HARE&FORBES
MACHINERYHOUSE

Established 1930
Distributors of new & used workshop Equipment

T604 TB-42
T606 TB-60

TUBE BENDERS

INSTRUCTION & PARTS MANUAL

25-11-10

T604 TB-42 # T606 TB-60 24-11-10

HAFCO METALMASTER TUBE/PIPE BENDING MACHINE

OPERATING INSTRUCTIONS TO BE USED IN CONJUNCTION WITH FACTORY MANUAL SUPPLIED

PAGE 1 0F 5

Cautions

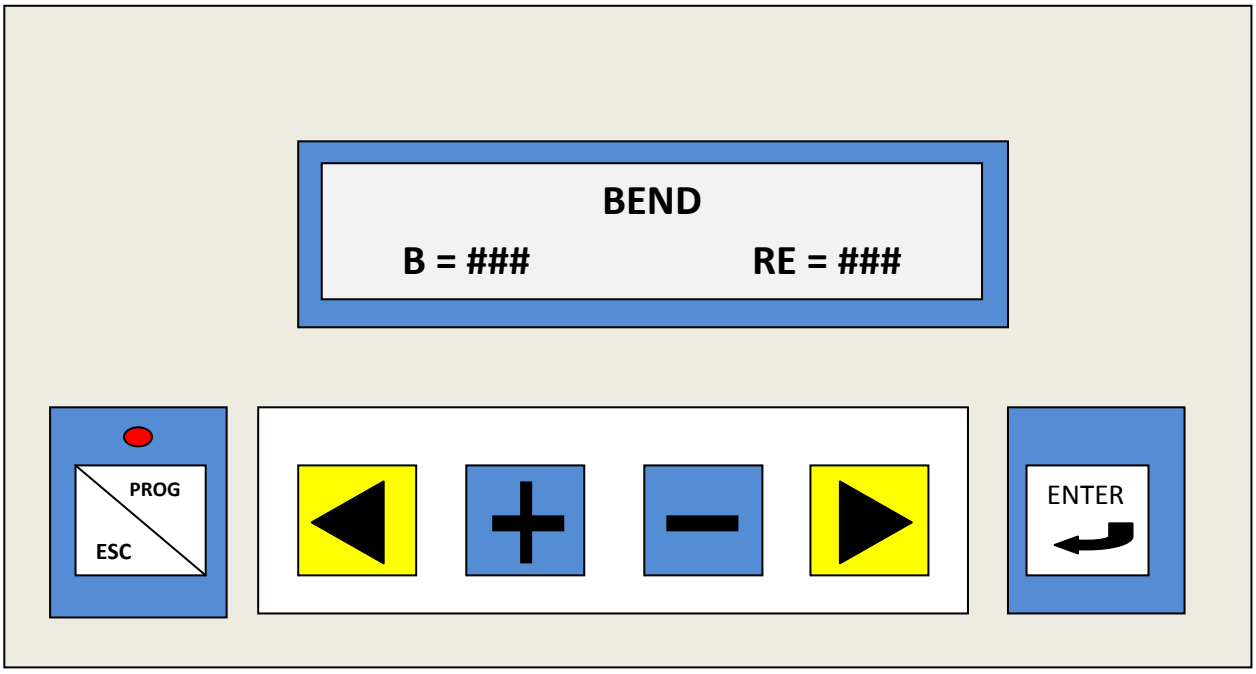
Beware of pinch points

Ensure Safety glasses are worn at all times

PLUG machine in

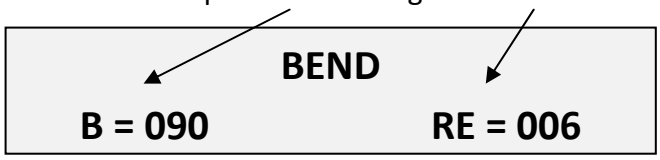
Ensure emergency stop is released (twist clockwise)

The Screen will come up similar to below (with Numbers instead of ###)



A **# SINGLE BEND**

A bend is made up of a "**Be**nd Angle" and a "**Re**covery Angle" (or "over bend" for *spring* of workpiece)



Depending on the type of material, wall thickness etc, the "**RE**" setting will be different and will have to be adjusted as needed by operator.
"**B**"= "the bend angle you want to do"
"**RE**" = "the extra angle the machine will go over the **B** setting" This will have to be worked out from trial and error and it is suggested a list be kept to refer to for future similar bends.

<u>To Set a single bend</u>

"Press the " ◀ "arrow once. ("B", angle can be changed) see *flashing* number on screen.

Press " + " or " − " button to change number as needed.

Press "◀"or "▶" arrow to select digit to change.

When it is set correctly press "**ENTER**" to set.

To change the "**RE**" "Recovery Angle" or over bend!

Press the "▶" arrow once (bend angle can be changed) see *flashing* number,

Press" + "or " − "button to change number as needed.

Press " ◀ "or" ▶ " arrow to select digit to change.

When it is set correctly press "**ENTER**" to set.

<u>To bend</u>

With correct formers and dies fitted, place pipe/tube in position as needed ensuring the retaining ring is well fitted over hook pin on bending die

Ensure the top quick release lever is in the locked position (to rear of machine)

Wind vice handle clockwise to lock tube/bar firmly in place.

Check that the movement and bending of the workpiece will not interfere with anything in the surrounding area.

With two hands, press simultaneously the left hand and right hand buttons and hold buttons in until bending is complete, Display will count up to total of the bend angle (**B+RE**) and when fingers are released the bending arbour will return to "0" ready for next bend.

Check angle bent and if more needed reset "**RE**" and rebend.

Note; the bending die will remain were it finished and after release of the workpiece it will have to be returned to home position by hand before the next .

NB ; Releasing one or both of the buttons while bending will bring up " "**INTERRUPT**' on the screen.

To continue, press both buttons again. Or remove workpiece and continue to full bend to allow bending arbour to return to "Zero point" automatically.

B **Entering into Programmed bends**

Press "**Prog/ESC"** button. RED light above this button will go on and screen will show "**LIST BEND"**

LIST BEND

Press "  " arrow. Screen will show " **LIST PROGRAM**"

LIST PROGRAM

Press the "**ENTER**" button. The screen will show

LOAD P=1 C=1 B= ### RE= ###

"**P**" is the program number. Pressing the "  " arrow will count up to 50 programs. Pressing the "  " arrow will count back down!

"**C**" is the number of the bend in each program (1 to 9)

C **Editing a program**

After entering into programme mode as above.

select the number of the "**PROGRAM**" or bend you wish to edit by pressing the "  " or "  " arrow.

Then press "**ENTER**" Button

LOAD PROGRAM? P=###

Press "**ENTER**" again, this will put you into the program to **Run** it or **Edit** it.

To **Edit,** press the "  " or "  " button to select the bend number in the program you want to change.

When you have the correct program, Press the "  " arrow once (bend angle can be changed) see *flashing* number.

Press "  " or "  " button to change number as needed.

Press "  "or "  " arrow to select digit to change.

When it is set correctly press "**ENTER**" to set.

To change the "**RE**" "Recovery Angle" or over bend!

Press the "  " arrow once (bend angle can be changed) see *flashing* number,

Press "  " or "  " button to change number as needed.

Press "  " or "  " arrow to select digit to change.

When it is set correctly press "**ENTER**" to set.

D **To Run a program** (See section B " *Entering into programmed bends*" first)

Select the number of the "**PROGRAM**" or bend you wish to edit by pressing the "  "or "  " arrow.
Then press "**ENTER**" Button

LOAD PROGRAM?
P=###

Press "**ENTER**" again, this will put you into the program to **Run** it or **Edit** it.

To Run the Program selected

With correct formers and dies fitted, place pipe/tube in position as needed ensuring the retaining ring is well fitted over hook pin on bending die.
Ensure the top quick release lever is in the locked position (to rear of machine)
Wind vice handle clockwise to lock tube/pipe firmly in place.
Check that the movement and bending of the workpiece will not interfere with anything in the surrounding area.
With two hands, press simultaneously the left hand and right hand buttons and hold buttons in until bending is complete, (Display will count up to total of the bend angle (**B+RE**) and when fingers are released the bending arbour will return to "0" ready for next bend.
Release tube/pipe by pulling the top quick release lever forward
Reposition tube/pipe as needed for the second bend if programmed. Then relock the tube/pipe in place.
With two hands, press simultaneously the left hand and right hand buttons and hold buttons in until bending is complete,
Repeat above as needed depending on number of bends programmed in.

NB
; Releasing one or both of the buttons while bending will bring up " "**INTERRUPT**' on the screen. To continue, press both buttons again. Or remove workpiece and continue to full bend to allow bending arbour to return to "Zero point" automatically.

A

F.A.Q

Will my bender Repeat bends the same

When repetition bending the **Same** (Material, Diameter & Angle) you can achieve a 0.1 degree tolerance.

Once the Angle and "RE" has been set. Ensure that between bends you **only** loosen the Quick Acton leaver without adjusting the hand wound screw.

Will all grades of steel bend the same

No. ("RE" or Spring back)varies for different types of steel i.e. Mild Steel is less than that used for Stainless.

How do I stop thin Wall Tubing getting crushed

When wall thickness is below 2mm a "Counter Former Die" (Slip Die) must be used, also it must be lubricated with a free flowing thin lubricant such as "Inox"

How do I stop stainless tube getting "Wrinkles" on it?

When bending Stainless Steel requires a lot of pressure on the "Counter Former Die", if not enough pressure will get rippling effects on the inside of the tube.

NB; When Bending ERW Tube, only require light pressure as will squash the tube wall.

