



# DIGITAL BENDING MACHINE

## BM-70A

### INSTRUCTION MANUAL



 **WARNING!**

Read and understand all instructions and responsibilities before operating. Failure to follow safety instructions and labels could result in serious injury.

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## **DAKE STANDARD LIMITED WARRANTY**

### **Finished Machines**

Dake warrants to the original purchaser the finished machine manufactured or distributed by it to be free from defects in material and workmanship under normal use and service within 1 year (12 months) from the delivery date to the end user.

### **Parts**

Dake warrants to the original purchaser the component part manufactured or distributed by it to be free from defects in material and workmanship under normal use and service within 30 days from the delivery date to the end user. The standard limited warranty includes the replacement of the defective component part at no cost to the end user.

### **Sale of Service (Repairs)**

Dake warrants to the original purchaser the component part repaired by Dake Corporation at the manufacturing facility to be free from defects in material and workmanship under normal use and service within 90 days from the return date to the end user, as it pertains to the repair work completed. The standard limited warranty includes repair of the defective component part, at no cost to the end user.

### **Warranty Process**

Subject to the conditions hereinafter set forth, the manufacturer will repair or replace any portion of the product that proves defective in materials or workmanship. The manufacturer retains the sole right and option, after inspection, to determine whether to repair or replace defective equipment, parts or components. The manufacturer will assume ownership of any defective parts replaced under this warranty.

All requested warranty claims must be communicated to the distributor or representative responsible for the sale. Once communication has been initiated, the Warranty Representative at Dake Customer Service must be contacted for approval:

Phone: (800) 937-3253

Email: [customerservice@dakecorp.com](mailto:customerservice@dakecorp.com)

When contacting Dake, please have the following information readily available: - Model # - Serial # - Sales Order #

Purchasers who notify Dake within the warranty period will be issued a Case number and/or a Return Material Authorization (RMA) number. If the item is to be returned per Dake's request, the RMA number must be clearly written on the exterior packaging. Any item shipped to Dake without an RMA will not be processed.

**Warranty Exceptions:**

The following conditions are not applicable to the standard limited warranty:

- a. Part installation or machine service was not completed by a certified professional, and is not in accordance with applicable local codes, ordinances and good trade practices.
- b. Defects or malfunctions resulting from improper installation or failure to operate or maintain the unit in accordance with the printed instructions provided.
- c. Defects or malfunctions resulting from abuse, accident, neglect or damage outside of prepaid freight terms.
- d. Normal maintenance service or preventative maintenance, and the parts used in connection with such service.
- e. Units and parts which have been altered or repaired, other than by the manufacturer specifically authorized by the manufacturer.
- f. Alterations made to the machine that were not previously approved by the manufacturer, or that are used for purposes other than the original design of the machine.

## RETURN & REFUND POLICY

Thank you for purchasing from Dake! If you are not entirely satisfied with your purchase, we are here to help.

### **Returns**

All Dake manufactured / distributed machines and parts include a 30-day return option. These policies are valid from the date of final shipment to the end user.

To be eligible for a return, the item must be unused and in the same condition as received.

All requested warranty claims must be communicated to the distributor or representative responsible for the sale. Once communication has been initiated, Dake Customer Service must be contacted for approval by the distributor or representative: Phone: (800) 937-3253 Email: [customerservice@dakecorp.com](mailto:customerservice@dakecorp.com)

Once the return request has been approved by Customer Service, a representative will supply a Return Material Authorization (RMA) number. The returned item must have the provided RMA number clearly marked on the outside packaging. Any item received without an RMA number clearly visible on the packaging will not be processed. An RMA number can only be provided by the Dake Customer Service team and must be obtained prior to the return shipment.

The item must be shipped and received back to Dake within 30 days from being issued the RMA number, or the return will be void and nonreturnable.

### **Refunds**

Once the item has been received and inspected for damages, a representative will notify the requestor referencing the provided RMA number.

If the return is approved, a refund will be issued to the original method of payment, less a 20% restocking fee. The restocking fee may be waived if an order is placed at the time of return with like-value merchandise.

Transportation costs are the responsibility of the end user and will not be credited upon return approval.

Any item that is returned after the initial 30 days or has excessive/obvious use will not be considered for a full refund.

## DAKE STANDARD TERMS & CONDITIONS OF SALE

All proposals and quotations for the original sale of our products are subject to the following terms and conditions:

**ACCEPTANCE OF ORDER:** All orders are subject to acceptance by Dake at its main office in Grand Haven, Michigan.

**APPLICABLE LAWS:** This quotation or acceptance shall be governed in all respects by the laws of the State of Michigan.

**CANCELLATION:** We reserve the right to cancel and/or refuse to complete your order if, in our opinion, you have not established credit to promptly meet the payment terms of your order. Any cancellation from the Purchaser may be subject to a 10% cancellation fee for any of our standard machinery and/or component parts upon the discretion of Dake. All non-standard or special quotes will not be eligible for cancellation, nor returns.

**DELIVERY:** The proposed shipment date is an estimate and is contingent upon causes beyond Dake's control. Under no circumstances shall Dake have any liability for loss of use or for any direct or consequential damages resulting from delay. All shipments from the Dake facilities are F.O.B.

**FREIGHT CLAIM:** Lost or damage freight claims must be submitted to Dake within thirty (30) days of shipment from Dake's facility. If shipment for order was set up by the Purchaser, Dake is not liable to handle the freight claims.

**PERMITS AND COMPLIANCE:** Dake shall not be responsible for obtaining any permits, inspections, certifications, or licenses required for the installation or use of the equipment. Dake makes no promise or representation that the equipment or any services to be furnished by Dake will conform to any federal, state, or local laws, ordinances, regulations, codes or standards.

**PRICES:** Unless otherwise agreed to in writing, all prices are F.O.B. from our plants in Grand Haven, Michigan, Grand Prairie, Texas, and Riverside, CA. In any event, the quoted prices for component parts become invalid ten (10) days after date of quotation, and machinery may become invalid sixty (60) days after date of quotation. Unless otherwise specified in Dake's quotation, installation services and final on-site adjustments are not included in the quotation.

**TAXES:** Prices do not include taxes. If any sales, use or similar tax is payable to Dake in connection with any transaction or part thereof between the Purchaser and Dake with respect to goods delivered, the Purchaser will, upon demand, pay to Dake the amount of any such tax. If you are tax exempt, please include your exemption document when submitting your order.

**TERMS OF PAYMENT:** Terms of payment are as stated in Dake's quotation subject to credit approval by our home office. Dake will invoice Purchaser when the equipment is completed and ready for shipment. Payment terms run from invoice date. Purchaser may be required to issue a down payment before production of order, at the discretion of Dake Accounting. For credit card purchases, a 2% processing fee may be applicable to the order. The following states are exempt from the 2% processing fee: CA, CO, KS, OK, TX, FL, NY, CT, MA, and ME.

**WARRANTY:** If, within a period of one (1) year from date of shipment of the original order, any part of any equipment sold by Dake is defective in material or workmanship and is so found after inspection by Dake, it will be replaced or repaired at the option of Dake, providing the equipment has been given normal and proper usage and is still the property of the original Purchaser. Purchased components such as Micro Drop mist system or the like, installed as a part of Dake equipment are warranted only to the extent of the original Manufacturer's warranty. Dake is not responsible for any service work performed unless authorized in advance.

**THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER WRITTEN, ORAL, OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE). UNDER NO CIRCUMSTANCES SHALL DAKE BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

## SAFETY



### **WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY**

This machine was designed for certain applications only. We strongly recommend that this machine NOT be modified and/or used for any application other than for which it was designed.

#### **USER SAFETY:**

- **WEAR PROPER APPAREL.** No loose clothing, gloves, rings, bracelets, or other jewelry to get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
- **ALWAYS WEAR EYE PROTECTION.** Refer to ANSLZ87.1 standard for appropriate recommendations.
- **DON'T OVERREACH.** Keep proper footing and balance at all times.
- **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped.
- **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Don't leave tool until it comes to a complete stop.
- **DRUGS, ALCOHOL, MEDICATION.** Do not operate tool while under the influence of drug, alcohol or any medication.
- **MAKE SURE TOOL IS DISCONNECTED FROM POWER SUPPLY.** While motor is being mounted, connected or reconnected.
- **STOP** the machine before removing chips.
- **SHUT- OFF** power and clean the bending machine and work area before leaving the machine.

#### **USE OF MACHINE SAFETY:**

- **REMOVE ADJUSTING KEYS AND WRENCHES.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it "on".
- **DON'T FORCE TOOL.** It will do the job better and be safer at the rate for which it was designed.
- **USE RIGHT TOOL.** Don't force tool or attachment to do a job for which it was not designed.
- **SECURE WORK.** Use clamps or a vise to hold work when practical. It's safer than using your hand frees both hands to operate tool.
- **MAINTAIN TOOLS IN TOP CONDITION.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
- **USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause hazards.
- **AVOID ACCIDENTAL STARTING.** Make sure switch is in "OFF" position before plugging in power cord.
- **GROUND ALL TOOLS.** If tool is equipped with three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter plug must be attached to a known ground. Never remove the third prong.

## ADJUSTMENT SAFETY

Make all adjustments with the power off. To learn how to make precise adjustments, the user should read the detailed instruction in this manual.

## WORKING ENVIRONMENT SAFETY

**KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.

**DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use power tools in damp or wet locations or expose them to rain. Keep work area well-lighted.

When you operate machine, please pay attention to suitable environment, keep away from too much dust, cotton fiber, prevent static electricity and interference

**DON'T install & use this machine in explosive, dangerous environment.**

Motor must be used in low-dust environment, to prevent the spark and cause explosion while motor is start.

### MAINTENANCE:

**DISCONNECT** machine from power source when making repairs.

**CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to ensure that it will operate properly and perform its intended function check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

**TO PREVENT** corrosion of machined surfaces when a soluble one is used as coolant, pay particular attention to wiping dry the surfaces where fluid accumulates and does not evaporate quickly, such as between the machine bed and vise.

### NOISE:

A weighted sound pressure level : 80 dB. measured from 1 meter distance, and 1.6 m from the ground

## INFORMATION ON DANGERS

- During the quick-approach of the guide support, verify that the lever is locked.
- Verify that the pin for the guide (or of the roller) is fitted and the support hook is tight.
- For thick-pipes, at the end of the bend cycle, the machine maintains a certain potential energy.
- Mobile parts of the machine can be dangerous for the hands of the worker. **Do not modify the two hand button operation system.**
- Verify that cable is not damaged.
- Do not use the machine in presence of high humidity.
- The machine must be repaired exclusively by qualified and trained staff.



## SPECIFICATIONS

<b>Model</b>	BM-70A
<b>Motor</b>	1.5/2.2HP (3-Phase 2/4P 3500RPM/1740RPM)
<b>Max. Tube Diameter</b>	2" (3.5mm)
<b>Angle</b>	0-180°
<b>Bending Radius</b>	60MM 100MM 125MM 152MM
<b>Max No. of Programs</b>	50
<b>Max Angles on Program</b>	9 angles
<b>Machine Dimensions (L x W x H)</b>	32" x 20-1/4" x 43-1/2"
<b>Weight</b>	462 lbs.

In the space provided record the serial number and model number of the machine. If contacting DAKE this information must be provided to assist in identifying the specific machine.

<b>Serial No.</b>	
<b>Model No.</b>	962101
<b>Install Date</b>	

## FUNCTIONAL DESCRIPTION

The BM70A electric benders are suitable to bend metal pipes with bending angles from 0° to 180° there are made with a reduction gearbox driven by electric motor with outlet shaft on which bending formers are mounted (one for each tube outside diameter) and of a quick positioning device suitable to position the counterforce to tighten and compress the pipe against the former.

