

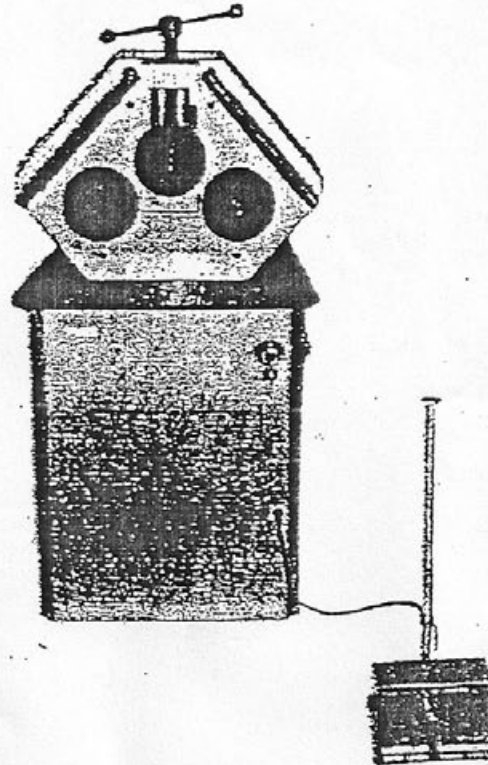
## CONTENTS

- . COMPOSITION
- . USE RANGE
- . TECHNICAL CHARACTERISTICS
- . OPERATION
- . LABOUR PROTECTION RULES
- . MAINTENANCE
- . SPARE PARTS CATALOGUE
- . INDICATIONS FOR STARTING, USE AND MAINTENANCE OF THE ELECTRIC INSTALLATION

## . COMPOSITION

The MIP 30 machine consists of:

- engine base
- bending mechanism
- driving mechanism
- front guard
- back guard
- driving pedal
- electric installation



## . USE RANGE

The MIP 30 Profile roller 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 are delivered on demand.

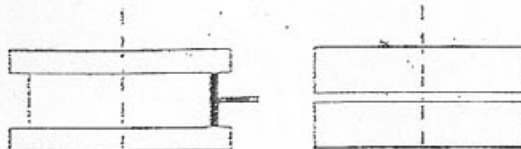
5. PROFILE WITH CLEAN OUTSIDE

MIP 30-15-8-0

Leading roll R6/R5	MIP30-15-8-1	2
Leading roll R4/R3	MIP30-15-8-2	2
Ring Ø58x5	MIP30-15-6-1	1
Ring Ø58x4	MIP30-15-6-2	1
Ring Ø58x3	MIP30-15-6-3	1
Ring Ø58x2	MIP30-15-6-4	1
Flange Ø148x13	MIP30-15-3-1	4
Guide roll 50	MIP30-15-1-2	2
Guide roll 45	MIP30-15-1-3	2
Guide roll 40	MIP30-15-1-4	2
Guide roll 35	MIP30-15-1-5	2
Guide roll 30	MIP30-15-1-6	2
Guide roll 25	MIP30-15-1-7	2

Guide roll

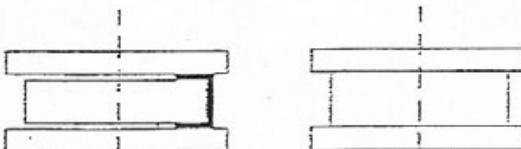
Leading roll



6. PROFILE WITH CLEAN INSIDE

MIP 30-15-9-0

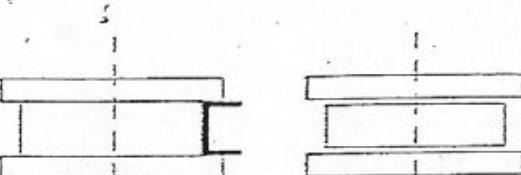
Flange Ø148x13	MIP30-15-3-1	4
Flange Ø148x13	MIP30-15-3-2	2
Ring Ø58x5	MIP30-15-5-1	4
Ring Ø58x4	MIP30-15-5-2	4
Ring Ø58x3	MIP30-15-5-3	4
Ring Ø58x2	MIP30-15-5-4	4
Guide roll 50	MIP30-15-9-1	4
Guide roll 40	MIP30-15-9-2	4
Guide roll 30	MIP30-15-9-3	4
Driving axle ring 4	MIP30-15-9-4	2
Driving axle ring 2	MIP30-15-9-5	2
Leading roll 50	MIP30-15-1-8	1
Leading roll 40	MIP30-15-1-10	1
Leading roll 30	MIP30-15-1-11	1



7. PROFILE WITH CLEAN OUTSIDE

MIP 30-15-10-0

Flange Ø148x13	MIP30-15-3-1	4
Flange Ø148x13	MIP30-15-3-2	2
Ring Ø58x5	MIP30-15-6-1	2
Ring Ø58x4	MIP30-15-6-2	2
Ring Ø58x3	MIP30-15-6-3	2
Ring Ø58x2	MIP30-15-6-4	2
Leading roll 50	MIP30-15-10-1	2
Leading roll 40	MIP30-15-10-2	2
Leading roll 30	MIP30-15-10-3	2
Driving axle ring 4	MIP30-15-10-4	1
Driving axle ring 2	MIP30-15-10-5	1
Guide roll 50	MIP30-15-1-2	2
Guide roll 40	MIP30-15-1-4	2
Guide roll 30	MIP30-15-1-6	2



8. ROUND BAR PROFILE  $30 < D \leq 60$

MIP 30-15-11-0

Guide roll 60	MIP30-15-11-1	2
Guide roll 55	MIP30-15-11-2	2
Guide roll 50	MIP30-15-11-3	2
Guide roll 45	MIP30-15-11-4	2
Guide roll 40	MIP30-15-11-5	2
Guide roll 35	MIP30-15-11-6	2
Leading roll 60	MIP30-15-11-7	1
Leading roll 55	MIP30-15-11-8	1
Leading roll 50	MIP30-15-11-9	1
Leading roll 45	MIP30-15-11-10	1
Leading roll 40	MIP30-15-11-11	1
Leading roll 35	MIP30-15-11-12	1
Short distance piece	MIP30-8-3	3
Long distance piece	MIP30-8-4	3



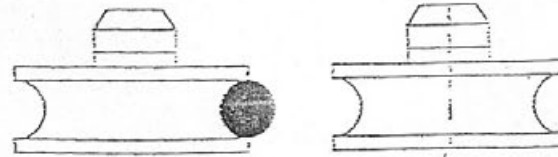
1. ROUND PROFILE  $\leq 30$

MIP 30-15-4-0

Guide roll $\varnothing 30$	MIP30-15-4-1	2
Guide roll $\varnothing 25$	MIP30-15-4-2	2
Guide roll $\varnothing 20$	MIP30-15-4-3	2
Guide roll $\varnothing 15$	MIP30-15-4-4	2
Leading roll $\varnothing 30$	MIP30-15-4-5	1
Leading roll $\varnothing 25$	MIP30-15-4-6	1
Leading roll $\varnothing 20$	MIP30-15-4-7	1
Leading roll $\varnothing 15$	MIP30-15-4-8	1
Short distance piece	MIP30-8-3	3
Long distance piece	MIP30-8-4	3