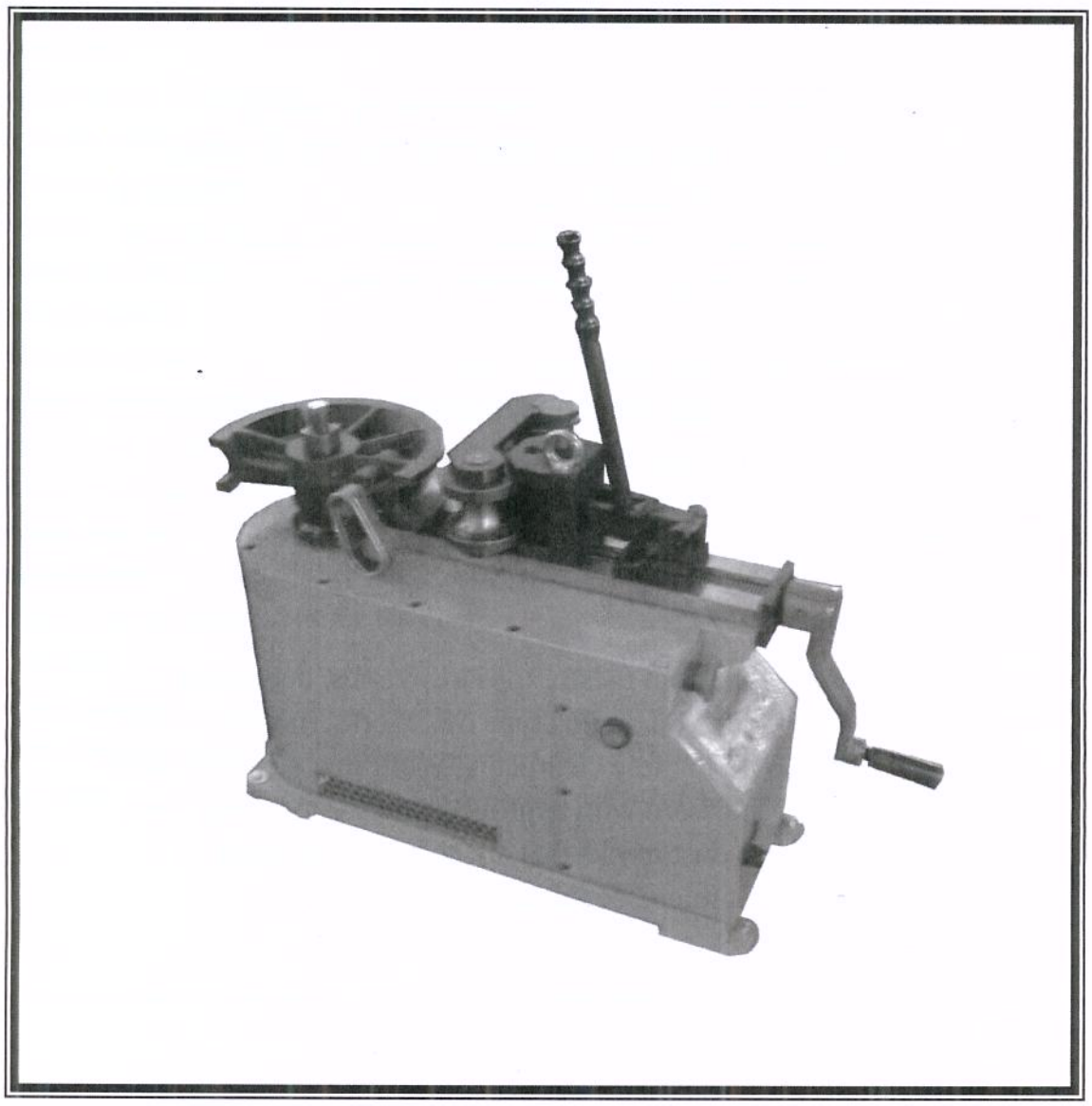
When I use a "Counter Former Die" (Slip Die) my tube ends up with scratches in!

If you find scratch marks were the" counter former die" is picking up on the tube and scratching, use 1200 wet and dry on the Bronze counter former which will remove these scratches and also ensure lubricate in used when bending

Can I use the "RE" angle on the same tube and size for different bend angles?

No. You will have to calculate "RE" for each angle even on the same tube and if you want to bend a series on different bends, the accuracy would be approx 0.7 degree.

DIGITAL BENDING MACHINE



BM-60A / BM-42A
INSTRUCTION MANUAL

60A/42A-091126-R0

⚠ WARNING !

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reprodrctive harm. Some examples of these chemical are:

- Lead from lead-based paints.
- Crystalline silica from bricks, cement and other masonry products.
- Arsenic and chromium from chemically-treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and word with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

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

As with all machinery there are certain hazards involved with operation and use of the machine. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

This machine was designed for certain applications only. We strongly recommends that this machine NOT be modified and/or used for any application other than for which it was designed. If you have any questions relative to its application DO NOT use the machine until you contact with us and we have advised you.

Your machine might not come with a power socket or plug. Before using this machine, please Do ask your local dealer to install the socket or plug on the power cable end.

ULES FOR ALL TOOLS

A .USER:

(1). **WEAR PROPER APPAREL.** No loose clothing, gloves, rings, bracelets, or other jewelry to get caught in moving parts.

Non-slip foot wear is recommended. Wear protective hair covering to contain long hair.

(2). **ALWAYS WEAR EYE PROTECTION.** Refer to ANSLZ87.1 standard for appropriate recommendations. Also use face or dust mask if cutting operation is dusty.

(3). **DON'T OVERREACH.** Keep proper footing and balance at all times.

(4). **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.

(5). **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Don't leave tool until it comes to a complete stop.

(6). **DRUGS, ALCOHOL, MEDICATION.** Do not operate tool while under the influence of drug, alcohol or any medication.

(7). **MAKE SURE TOOL IS DISCONNECTED FROM POWER SUPPLY**. While motor is being mounted, connected or reconnected.

(8). **STOP** the machine before removing chips.

(9). **SHUT- OFF** power and clean the bending machine and work area before leaving the machine.

B. USE OF MACHINE:

(1). **REMOVE ADJUSTING KEYS AND WRENCHES.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it "on".

(2). **DON'T FORCE TOOL.** It will do the job better and be safer at the rate for which it was designed.

(3). **USE RIGHT TOOL.** Don't force tool or attachment to do a job for which it was not

designed.

(4). **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.

(5). **MAINTAIN TOOLS IN TOP CONDITION**. Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

(6). **USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause hazards.

(7). **AVOID ACCIDENTAL STARTING.** Make sure switch is in **"OFF"** position before plugging in power cord.

(8). **GROUNDALL 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 atwoprong receptacle, the adapter lug must be attached to a known ground. Never removed the third prong.

C. ADJUSTMENT :

MAKE all adjustments with the power off. In order to obtain the machine. Precision and correct ways of adjustment while assembling, the user should read the detailed instruction in this manual.

D. WORKING ENVIRONMENT:

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

(2). **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.

(3). **KEEP CHILEREN AND VISITIORS AWAY.** All children and visitors should be kept a safe distance from work area.

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

E. MAINTENANCE:

(1). **DISCONNECT** machine from power source when making repairs.

(2). **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.

(3). **TO PRNMT** corrosion of machined surfaces when a soluble on 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.

F. SPECTIFIED USAGE:

This machine is used only for general metals cutting within the range of cutting capacity.

G. NOISE:

A weighted sound pressure level : 80 Db.

H. SAFETY DEVICE:

Interlock switch on cutting area as soon as the cover of cutting area is open, machine will stop at once witch the function of this switch.

Do not remove this switch from machine for any reason, and check it's function frequently.

Your machine might not come with a power socket or plug. Before using this machine, please do ask your local dealer to install the socket or plug on the power cable end.

2 SPECIFICATION

Model	RF-BM60A RF-BM42A	Electrical operation	Single chip programming control via digital input
Machine size	60A=>600 x 220 x 470 42A=>600 x 180 x 450	Motor specification	60A=1.1 KW 42A=0.65KW (220 V,, 60 HZ,, 1 PH,, 2 P ,,3500 RPM)
Weight	60A=> 107KG 42A=>94KG	Switch spec.	1. Emergency button 2. Interlock button 3.Single chip programming input control
Program	1. Max. program		50
	2. Max. bending angle per program		9 angle

2-1 BENDING CAPACITY

ITEM	Bending capacity	
	RF-BM60A	RF-BM42A
1. Max. tube Dia. (tube thickness)	Φ1 1/4 inch (3.2mm)	Φ1 inch (2.8mm)
2. Max. available angle	210°	210°
3. Available Bending radius	38 60 100 (mm)	38 60 100 125 (mm)

3 TRANSPORTATION OF MACHINE

3-1 DIMENSIONS AND WEIGHT

	Weight kg. about	Length mm	Width mm	Height mm
BM42A	94 kg (110kg)	690	470	655
BM60A	107kg (125kg)	690	470	655

3-2 UNPACKING

1. **Transportation to desired location before unpacking, please use lifting jack.(Fig. B)**
2. **Transportation after unpacking, please use heavy duty fiber belt to lift up the machine.**

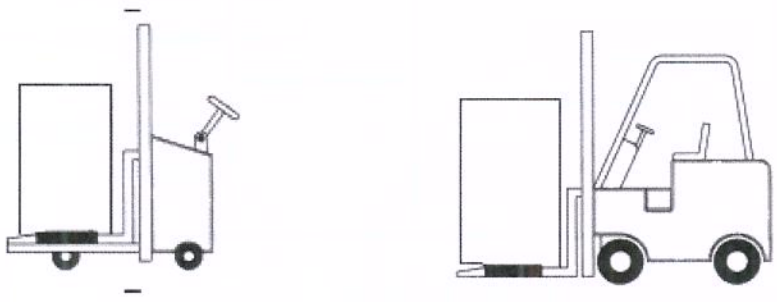


Fig. B

ALLWAYS KEEP PROPER FOOTING & BALANCE WHILE MOVING THIS MACHINE.

3-3 INSTALLATION:

* The machine can be placed on working table, on the stand or on the universal standard accessories.
* Remove the lifting eyebolt **3-1**, from the top casing of the machine after the installation.