## TRANSPORT & INSTALLATION OF MACHINE

### UNPACKING

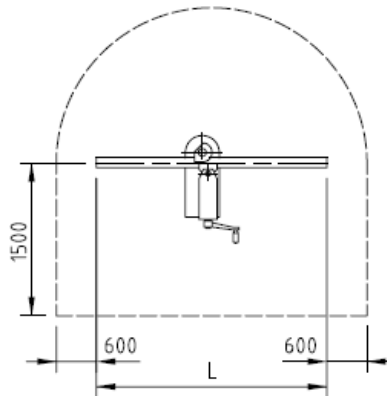
- The machine must be placed in a covered dry area, it is recommended to keep machine inside of package until product is ready for use.
- The machine must be kept in vertical position, as pointed out on packaging.
- Transportation to desired location before unpacking, please use lifting jack.
- Transportation after unpacking, please use heavy duty fiber belt to lift machine.



**ALWAYS KEEP PROPER FOOTING & BALANCE WHILE MOVING THIS MACHINE.**

### SPACE REQUIREMENTS

- The required area and the safety space of the machine are represented in the drawing below.
- Furthermore it's necessary to foresee a deposit area for piping to be bent and unloaded.



L = MAX. LENGTH OF THE PIPE IN THE MOST CUMBERSOME POSITION

### INSTALLATION

- After the machine has been unpacked it can be now placed on a flat surface with or without the stand and the universal base.
- Remove the lifting eyebolt from the top casting of the machine after the installation.
  - Make sure the load of the machine is in the center when using lifting eye.
- The lifting eyebolt must be removed after its installation before operating because it hinders the working space on the machine.

## **ELECTRIC CONNECTION**

- Install motor on the BM70A , 1.5 / 2.2 HP
- The main power supply is reported on the embossed plate on the machine.
- The outlet cable type SG3 X 1.5 is provided with a die-casting pin.
- Before connecting the plug, verify that the power outlet corresponds to the same voltage of the machine.
- Refer to the electrical wiring diagram supplied with your machine for instructions on how to connect machine to power source.

## **CLEANING & LUBRICATING**

Your machine has been coated with a heavy grease to protect it in shipping. This coating should be completely removed before operating the machine. Commercial degreaser, kerosene or similar solvent may be used to remove the grease from the machine.

\* After cleaning, coat all bright work with a light lubricant.

By operating the motor, the special former mounted on the outlet shaft makes the programmed rotation which corresponds to the required bending angle of the pipe.

## **STRUCTURE**

- \* Fusion reduction gear boxes contain a gear reduction ratio of about 654:1
- \* Asynchronous induction motor 220/380v, 50/60Hz. Input
- \* Metric holder shaft outlet.
- \* Quick-positioning device: used for bending without mandrel to make the counter former or guide for rolls, lock and unlock quicker.

## ACCESSORIES

### FORMER OR BENDING DIE +RING

Former in aluminum or in cast-iron complete with ring for bending without mandrel with standard radii (3 or 4 x O.D.).

Each former is marked:

- \* External diameter of the pipe in mm/inches/GAS inches.
- \* Centre line bending radius in mm.



### COUNTER-FORMER

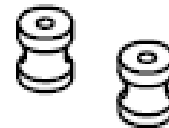
Used for bending thin-wall pipes.

Each counter former is marked with pipes diameter in mm/inches/GAS inches.



### PAIR OF ROLLERS

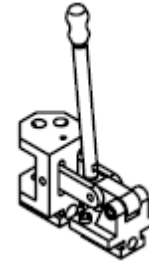
A pair of rollers is used together with the special guide for rollers (two for each diameter).



### 7-4 QUICK COUNTER-FORMER POSITIONING DEVICE

Quick counter former positioning device:

Used to make the counter former or roller lock and unlock faster.



## BENDING CAPACITY

The equipment must be used according to the specifications described in the following tables:

- \* **8-1 second** pipes with dimensions in mm
- \* **8-1 third** pipes with dimensions in inches
- \* **8-1 fourth** pipes with dimensions in GAS inches
- \* **8-1 fifth** pipes with small radii without mandrel
- \* **8-1 sixth** pipes for bending with mandrel











### IMPORTANT

The dies for pipes with diameter >44mm (1.73") which are indicated in the tables 8-1 Second ,8-1 third,8-1 fourth must be used on BM70A with equipped outlet shaft Ø 42mm (1.65").

Example: STAINLESS steel pipe with maximum diameter 48mm. (48-15) = 33mm. the tie-rod must be used from diameter 33mm up to diameter 48mm.

<b>BENDING CAPACITY BM70A</b>		
	<b>WITHOUT MANDREL</b>	
<b>TYPE OF PIPE</b>	<b>Φ &lt; / = mm</b>	<b>Thickness &lt; / = mm</b>
Hard and soft copper pipe, annealed brass pipes.	64	4
Electrical conduit	60	2
Stainless steel AISI 304/316	60	3
Hydraulic steel pipe ST. 35,4 for hydraulic plants	60	4
Furniture tube	60	3
PE Boiler pipes	60	4
Aluminum pipes	60	8
Gas pipes UNI 5745	2"	standard
Square pipe	-	-
Standard centerline bending radius	3 to 4 times Φ	






**TABLE 8-1 Second**

 mm R		 mm Min. Max.			 mm Min. Max.			 mm R		 mm Min. Max.			 mm Min. Max.		
<b>6</b>	30	1	2	/	2.5	>2.5	/	<b>8</b>	30	1	2	/	2.5	>2.5	/
<b>10</b>	30	1	2	/	2.5	>2.5	/	<b>10</b>	40	1	2	/	2.5	>2.5	/
<b>12</b>	36	1	2	/	2.5	>2.5	/	<b>12</b>	48	1	2	/	2.5	>2.5	/
<b>14</b>	42	1	2	/	2.5	>2.5	/	<b>14</b>	56	1	2	/	2.5	>2.5	/
<b>15</b>	45	1	2	/	2.5	>2.5	/	<b>15</b>	60	1	2	/	2.5	>2.5	/
<b>16</b>	48	1	2	/	2.5	>2.5	/	<b>16</b>	64	1	2	/	2.5	>2.5	/
<b>17</b>	51	1	2	/	2.5	>2.5	/	<b>17</b>	68	1	2	/	2.5	>2.5	/
<b>18</b>	54	1	2	/	2.5	>2.5	/	<b>18</b>	72	1	2	/	2.5	>2.5	/
<b>19</b>	57	1	2	/	2.5	>2.5	/	<b>19</b>	76	1	2	/	2.5	>2.5	/
<b>20</b>	60	1	2	/	2.5	>2.5	/	<b>20</b>	80	1	2	/	2.5	>2.5	/
<b>22</b>	66	1	2	/	2.5	>2.5	/	<b>22</b>	88	1	2	/	2.5	>2.5	/
<b>24</b>	72	1	2	/	2.5	>2.5	/	<b>24</b>	96	1	2	/	2.5	>2.5	/
<b>25</b>	75	1	2	/	2.5	>2.5	/	<b>25</b>	100	1	2	/	2.5	>2.5	/
<b>26</b>	78	1	2	/	2.5	>2.5	/	<b>26</b>	104	1	2	/	2.5	>2.5	/
<b>28</b>	84	1	2	/	2.5	>2.5	/	<b>28</b>	112	1	2	/	2.5	>2.5	/
<b>30</b>	90	1	2	/	2.5	>2.5	/	<b>30</b>	120	1	2	/	2.5	>2.5	/
<b>32</b>	96	1	2.5	/	2.5	>2.5	/	<b>32</b>	128	1	2.5	/	2.5	>2.5	/
<b>34</b>	102	1	2.5	/	2.5	>2.5	/	<b>34</b>	136	1	2.5	/	2.5	>2.5	/
<b>35</b>	105	1	2.5	/	2.5	>2.5	/	<b>35</b>	140	1	2.5	/	2.5	>2.5	/
<b>37</b>	111	1	2.5	/	2.5	>2.5	/	<b>37</b>	148	1	2.5	/	2.5	>2.5	/
<b>38</b>	114	1	2.5	/	2.5	>2.5	/	<b>38</b>	152	1	2.5	/	2.5	>2.5	/
<b>40</b>	120	1	2.5	/	2.5	>2.5	/	<b>40</b>	160	1	2.5	/	2.5	>2.5	/
<b>42</b>	126	1	2.5	/	2.5	>2.5	/	<b>42</b>	168	1	2.5	/	2.5	>2.5	/
<b>45</b>	135	1	2.5	/	2.5	>2.5	/	<b>45</b>	180	1	2.5	/	2.5	>2.5	/
<b>50</b>	150	1	2.5	/	2.5	>2.5	/	<b>50</b>	200	1	2.5	/	2.5	>2.5	/
<b>54</b>	162	1	2.5	/	2.5	>2.5	/	<b>54</b>	216	1	2.5	/	2.5	>2.5	/



**NOTE: FORMER RADIUS ARE EXPRESSED AS CENTERLINE RADIUS**

 **ATTENTION:**




- Aluminum formers can only be used with counter formers. Used for bending hard and soft copper pipes, aluminum, annealed brass pipes and electrical conduit.
- Cast-iron formers can be used with either counter formers or guide for rollers. Used for bending hard copper, steel, stainless steel hydraulic, furniture tube and GAS pipe.
- Cast-iron formers are for bending all types of pipe.

TABLE 8-1 Third							
 Ø R mm		 mm Min. Max.			 mm Min. Max.		
1/4"	R3D(6.3)	1	2	/	2.5	>2.5	/
5/16"	R3D(7.9)	1	2	/	2.5	>2.5	/
3/8"	R3D(9.5)	1	2	/	2.5	>2.5	/
1/2"	R3D(12.7)	1	2	/	2.5	>2.5	/
1/2"	R4D(12.7)	1	2	/	2.5	>2.5	/
5/8"	R3D(15.8)	1	2	/	2.5	>2.5	/
5/8"	R4D(15.8)	1	2	/	2.5	>2.5	/
3/4"	R3D(19)	1	2	/	2.5	>2.5	/
3/4"	R4D(19)	1	2	/	2.5	>2.5	/
7/8"	R3D(22.2)	1	2	/	2.5	>2.5	/
7/8"	R4D(22.2)	1	2	/	2.5	>2.5	/
1"	R3D(25.4)	1	2	/	2.5	>2.5	/
1"	R4D(25.4)	1	2	/	2.5	>2.5	/
1"1/8	R3D(28.5)	1	2	/	2.5	>2.5	/
1"1/8	R4D(28.5)	1	2	/	2.5	>2.5	/
1"1/4	R3D(31.7)	1	2.5	/	2.5	>2.5	/
1"1/4	R4D(31.7)	1	2.5	/	2.5	>2.5	/
1"3/8	R3D(34.9)	1	2.5	/	2.5	>2.5	/
1"3/8	R4D(34.9)	1	2.5	/	2.5	>2.5	/
1"1/2	R3D(38.1)	1	2.5	/	2.5	>2.5	/
1"1/2	R4D(38.1)	1	2.5	/	2.5	>2.5	/
1"5/8	R3D(41.2)	1	2.5	/	2.5	>2.5	/
1"5/8	R4D(41.2)	1	2.5	/	2.5	>2.5	/
1"3/4	R3D(44.4)	1	2.5	/	2.5	>2.5	/
1"3/4	R4D(44.4)	1	2.5	/	2.5	>2.5	/
1"7/8	R3D(47.6)		2.5	/	2.5	>2.5	/
1"7/8	R4D(47.6)	1	2.5	/	2.5	>2.5	/
2"	R3D(50.8)	1	2.5	/	2.5	>2.5	/
2"	R4D(50.8)	1	2.5	/	2.5	>2.5	/
2"1/8	R3D(53.9)	1	2.5	/	2.5	>2.5	/
2"1/8	R4D(53.9)	1	2.5	/	2.5	>2.5	/