Guide roll

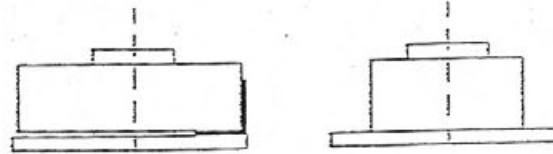
Leading roll



2. PROFILE WITH CLEAN INSIDE

MIP 30-15-5-0

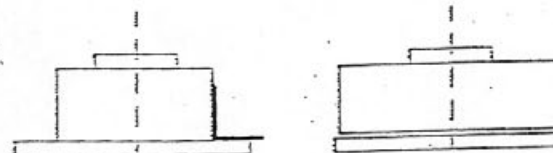
Flange $\varnothing 148 \times 13$	MIP30-15-3-1	2
Ring $\varnothing 58 \times 5$	MIP30-15-5-1	2
Ring $\varnothing 58 \times 4$	MIP30-15-5-2	2
Ring $\varnothing 58 \times 3$	MIP30-15-5-3	2
Ring $\varnothing 58 \times 2$	MIP30-15-5-4	2
Guide roll R6/R5	MIP30-15-5-5	2
Guide roll R3.5/R2.5	MIP30-15-5-6	2
Leading roll	MIP30-8-2	1
Short distance piece	MIP30-8-3	3
Long distance piece	MIP30-8-4	3



3. PROFILE WITH CLEAN OUTSIDE

MIP 30-15-6-0

Flange $\varnothing 148 \times 13$	MIP30-15-3-2	1
Clean ring $\varnothing 58 \times 5$	MIP30-15-6-1	1
Clean ring $\varnothing 58 \times 4$	MIP30-15-6-2	1
Clean ring $\varnothing 58 \times 3$	MIP30-15-6-3	1
Clean ring $\varnothing 58 \times 2$	MIP30-15-6-4	1
Leading roll R6/R5	MIP30-15-6-5	1
Leading roll R3.5/2.5	MIP30-15-6-6	1
Guide roll	MIP30-8-1	2
Short distance piece	MIP30-8-3	3
Long distance piece	MIP30-8-4	3



4. PROFILE WITH CLEAN INSIDE

MIP 30-15-7-0

Guide roll R6/R5	MIP30-15-7-1	4
Guide roll R4/R3	MIP30-15-7-2	4
Ring $\varnothing 58 \times 5$	MIP30-15-5-1	2
Ring $\varnothing 58 \times 4$	MIP30-15-5-2	2
Ring $\varnothing 58 \times 3$	MIP30-15-5-3	2
Ring $\varnothing 58 \times 2$	MIP30-15-5-4	2
Flange $\varnothing 148 \times 13$	MIP30-15-3-2	2
Leading roll 50	MIP30-15-1-8	1
Leading roll 45	MIP30-15-1-9	1
Leading roll 40	MIP30-15-1-10	1
Leading roll 35	MIP30-15-1-11	1
Leading roll 30	MIP30-15-1-12	1
Leading roll 25	MIP30-15-1-13	1



### 3. TECHNICAL CHARACTERISTICS

- Diameter of roller shaft	mm	Ø 30
- Diameter of leading roller	mm	Ø 98-148
- Speed of leading roller	rpm	5
- Electric motor		
- Voltage	V	220
- Power	kW	0.75
- Speed	rpm	1500
- Length	mm	1000
- Width	mm	620
- Height	mm	1400
- Weight	kg	220

### 4. OPERATION

The machine is provided with the tiltable bending mechanism. It works 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 way 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 directions is made using the double pedal.