3-4 LOAD CENTRE FOR LIFTING

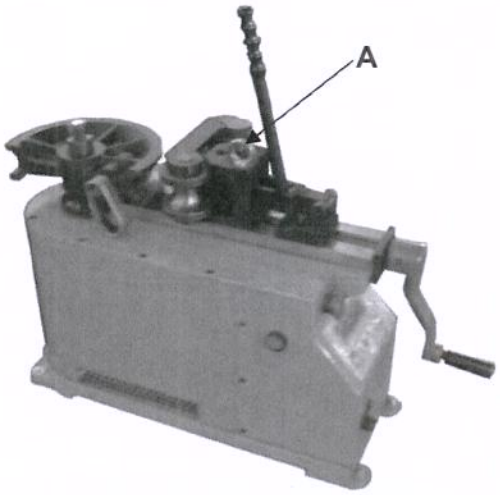
* The load centre of the machine must be set using the lifting eyebolt to be screwed on the top casing.
* The lifting eyebolt must be removed after its installation before operating because it hampers the working space on the machine.
* The machine is provided with knobs for the manual movement.

3-5 STORAGE CONDITIONS

* The machine is packed in a carton.
* The machine must be kept in vertical position.
* The vertical position is pointed out on the packing with appropriate diagrams.
* After the machine has been unpacked, use the procedures described in point **3-1**, it can be now placed on a flat surface with or without the stand and the universal base

(which are optional)

* The machine must be placed in a covered and dry place and it is recommended to keep it inside the package until the product is delivered or used.



Picture 3-1

3-6 ELECTRIC CONNECTION

* Installed motor on the BM42A „ 0.55KW
* Installed motor on the BM60A „ 1KW
* 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 SHUKO 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.

3-7 SPACE REQUIREMENTS

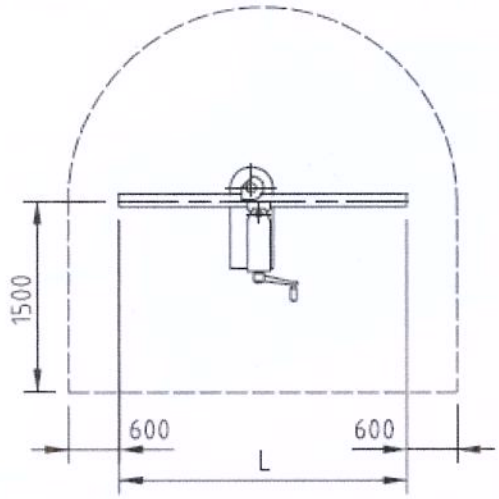
* The required area and the safety space of the machine are represented in the drawing.
* Furthermore, it is necessary to foresee the necessary deposit area for the pipes which must be bent and pipes which have already been bent.

3-8 CLEAIG & LURICATING

* 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, but avoid getting solvent on belts or other rubber parts.
* After cleaning, coat all bright work with a light lubricant.

4 MINIMUM ROOM SPACE FOR MACHINE OPERATION

* The required area and the safety space of the machine are represented in the drawing.
* Furthermore, it is necessary to foresee the necessary deposit area for the pipes which must be bent and pipes which have already been bent.



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

5 FUNCTIONAL DESCRIPTION

The BM42A/BM60A electric benders are portable machines suitable to bend metal pipes with bending angles from 0° up to 210° the are made up of 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.

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.

The machine in provided with several accessories whose functional description is fully stated in point 7 the machine various operations are described in point **9**.

6 STRUCTURE

* Fusion reduction gear boxes contain a gear reduction ratio of about 1800:1
* Asynchronous induction motor 220/380v,50/60Hz. Input
* Metric holder shaft outlet.
* Quick-positioning device: it is used for bending without mandrel to make the counter former or guide for rolls, lock and unlock quicker.

7 ACCESSORIES DESCRIPTION

7-1 FORMER OR BENDING DIE +RING

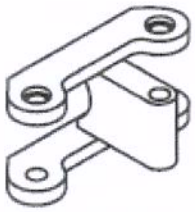
Former in aluminum or in cast-iron complete with ring for bending without mandrel with standard radii (3 or 4 x O.D.).
Each former is marked:
* External diameter of the pipe in mm/inches/GAS inches.
* Centre line bending radius in mm.

7-2 COUNTERFORMER

It is used for bending thin-wall pipes.
Each counter former is marked with pipes diameter in mm/inches/GAS inches.

7-3 GUIDE FOR TWO ROLLS:

The special guide for rolls must be used for bending pipes with thickness over 2.5 mm.(it must be used with 2 rolls according to pipes diameter). This special guide avoids pipes exterior flattening and places less strain on the bending system.

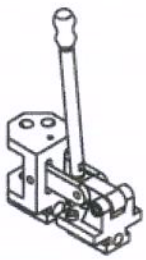


7-4 PAIR OF GOLLS

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

7-5 QUICK COUNTERFORMER POSITIONING DEVIVE

Quick counter former positioning device:
It is used to make the counter former or roll lock and unlock faster.



8 BENDING CAPACITY

It is reported in the table **8.1** first.

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

* **8-1 second** pipes with dimensions in mm
* **8-2 third** pipes with dimensions in inches
* **8-3 fourth** pipes with dimensions in GAS inches
* **8-4 fifth** pipes with small radii

IMPORTANT

The reinforcing tie-rod point **8-1**, is used when the diameter of the pipe to bend is equal or bigger than the result obtained from the difference between the maximum bending capacity stated in the table **8-1** first (also on the basis of the type of pipe) and the fixed value of 15mm.

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

BENDING CAPACITY BM42A	TABLE	8-1 first
TYPE OF PIPE	Φ < / = mm	Thickness
Hard and soft copper pipe, annealed brass pipe.	42	1.5
Electrical conduit	40	1.5
Stainless steel AISI 304/316	30	2
Hydraulic steel pipe ST. 35,4 for hydraulic plants	42	3
Furniture tube	42	2
PE Boiler pipes	42	3
Aluminum pipes	42	3
	50	standard
Gas pipes UNI 5745	1"1/4	standard
Standard centerline bending radius	3 to 4 times Φ	

BENDING CAPACITY BM60A	TABLE	8-1 first
TYPE OF PIPE	Φ < / = mm	Thickness
Hard and soft copper pipe, annealed brass pipe.	54	4
Electrical conduit	54	2
Stainless steel AISI 304/316	42	3
Hydraulic steel pipe ST. 35,4 for hydraulic plants	54	4
Furniture tube	54	3
PE Boiler pipes	54	4
Aluminum pipes	54	5
	63	standard
Gas pipes UNI 5745	1"1/2	standard
Standard centerline bending radius	3 to 4 times Φ	

MOTE : FORMER RADIUS EXPRESSED AS CENTRELINE RADIUS

TABLE 8-1 Second

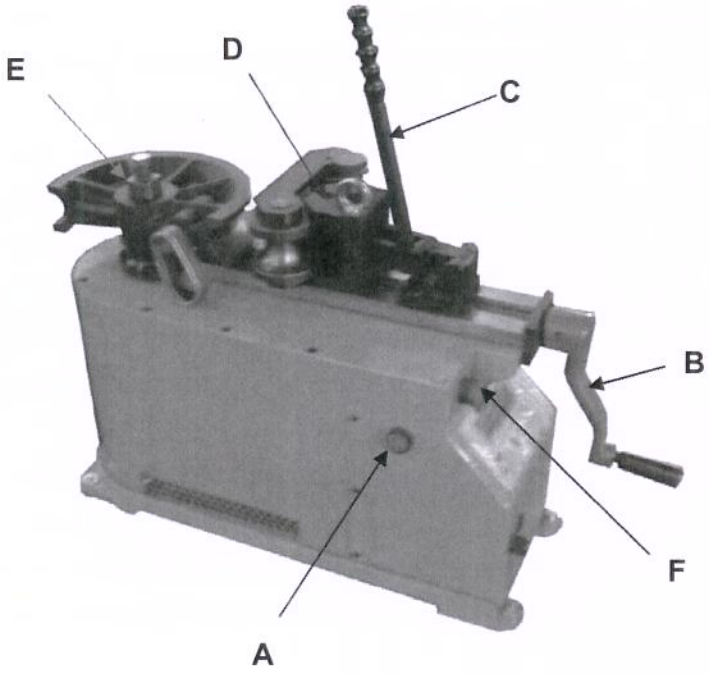
Ø mm	R	mm Min.	Max.		mm Min.	Max.		Ø mm	R	mm Min.	Max.		mm Min.	Max.	
6	30	1	2	/	2.5	>2.5	/	**8**	30	1	2	/	2.5	>2.5	/
10	30	1	2	/	2.5	>2.5	/	**10**	40	1	2	/	2.5	>2.5	/
12	36	1	2	/	2.5	>2.5	/	**12**	48	1	2	/	2.5	>2.5	/
14	42	1	2	/	2.5	>2.5	/	**14**	56	1	2	/	2.5	>2.5	/
15	45	1	2	/	2.5	>2.5	/	**15**	60	1	2	/	2.5	>2.5	/
16	48	1	2	/	2.5	>2.5	/	**16**	64	1	2	/	2.5	>2.5	/
17	51	1	2	/	2.5	>2.5	/	**17**	68	1	2	/	2.5	>2.5	/
18	54	1	2	/	2.5	>2.5	/	**18**	72	1	2	/	2.5	>2.5	/
19	57	1	2	/	2.5	>2.5	/	**19**	76	1	2	/	2.5	>2.5	/
20	60	1	2	/	2.5	>2.5	/	**20**	80	1	2	/	2.5	>2.5	/
22	66	1	2	/	2.5	>2.5	/	**22**	88	1	2	/	2.5	>2.5	/
24	72	1	2	/	2.5	>2.5	/	**24**	96	1	2	/	2.5	>2.5	/
25	75	1	2	/	2.5	>2.5	/	**25**	100	1	2	/	2.5	>2.5	/
26	78	1	2	/	2.5	>2.5	/	**26**	104	1	2	/	2.5	>2.5	/
28	84	1	2	/	2.5	>2.5	/	**28**	112	1	2	/	2.5	>2.5	/
30	90	1	2	/	2.5	>2.5	/	**30**	120	1	2	/	2.5	>2.5	/
32	96	1	2.5	/	3	>3	/	**32**	128	1	2.5	/	3	>3	/
34	102	1	2.5	/	3	>3	/	**34**	136	1	2.5	/	3	>3	/
35	105	1	2.5	/	3	>3	/	**35**	140	1	2.5	/	3	>3	/
37	111	1	2.5	/	3	>3	/	**37**	148	1	2.5	/	3	>3	/
38	114	1	2.5	/	3	>3	/	**38**	152	1	2.5	/	3	>3	/
40	120	1	2.5	/	3	>3	/	**40**	160	1	2.5	/	3	>3	/
42	126	1	1.5	/	2	>3.5	/	**42**	168	1	1.5	/	2	>3.5	/
45	135	1	1.5	/	2	>3.5	/	**45**	180	1	1.5	/	2	>3.5	/
50	150	1	1.5	/	2	>3.5	/	**50**	200	1	1.5	/	2	>3.5	/
54	162	1	1.5	/	2	>3.5	/	**54**	216	1	1.5	/	2	>3.5	/
63	240	**standard**		-	-	-									

ATTENTION :

* Formers in aluminum must be used only with counter formers. They are used for bending hard and soft copper pipes, aluminum, annealed brass pipes and electrical conduits.