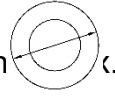
**TABLE 8-1 Fourth**

 φ GAS	 mm	mm
<b>1/4"</b>	47	13.7
<b>3/8"</b>	53.5	17.2
<b>1/2"</b>	59	21.3
<b>3/4"</b>	78	26.9
<b>1"</b>	100	33.7
<b>1"1/4</b>	157	42.2
<b>1"1/2</b>	199.5	48.2




**TABLE 8-1 Fifth**

 Min. φ mm Max.		 Min. mm	 Max. mm
<b>12</b>	20	2D	43
<b>22</b>	30	2D	61
<b>32</b>	38	2D	76
<b>40</b>	42	2D	91
<b>42</b>	45	2D	128

**TABLE 8-1 Sixth**

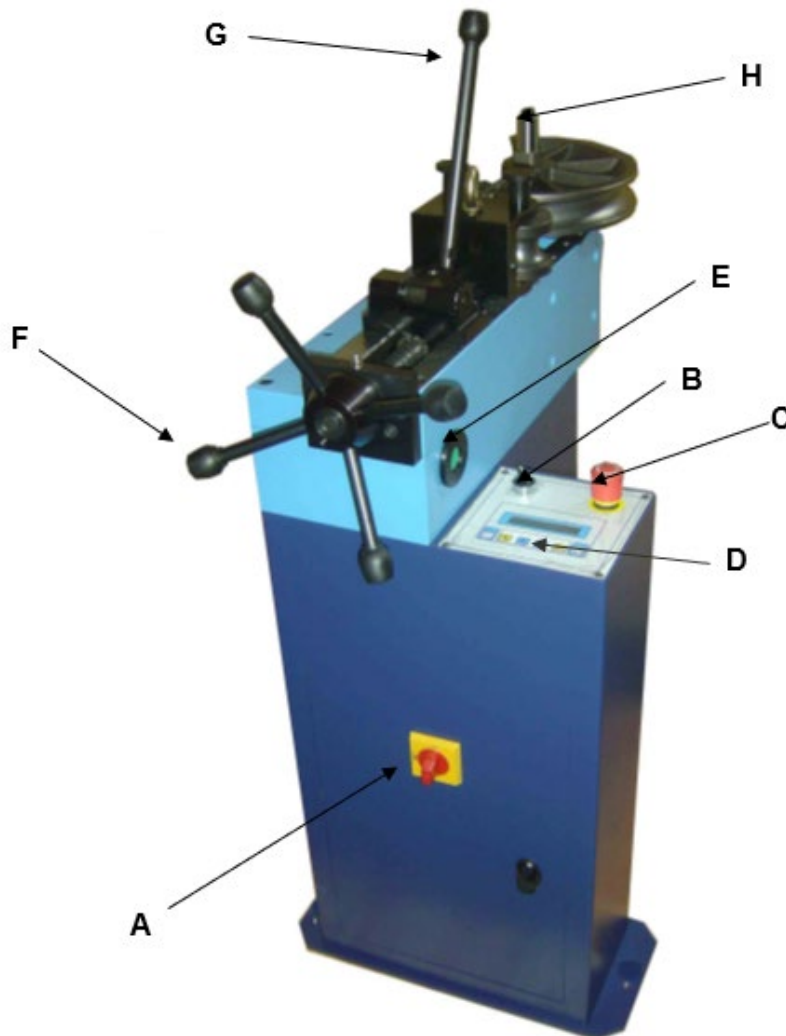
 	 min. mm	
<b>28 → 50 mm</b>	10	25
<b>50 → 80 mm</b>	10	40
<b>80 → 100 mm</b>	10	40
<b>100 → 112 mm</b>	10	40
<b>112 → 129 mm</b>	10	40
<b>129 → 148 mm</b>	10	40
<b>148 → 170 mm</b>	10	40
<b>170 → 200 mm</b>	10	40

**TABLE 8-1 Seventh**

 	 min. mm	
<b>28 → 43 mm</b>	10	20
<b>44 → 62 mm</b>	10	28
<b>63 → 78 mm</b>	10	28
<b>79 → 92 mm</b>	10	28



## DRIVES DESCRIPTION



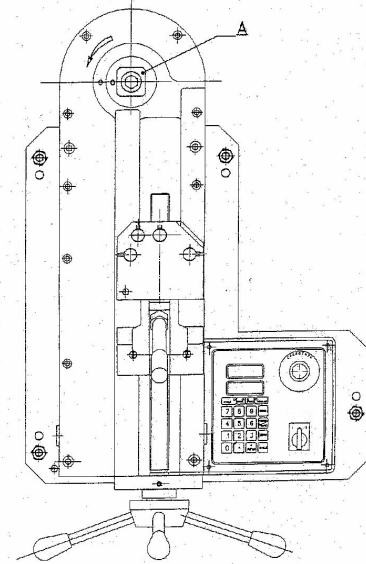
### THE DRIVES ARE:

- A. Ignition switch with electric board holder-interlock
- B. Motor speed selection switch
- C. Emergency Stop
- D. Display with keyboard for programming the cycle
- E. Dual palm control buttons, buttons must be continuously pressed during the entirety of the bending operation
  - a. The return of the control-die pin to the starting position is driven with an impulse on the 2-hands drive. The die is reported in the starting position by hand.
- F. Regulation support roller handle
- G. Quick-positioning lever of the guide support roller
- H. The outlet shaft for die-clutch for mod. BM 70A is supplied in 2 dimensions

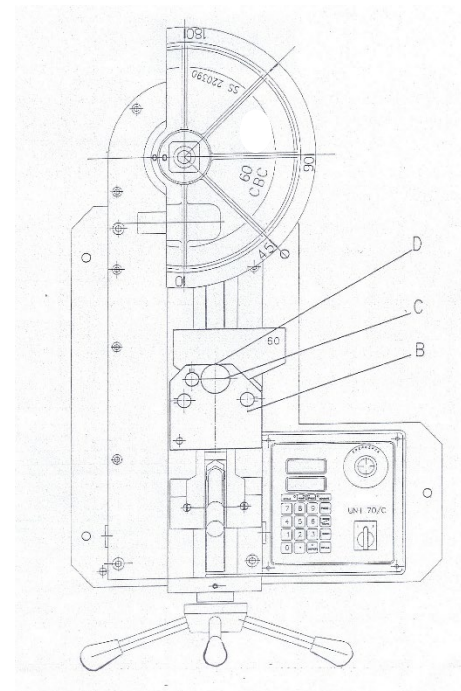
## BENDING OF THIN-WALL PIPES - USE WITH GUIDE

### For bending hard copper and thin pipes (max. thickness 1.5mm)

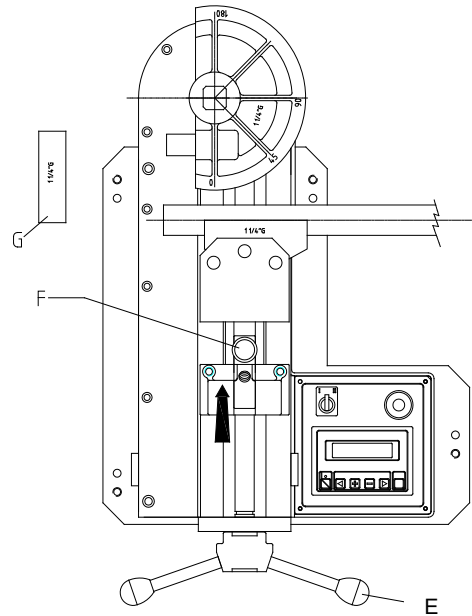
- ◆ Machine ready for fitting all accessories.  
Turn former arbor "A" anticlockwise to stroke end.



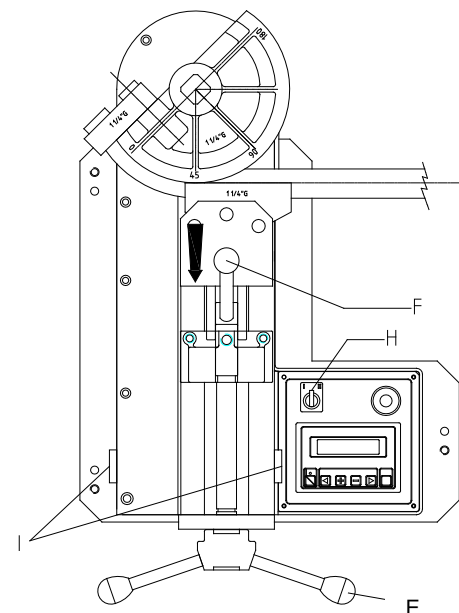
- ◆ Place the former, according to the desired size, on the arbor making sure that home position on the former matches calibration line on the arbor.
- ◆ Then place the counter former in the support "B" using the pin "C", which will have to be fixed with the frontal screw "D"



- ◆ Via the special hand wheel “E”, bring the counter former close to the former, leaving a gap for the pipe.
- ◆ Place the pipe at the desired length, insert the locking ring “G” into the pipe and former’s pin.
- ◆ Move the lever “F” of the quick-positioning support of the guide as indicated by the arrow.
- ◆ Move the guide forward against the pipe, to get rid of any play among former, pipe and guide.

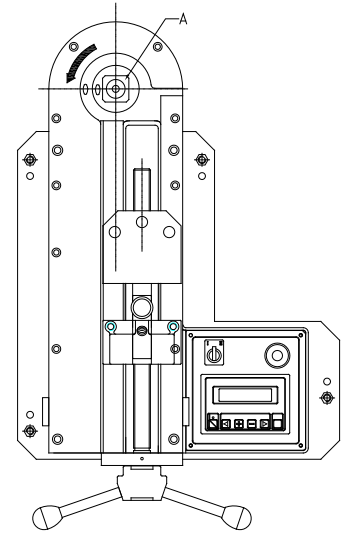


- ◆ Machine ready for bending cycle; move the switch “H” to the Optimal speed:  
1 for pipes with diameter from 36 mm and up  
2 for pipes with diameter from 6 mm to 36 mm
- ◆ And push simultaneously the 2 buttons until the end of the bending cycle.
- ◆ Then, keeping buttons pressed for a few seconds, the machine will be automatically return to its starting position.
- ◆ Release the bent pipe moving the lever “F” of the quick-positioning support of the guide as indicated by the arrow and unload the machine from the bent pipe.

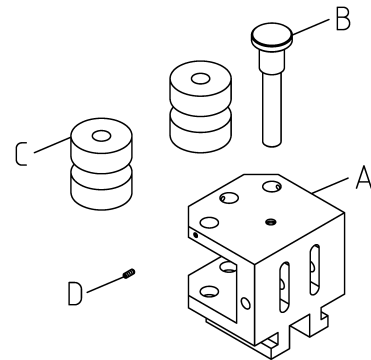


## BENDING OF THICK-WALL PIPE-USING THE GUIDE FOR 2 ROLLS

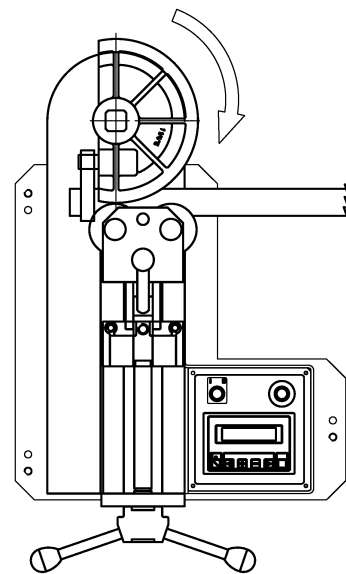
- ◆ Machine ready for the installation of all accessories. Rotate the outlet shaft "A" anti-clockwise until stroke end.
- ◆ Then fit the desired former on the shaft having care that shaft's calibration line matches with former's home position.



- ◆ Put rollers (C) in the counter former support hole (A) and fix them through the pins (B) to be screwed with 2 screws (D).