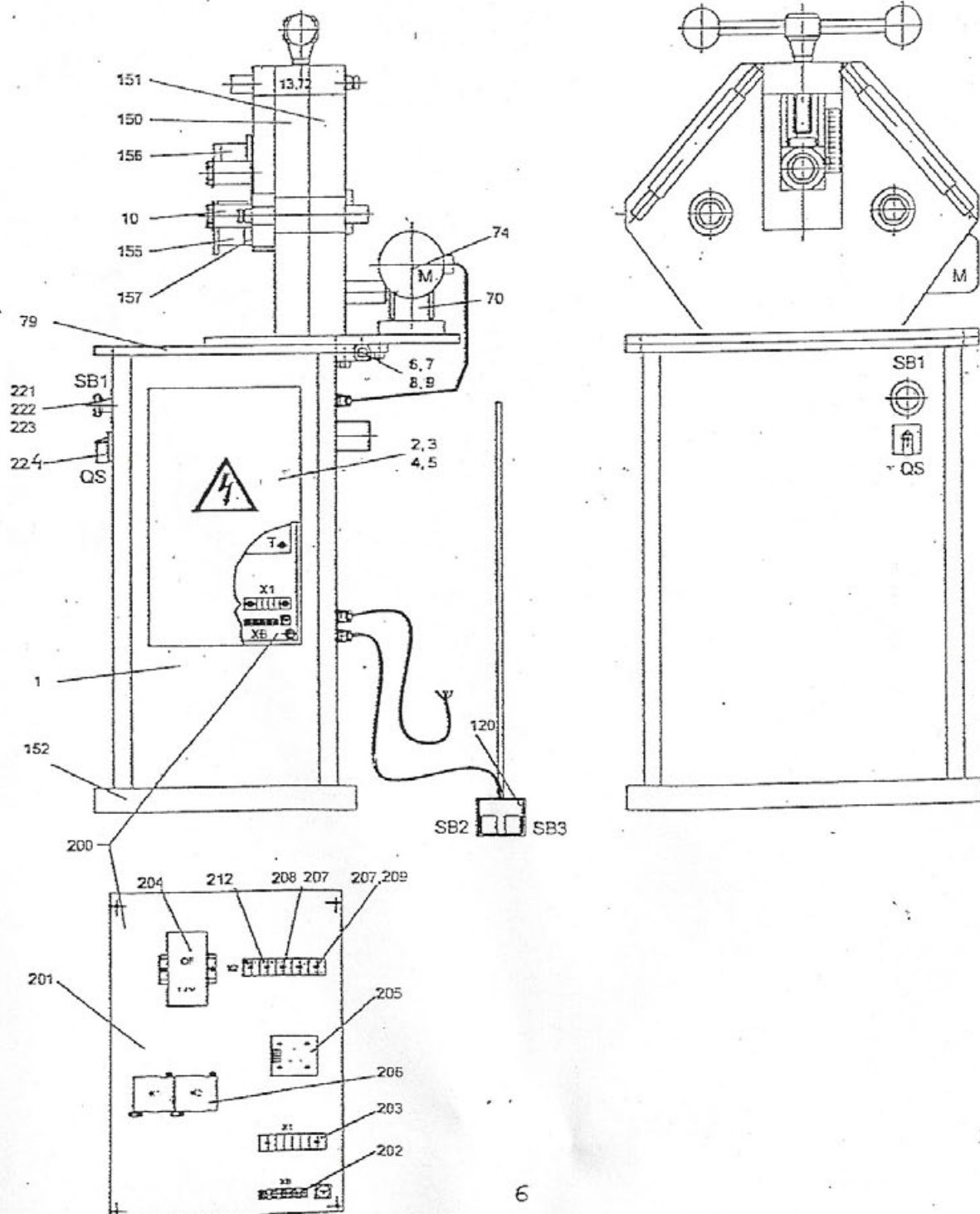
### 5. LABOUR PROTECTION RULES

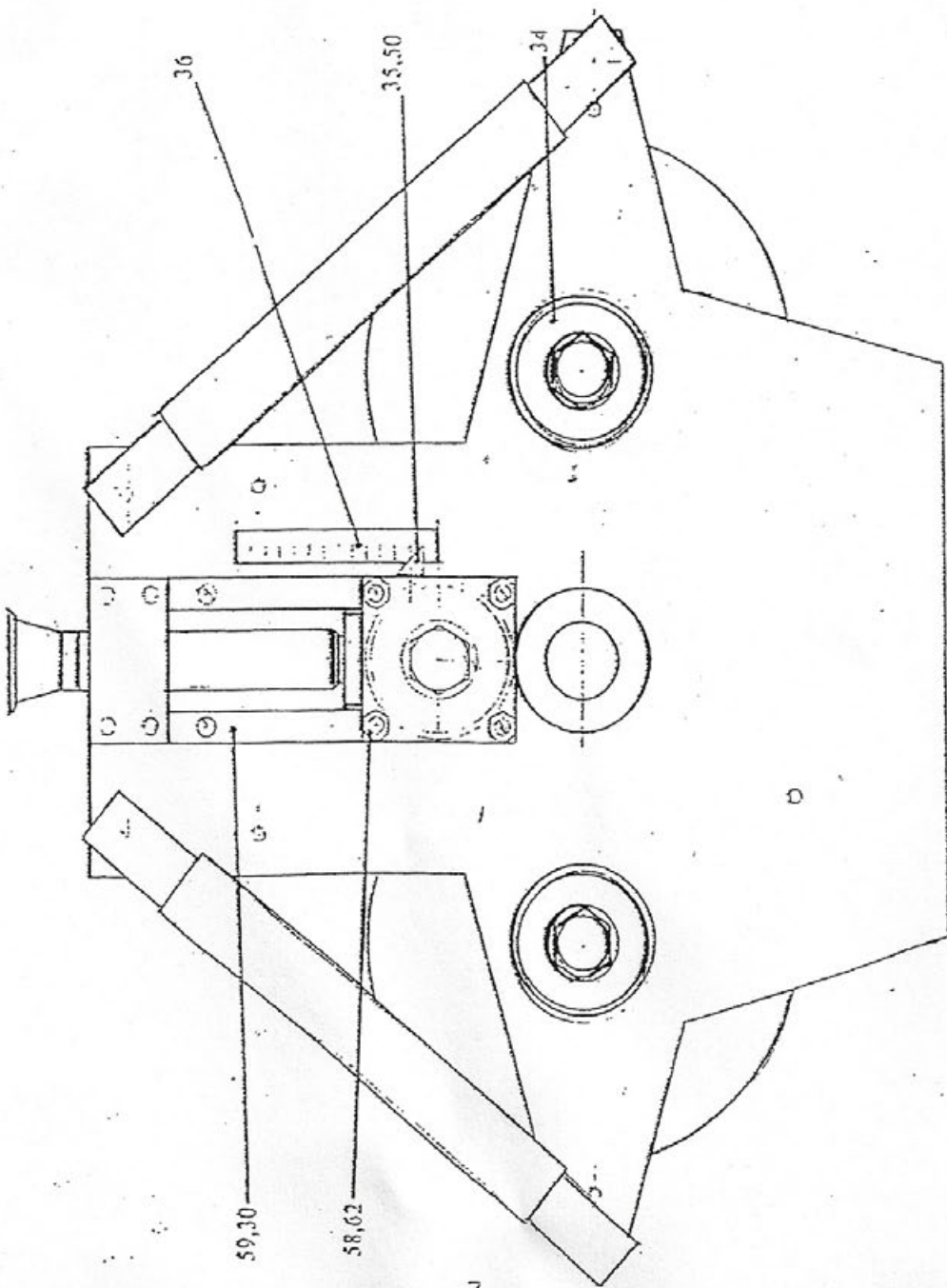
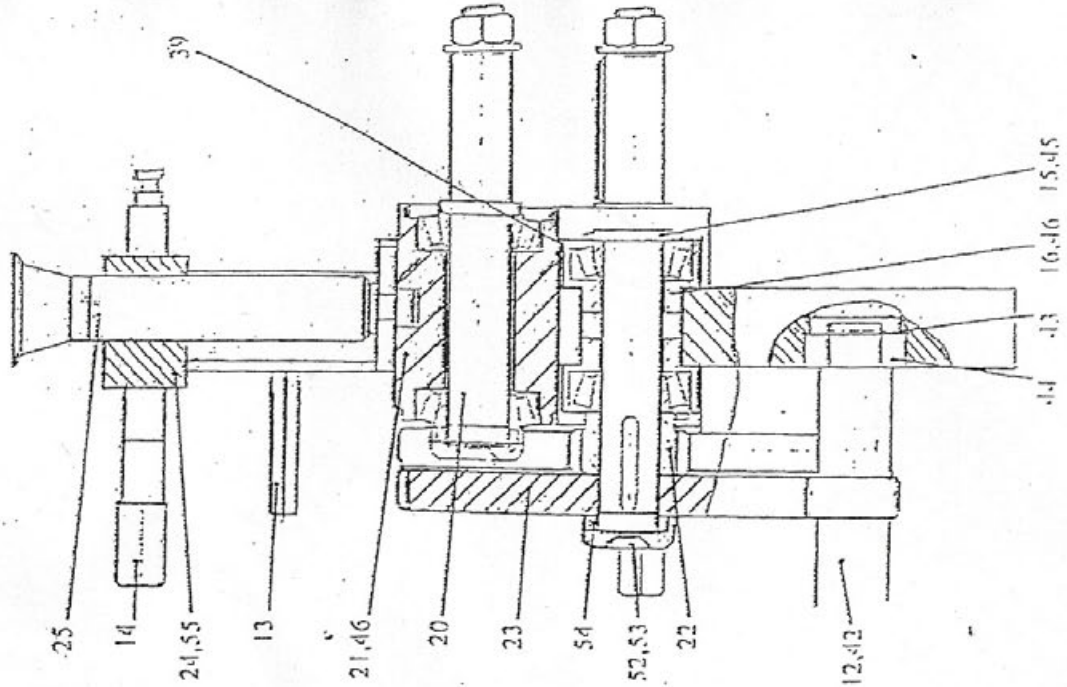
- ◆ Take the machine from the mains for any repair or intervention.
- ◆ It is forbidden to intervene to the gears during operation. They are protected by guards.
- ◆ Clothing and the tools you use for interventions have to be proper for the work you make.
- ◆ Check the fastening of the bending rollers on the shafts before starting the machine.
- ◆ Do not use pinched or cracked bending rollers.

