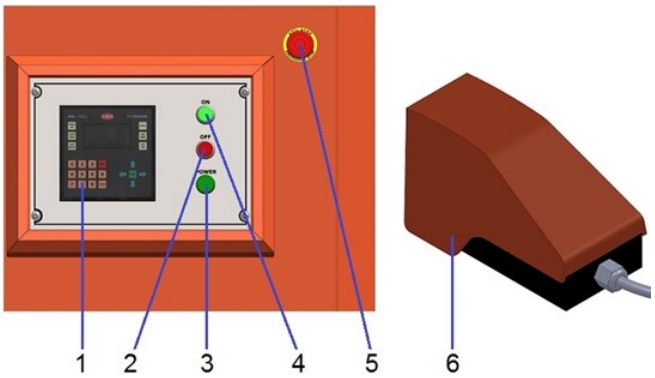


Figure 3: Machine control panel and functions

NO	BUTTON	FUNCTION
1	Digital Panel	Electrical components are in this panel
2	Off	Enables machine stops.
3	On	Enables machine working.
4	Power	When pushing on button, system flash light.
5	Emergency Stop	In case of an emergency, it stops the machine when pushes.
6	Foot Pedal	Part that enables to bending flange.

3.2. Thermal flow setting range and motor protection switch

A motor is set by machine manufacturer. It is not appropriate for user to change settings. Motor protection switch is mounted to the machine in order to prevent damage on the system by cutting the electricity current when excessive current is drawn by the system. If the switch is tripped switch should be turned on by turning the button to position 1. Motor protection switch should never be disassembled.

4. TECHNICAL DATA

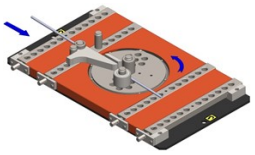
BD36	1	1	5	70,90,110,130,160	1	6	1	1	1
BD45	1	1	5	60,80,110,150,180	1	6	1	1	1
BD46	1	1	5	60,80,110,150,200	1	6	1	1	1
BD60	1	1	5	70,90,130,200,250	1	6	1	1	1

5.USING THE MACHINE

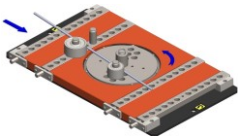
5.1. Connection and Placement

5.1.1.Correct Connection of the Irons on the machine

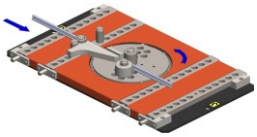
4a) Fixing the iron to be bent on the machine with the help of



4b) Fixing the iron to be bent on the machine with the help of



4c) Fixing with the help of retainer in multi-iron bending the irons to be bent on the machine



4d) Fixing the irons to be bent on the machine with the help of bending sleeves in multi-iron bending

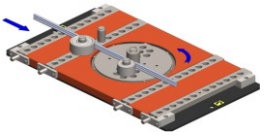
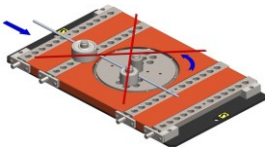


Figure 1(a,b,c,d): Placing the irons on the machine correctly

5.1.2. Incorrect placement of the irons to be bent on the machine

5a) Incorrect placement of a single iron to be bent with bending sleeves



*5b)*Incorrect placement of a single iron to be bent with retainer

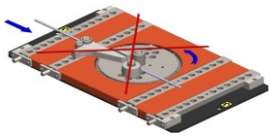
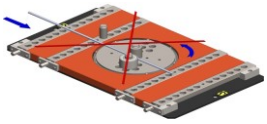


Figure 2(a,b): Incorrect connection of the irons on the machine

5.1.3. Incorrect placement of the irons to be bent on the machine

6a) Incorrect connection of multi-irons to be bent on the machine with bending sleeves



*6b)*Incorrect connection of multi- irons to be bent on the machine with retainer

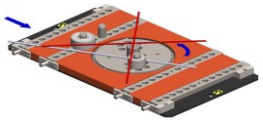
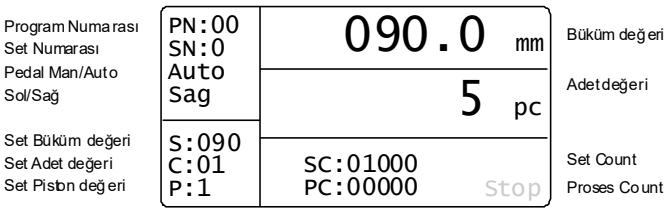