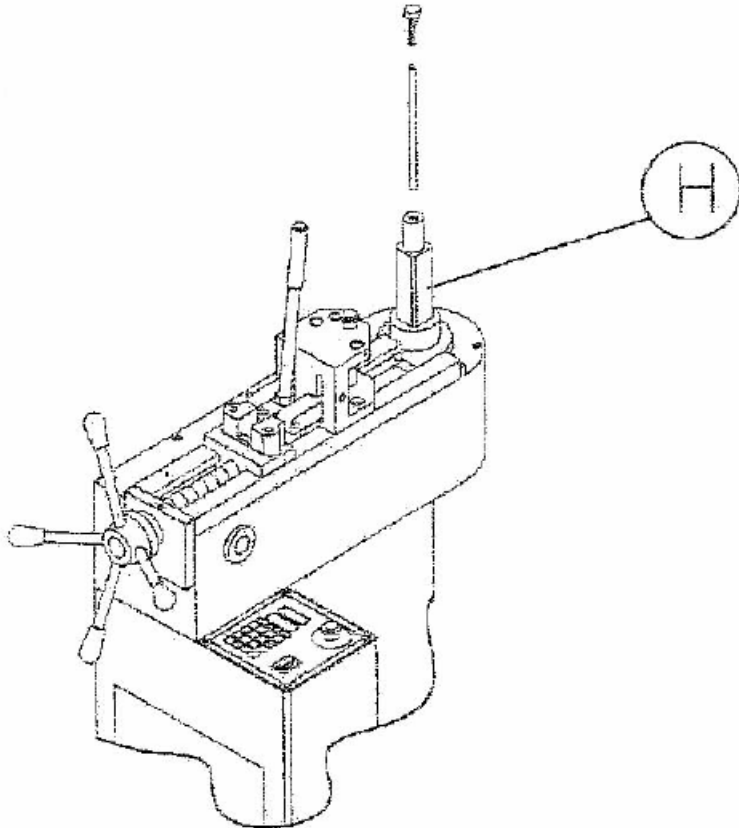


- ◆ When the counter former support for rollers is ready for use, bring it to the pipe without applying pressure. Now the machine is ready for bending cycle.

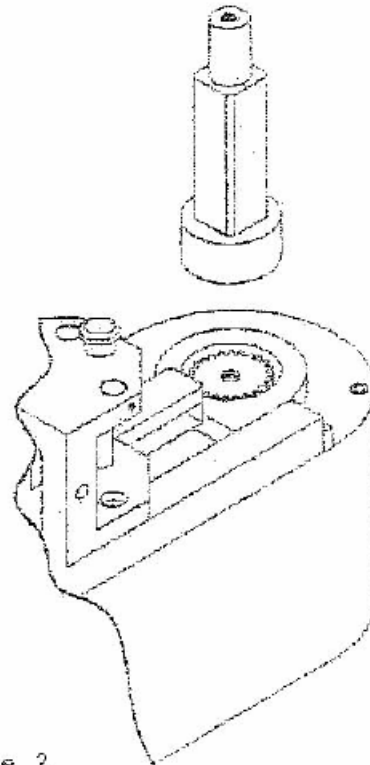


## OUTLET SHAFT REPLACEMENT

1. Insert the pin  $\varnothing 9 \times 185$  (supplied together with machine) in the outlet shaft H and screw the bolt (M14 $\times$ 45) on the shaft, as indicated in picture 1.
2. For inserting the new shaft, put it on the gear, in coincidence with its tooting than make a little pressure.



Picture 1



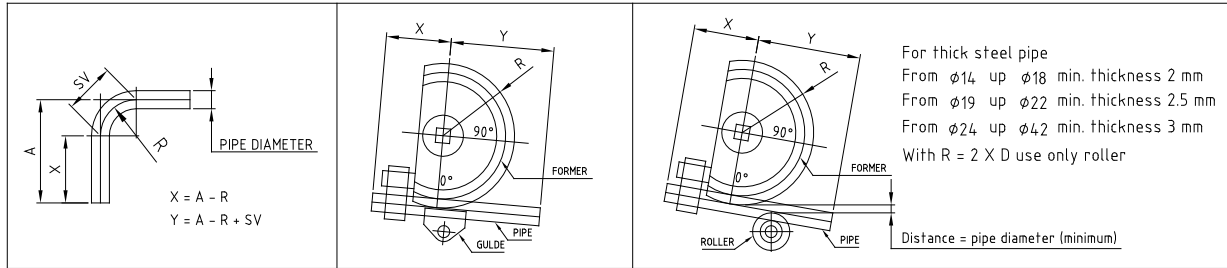
Picture 2

### CAUTION

Before using, verify that home position of the former fitted in the outlet shaft corresponds to calibration line of the arbor itself.

### NON-ALLOWED USES

- ◆ Do not exceed the pipes dimensions stated in the table 8.1 first; use bending equipment in a different way from that indicated on tables 8-1 second, 8-1 third, 8-1 fourth and 8-1 fifth.
- ◆ Use different procedures from those listed in points 10, 11, 12.

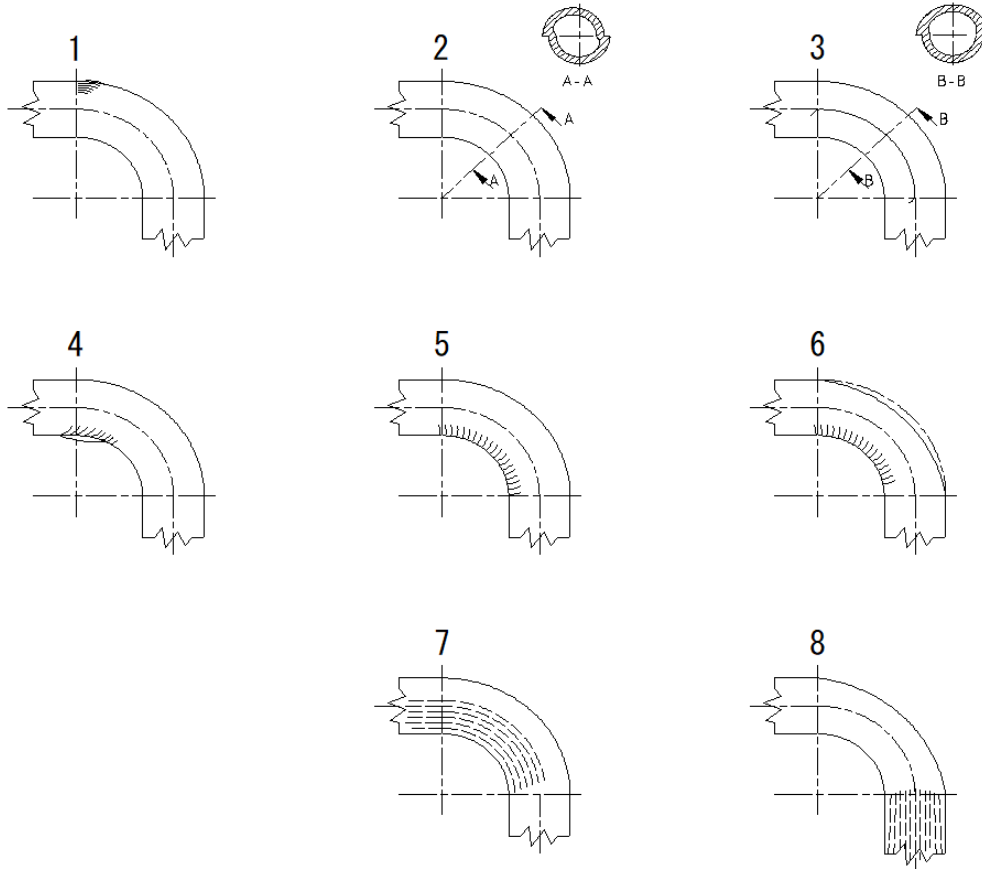


**TABLE OF PIPE DEVELOPMENT ON BENDING RADII**

PIPE DIM	R=2 xD	90° SV	X	Y	R=3 xD	90° SV	X	Y	R=4 xD	90° SV	X	Y
Φ10					30	47	A-30	X+47	40	63	A-40	X+63
Φ12	24	37.5	A-24	X+37.5	36	56.5	A-36	X+56.5	48	75	A-48	X+75
Φ14	28	44	A-28	X+44	42	66	A-42	X+66	56	88	A-56	X+88
Φ15	30	47	A-30	X+47	45	70.5	A-45	X+70.5	60	94	A-60	X+94
Φ16	32	50	A-32	X+50	48	75	A-48	X+75	64	100.5	A-64	X+100.5
Φ17	34	53	A-34	X+53	51	80	A-51	X+80	68	106.5	A-68	X+106.5
Φ18	36	56.5	A-36	X+56.5	54	84.5	A-54	X+84.5	72	113	A-72	X+113
Φ19	38	59.5	A-38	X+59.5	57	89.5	A-57	X+89.5	76	119	A-76	X+119
Φ20	40	62.5	A-40	X+62.5	60	94	A-60	X+94	80	125.5	A-80	X+125.5
Φ22	44	69	A-44	X+69	66	103.5	A-66	X+103.5	88	138	A-88	X+138
Φ24	48	75	A-48	X+75	72	113	A-72	X+113	96	150	A-96	X+150
Φ25	50	78.5	A-50	X+78.5	75	117.5	A-75	X+117.5	100	157	A-100	X+157
Φ26	52	81.5	A-52	X+81.5	78	122	A-78	X+122	104	163	A-104	X+163
Φ27	54	84.5	A-54	X+84.5	81	127	A-81	X+127	108	169.5	A-108	X+169.5
Φ28	56	87.5	A-56	X+87.5	84	131.5	A-84	X+131.5	112	175.5	A-112	X+175.5
Φ30	60	94	A-60	X+94	90	141	A-90	X+141	120	188	A-120	X+188
Φ32	64	100	A-64	X+100	96	150	A-96	X+150	128	201	A-128	X+201
Φ34	68	106	A-68	X+106	102	160	A-102	X+160	136	213	A-136	X+213
Φ35	70	109.5	A-70	X+109.5	105	164.5	A-105	X+164.5	140	219.5	A-140	X+219.5
Φ37	74	116	A-74	X+116	111	174	A-111	X+174	148	232	A-148	X+232
Φ38	76	119	A-76	X+119	114	179	A-114	X+179	152	238	A-152	X+238
Φ40	80	125	A-80	X+125	120	188	A-120	X+188	160	251	A-160	X+251
Φ42	84	131.5	A-84	X+131.5	126	197.5	A-126	X+197.5	168	263.5	A-168	X+263.5
Φ45					135	212	A-135	X+212	180	282	A-180	X+282
Φ50									200	314	A-200	X+314
Φ54									216	339	A-126	X+339
Φ60									240	376.5	A-135	X+376.5

## TROUBLESHOOTING - BENDING

### MAIN FAULTS IN BENDING WITH MANDREL (CAUSES AND SOLUTIONS)



#### 1. DEFORMATION AT THE END OF THE BEND

Correction : Move the mandrel backwards in comparison with the beginning of the bend, till the disappearance of the deformation.

#### 2. SCRATCHES ON THE CENTRAL PART OF THE BEND

Correction: a) Over dimensioned pipe  
b) Settle the alignment of the locking jaw or of the guide  
c) Throat of the under dimensioned form

#### 3. SCRATCHES ON THE CENTRAL PART OF THE BEND (JAW AND GUIDE AREA)

Correction : a) Reduce the guide pressure  
b) Over dimensioned pipe or throat of the under dimensioned guide

#### 4. WRINKLES ON THE BENDING, ALSO IN THE ACTION AREA OF THE WIPER-DIE (Only for mod. BM 70A)

Correction : a) Push the wiper-die forward, closer the point bending-beginning  
b) Reduce the wiper-die angulations  
c) Useless wiper-die. Sharpen it again.

### 5. WRINKLES ON THE BENDING WITH WIPER-DIE AND MANDREL IN THE CORRECT POSITION (Only for mod. BM 70A)

Correction : a) Under dimensioned mandrel  
b) Increase the guide pressure

### 6. EXCESSIVE CRUSHING WITH OR WITHOUT WRINKLES

Correction : Move the mandrel backwards in comparison with the beginning of the bend, till the disappearance of the deformation.