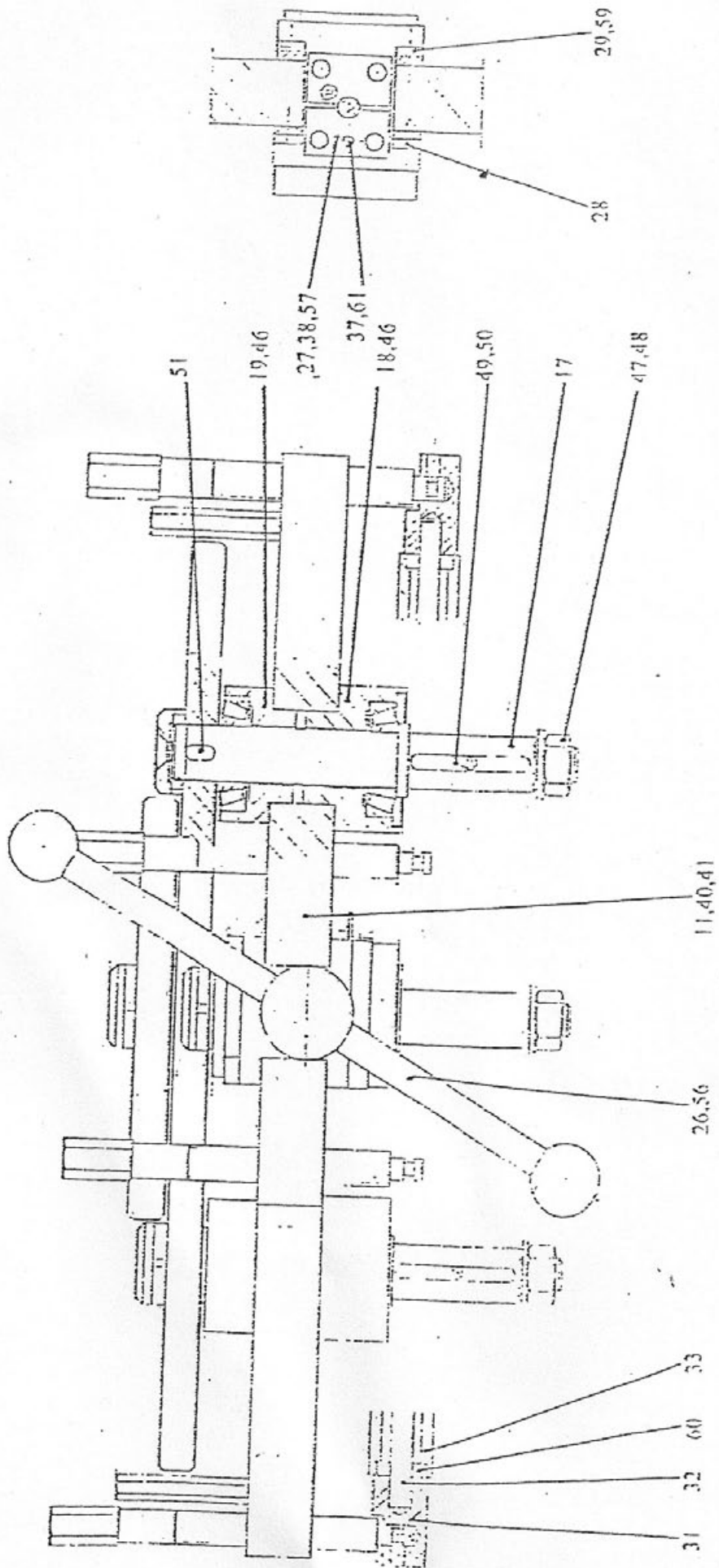
## 5. MAINTENANCE

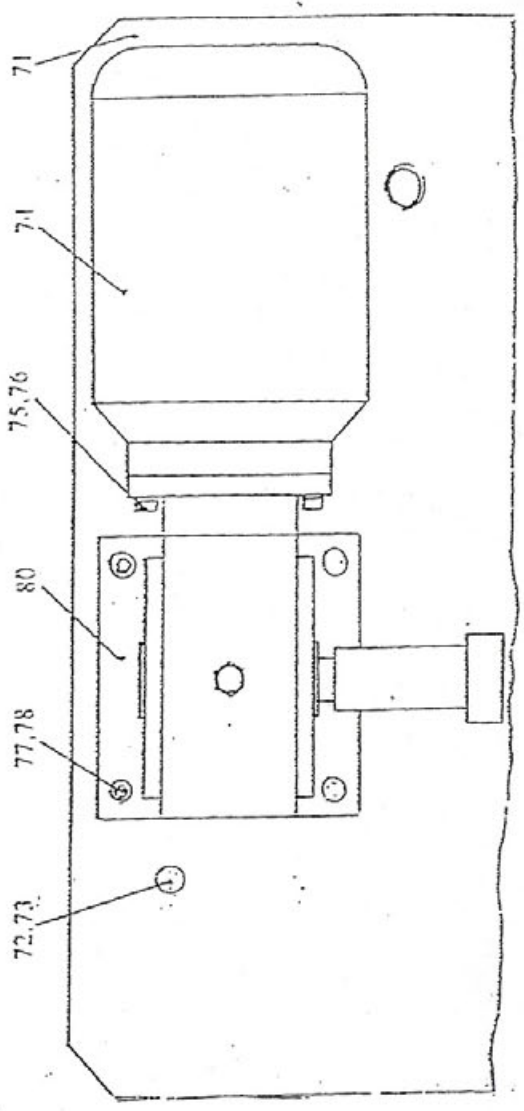
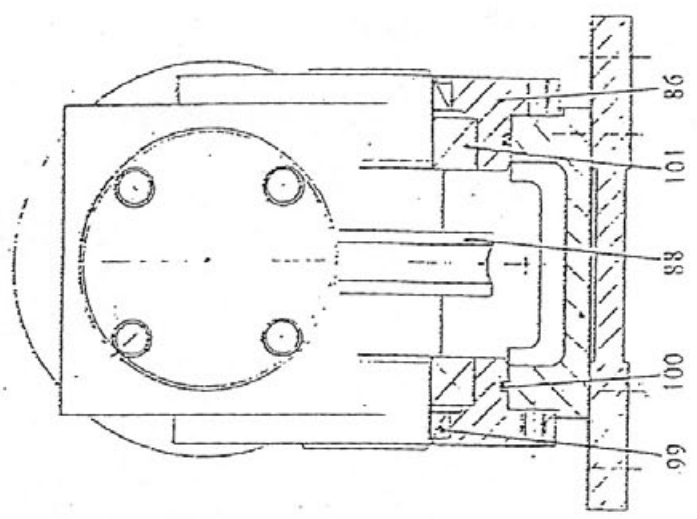
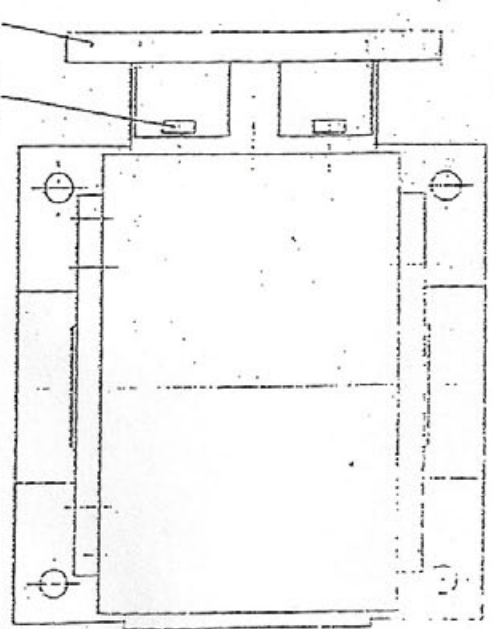
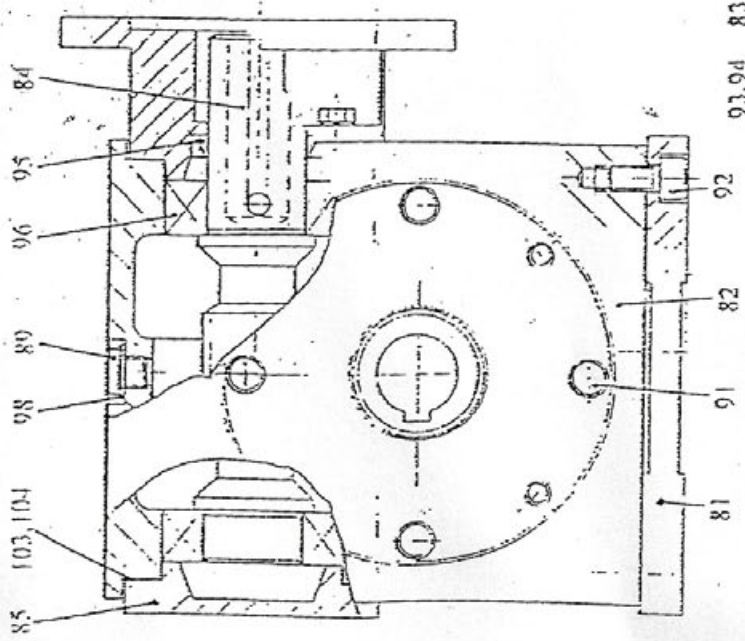
Clean, grease and make the necessary adjustments before each operation.