Figure 3(a,b): Wrong placement of the irons on the machine

5.2.Digital Panel

DISPLAY FUNCTIONS



Program Numarası – Program Number
Set Numarası – Set Number
Pedal Man auto
Sol / Sağ – Left / Right
Set Büküm Değeri – Set Bending Value
Set Adet değeri – Set Piece value
Set piston değeri – Set Piston Value
Büküm Değeri – Bending Value
Adet Değeri – Piece Value

PROGRAM NUMBER ENTRY:

- Program number is showing on display constantly.
- Take machine position to stop.
- Press Prog.No. and shows saved number on digital screen.
- New program is saved with using numeric buttons and pushing ENT.
- You can out without changing program number If you push ESC button
- Machine will back to STOP position if you do not push any button during 60 seconds

SET NUMBER ENTRY:

- Set number is always showing on digital screen between 0-9.
- Make STOP position to the machine.
- Set number will be adjusting by pushing the numeric buttons.

PROGRAM ENTRY:
All programs consist of 10 set value. Angle, piece and piston values is entering by using program entry. You have to observe following conditions when entering values, All values has to be enter correctly from the first entry and set 0 for none usage entries.
How do you make the Program entry

- Make machine as STOP position
- Program number is adjusting with Prog No button for desired program.
- Programmig is adjusting by pushing Prog Button. .
- Angle (S) , Piece (C) and Piston (P) vales are shown on digital screen for all registered sets.
- All program values will be entering by using OK buttons.
- You can out by pushing ESC.

AUTO / MAN SELECTION:
Pedal is using by choosing MAN or AUTO.

- Make machine as STOP position
- AUTO / MAN choose will be change by pushing AUTO MAN button on digital screen.

LEFT / RIGHT SELECTION
Using to choose bending way.

- Make machine as STOP position
- LEFT / RIGHT selection position will be change by pushing Left Right button on digital screen.

PIECE COUNTING:

Every set value will process the next transaction value automaticly after each SET value entered on digital screen. After processing the last set value go back to first set value. Choosen program is processed one time in this situation and process count value increased as one time. Process count value is shown constantly on screen. How many pieces will be bend is shown also on SET COUNT part. .
Set count vales can be entered by user.

- Make machine as STOP position
- Set CNT and push. .
- How many transaction will be made is enable by numeric buttons on screen and out & saved by pushing ESC.

Set Count value starts to flashes when its reaches on Process Count value and system does not accepts foot pedal. Process count can be erased by using CLR button.Process count does not control if set count value is enetered as 0.

SPIRAL (HELIX)
Machine becomes Helix mode by pushing SPR button. Bending degree is not shown on helix mode. If you want to go out from Helix mode, press SPR button.

5.3.Bending Modes

5.3.1 - 180 degrees bending

180 degrees bending is materalized by pushing S:180 (with board asisstance) on set bending value in order to make 180 degrees angle.

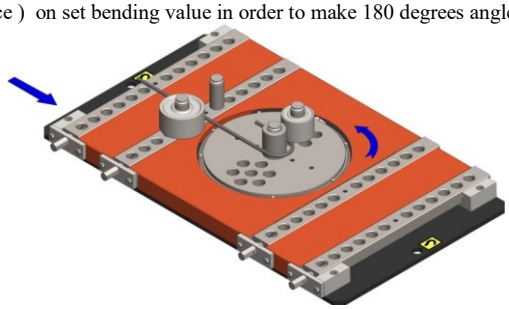


Figure 7: 180 degrees bending adjustment

5.3.2 - 90 degrees bending

90 degrees bending is materalized by pushing S:090 (with board asisstance) on set bending value in order to make 90 degrees angle.

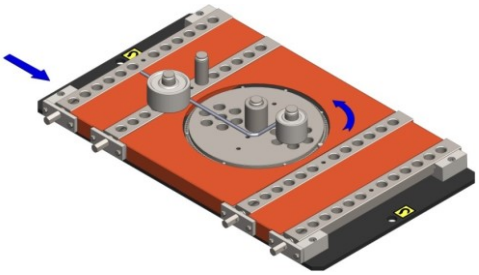


Figure 8: 90 degrees bending adjustment

5.3.3 45 degrees bending:

90 degrees bending is materalized by pushing S:045 (with board asisstance) on set bending value in order to make 45 degrees angle.