### 7. DEEP SCRATCH ON THE BEND AND ON THE ACTION AREA OF THE WIPER-DIE (Only for mod. BM 70A)

Correction : Increase the wiper-die angulations

### 8. WRINKLES ON THE BEND AND SCRATCH IN THE LOCKING JAW AREA WHICH SHOW A PIPE SLIDING


Correction : a) Reduce the guide pressure  
b) Verify the mandrel and the wiper-die position-lubricate mandrel and wiper-die generously  
c) Increase the locking-jaw pressure  
d) Insert a piece of abrasive paper into the locking-jaw throat, turning the rough part towards the pipe.

## MAINTENANCE

### TYPE AND FREQUENCY OF THE INSPECTIONS

- Verify the rectilinear position of the outlet arbor every 50 hours, making the motor turn with a comparator on the ground flat of the engine.
  - The maximum wobble is 0.05.
- Replace the arbor should a major error occur.

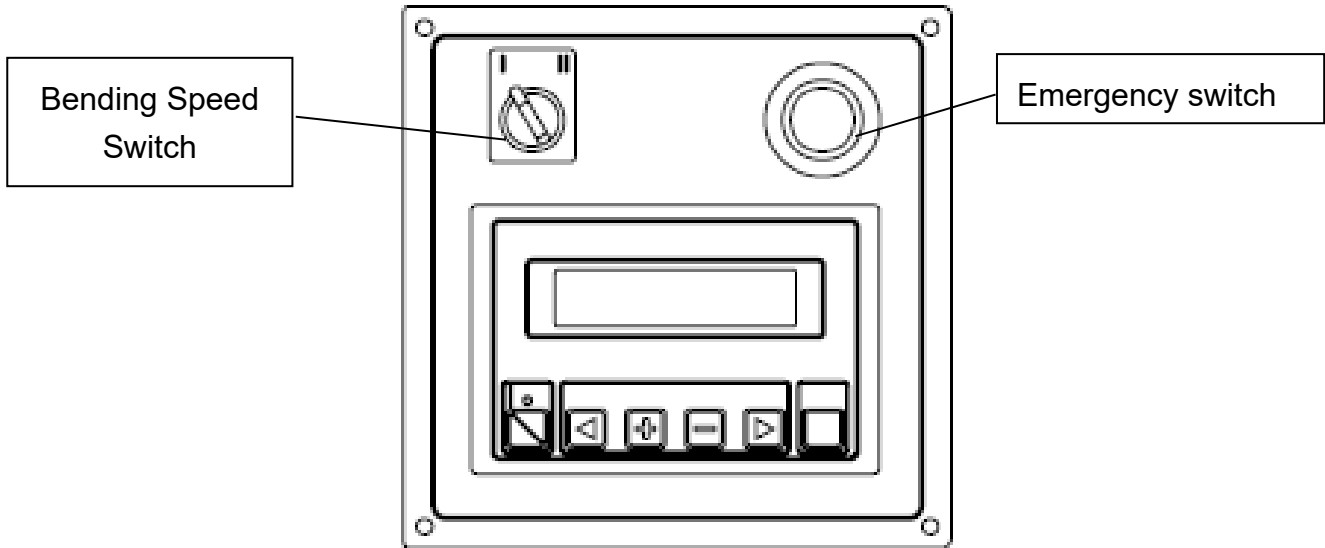
### GENERIC MAINTENANCE

DESCRIPTION	FREQUENCY
Cleaning and lubrication of the guide's support	1 DAY
Whole cleaning from the dust etc.	1 WEEK
Grease where indicated	1 WEEK
Check electrical cable condition	1 DAY
Clean out gear box, grease with heavy duty grease	1000 HOURS
 Do not use any solvents to clean gear box	




## PROGRAMMING MANUAL

### OPERATORS PANEL





### OPERATING ILLUSTRATE:

1.  : LED exhibit the information of operation presently

2.  : return or enter the menu to select

3.  : move left or select "B"












4.  : move right or select "RE"

5.  : increase number value





6.  : decrease number value









7.  : confirm

## REGULAR OPERATING MODE:

1. Press  enter the menu, the first line show LIST, press  or  select program, select the "BEND" program and press  to confirm.
2. The first line shows the "BEND" in the menu.
3. The second line show the "B" and "RE" in the menu.
4. Press  and the cursor will move "B" and set up to the angle, after enter the angle to set up and will present cursors below the number value, press  or  change cursors position. Press  or  increase or decrease angle, after the angle is input and finished, press  to confirm and automatic return.
5. Confirm "B" and "RE" are correct, press left and right switch button continuity (the time difference can't exceed one second) or step on the foot step switch to start bending pipes.
6. When bending pipes, the first line will appear "α=XXX.X BENDING NOW!"(XXX.X is the bending angle).
  - a. Release switch when bending pipes, the first line will appear "α=XXX.X INTERRUPT!"(XXX.X is the bending angle), if you want to bend pipes again, you must press left and right switch button continuity or step on the foot step switch to start bending pipes.
7. When the value of "α" is the sum of "B" and "RE", the first line will appear "FINISH! WAIT RETURN", and wait 2 seconds later, it will be" RETURN NOW!" .
8. If during 35 seconds, it is unable return to the basic point, it will appear "HOME SENSOR ERROR", and emit the alarm sound present the mistake with the notice operator, press  stop alarm sound and back to wait to start the state.

## PROGRAMMED OPERATING MODE:

- a. Displayer first line show the "BEND".
  - b. Displayer the second line show the "B" and "RE".
  - c. Each bending angle is composed of "B" and "RE".
  - d. Test finishes angle to input to the procedure group.
  - e. Each procedure group can have a maximum of 9 bends.
  - f. Can have up to 50 procedure groups or programs.
  - g. The angle total to be 210° at most. EX: "B" + "RE" =204°+6°=210°.
1. Press  enter the menu, the first line appear LIST, press  or  select program, select the "PROGRAM" program and press  to confirm.
  2. The first line shows the" LOAD P=X, C=Y" (X is procedure serial number, Y is bending


























- section counting) in the menu
3. The second line show the "B" and "RE" in the menu.
  4. Press  or  change the value of procedure serial number P, press  or  change the value of bending section counting, and observe whether it is correct with "B" & "RE" in the second line. If it is correct, press  to confirm. (procedure serial number P value between 1~50, bending section counting C value between 1~9) .
  5. The first line shows the "LOAD PROGRAM?" in the menu, the second line show" P=X" (X is procedure serial number), confirm to add into the procedure serial number. If it is YES, press  , it is NO press .
  6. After entering, the first line shows the "P=X C=Y" in the menu (X is procedure serial number, and it cannot change now; Y is bending section counting, and the value between 1-9). The second line show the "B" and "RE" in the menu.
  7. Confirm to begin to be carried out section count C.
  8. After it is correct to confirm "B" and "RE", press left and right switch button continuity (the time difference can't exceed one second).
  9. When bending pipes, the first line will appear"  $\alpha = XXX.X$  BENDING NOW!"(XXX.X is the bending angle).
  10. Release switch when bending pipes, the first line will appear " $\alpha = XXX.X$  INTERRUPT!" (XXX.X is the bending angle), if you want to bend pipes again, you must press left and right switch button continuously to start bending pipes.
  11. When the value of "  $\alpha$  " is the sum of "B" and "RE", the first line will appear "FINISH! WAIT RETURN", and wait 2 seconds later, it will be "RETURN NOW!" .
  12. If during 35 seconds, it is unable return to the basic point, it will appear "HOME SENSOR ERROR", and emit the alarm sound present the mistake with the notice operator, press  stop alarm sound and back to wait to start the state. The bended serial number C adds 1 automatically.

**NOTE: Step on the foot step switch or start the button by hand.**

**Don't use at the same time.**

### REVISING OPERATING PROGRAMS

- a. First line shows the "BEND" in the menu
- b. Second line show the "B" and "RE" in the menu
- c. Each bending angle is composed of "B" & "RE"
- d. Test finishes the angle to input to the procedure group
- e. Each procedure group can have a maximum of 9 bends.
- f. Can have up to 50 procedure groups or programs.
- g. The angle total to be  $210^\circ$  the most largely EX: "B" + "RE" =  $204^\circ + 6^\circ < = 210^\circ$

1. Press  enter the menu, the first line appear LIST, press  or  to select program, select the "PROGRAM" program and press  to confirm.
2. The first line shows the "LOAD P=X C=Y" (X is procedure serial number, Y is bending section counting) in the menu.
3. The second line show the "B" and "RE" in the menu.
4. Press  or  change the value of procedure serial number P, press  or  change the value of bending section counting, and observe "B"&"RE" in the second line, and select procedure serial number P to be revised, after procedure serial number P confirmed revisions are errorless, press  enter. (procedure serial number P value between 1~50, bending section counting C value between 1-9).
5. The first line shows the "LOAD PROGRAM?" in the menu, the second line show" P=X" (X is procedure serial number), confirm to save to procedure serial number. If it is YES, press , if is NO press  return.
6. After entering, the first line shows the "P = X C = Y" in the menu (X is procedure serial number, and now it cannot change; Y is bending section counting, and the value between 1-9). The second line show the "B" and "RE" in the menu.
7. Press  or  to increase or decrease bending section counting C the will be revised.
8. Press  and the cursor will move to "B" and set up the angle, after entering the angle to set up and will present cursors below the number value, press  or  change cursors position.  
Press  or  increase or decrease angle, after the angle is input and finished, press  to confirm and automatic return.
9. Press  and the cursor will move to "RE" set up the angle, after entering the angle to set up, cursors will present below the number value, press  or  change cursors position. Press  or  increase or decrease angle, after the angle input is finished, press  to confirm and automatic return.
10. Repeat above-mentioned step 7 to 9, until the bended angle in all bended serial numbers of this procedure is correct.
11. If only using 4 bends, (only use C=1~4),set up the "B" and "RE" as 0 after the fifth bending (C=5~9).

**NOTE: After revising every section of bended serial number, the procedure will store automatically. No further action needed.**

## **TROUBLE SHOOTING – PROGRAM**

1. Appear " BAND H\_ "  
After pressing starting button for 1.25 seconds, the encoder is without signal feedback, the screen will appear " BAND H\_" and stop, press "ESC" or emergency button to close warning, press left and right switch button continuity at the same time to carry out automatically return .
2. Appear "HOME SENSOR ERROR"  
"HOME SENSOR" could be bad, please reference the circuit diagram and change the HOME SENSOR component.
3. Appear " ENCODER ERROR"  
Please check "HALL SENSOR" circuit , if no problem, it must be broken-down for HALL SENSOR. Change HALL SENSOR please.
4. The outside power has been opened, but there is no picture:
  - a. Please check whether there is electricity in the outside power. (please examine with the ammeter)
  - b. Confirm the emergency button is not pressed. (if have press, please release clockwise)
  - c. Press the take off switch
  - d. Confirm AC\_L and AC\_N have power in the electrical board.
  - e. The above already confirmed being errorless, and AC\_L and AC\_N have power, please contact with locally vender.
5. The direction of motor is error: confirm the wiring is correct (please reference the circuit diagram). If it is correct, please let two line exchange (red, white) or (red, black) or (white, black) of three electric line 3Φ380V for one group (note: the cable exchanges are only suitable for the motor power which is 3Φ380V, it is not suitable for single-phase 1Φ220V or 110V ) .