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

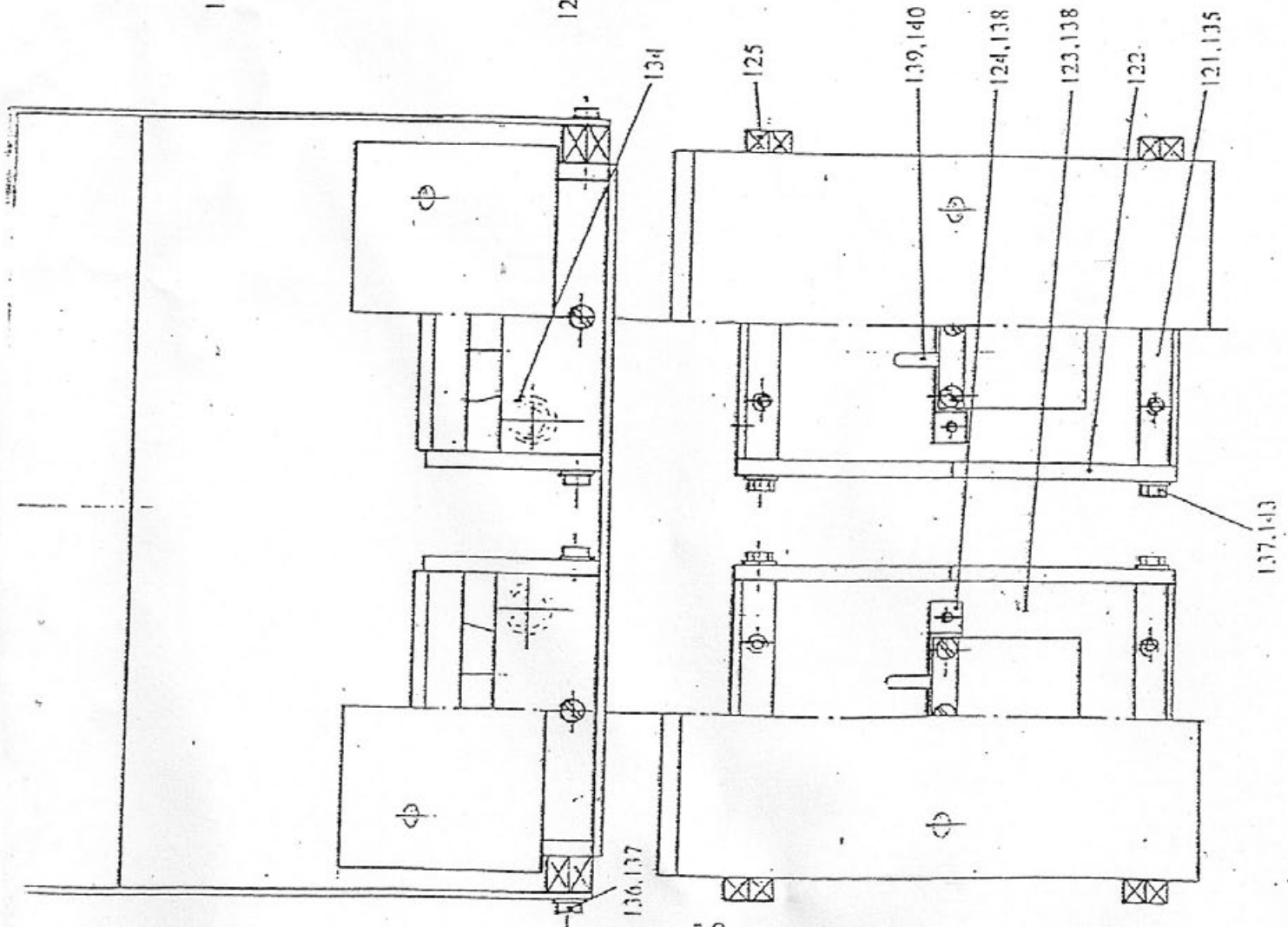
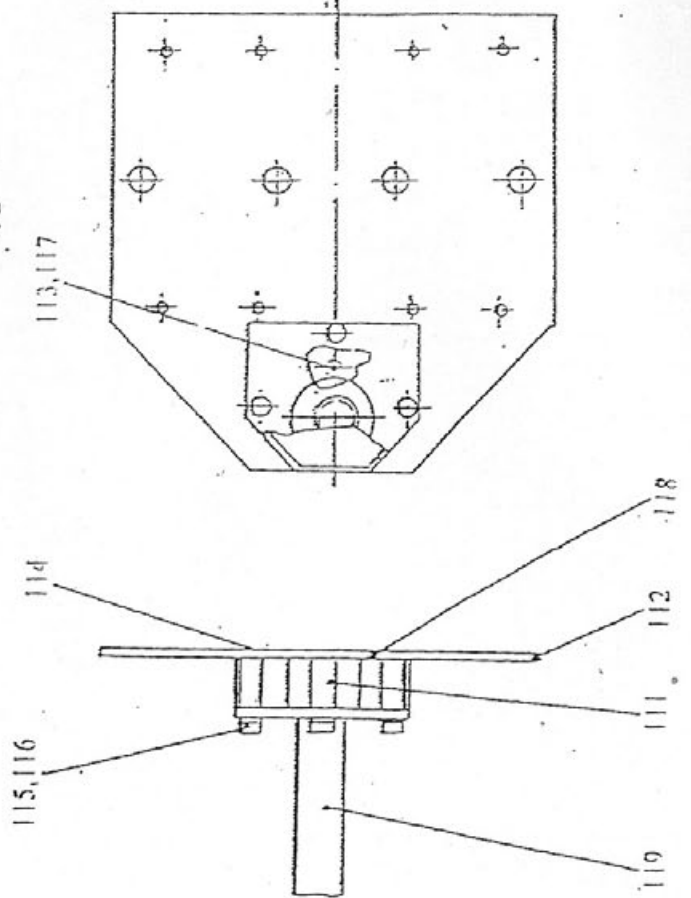
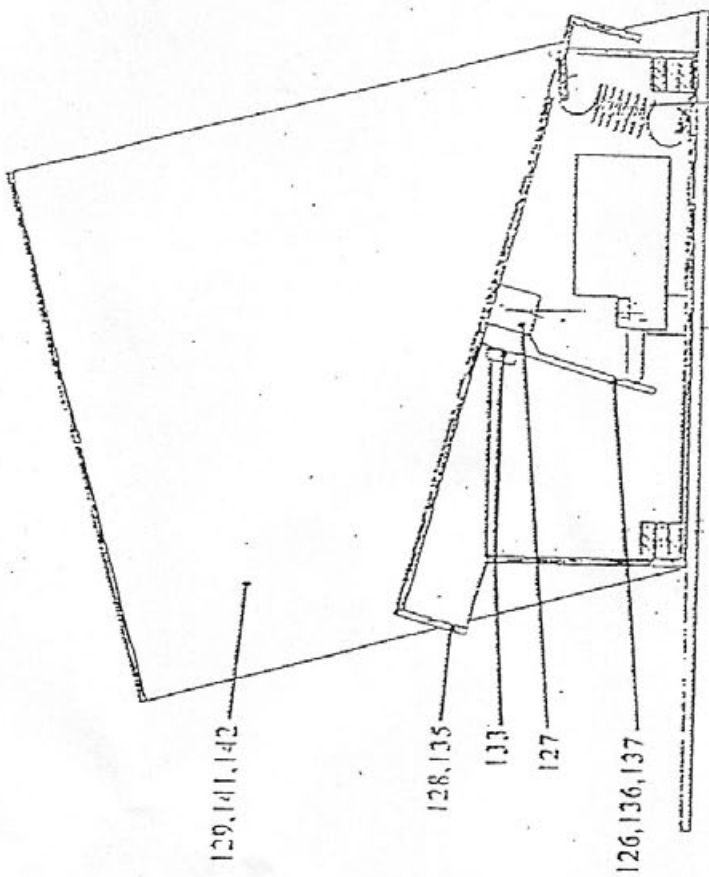












# 7. SPARE PARTS CATALOGUE

Pos	Code	Denomination	Pos	Code	Denomination
1.	21310774	Base	57.	31236074	Screw M5x14
2.	22624464	Door	58.	31123024	Nut M8
3.	22627113	Door handle	59.	31225364	Screw M5x14
4.	21142365	Ball lock	60.	23794492	Ball bearing 6001 2RS
5.	22194266	Lock key	61.	22146471	Compressing spring
6.	22637985	Spindle	62.	31524393	Threaded pin
7.	22637963	Hinge	70.	21310796	Driving mechanism
8.	22637974	Hinge	71.	22640015	Lower plate
9.	31236551	Screw	72.	31321662	Screw M10x35
10.	21310785	Bending equipment	73.	31040306	Check washer MN10
11.	22623473	Vertical support plate	74.	24031766	Three-phase electric motor
12.	22623484	Connecting arbor	75.	31321102	Screw M6x20
13.	22623495	Guard bolt	76.	31040284	Check washer MN6
14.	22623506	Threaded rod	77.	31236295	Screw M8x30
15.	22623510	Main shaft	78.	31040295	Check washer MN8
16.	22623521	Trunnion bearing	79.	22637996	Plate
17.	22623532	Driven axle	80.	21311791	Reducer RM50x12.5
18.	22623543	Front bearing	81.	22626435	Shoe
19.	22623554	Back bearing	82.	22626446	Reducer case
20.	22623565	Slideway axle	83.	22626450	Axle flange
21.	22623576	Slideway	84.	22626461	Worm shaft
22.	22623580	Central pinion	85.	22626472	Bearing cover
23.	22623591	Driven wheel	86.	22626483	Axle flange
24.	22623602	Threaded body	87.		
25.	22623613	Driving shaft	88.	21311802	Worm gear axle
26.	22623624	Handle	89.	21299644	Valve