* Cast-iron formers can be used either with the counter formers or guide for rolls and are used for bending hard copper, steel, stainless steel hydraulic, furniture tube and GAS pipe.

9 DRIVES DESCRIPTION



DRIVES ARE:

A => 2-hands security button for cycle control, the button must be kept pressed during all the bending stages.
The return to the control-die pin in the starting position is driven with an impulse on the 2-hand drive buttons. The former is placed back in the staring position by hand.

B => Roll or counter former adjustment hand-wheel

C => Quick-positioning lever of the counter former or support of roll

D => Guide support for roll

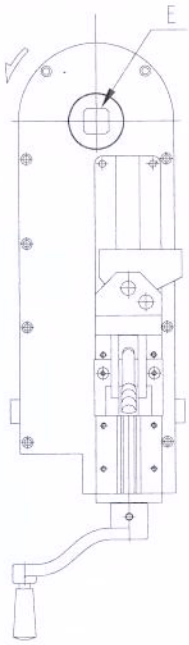
E => Outlet shaft and former-clutch

F => Emergency stop button

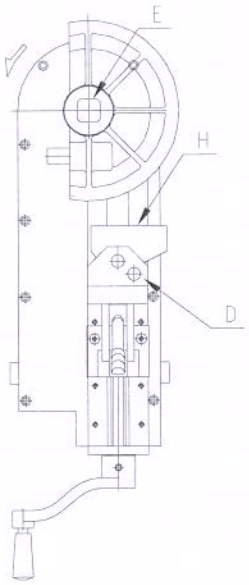
10 BENDING OF THIN-WALL PIPES - USE WITH COUNTERFORMER

Designed to bend hard copper and thin pipes (max. thickness 1.5mm)

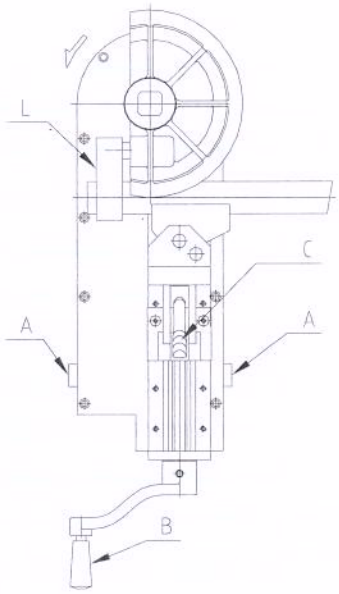
- Turn shaft "E" anticlockwise till stroke end.



- place the former, according to the desired size, on the shaft "E".
- place the counter former into jaw "D" and insert the pin H.
- Make sure that "O" on the former matches the "O" on the shaft.



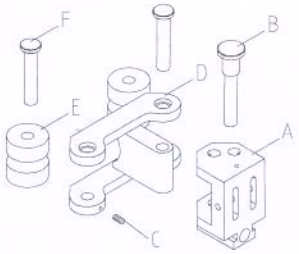
- Push lever "C" forward in the direction or arrow.
- Bring the counter former closer to the former rotating the crank-lever "B" leaving a gap for inserting the pipe.
- Place the pipe as shown insert the locking ring "L" into the pipe and former pin.
- For a good bending result, move the counter former forward against the pipe, to get rid of any play among former, pipe and counter former.
- Select the desired bending angle using the ring with indicator "F", situated on the graduated angle of bend scale.
- Push simultaneously the 2 start-buttons "A" till the end of the bending cycle. By keeping the 2 buttons pressed for some seconds, the machine will automatically return to its starting position.
- Unlock the bent pipe, then release the counter former in the starting position using the lever "C".
- Remove the pipe and bring the former to its starting position by manually turning it anticlockwise.



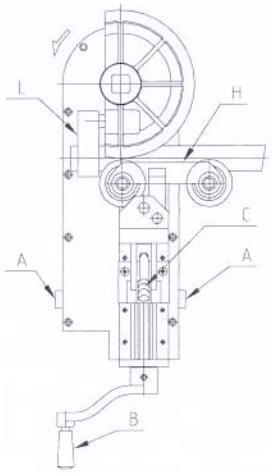
10-1 BENDING OF THICK-WALL PIPE-USING THE GUIDE FOR 2 ROLLS

Designed to bend hydraulic or gas pipes, and pipes with min. thickness 2 mm.

- Put rolls (E) in the special guide's body (D) and fix them through the pins (F) to be screwed with 2 screws (C). Put the complete guide in the counteformer support hole (A) and fix it with the pin (B).



- When special guide for two rolls is ready for use, bring it close to the pipe without applying any pressure.
  Now the machine is ready for the bending cycles.



11 INFORMATION ON DANGERS

11-1 Verify that point "0" of the former fitted in the outlet shaft corresponds to its "0".

11-2 During the quick-approach of the counter former support, verify that the lever is locked (completely pressed down).

11-3 Verify that the pin for the counter former (or for the special guide for two rolls) is correctly fitted and the support hook is tight.

11-4 For thick-pipes, at the end of the bend cycle, the machine maintains a certain potential energy due to the spring back of the pipe; in this case it is necessary to remove the counter former rotating the crank lever.

11-5 Moving parts of the machine can be dangerous for the hands of the worker. Do not modify the two hand button operation system.

11-6 Verify that the cable is not damaged.

11-7 The stated noise value of 80 dB is measured from 1 meter distance, and 1.6 m from the ground.

11-8 Do not wear loose clothes or ties and wear your hair very short or place them inside a hair net.

12 NON-ALLOWED USES

Do not exceed the pipes dimensions stated in the table **8-1** first; do not use bending equipment in a different way from that indicated on tables **8-1** second, **8-1** third, **8-1** fourth and 4-1 fifth.

Do not use different procedures from those listed in points **10,10-1.**

13 PUTTING OUT DERVICE (DISCHARGE)

13-1 The machine must be installed and taken to an equipped area.

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

13-2 The metallic parts can be destined to foundries.

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

13-3 TABLE

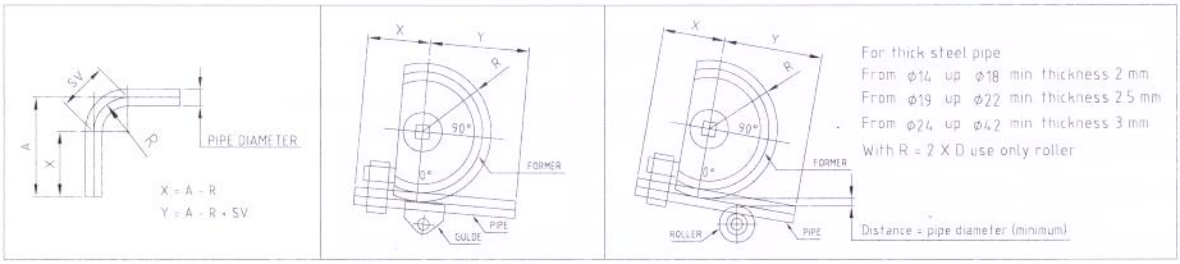


TABLE OF PIPE DEVELOPMENT ON BENDING RAD												
PIPE DIM	R=2 xD	90° SV	X	Y	R=3 xD	90° SV	X	Y	R=4 xD	90° SV	X	Y
Φ10					30	47	A-30	X+47	40	63	A-40	X+63
Φ12	24	37.5	A-24	X+37.5	36	56.5	A-36	X+56.5	48	75	A-48	X+75
Φ14	28	44	A-28	X+44	42	66	A-42	X+66	56	88	A-56	X+88
Φ15	30	47	A-30	X+47	45	70.5	A-45	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+54	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

14 MAINTENANCE

14-1 TYPE AND FREQUENCY OF THE INSPECTIONS

Verify the linear position of outlet shaft making it rotate with a comparator on the ground flat and perfectly aligned.

The maximum agreed wobble is 0.01.

Should a major error occur, it is recommended to replace the shaft.

14-2 GENERIC MAINTEINANCE

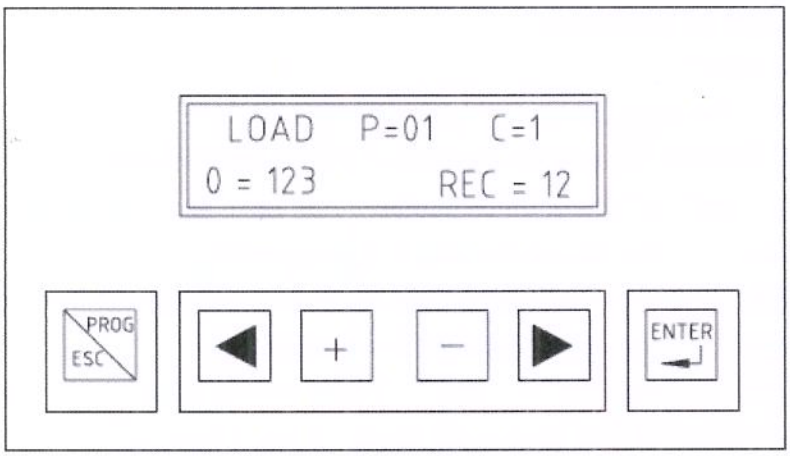
DESCRIPTION	FREQUENCY
Cleaning and lubrication of the counter formers	1 DAY
Whole cleaning of the dust etc.	1 WEEK
Cable's control	1 DAY

14-3 SPECIFIC MAINTENANCE

Opening of the gear box, accurate cleaning if the grease without using any solvents.