## **Specification for the speed of motor**

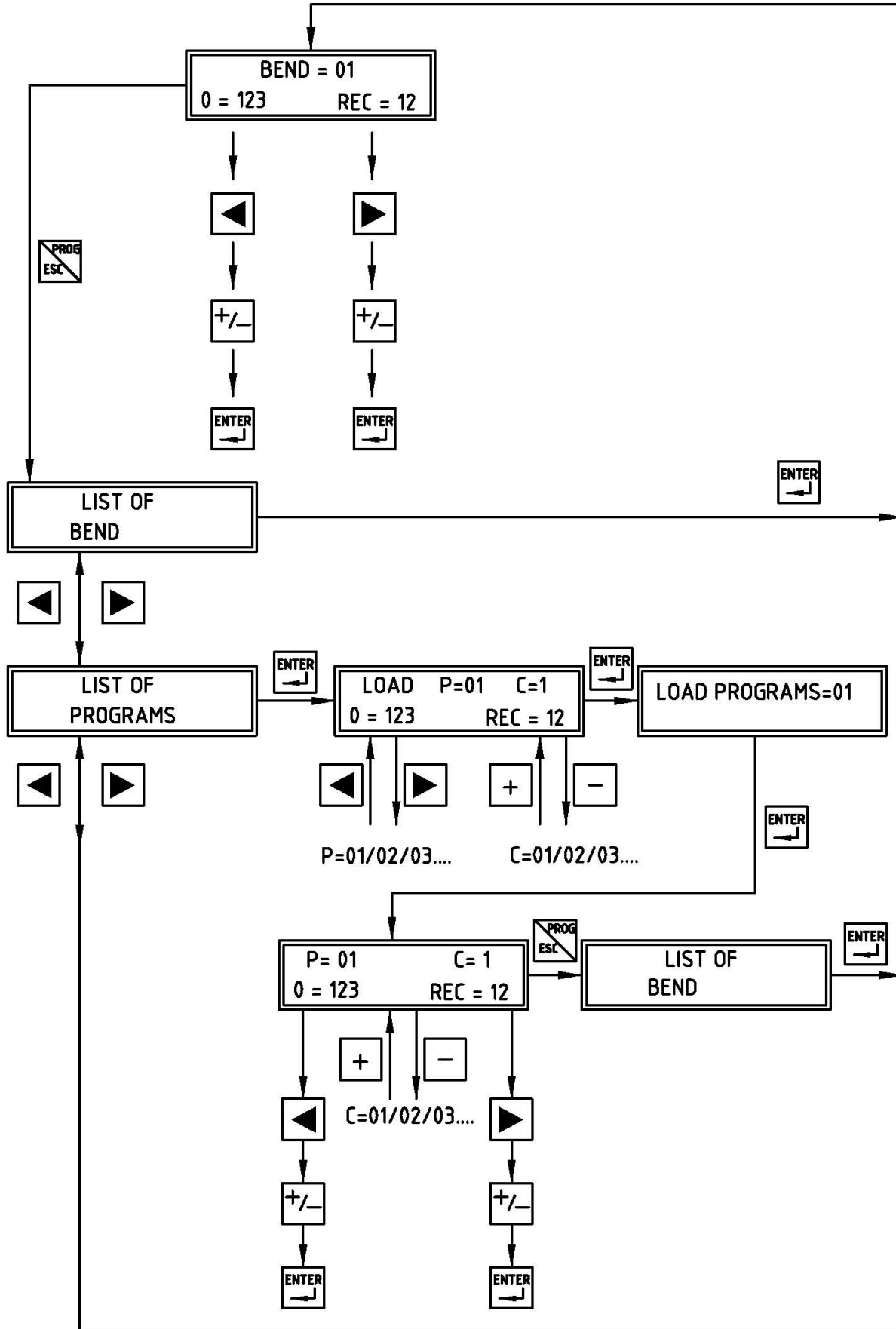
1. Selector switch of the speed on Operators panel, select "I", movement of bend will be going slowly, before reaching and setting up the angle at last 15 degrees, the motor will change to low speed, until set up, then angle motor stop
2. Selector switch of the speed on Operators panel, movement of bend will be going quickly, before reaching and setting up the angle at last 15 degrees, the motor will change to low speed, until set up, then angle motor stop
3. When the motor goes to the angle, it will stop and round automatically, about 2 seconds later. Once the gear is back to zero-point HOME, motor will stop.

## Specification about zero point

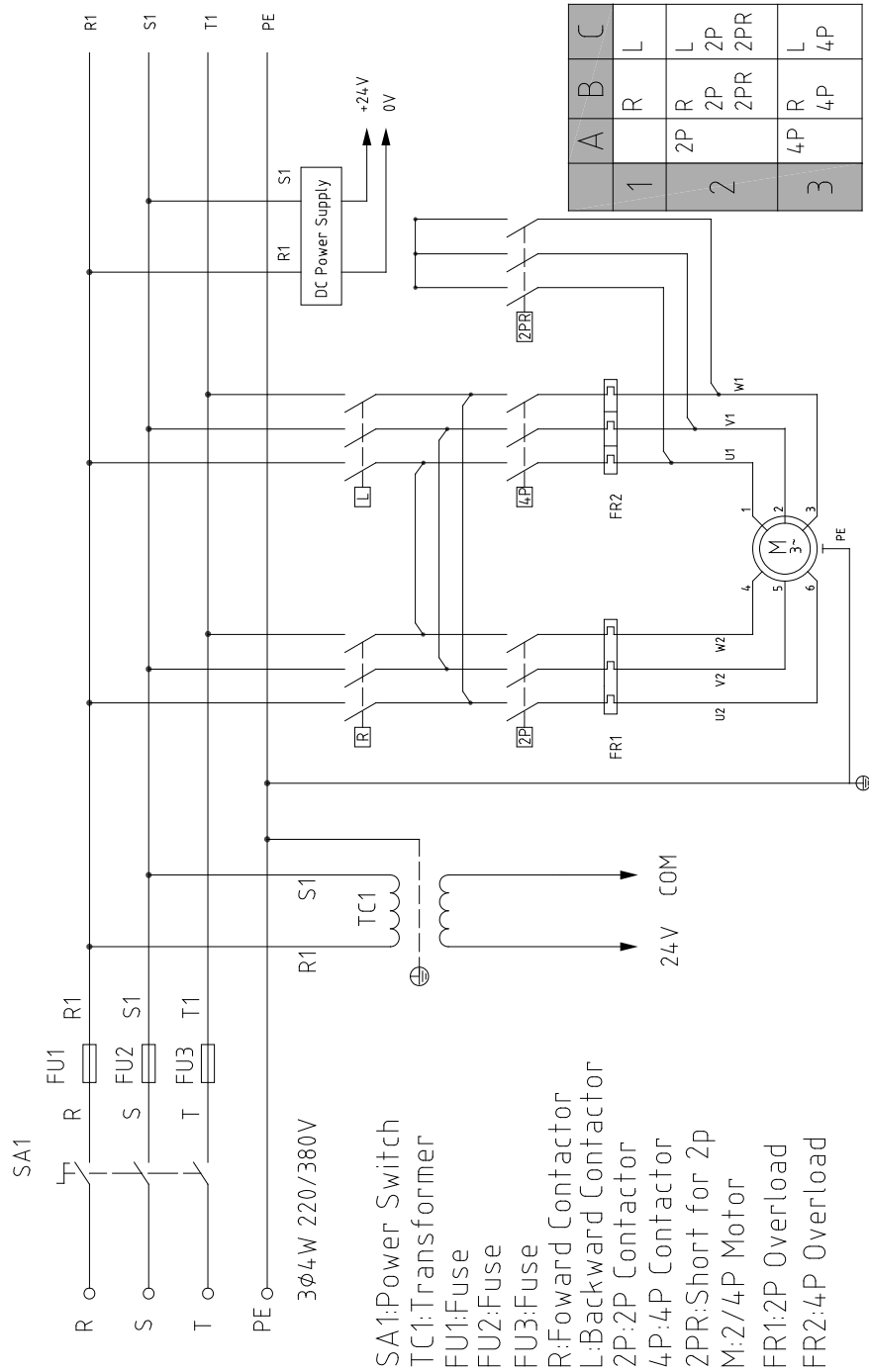
1. When motor gear is at zero-point motion, it will not drive the main shaft to turn round, this is for safety, it will not destroy the work piece or injure the personal security while avoiding turning round.
2. Must turn round main shaft to zero point manually before bending each time.
3. When the main shaft doesn't round to zero point of manually, the second bending execution for about 2 seconds, the machine will show "ENCODER ERROR" and emit alarm, please remove pressing "ESC". To make the procedure return to normal, hold double switches again, the machine will be doing zero point motion and work normally.
  - a. when pressing the emergency switch, the machine will stop, LED also be closed, when the switch is returned, the machine will return to normal state.

## Calculation for the main shaft bending angle

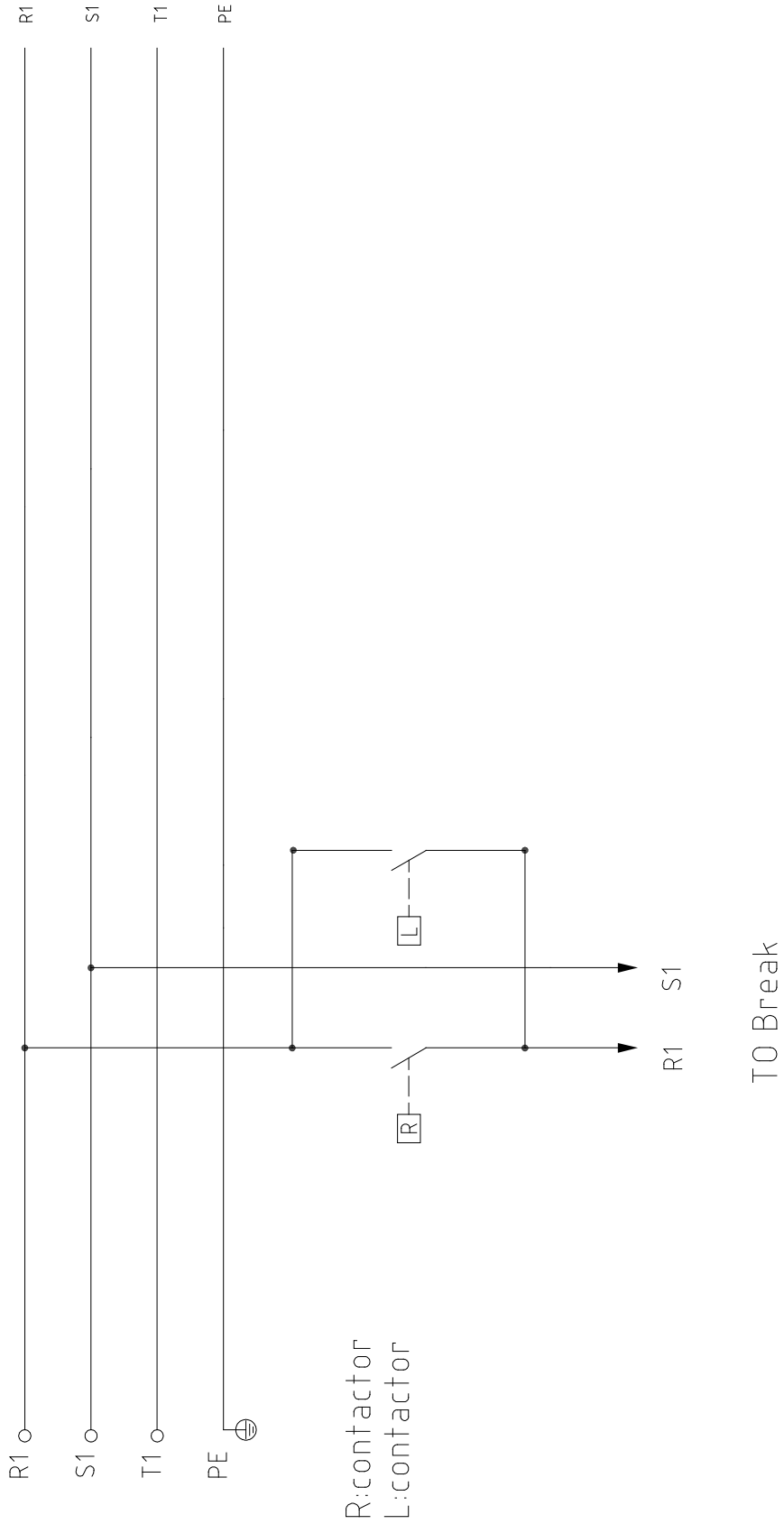
1. Angle calculation way of bending: when the pipe fit in the gyro wheel group, the position of the pulley doesn't belong to zero, it does not calculate the angle because gear wheel turns the motor, it calculates the angle until the gear wheel group rotates and depends on the main shaft.
2. Angle conversion coefficient = set up the angle  $\ast 1000/360 = xxx$ . xx wave, round up = xxx wave, + or - 0.5 wave =  $0.36 \ast 0.5 = 0.18$  degree, maximum error wave =  $\pm 0.18$  degree.