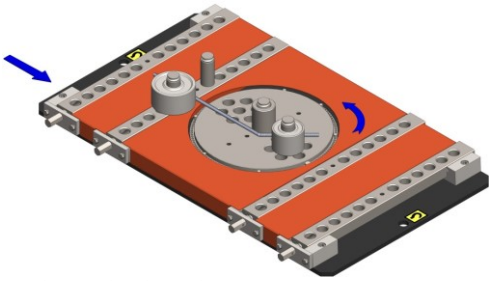


Figure 9: 45 degrees bending adjustment

5.3.4 Stirrup Bending

In order to make stirrup bendings following values has to be made, Bending values has to be entered by in order as follows, S :135 (1 time), S 090 (3 times) and S: 180 (1 time). These angles can be increased or decreased by using strength of rebar.

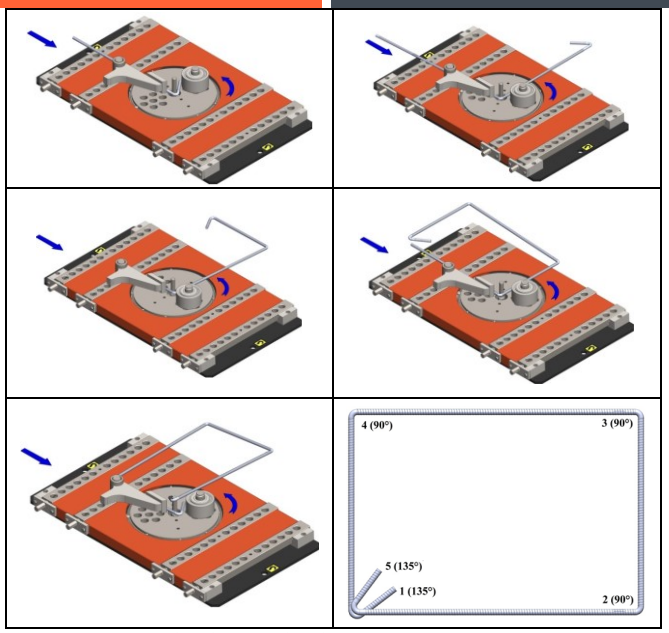


Figure 10: How to bend stirrup bendings

6. PROHIBITED USAGE ON THE MACHINE

- When bending no one must stand in front of the machine and any one standing must be taken away.
- While the machine is running no any other construction material such as adze, hammer, meter, caliper etc. should be put between the bending apparatus other than the material that will be bent.
- Machine mustn't be run when it is wet.
- No any bending must be made other than the measurements, dimensions and units stated on the capacity plate
- During the multi bending number of irons stated on the capacity plate should be aligned one on top of the other and should be leaned to the retainer or bending rollers.
- No any other bending should be made other than this.
    - Machine mustn't be run when the electricity Board Cap is open.
    - Electrical settings made in the factory shouldn't be changed.
- Machine shouldn't be operated without making grounding connection.
- Machine shouldn't be operated when the housing covers are dismantled.
- Machine should be operated by instructed workers.
- Machine never should be run unlubricated.
- Warning plates attached on the machine mustn't be removed.
- No other parts should be mounted to the machine other than the ones manufactured by Göçmaksan company.
- No bending should be made on the machine with bending apparatus which are deformed, cracked or have an increased hole diameter.
- No wrong bending should be made on the machine.
- Machine should be cleaned by air
- In cases when electricity board cap should be opened, the cap mustn't be opened without cutting the power of the machine from the main switch.
- Irons to be bent should be fixed on the machine correctly. Fixing with retainer bending sleeve and pins

7.PROTECTORS

Protector apparel

- Helmet must be worn.
- Glasses must be worn.
- Boots with steel toe must be put on.
- Gloves must be worn.

The aforementioned protectors will be used. In case of not using these apparels there are risks of injury, cutting and trapping hands.

Work clothes

Inappropriate clothes against snatch or grip while working with the machine are listed below and in case of not conforming to this list might cause risk of injury.

Long hair, dress with long arms, bracelet, uniform with long skirt, any ornament leaning out.

8.MAINTENANCE AND LUBRICATION INSTRUCTIONS

It is important to make maintenance correctly in order to extend service life of the machine and to ensure safe bending. We suggest for each user to set up a secure system for control and maintenance of the machine. The following descriptions are given for reference. Number 140 gear oil is used in machine's reducer unit.