27.	22623635	Axiale fastening plate	90.		
28.	22623646	Front slidable crosshead shoe	91.	31236133	Screw M6x14
29.	22623650	Back slidable crosshead shoe	92.	31236262	Screw M816
30.	22623661	Stationary crosshead shoe	93.	31321102	Screw M6x20
31.	22623672	Shaft end	94.	31040284	Check washer MN6
32.	22623683	Supporting shaft	95.	23620645	Sleeve A30x40x7
33.	22623694	Supporting sleeve	96.	23745024	Bearing 32006xA
34.	22623705	Bearing (guard) housing	97.	23224025	Union body M10x1
35.	22623716	Vernier	98.	25627210	Packing ring
36.	22624206	Comparing rule	99.	23621080	Sleeve
37.	22626634	Stopping bolt	100.	25602452	"O" ring
38.	13000282	Shaft fixing backing plate	101.	23716125	Bearing 6008
39.	22627920	Bearing (guard) housing	102.		
40.	31236542	Screw M12x35	103.	22627942	Gasket
41.	31040310	Check washer MN12	104.	13002835	Gasket
42.	23606715	Parallel key	110.	21311743	Pedals support
43.	31038070	Flexible ring	111.	22626273	Bolt
44.	23795575	Ball bearing 62052RS	112.	22626284	Support plate
45.	23606741	Parallel key	113.	32320783	Screw M5x8
46.	23746041	Bearing	114.	31225353	Screw M5x12
47.	31029154	Flat washer AN20	115.	31236063	Screw M5x12
48.	31107285	Nut M20x1.5	116.	31029062	Flat washer
49.	23609106	Fixing key	117.	32099071	Slot washer
50.	31231130	Screw M8x8	118.	21311754	Dividing box
51.	22626601	Parallel key	119.	21312340	Rod
52.	31309493	Screw	120.	21311776	Double pedal
53.	31055570	Washer B45x6	121.	22626310	Connecting bolt
54.	31705041	Nut KM6	122.	22626321	Lateral plate
55.	31236472	Screw M10x60			
56.	23642043	Handle N35			