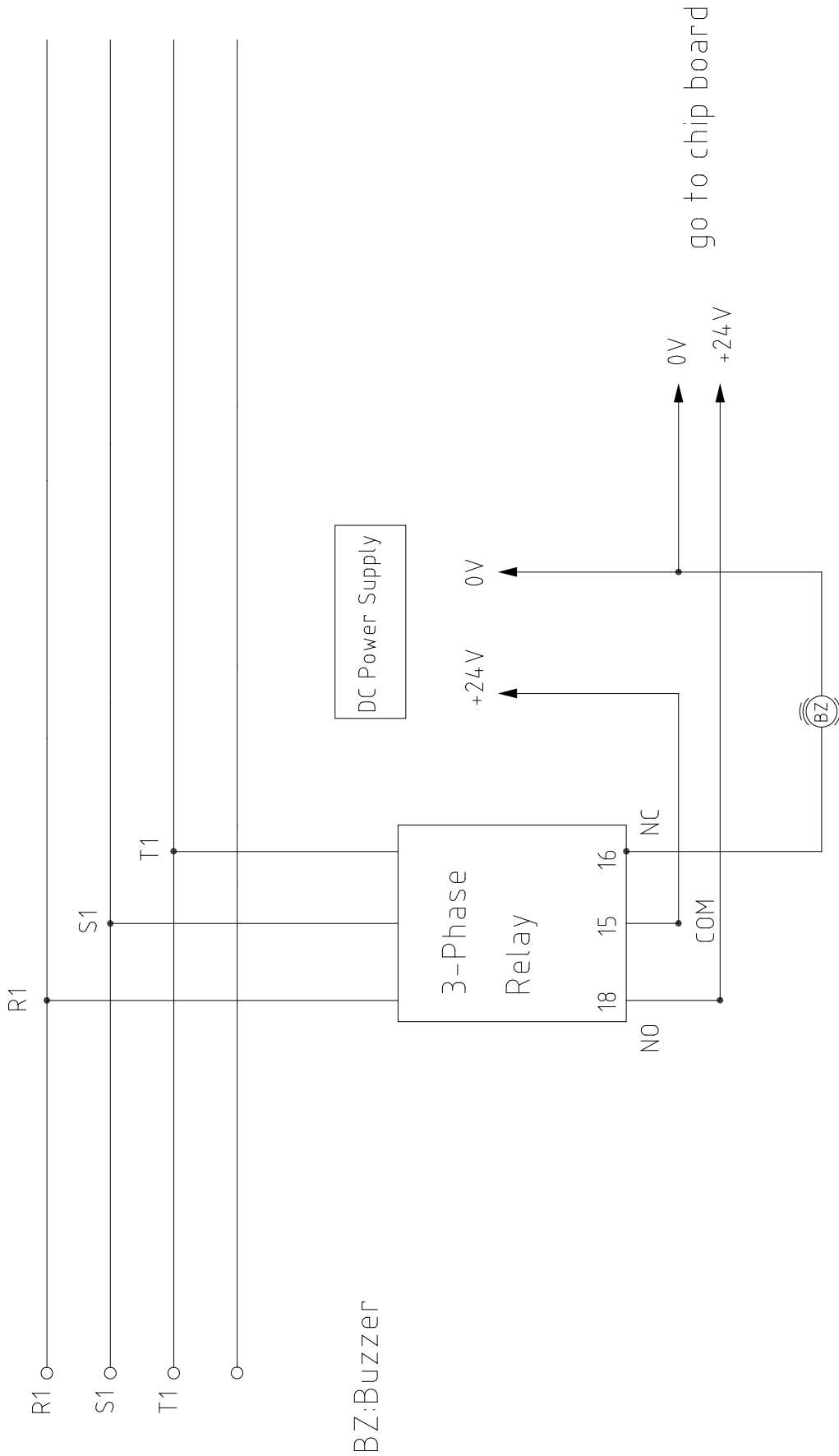


# CIRCUIT DIAGRAM

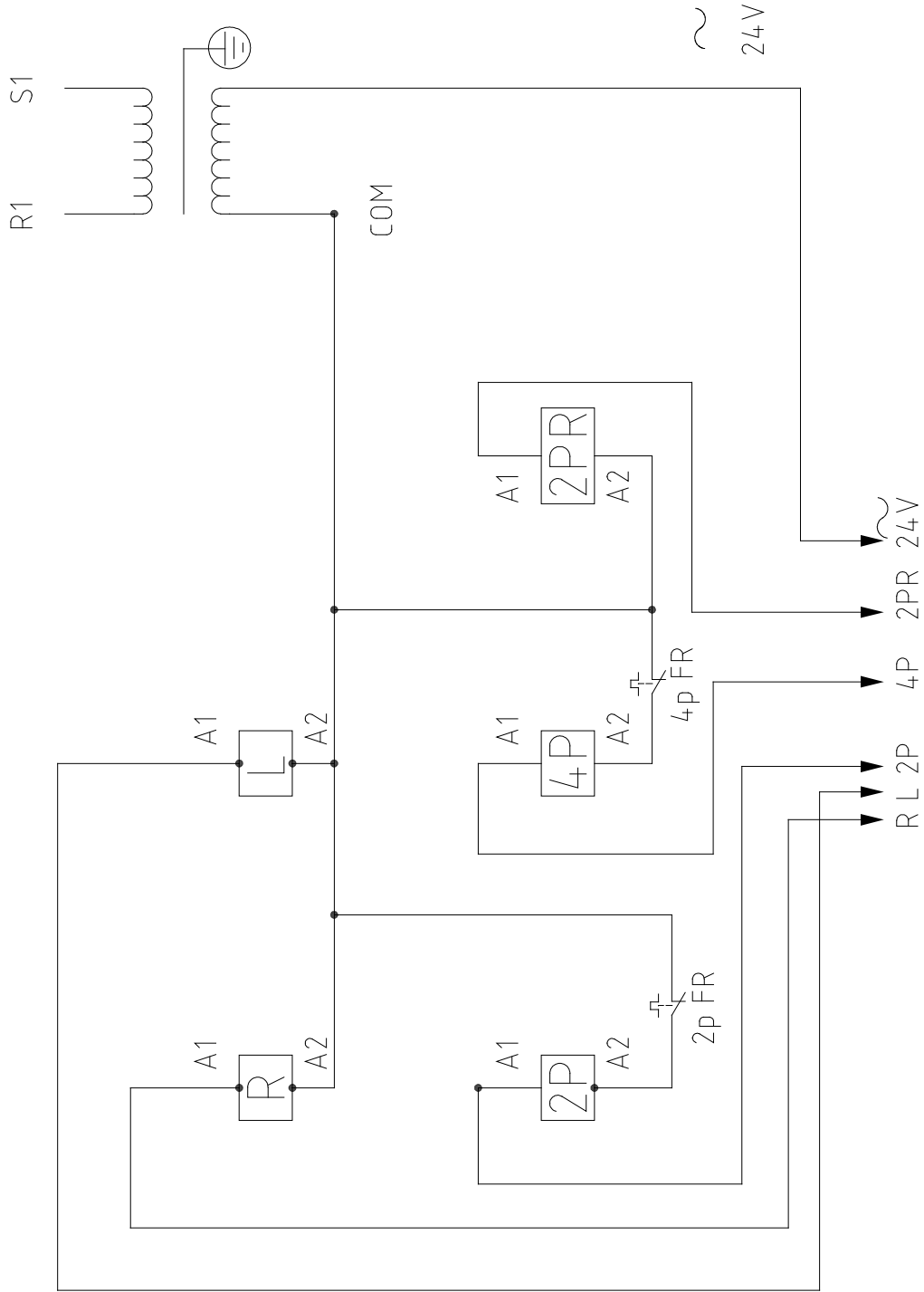




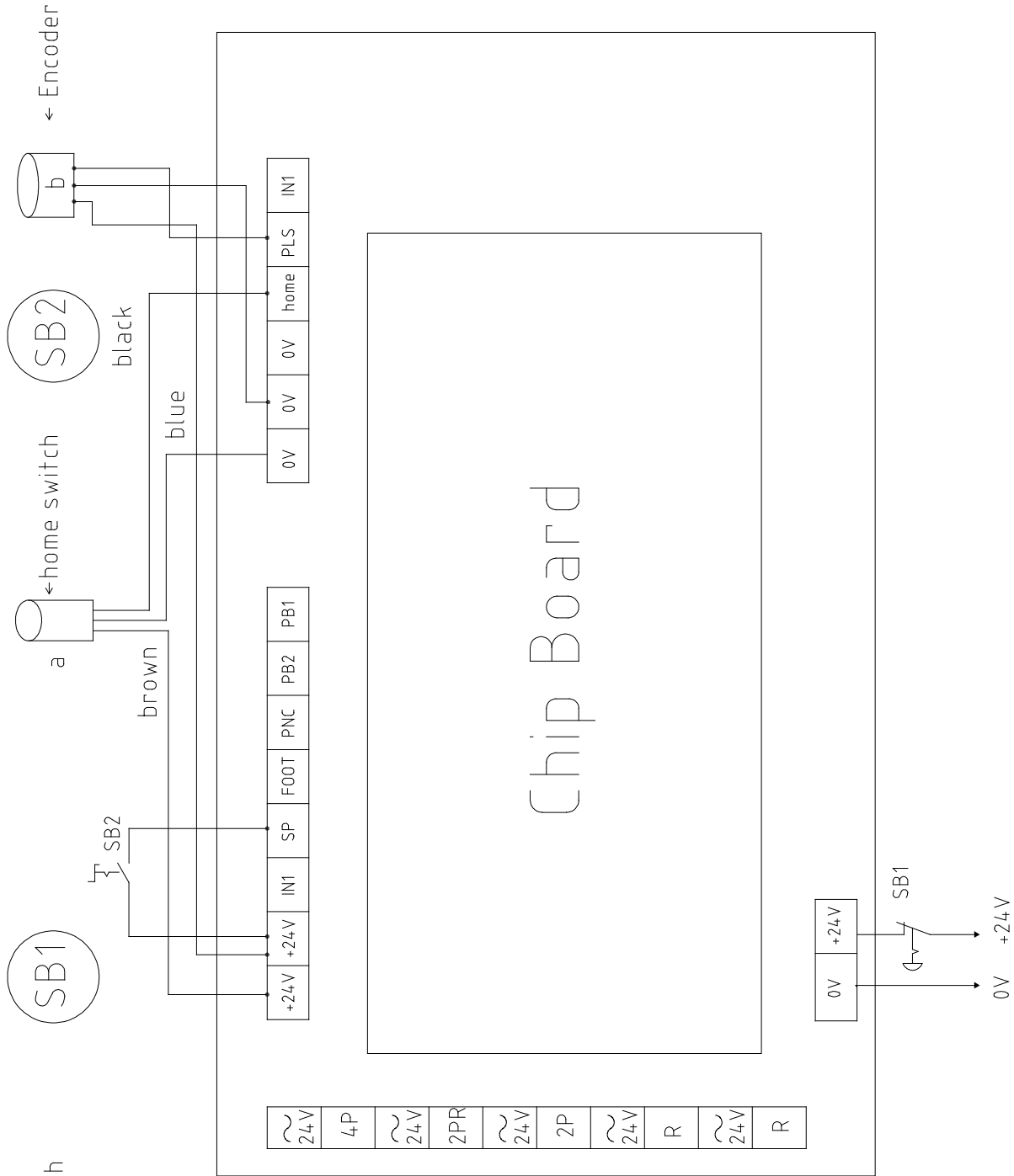




Contactor Coil

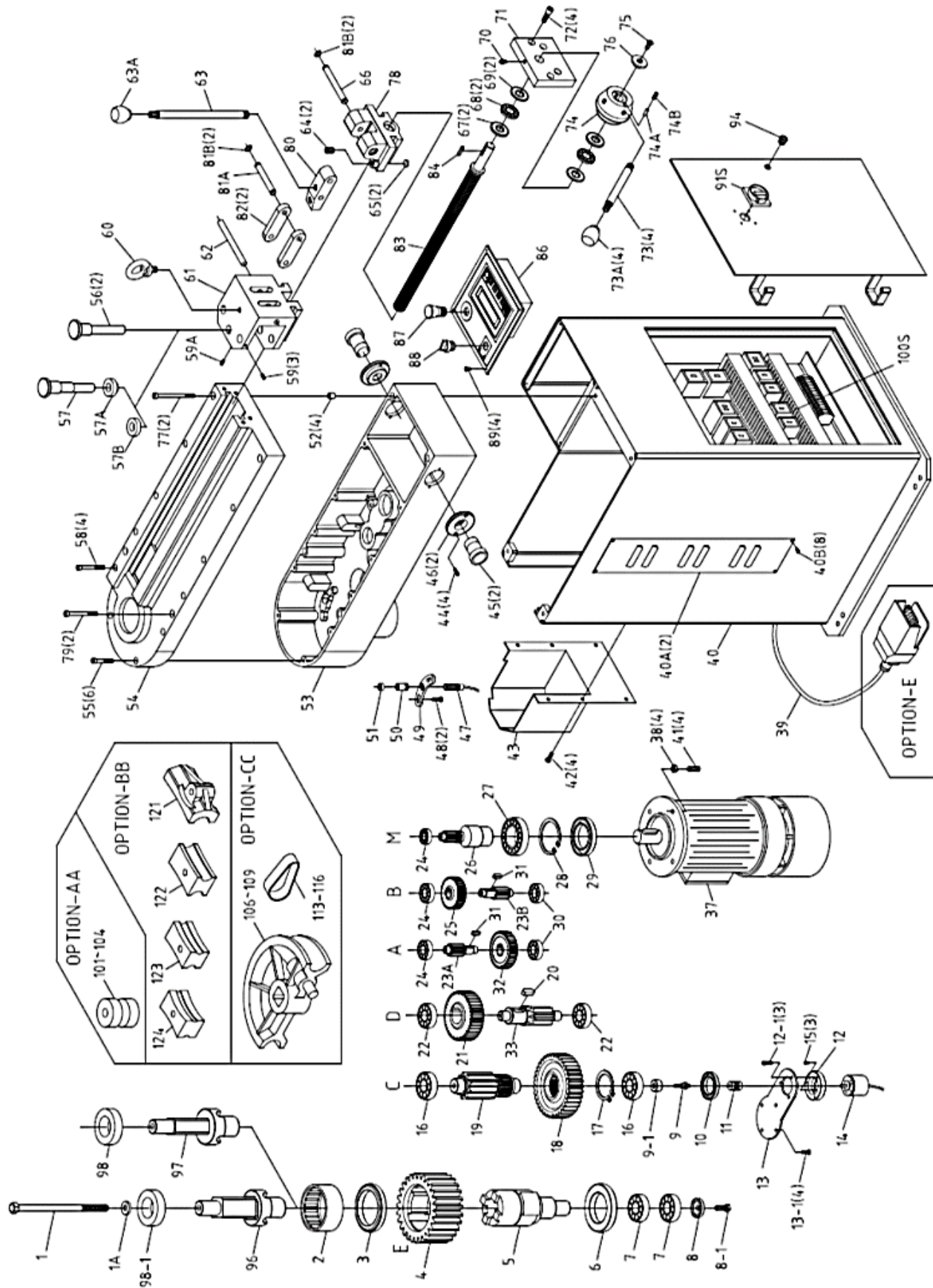


go to chip board



SB1:Emergency Stop Switch  
SB2:Faster Switch  
a:home Proximity Switch  
b:Encoder

**EXPLODED VIEW**



## PARTS LIST

<u>Item</u>	<u>Ref. No.</u>	<u>Dake Part No.</u>	<u>Description</u>	<u>Qty</u>
1	168748		Leadscrew	1
1A	168747		Bushing	1
2	CANK7535		Bearing (NK75/35(92B)	1
3	168718		Shaft Bushing(B)	1
4	168717		Gear	1
5	168715		Power Shaft	1
6	168716		Shaft Bushing(A)	1
7	CA30206J		Tapered Bearing (30206J)	2
8	168730		Washer Ring	1
9	168731		Fixed Bolt	1
10	HG042		Oil Seal (TC40X62X40B)	1
11	168770		Connecting shaft	1
12	168750		Connect Plate	1
13	HS230		Hex. Socket Head Screw (M6X20L)	2
14	ET2501		Encoder	1
15	HS610		Flat Cross Head Screw (M5X10L)	3
16	CANJ2206		Bearing (#NJ2206)	2
17	HCS24		C-Retainer Ring (S42)	1
18	168722		Gear	1
19	168721		Gear	1
20	HK139		Key (10X8X30L)	1
21	168720		Gear	1
22	CANJ2304		Bearing (NJ2304)	2
23A	168723		Gear	1
23B	168725		Gear	1
24	CA6202RS		Bearing (6202RS)	3
25	168726		Gear	1
26	168727		Gear	1
27	CA60082RS		Bearing (6008-2RS)	1
28	HCR09		C-Retainer Ring (R68)	1
29	HG043		Oil Seal (TC40x68x10B)	1
30	MCA6202ZZ		Bearing (6202)	2
31	HK025		Key (6X6X20L)	2

32	168724		Gear	1
33	168719		Gear	1
37	MFV2165-1		Motor	1
38	HN006		Hex. Nut (M10)	4
39				1
40	168701		Stand	1
40A	168702		Chip Tray	2
40B	HT026		Cross Round Head Screw (M5X12L)	8
40C	168702-1		Vesicant Pad (10X10X1750L)	1
41	HS444		Hex. Socket Headless Screw (M10X40L)	4
42	HT016		Cross Round Head Screw (M6X12L)	4
43	168703		Cover	1
44	HS218		Hex. Socket Head Screw (M5X10L)	4
45	MET1276		Push-Button Switch	2
46	168749		Bushing	2
47	ET1641		Sensor	1
48	HS229		Hex. Socket Head Screw (M6X15)	2
49	168765		Connect Plate	1
50	168766		Connecting pipe	1
51	168767		Registry Sensor	1
52	168732		Positioning Ring	4
53	168710		reduction box	1
54	168711		Box reduction cap	
55	HS250		Hex. Socket Head Screw (M8X60L)	6
56	168036		Pin	2
57	168052		Pin	1
57A	168053		Base Broad	1
57B	168041		Interval Ring	1
58	HS324		Hex. Socket Head Screw (M8X90L)	4
59	HS462		Hex. Socket Headless Screw (M6X8L)	3
59A	HS422		Hex. Socket Headless Screw (M6X8L)	1
60	HI413		Ring Bolt (M12)	1
61	168709		Fixed Board	1
62	168737		Shaft(C)	1
63	168043		Locking Lever	1
63A	290086		Plastic Round Knob	1

64	HS464		Hex. Socket Headless Screw (M12X16L)	2
65	168739		Screw rod washer	2
66	168735		Shaft(A)	1
67	CAGS2035		Sheaths (GS2035)	2
68	CANTB2035		Bearing (NTB2035)	2
69	CAAS2035		Sheaths (AS2035)	2
70	HB501		Grease Nipple (PT-1/8")	1
71	168745		Vice Plate	1
72	HS259		Hex. Socket Head Screw (M10X25L)	4
73	168744		Handle Rod	4
73A	290086		Plastic Round Knob	4
74	168743		Handle Body	1
74A	168741		Shaft Block	1