Daily maintenance of the machine

- Clean dust and scales on the machine with a brush.
- If the machine is running outdoors it must be protected from rain water when raining.
- Machine should be checked if there is extraordinary voice or not.

Weekly maintenance of the machine

- Parts driving machine bending plates should be cleaned and lubricated.
- Machine adjusting lever mechanism should be cleaned and lubricated.

Monthly maintenance of the machine:

- Bending pins and bending plates should be checked and any cracked or skewed parts mustn't be used.
- Reducer should be checked if there is oil leakage or not.
- Machine's sensor display should be checked if it has dirt on it or not and also the lamp behind it should be checked if it is working or not.

Semi-annual maintenance of the machine:

- All the bolt connections of the machine should be checked.

Annual maintenance of the machine:

- Oil of the machine should be changed.
- If it is out of order seals and bearings should be changed.
- Any skewed, cracked, worn parts should be checked and replaced.

9.PROBLEMS AND SOLUTIONS

Any faults those might arise when running the machine, and their causes and solutions are given in the table below.

FAULT 1: If machine isn't running

	DESCRIPTION	SOLUTION
1	Missing phase might come to the electric supply system where the machine is connected.	Check the phases.
2	Emergency stop button might be pressed	Check the button. If it is pressed open it by turning to the direction of the arrow on the button
3	Motor protection switch might be blown	Check the motor protection switch. If the switch is blown
		turn it to the position 1
4	LEFT STOP RIGHT switch might be turned off	Check the switch. If it is on stop position turn it to right or left positions
5	Electricity Board Cap might be open or haven't been closed completely	Check the Electricity Board Cap

FAULT 2: If bending disk turning continuously

	DESCRIPTION	SOLUTION
1	Sensor might be broken down	Check whether the sensor is working or not, if it is out of order replace it.
2	There might not be Zero Adjustment Pin and SWITCH pins over the machine flange	Check the pins and if any of them is missing, complete it.
3	Direction contactors might be broken down.	Check the contactors

FAULT3: Motor protection switch is blowing continuously

	DESCRIPTION	SOLUTION
1	Diode might me broken	Check the diode
2	Motor might be blown	Check the motor
3	If the machine is bending iron over its bending capacity	Check the bent iron according to the material type and measurements on the capacity plate
4	Missing phase might come to the electric supply system	Check the phases on the electricity network
5	Transformer might be blown	Check the transformer
6	There might be short circuit or wearing on the cables	Check the cable and connections

FAULT4: Machine is not running although the foot pedal is pressed

	DESCRIPTION	SOLUTION
1	The plug might be displaced	Check the plug.
2	Pedal switch might be out of order	Check the SWITCH. Change them if they are out of order
3	Contactors in the electricity network might be out of order	Check the contactors

FAULT5: Emergency Stop is not running

	DESCRIPTION	SOLUTION
1	Bearings might be broken down	Check the bearings.
2	Motor's propeller cap might be rubbing	Check the propeller cap
3	Gears might be broken down	Check the gears
4	There might be no oil in the reducer	Check the reducer oil
5	Missing phase might come to the electric supply system which the machine is connected.	Check the phases in the network
6	Machine might have difficulty over its capacity.	Check the bent iron according to the capacity plate
7	Brake might not be released or brake lining might scrape after being broken down in the electromagneticbraked machines.	Check whether the brakes are running or not and the brake linings

FAULT 6 : Machine is leaking oil

	DESCRIPTION	SOLUTION
1	Reducer ventilation cap might not be mounted.	Check whether the plug is mounted or not.
2	Motor seal might be leaking oil.	Check the motor from the propeller side. If there is oil change the motor seal.
3	Reducer connection bolts might be loose.	Check the connection bolts and if loose screw.

10. SAFETY

➢ This symbol is put before the articles giving warning explanations in order to draw attention of the trained operator to important functions.

€ This symbol is put before the articles giving warning explanations in order to draw attention of the trained operator to electrical issues.

This symbol is put before the sentences in order to draw attention of the trained operator to the master instructions and directive regarding to handling or safety.

TAGS USED ON THE MACHINE

GÖÇMAKSAN	Trademark plate of manufacturer company
GMS	Logo plate of manufacturer company
BS26,36,45,50,60	Model name tag of the machine
CE	CE norm conformity tag
	Plate on capacity and technical information of the machine
	Machine user's and maintenance manual tag
	Handling and carrying hook tag
	Electricity panel warning tag
	Grounding output tag