Pos	Code	Denomination	Pos	Code	Denomination
123.	22626332	Base plate	152.	21316002	Base
124.	22626343	Microswitch support	155.	22626693	Guide pulley
125.	22626354	Screw	156.	22626704	Leading roller
126.	22626365	Driving plate	157.	22626715	Distance piece
127.	22626376	Pedal axle			
128.	22626380	Pedal body	200.	21085890	Plate with instruments
129.	22626391	Guard	201.	21313154	Plate for instruments
			202.	22616230	XB Null bar
132.	22626402	Traction spring	203.	24161141	X1 Multi-pole clamp
133.	31040273	Check washer N5	204.	26030281	QF Circuit breaker
134.	24015025	Traction ring	205.	26067156	T Transformer
135.	31225353	Screw M5x12	206.	26030421	K1;K2 Contactor
136.	31231351	Screw M5x14	207.	26030093	F1,F2,F3 Fuse base
137.	31029062	Washer AN5	208.	26030104	F1,F2 Fuse link
138.	31225246	Screw M4x10	209.	26030115	F3 Fuse link
139.	24162526	Microswitch			
140.	31231270	Screw M4x16	212.	24161104	X2 Multi-pole clamp
141.	31231233	Screw M4x8			
142.	31029051	Washer AN4	221.	26030023	SB1 Mushroom push-Support
143.	31320811	Screw M5x14	222.	26030056	Contact block INC
150.	21313961	Front guard	223.	26030060	OFF-ON Cam switch
151.	21313972	Back guard	224.	26030561	

## 8. DIRECTIONS FOR OPERATION, USE AND MAINTENANCE OF ELECTRIC INSTALLATION

### 8.1. Technical conditions

8.1.1. Supply with electrical power is made according to EN 60204-1, § 4.3.

The machine is wired up to a three-phase supply network: 3~60Hz; 220V; equipped with working null (N) and earthing (PE).

The feed circuit will be protected against shortcircuit and amperrages exceeding the permitted values.

8.1.2. Electric installation is made under IP44 protection degree.

8.1.3. Electric installation works under the following conditions :

- maximum altitude 1000 mm
- environment temperature  $-5^{\circ}\text{C}$  up to  $+40^{\circ}\text{C}$
- relative humidity of environment 40% up to 80% at  $25^{\circ}\text{C}$

8.1.4. Electric installation works normally at:

- voltage between ( 0.9 - 1.1 )  $U_n$
- frequency between ( 0.99 - 1.01 )  $F_n$

8.1.5. Voltage for control circuit: 24V/60Hz

8.1.6. Maximum power input in the supply network  $P_a = 1.06$  kW

### 8.2. The main parts of the electric installation :

- instruments plate MIP 30-9.1-0 - for control and driving
- three-phase induction motor M1 for machine driving.
- pedal MIP 30-7-0 (with microswitch SB1, SB2) - for START / STOP control

### 8.2.1. Instruments specification and their part inside the electric installation

SYMB	POS.	DENOMINATION	TYPE (COD.)	FEATURES	PART INSIDE EL. INST.
F1:F2	207 208	Fuse base Fuse link 0,2A	code BM 972 CS code 533432	250V / 10A $I_r=0,2A$	Protection of electric motor supply circuit
F3	207 209	Fuse base Fuse link 0,25A	code BM 972 CS code 533246	250V / 10A $I_r=0,25A$	Protection of transformer primary circuit
QF	204	Circuit breaker	code GV2-ME 07	$I_s=1,6-2,5A$ ; $I_r=2,3A$	Protection against overload of M motor
K1, K2	206	Contacteur	B6-30-10	$P=4Kw$ ; $U_c=24V-60Hz$	Driving of M motor
M	74	Three-phase induction motor	Type: MA - AL19F100-4A	3-60Hz, 220V; 0,75kW; 1500rpm	Rollers driving
QS	224	OF-ON Cam switch	Type: KKVO-20-9022	220V/2,2kW; $I_{th}=10A$	Closing / opening of supply circuit
SB1	221 222 223	- Mushroom push- button - Support - Contact block: 1Ø	-PTZ-4-RT -KBH 3 -SEF-01	240V / 6A	Emergency stop
SB2	139	Microswitch	Code 7400	$U_n=250V$ $I_n=10A$	M start control sense to the right
SB3	139	Microswitch	Code 7400	$U_n=250V$ $I_n=10A$	M start control sense to the left
T	205	Transformer	TNC 30A	30VA/220V/24V	Supply, 24 V, of control circuit
X1	203	Multi-pole clamp	AC1-5	8 Poles; 2,5mm <sup>2</sup> ; 220V/10A	For electric connections
X2	212	Multi-pole clamp	AC1-5	4 Poles; 2,5mm <sup>2</sup> ; 220V/10A	For electric connections
XB	202	Null bar	SAR-34.1-3	for 5 connections	Connections for earth circuit

### 8.3. Operation instructions

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

- 8.3.1. 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  $< 0.4\Omega$ .
- 8.3.2. Check condition of electric instruments, junction wires, cables and electrical connections.
- 8.3.3. 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); or equip the power unit with an automatic switch 3P + N with  $I_r = 2.5A$ .
- 8.3.4. Check if machine is correctly supplied after it is connected to the mains.
- 8.3.5. 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.
- 8.3.6. 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.

8.3.7. Start the machine under load and repeat all checkings from 8.2.6.

#### 8.4. Operation of electric equipment

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

- the QS 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 SB2 microswitch making its contact; it controls connection of K1 contactor which supplies the M motor. The motor starts with the sense of rotation to the right.

Push the pedal L.H. for starting with the sense of direction to the left. The pedal acts the SB3 microswitch making its contact; it controls connection of K2 contactor which supplies the M motor. The motor starts with the sense of rotation to the left.

When the pedal is not pushed, the contact of the microswitch (SB2 or SB3) opens, the contactor (K1 or K2) turns off and the M motor stops.