Greasing with heavy duty grease, per every 1000 hours of operation.

15 PROGRAMMING INSTRUCTIONS FOR THE DIGITAL MODELS



GENERAL PRINCIPLES :

1, A bend is always made up of a bend angle and a recovery angle.

2, A program is made up of a succession of bends previously memorized.

3, The maximum number of bends found in a program is 9.

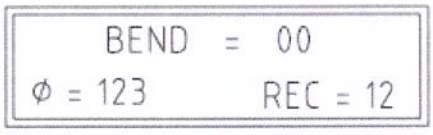
4, The maximum number of programs is 50.

5, The maximum total angle memorized is 210°

(Split in bend + recovery angle: e.g.: 204° + 6°)

REGULAR OPERATING MODE

When turning the machine on, it will automatically load the bend number 0, and the cursor will be set the " = " section of the screen:



PRESSING THE BUTTONS " < " and " > " The cursor will move from the angle " Φ " to the recovery angle " REC ".

PRESSING THE BUTTONS " + " and " - " It will be possible to increase or decrease the set values.

Once the bend insertion has been completed, the machine is ready to make a bend.

HOW TO ENTER IN THE DATA ENTRY MODE

By pressing the button " PRG " the machine will enter the input data mode, and a light placed on this button will turn on. The key " < " and " > ", " ENTER" will now be used to move and change the data contained in the various modes.

HOW TO LOAD A PROGRAM

In order to load a program act as follows:

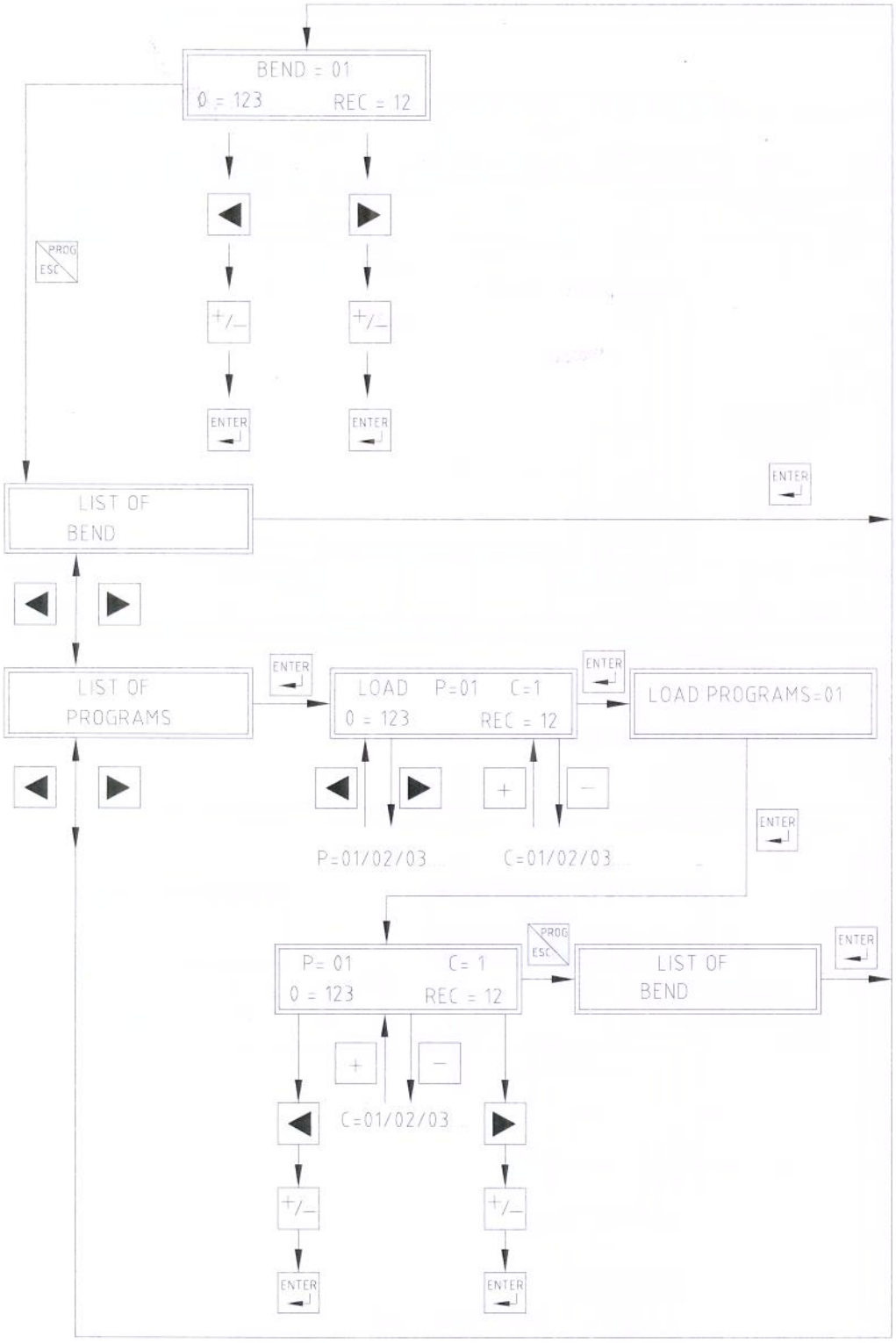
- Press the button " PRG "
- Press the button " > " to enter the menu " LIST OF PROGRAMS "
- Press the button " ENTER " to enter in the mode " LOAD PROGRAM "
- With the keys " > " and " < " select which number of program you want to load
- With keys " + " and " – " you can see bending in a programme
- Press the " ENTER " button to confirm the bend angle and exit from the main menu
- With keys " + " and " – " you can see bending in a programme
- With keys " > " and " < " and then " + " and " – " I can modify angle's values and recovery
- To end bending programmed you have to put angle = 0 (ex. 3 bending, 4 th = 0)
- To exit from a programme, press " PRG " and then " ENTER "

ALARMS

While the machine is operating correctly it automatically runs through a number of check in its system :

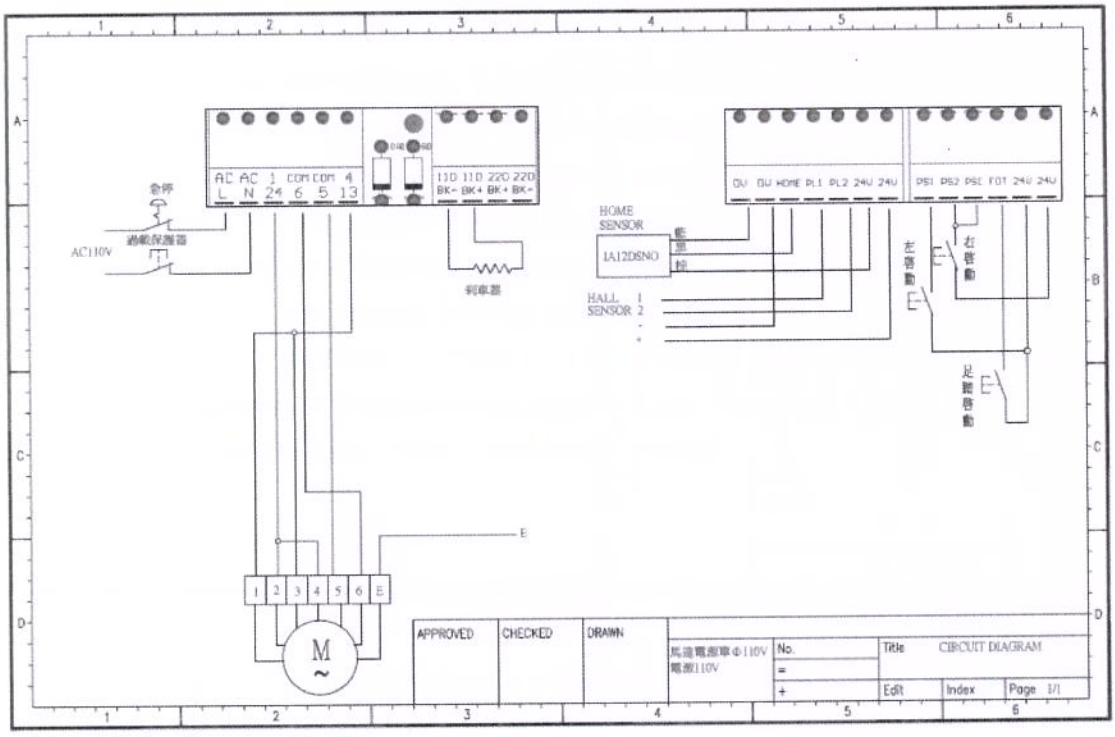
- If you try to enter the full angle (Bend angle + Recovery angle), from which the sum exceeds the 210° the machine will show " MAXIMUM ANGLE 210° " and the operation will not be allowed. Press the " ESC " button to exit and return to the normal operation system.
- If after approximately after 1.25 seconds the movement of the motor (forward/return), the encoder should not read (faulty encoder or the machine is blocked), the rotation will not occur and the display will show "EMERGENCY ENCODER " pressing the "ESC" button. It will exit from the alarm.
- If in the " RETURN " traveling mode the "0" stop will not be found (with a 20° margin from the original position), the motor will stop automatically and the message " EMERGENCY STROKE END ". Pressing the "ESC" button, it will exit from the alarm.
- If while bending the machine should accidentally meet the "0" stop again due to the following : a malfunction of the rotation, encoder no reading properly, electromagnetic interruptions which confuse the reading components, or an incorrect electronic board has been assembled on a machine which different gear reductions, the message "EMERGENCY ENCODER" will appear and the machine will return to its original position. Pressing the "ESC" button, it will exit from the alarm.