74B	HS434		Hex. Socket Headless Screw (M8X30L)	1
75	HS619		Flat Cross Head Screw (M8X20L)	1
76	168742		Chunk	1
77	HS367		Hex. Socket Head Screw (M10X190L)	2
78	168708		Quick positioner	1
79	HS368		Hex. Socket Head Screw (M10X160L)	2
80	168740		Shaft Block	1
81A	168736		Shaft(B)	1
81B	HCS02		C-Retainer Ring (S12)	4
82	168738		Shaft Plate	2
83	168746		Leadscrew	1
84	HK009		Key (5X5X25L)	1
86	168764		Name Plate	1
86-1	ET2557		Controller (Single Bending)	1
86-1	ET2557-1		Controller (Multiple Bending) (Option)	1
87	MET1245		Emergency Switch	1
88	MET1222		Selector Switch	1
89	HT026		Cross Round Head Screw (M5X12L)	4
91S	MET1732		Power Switch	1
94	168777		Key Lock	1
96	168707-1		Outlet shaft(42)	1
97	168707		Outlet shaft(32)	1
98	168030A		Interval Ring	1



98-1	168706		Interval Ring (Ø54)	1
100S			Electronic Control Module	1
101		303916	Roller (2" G.) (Option)	2
102	168055		Roller (1" G.) (Included)	2
103	168056	303913	Roller (1-1/4" G.) (Option)	2
104		303910	Roller (3/4" G.) (Option)	2
106		303911	Former (3/4" G.) (Option)	1
107		303917	Former (2" G.) (Option)	1
108	168008		Former (1" G.) (Included)	1
109	168009	303914	D423 Former (1-1/4" G.) (Option)	1
113		303918	Ring (2" G.) (Option)	1
114	168069		Ring (1" G.) (Included)	1
115	168070	303915	Ring (1-1/4" G.) (Option)	1
116		303912	Ring (3/4" G.) (Option)	1
121	168755		Gib 1 1/4"G(Ø42.7) (Option)	1
122	168756		Gib 1"G(Ø34)X3/4"G(Ø27.2) (Option)	1
123	168757		Gib 1/2"G(Ø21.7)X3/8"G(Ø17.3) (Option)	1
124	168758		Gib 1/4"G(Ø13.8)X1/8"G(Ø10.5) (Option)	1
-		716879	Die Det (3/4") (Option)	-
-		716880	Die Set (1-1/2") (Option)	-

***Please contact factory for current prices.***

## **ORDERING INFORMATION**

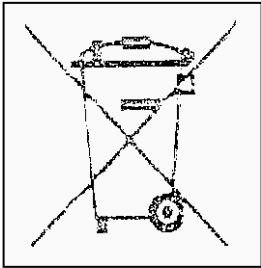
Parts are available for direct purchase from Dake or through a distributor. When placing a parts order, you will need to provide the part number, name of part, and model number. All parts shipped F.O.B. Factory in Grand Haven, MI.

## PUTTING OUT OF SERVICE

The machine must be installed and taken to an equipped area.

Dismount the machine separating the metallic parts according to the type of material (iron, aluminum, brass) from the electric parts. It is not necessary to recover the lubricants given the fact that they are an insignificant quantity.

The electric part consisting of metals and plastic (motors, cables, instruments) must be destined to authorized discharging services.



- The user is responsible for transferring the tool at the end of its “useful life” to the appropriate gathering structures. That is necessary to send the no longer used tool to the recycling, to the treatment and to the disposal compatible with the environment.
- If more detailed information about the available gathering systems are needed, please contact your local waste disposal service.