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

Machine is equipped with SB1 stop button, which can be used for emergency situation or when repairs, adjustments etc. take place. After the SB1 stop button was pushed, it is necessary to pull it out when you want to restart the machine, because it is a retaining button and stays pushed.

#### 8.5. Maintenance and repair of electric installation

##### 8.5.1. Trouble and remedies

8.5.1.1. In case all those indicated at the previous chapters were respected and machine does not start when pressing one of the pedals and K contactor (K1 or K2) does not connect, make the following operations:

- a. Check if machine is correctly supplied: 3 ~ 60Hz; 220V.
- 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 fusibles: F2 in transformer primary circuit and F3 in the control circuit.  
In case one of the fuses 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 T transformer for 24 V supply voltage of control circuit is in order:
    - check if T transformer is fed correctly in primary with a 220 V voltage ;
    - check if in secondary the transformer supplies the 24 V voltage ;
  - e. Check if the control circuit has continuity:
    - screws for connections to be well tighten.
    - contacts of instruments (SB1, SB2, SB3, FR) in the control circuit to close correctly.
  - f. Check if K contactor is in order.
- 8.5.1.2. If pressing the pedal contactor makes connection, but the M electric motor does not start, there could be two situations.
- a. If M motor is correctly fed from 3 ~ 60 Hz, 220 V 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 3~60Hz; 220V voltage, check motor force circuit :
    - check the F1 fusibles in the motor force circuit. In case one of the fusibles is broken make the necessary repairs and change the replacing element.

**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 (multimeter ) which measures :  
V, A,  $\Omega$ .

## 8.5.2. Maintenance operations

### 8.5.2.1. Weekly checking:

- make visual checking of electric apparatus condition and in case they are damaged will be replaced with others at the same parameters;
- tighten the screws of electric connections and the holding screws of electric apparatus;
- check condition of feeder cable, jack and connecting 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 apparatus and connecting elements. Cleaning can be made with an air jet of maximum 2 atm. or with a brush.

## 8.6. Labour 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 or 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.

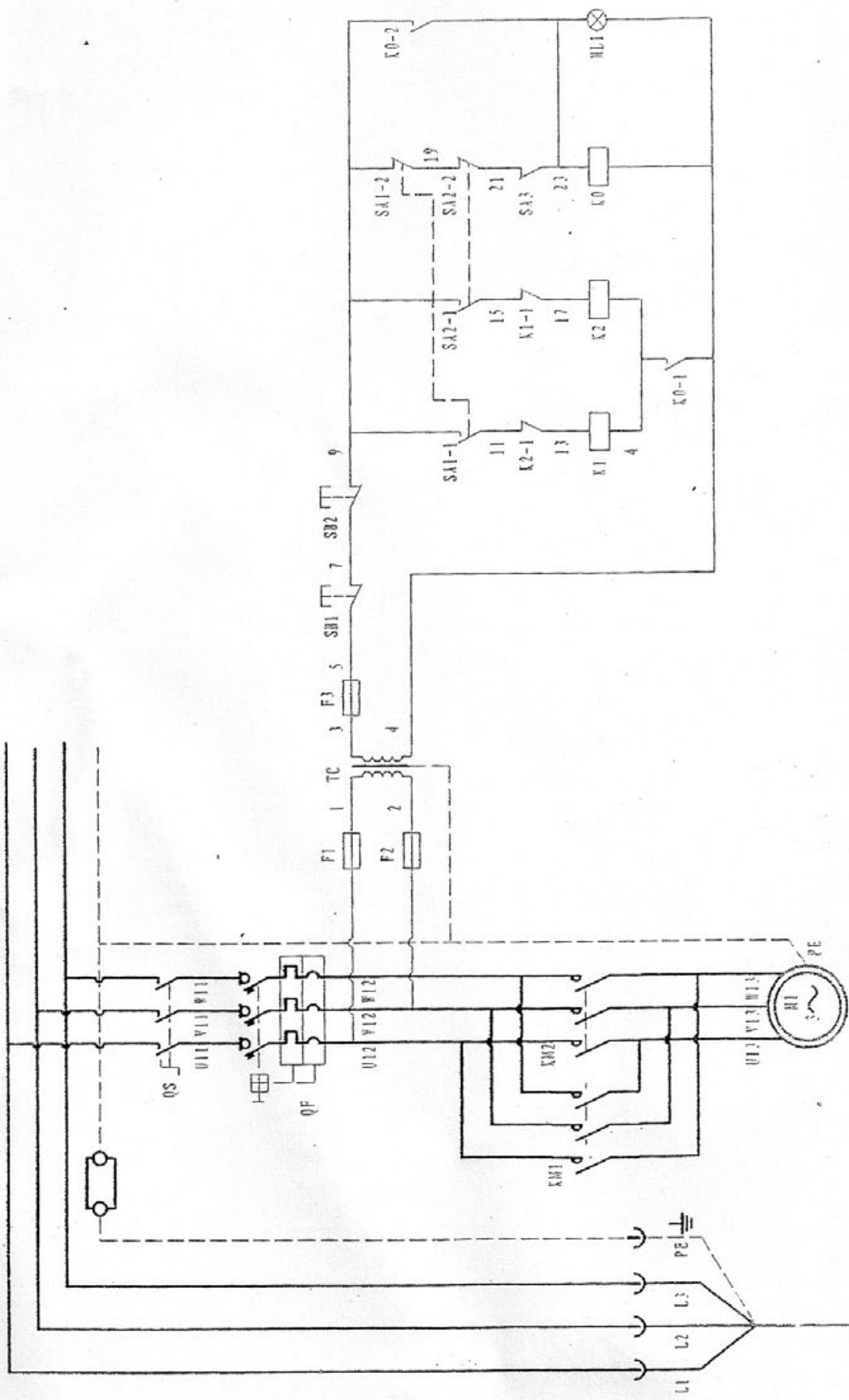
*It is forbidden any modification, of the electric installation if it is not certificated by the manufacturer. It could be dangerous.*

- 8.6.1. 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 EN 60204 § 6.2.1.
  - b. All active metallic parts are insulated against inactive metallic parts which the people could come in touch with, according to EN 60204 § 6.2.2.
  - c. External connecting elements, which the people could come in touch with have the active parts entirely insulated, according to EN 60204, § 6.2.2.
  - d. Galvanic separation of control circuit by transformer, according to EN 60204 § 6.3.3.
  - e. Use of reduced voltage (PELV) of 24V for supply of control circuit, according to EN 60204 § 6.4.
  - f. In order to avoid undesired acting owing to insulation damage, broaking or detaching of conections of conductors in the control circuit, a branch of this circuit is connected to the protection circuit, according to EN 60204 § 8.4.
  - g. All inactive metallic parts of machine are earthed according EN 60204-1 § 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.

*Earthing 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 earthing 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.



3-60Hz 220V  
M. 25A3 1500r/min

220V  
3-60Hz+PE