15-1 OPERATION DIAGRAM

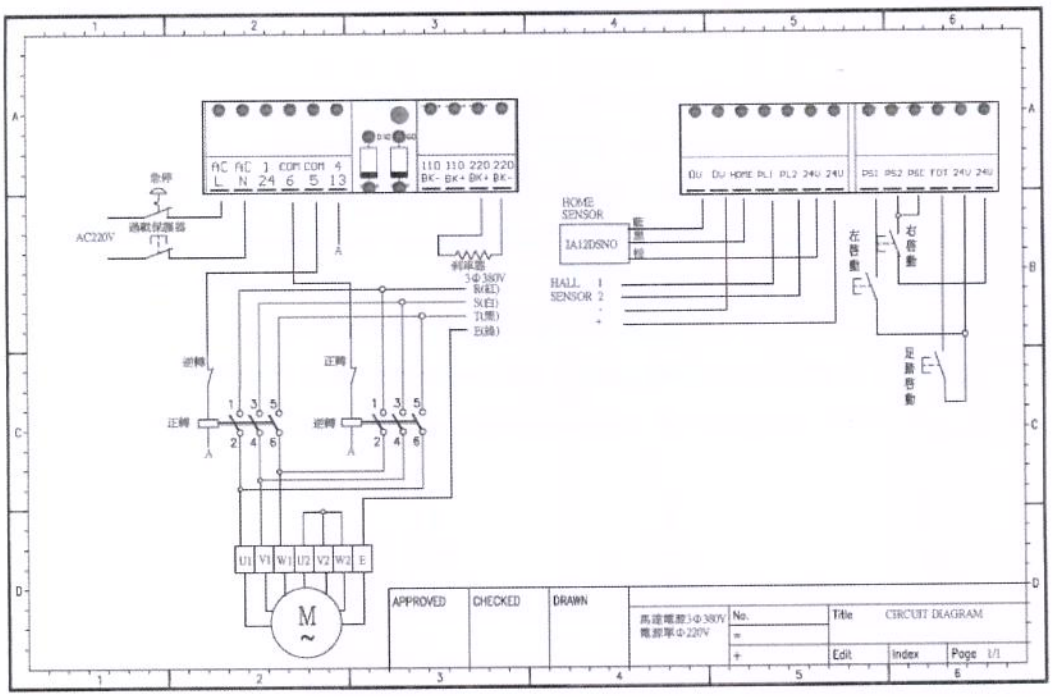


16 CIRCUIT DIAGRAM

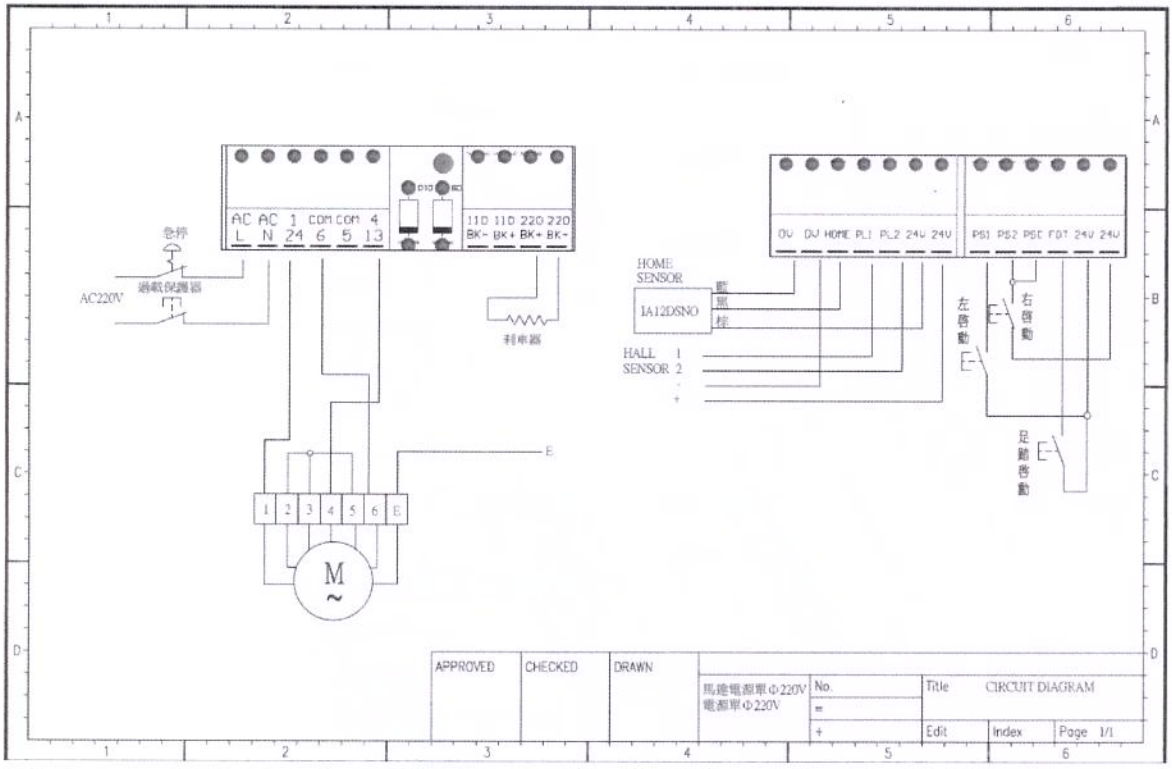
16-1 MOTOR(Φ110V) POWER(110V)

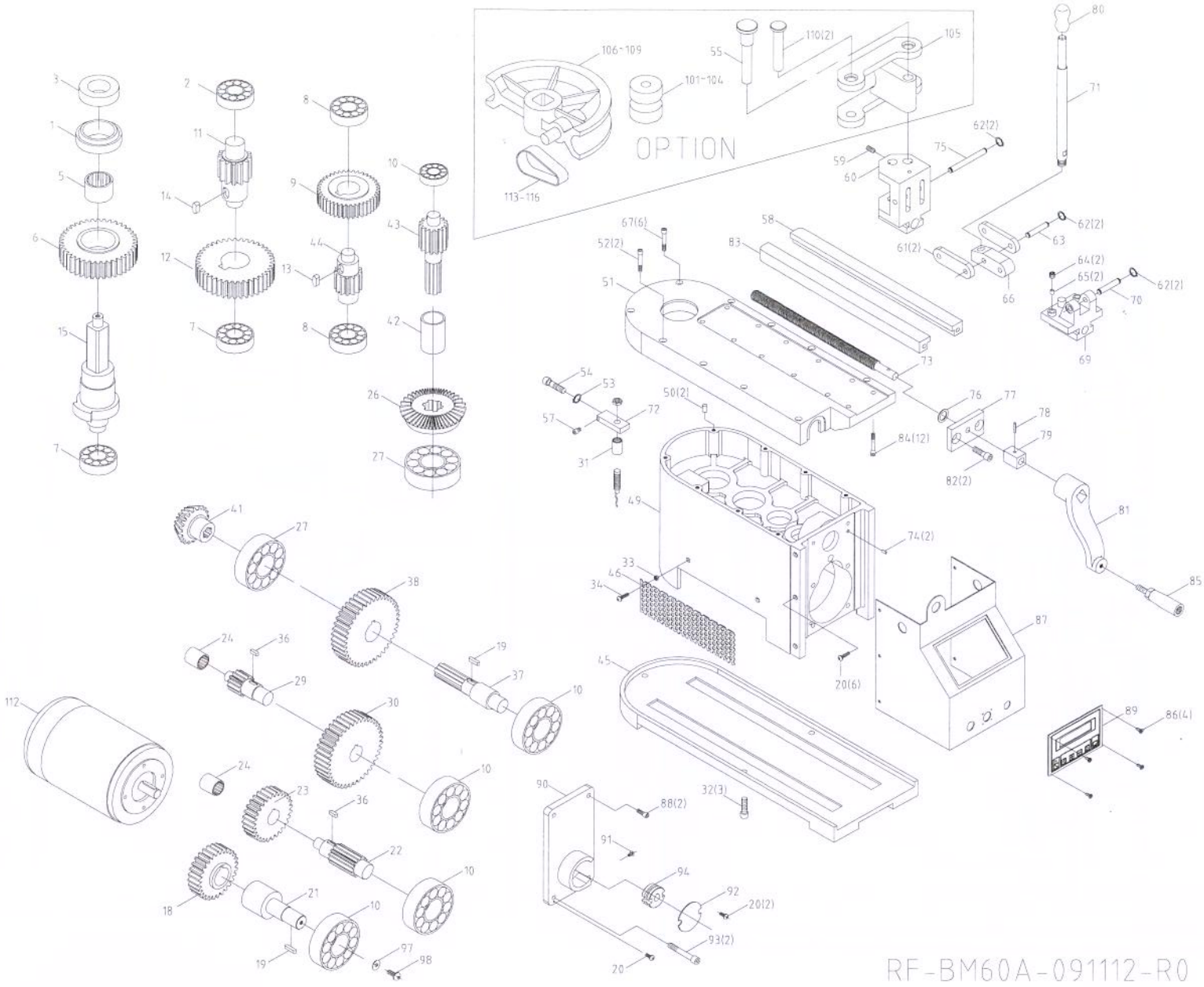


16-2 MOTOR(3Φ380V) POWER(220V)



16-3MOTOR(單相 220V) POWER(220V)




OPTION
RF-BM60A-091112-R0

PARTS LIST

MODEL NO. BM60A

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
1	168029	Positionning ring		1	
2	CARNU206ECP	Bearing	RUN206ECP	1	
3	168030	Outlet shaft's spacer		1	
5	CANK6525	Bearing	NK65/25	1	
6	168013	Outlet gear		1	
7	CA6206ZZ	Bearing	6206ZZ	2	
8	CA6204ZZ	Bearing	6204ZZ	2	
9	168017	Plate wheel		1	
10	CA62022RS	Bearing		5	
11	168014	Pinion		1	
12	168015	Plate wheel		1	
13	HK134	Key	4x4x12L	1	
14	HK133	Key	12x8x20L	1	
15	168012	Outlet shaft		1	
18	168028	Motor's Pinion		1	
19	HK118	Key	5*5*12L	2	
20	HT020	Cross Round Head Screw	M5-0.8PX8L	9	
21	168027	Motor shaft's nut		1	
22	168025	Motor's pinion		1	
23	168026	Motor's plate wheel		1	
24	CAHK1012	Bearing	HK1012	2	
26	168020	Plate wheel		1	
27	CA60042RS	Bearing	6004-2RS	2	
29	168024	Pinion		1	
30	168023	Plate wheel		1	
31	168031	Spacer		1	
32	HS259	Hex. Socket Head Screw	M10-1.5Px25L	3	
33	HN003	Hex. Nut	M5	4	
34	HT002	Cross Round Head Screw	M5-0.8Px16L	4	
36	HK006	Key	5x5x10L	1	
37	168019	Keyed shaft		1	
38	168022	Plate wheel		1	
41	168021	Bevel pinion		1	
42	168033	Spacer		1	
43	168018	Outlet pinion		1	
44	168016	Pinion		1	
45	168001	Reduction box base		1	
46	168034	Protection plate		2	
49	168003	Reduction box		1	

PARTS LIST

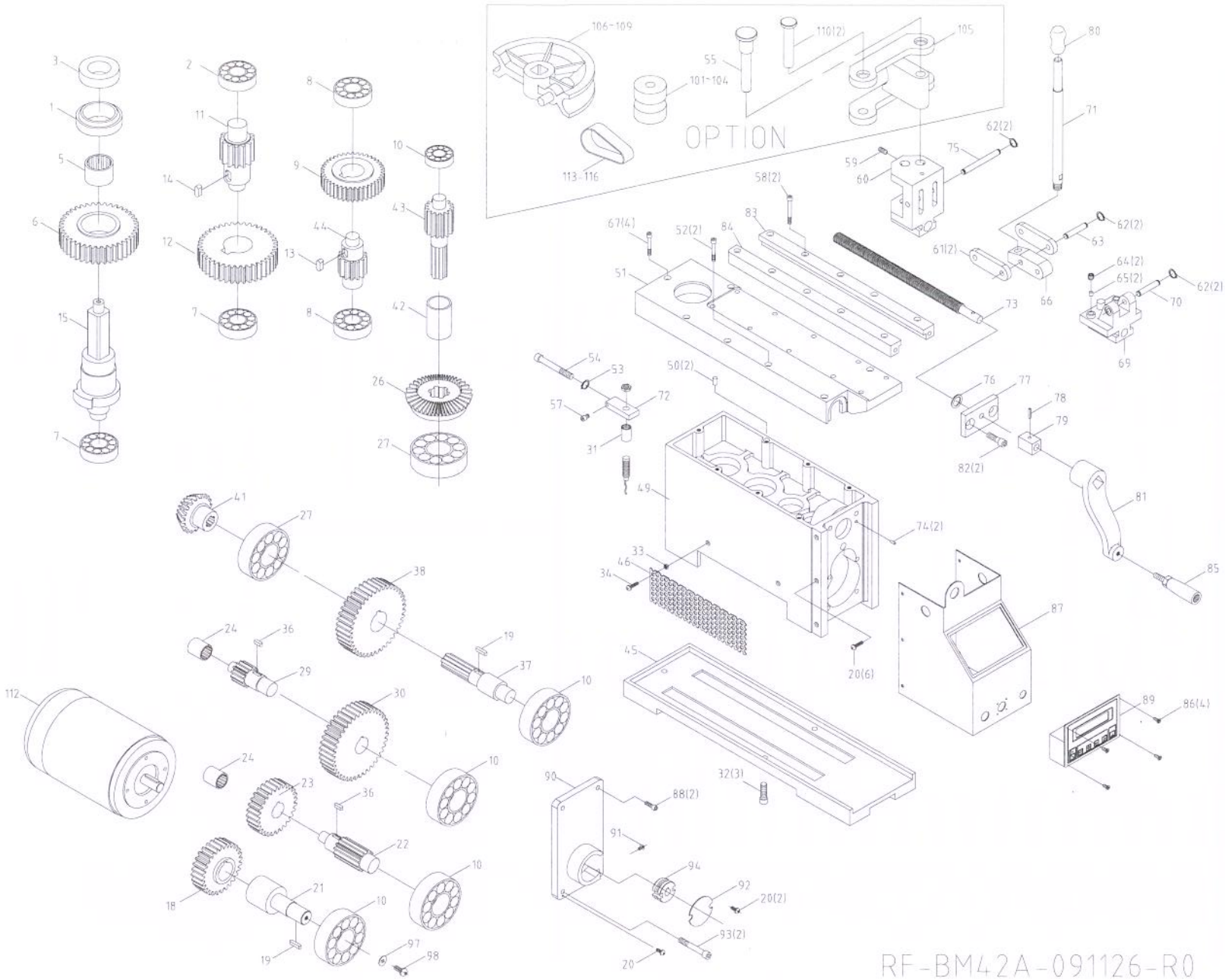
MODEL NO. BM60A

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
50	168061	Positionning ring		2	
51	168002	Box reduction cap		1	
52	HS250	Hex. Socket Head Screw	M8x60L	2	
53	HCS39	C-Retainer Ring	S8	1	
54	168062	Screw		1	
55	168036	C/former support pin		1	Option
57	HS332	Hex. Socket Head Screw	M5X6L	1	
58	168037	C/former support guide R		1	
59	HS413	Hex. Socket Headless Screw	M5x5L	2	
60	168011	C/former support		1	
61	168038	Action rod		2	
62	HCS01	C-Retainer Ring	S10	6	
63	168039	Plug rod		1	
64	HS430	Hex. Socket Headless Screw	M8x10L	2	
65	168066	Friction plate		2	
66	168040	Locking rod		1	
67	HS248	Carriage Screw	M8x50L	6	
69	168005	Quick positioner		1	
70	168042	Plug forquick positioner		1	
71	168043	Locking lever		1	
72	168044	Sensor plate		1	
73	168010	Regulation screw		1	
75	168045	Plug 10x85		1	
76	168046	Washer		1	
77	168047	Flange regulation screw		1	
78	HP031	Spring Pin	ϕ 6X20L	1	
79	168048	Hexagon regulation screw		1	
80	3015-1U	Plastic Bushing		1	
81	168060	Action arm		1	
82	HS258	Hex. Socket Flat Head Scvew	M10X20L	2	
83	168050	C7former support guide L		1	
84	HS242	Hex. Socket Head Screw	M8x20L	12	
85	6027-1S	Clamp Handle		1	
87	168051	Complete digital card		1	
88	HS244	Hex. Socket Head Screw	M8x30L	2	
89	ET2544	Controller	110/220V//1PH	1	
89	ET2545	Controller	220/380V//3PH	1	
90	168004	Flange		1	
91	HS503	Cross Round Head Screw	M3x10L	2	

PARTS LIST

MODEL NO. BM60A

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
92	168032	Cover		1	
93	HS252	Hex. Socket Head Screw	M8x70L	2	
94	168065	Magnets flange		1	
97	HW016	Washer	ϕ 6.5X ϕ 18xt1.5mm	1	
98	HT003	Cross Round Head Screw	M6-1.0Px10L	1	
101	168054	Roll-1		2	Option
102	168055	Roll-2		2	Option
103	168056	Roll-3		2	Option
104	168059	Roll-4		2	Option
105	168057	Guide body		1	Option
106	168006	Former-1		1	Option
107	168007	Former-2		1	Option
108	168008	Former-3		1	Option
109	168009	Former-4		1	Option
110	168058	C/former support		2	Option
112	MFC2035-AL	Motor	1.5HP/50HZ/220V/1PH	1	
113	168067	Ring-1		1	Option
114	168068	Ring-2		1	Option
115	168069	Ring-3		1	Option
116	168070	Ring-4		1	Option


OPTION
RF-BM42A-091126-R0

PARTS LIST

MODEL NO. B42A

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
1	168029	Positionning ring		1	
2	CARNU206ECP	Bearing	RUN206ECP	1	
3	168030	Outlet shaft's spacer		1	
5	CANK6525	Bearing	NK65/25	1	
6	168013	Outlet gear		1	
7	CA6206ZZ	Bearing	6206ZZ	2	
8	CA6204ZZ	Bearing	6204ZZ	2	
9	168017	Plate wheel		1	
10	CA62022RS	Bearing		5	
11	168014	Pinion		1	
12	168015	Plate wheel		1	
13	HK132	Key	8x7x20L	1	
14	HK133	Key	12x8x20L	1	
15	168012	Outlet shaft		1	
18	168028	Motor's Pinion		1	
19	HK118	Key	5*5*12L	2	
20	HT020	Cross Round Head Screw	M5-0.8PX8L	9	
21	168027	Motor shaft's nut		1	
22	168025	Motor's pinion		1	
23	168026	Motor's plate wheel		1	
24	CAHK1012	Bearing	HK1012	2	
26	168020	Plate wheel		1	
27	CA60042RS	Bearing	6004-2RS	2	
29	168024	Pinion		1	
30	168023	Plate wheel		1	
31	168031	Spacer		1	
32	HS259	Hex. Socket Head Screw	M10-1.5Px25L	3	
33	HN003	Hex. Nut	M5	4	
34	HT002	Cross Round Head Screw	M5-0.8Px16L	4	
36	HK006	Key	5x5x10L	1	
37	168019	Keyed shaft		1	
38	168022	Plate wheel		1	
41	168021	Bevel pinion		1	
42	168033	Spacer		1	
43	168018	Outlet pinion		1	
44	168016	Pinion		1	
45	168201	Reduction box base		1	
46	168034	Protection plate		2	
49	168203	Reduction box		1	

PARTS LIST

MODEL NO. B42A

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
50	168061	Positionning ring		2	
51	168202	Box reduction cap		1	
52	HS250	Hex. Socket Head Screw	M8x60L	2	
53	HCS39	C-Retainer Ring	S8	1	
54	168262	Screw		1	
55	168036	C/former support pin		1	Option
57	HS332	Hex. Socket Head Screw	M5X6L	1	
58	HS253	Hex. Socket Headless Screw	M8x75L	3	
59	HS413	Hex. Socket Headless Screw	M5x5L	2	
60	168011	C/former support		1	
61	168038	Action rod		2	
62	HCS01	C-Retainer Ring	S10	6	
63	168039	Plug rod		1	
64	HS430	Hex. Socket Headless Screw	M8x10L	2	
65	168066	Friction plate		2	
66	168040	Locking rod		1	
67	HS248	Carriage Screw	M8x50L	4	
69	168005	Quick positioner		1	
70	168042	Plug forquick positioner		1	
71	168043	Locking lever		1	
72	168044	Sensor plate		1	
73	168010	Regulation screw		1	
75	168045	Plug 10x85		1	
76	168046	Washer		1	
77	168047	Flange regulation screw		1	
78	HP031	Spring Pin	ϕ 6X20L	1	
79	168048	Hexagon regulation screw		1	
80	3015-1U	Plastic Bushing		1	
81	168060	Action arm		1	
82	HS258	Hex. Socket Flat Head Scvew	M10X20L	2	
83	168237	c/former support guide R		1	
84	168250	C7former support guide L		1	
85	6027-1S	Clamp Handle		1	
87	168051	Complete digital card		1	
88	HS244	Hex. Socket Head Screw	M8x30L	2	
89	ET2544	Controller	110/220V//1PH	1	
89	ET2545	Controller	220/380V//3PH	1	
90	168004	Flange		1	
91	HS503	Cross Round Head Screw	M3x10L	2	

PARTS LIST

MODEL NO. B42A

CODE NO	PART NO	DESCRIPTION	SPECIFICATION	QTY	NOTE
92	168032	Cover		1	
93	HS252	Hex. Socket Head Screw	M8x70L	2	
94	168065	Magnets flange		1	
97	HW016	Washer	ϕ 6.5X ϕ 18x1.5mm	1	
98	HT003	Cross Round Head Screw	M6-1.0Px10L	1	
101	168054	Roll-1		2	Option
102	168055	Roll-2		2	Option
103	168056	Roll-3		2	Option
104	168059	Roll-4		2	Option
105	168057	Guide body		1	Option
106	168006	Former-1		1	Option
107	168007	Former-2		1	Option
108	168008	Former-3		1	Option
109	168009	Former-4		1	Option
110	168058	C/former support		2	Option
112	MFC2015-AL	Motor	3/4HP/50HZ/220V/1PH	1	
113	168067	Ring-1		1	Option
114	168068	Ring-2		1	Option
115	168069	Ring-3		1	Option
116	168070	Ring-4		1	Option

⚠WARNING

General Machinery Safety Instructions

Machinery House
requires you to read this entire Manual before using this machine.

1. **Read the entire Manual before starting machinery.** Machinery may cause serious injury if not correctly used.
2. **Always use correct hearing protection when operating machinery.** Machinery noise may cause permanent hearing damage.
3. **Machinery must never be used when tired, or under the influence of drugs or alcohol.** When running machinery you must be alert at all times.
4. **Wear correct Clothing.** At all times remove all loose clothing, necklaces, rings, jewelry, etc. Long hair must be contained in a hair net. Non-slip protective footwear must be worn.
5. **Always wear correct respirators around fumes or dust when operating machinery.** Machinery fumes & dust can cause serious respiratory illness. Dust extractors must be used where applicable.
6. **Always wear correct safety glasses.** When machining you must use the correct eye protection to prevent injuring your eyes.
7. **Keep work clean and make sure you have good lighting.** Cluttered and dark shadows may cause accidents.
8. **Personnel must be properly trained or well supervised when operating machinery.** Make sure you have clear and safe understanding of the machine you are operating.
9. **Keep children and visitors away.** Make sure children and visitors are at a safe distance for you work area.
10. **Keep your workshop childproof.** Use padlocks, Turn off master power switches and remove start switch keys.
11. **Never leave machine unattended.** Turn power off and wait till machine has come to a complete stop before leaving the machine unattended.
12. **Make a safe working environment.** Do not use machine in a damp, wet area, or where flammable or noxious fumes may exist.
13. **Disconnect main power before service machine.** Make sure power switch is in the off position before re-connecting.
14. **Use correct amperage extension cords.** Undersized extension cords overheat and lose power. Replace extension cords if they become damaged.
15. **Keep machine well maintained.** Keep blades sharp and clean for best and safest performance. Follow instructions when lubricating and changing accessories.
16. **Keep machine well guarded.** Make sure guards on machine are in place and are all working correctly.
17. **Do not overreach.** Keep proper footing and balance at all times.
18. **Secure workpiece.** Use clamps or a vice to hold the workpiece where practical. Keeping the workpiece secure will free up your hand to operate the machine and will protect hand from injury.
19. **Check machine over before operating.** Check machine for damaged parts, loose bolts, Keys and wrenches left on machine and any other conditions that may effect the machines operation. Repair and replace damaged parts.
20. **Use recommended accessories.** Refer to instruction manual or ask correct service officer when using accessories. The use of improper accessories may cause the risk of injury.
21. **Do not force machinery.** Work at the speed and capacity at which the machine or accessory was designed.
22. **Use correct lifting practice.** Always use the correct lifting methods when using machinery. Incorrect lifting methods can cause serious injury.
23. **Lock mobile bases.** Make sure any mobile bases are locked before using machine.
24. **Allergic reactions.** Certain metal shavings and cutting fluids may cause an ellergic reaction in people and animals, especially when cutting as the fumes can be inhaled. Make sure you know what type of metal and cutting fluid you will be exposed to and how to avoid contamination.
25. **Call for help.** If at any time you experience difficulties, stop the machine and call you nearest branch service department for help.

⚠WARNING

Section Rolling Machine Safety Instructions

Machinery House
requires you to read this entire Manual before using this machine.

1. **Maintenance.** Make sure the Section Rolling Machine is turned off and disconnect from the main power supply and make sure all moving parts have come to a complete stop before any inspection, adjustment or maintenance is carried out.

2. **Section Rolling Machine Condition.** A Section Rolling Machine must be maintained for a proper working condition. Never operate a Section Rolling Machine that has damaged or worn parts. Scheduled routine maintenance should performed on a scheduled basis.

3. **Roll Condition.** Never operate a Section Rolling Machine with a damaged or badly worn rolls. Replace if required. Rolls should never be greased or lubricated as rolls will slip the material and will not bend.

4. **Roll Direction.** Be aware of the correct rotational axis of the motor when a qualified electrician connects the Machine.

5. **Hand Hazard.** Keep hands and fingers clear from moving parts. Serious injury can occur if hand or finger tips get pinched by rolls and can be dragged into machine.

6. **Personal Protection.** Gloves, safety glasses and safety hat are recommended during operation.

7. **Avoiding Entanglement.** Section Rolling Machine guards must be used at all times. Tie up long hair and use the correct hair nets to avoid any entanglement with the Section Rolling Machine moving parts.

8. **Understand the machines controls.** Make sure you understand the use and operation of all controls.

9. **Trained Operator.** This machine must be operated by authorized and trained personnel.

10. **Power outage.** In the event of a power failure during use of the machine, turn off all switches to avoid possible sudden start up once power is restored.

11. **Work area hazards.** Keep the area around the Section Rolling Machine clean from oil, tools, chips. Pay attention to other persons in the area and know what is going on around the area to ensure unintended accidents.

12. **Guards.** Do not operate Section Rolling Machine without the correct guards in place. Necessary guards protect you from injuries by worm-type gearbox and other gears. The only other area which needs to be carefully monitored during use is the rotational area of the rolls.

13. **Material condition.** Material must be clean of oil and dry. Oily material can slip and will not bend.

14. **Material hardness.** Make sure your hardness is the same throughout the material, we recommend that you use certified material. Never bend hard steel, glass or fragile material on this machine.

15. **Feeding material.** Making a tight bend in one pass is not possible. Several passes are needed before you can achieve a certain radius. Tighter curves and full radius always need more passes.

16. **Stopping the Rolls.** Do not stop or slow the rolls with your hand or workpiece. Allow the Section Rolling Machine to stop on its own.

17. **Emergency stop.** Use the emergency stop button in case of any emergency.

18. **Hearing protection and hazards.** Always wear hearing protection as noise generated from machine and workpiece can cause permanent hearing loss over time.

19. **Call for help.** If at any time you experience difficulties, stop the machine and call you nearest branch service department for help.

PLANT SAFETY PROGRAM

NEW MACHINERY HAZARD IDENTIFICATION, ASSESSMENT & CONTROL

Section Rolling Machine

Developed in Co-operation Between A.W.I.S.A and Australia Chamber of Manufactures
This program is based upon the Australian Worksafe Standard for Plant(NOHSC:1010-1994)

Item No.	Hazard Identification	Hazard Assessment	Risk Control Strategies (Recommended for Purchase / Buyer / User)
A	ENTANGLEMENT	HIGH	Eliminate, avoid loose clothing / Long hair etc.
B	CRUSHING	LOW	Secure & support work material. Ensure machine is bolted down.
C	CUTTING, STABBING, PUNCTURING.	MEDIUM	Isolate power to machine prior to any checks or maintenance being carried out. Do not adjust or clean until the machine has fully stopped. Wear gloves to prevent cuts from material.
D	SHEARING	MEDIUM	Isolate power to machine when checks or maintenance is being carried out. Make sure all guards are secured shut when machine is on. Hands should be kept clear of moving parts such as rolls etc.
F	STRIKING	MEDIUM	Ensure area is kept clear of material being rolled.
H	ELECTRICAL	MEDIUM	All electrical enclosures should only be opened with a tool that is not to be kept with the machine. Machine should be installed & checked by a Licensed Electrician.
O	OTHER HAZARDS, NOISE.	LOW	Wear hearing protection as required.
Plant Safety Program to be read in conjunction with manufactures instructions			

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Authorised and signed by:
Safety officer: .....
Manager: .....

Revised Date: Aug-08