

operation manual

E30 to E200



NEW CONTROL SYSTEM

CONTENTS

SPECIFICATION	1
UNPACKING	9
LIFTING	10
TRANSPORTATION	11
INSTALLATION	12
GENERATOR CONTROL PANEL	13
OPERATION	25
SAFETY GUIDE	27
DISCHARGE DATA SHEETS	



Unit 3, Hollingdon Depot, Stewkley Road, Soulbury,
Nr. Leighton Buzzard, Beds., LU7 0DF. England.
Telephone +44 (01525) 270261 Fax +44 (01525) 270235

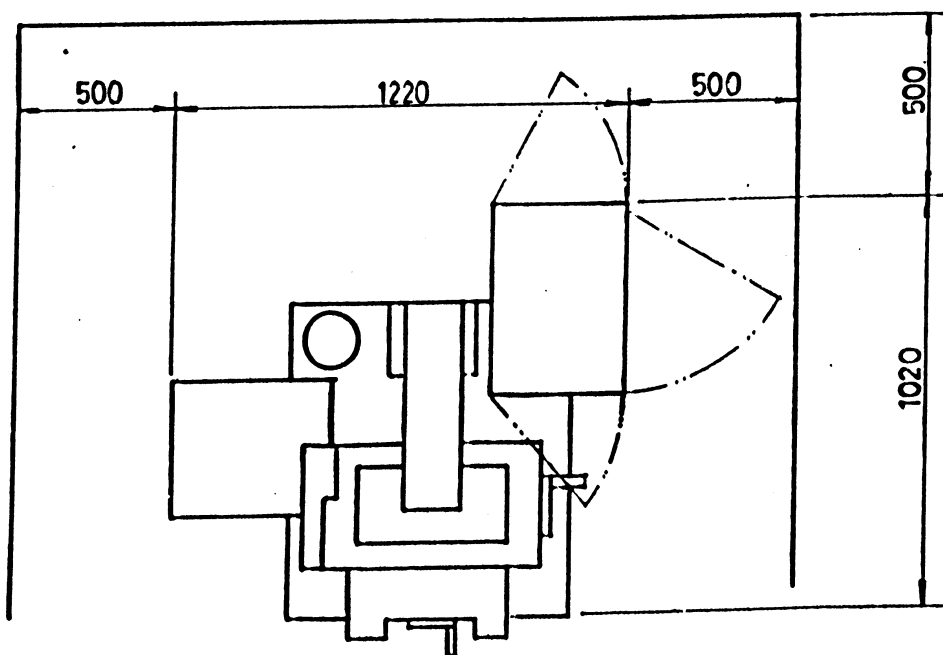
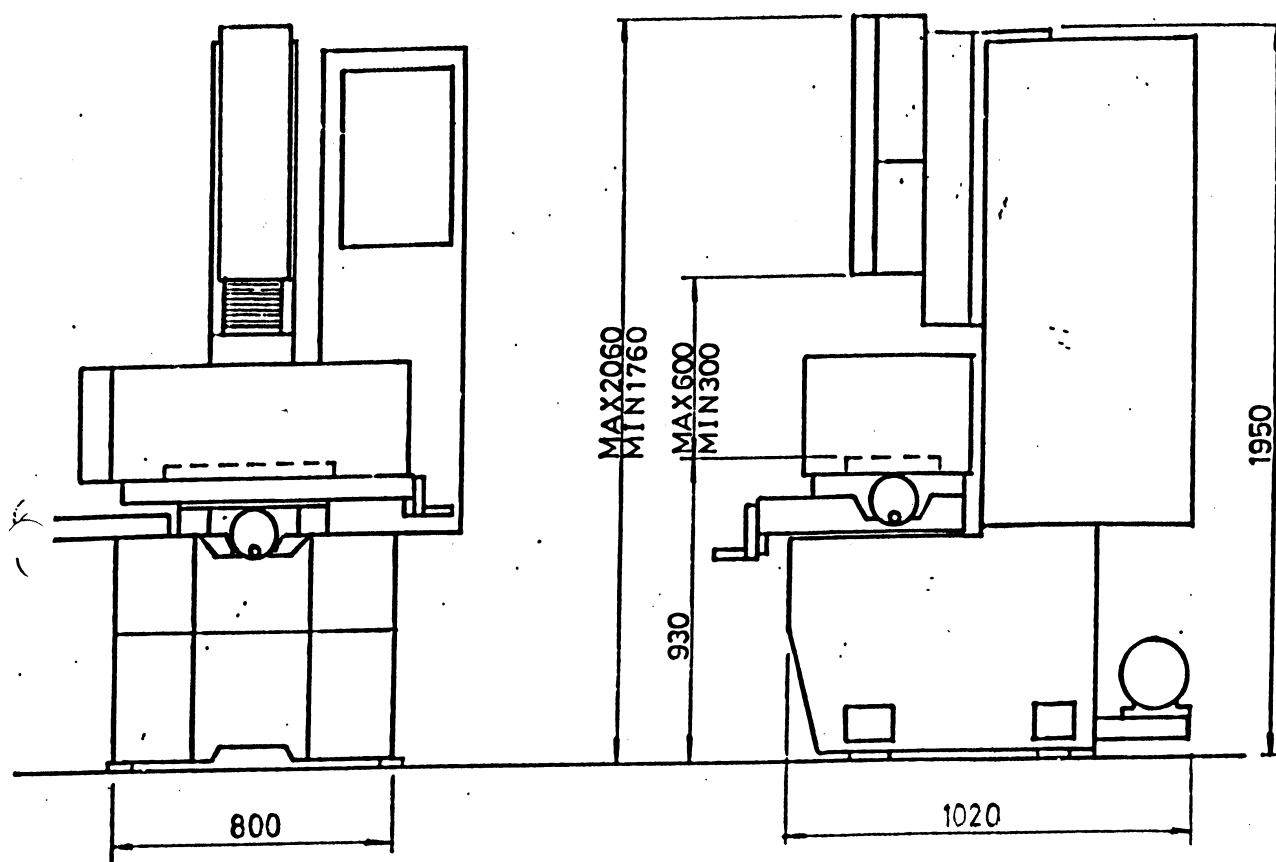
E-Mail sales@anotronic.com

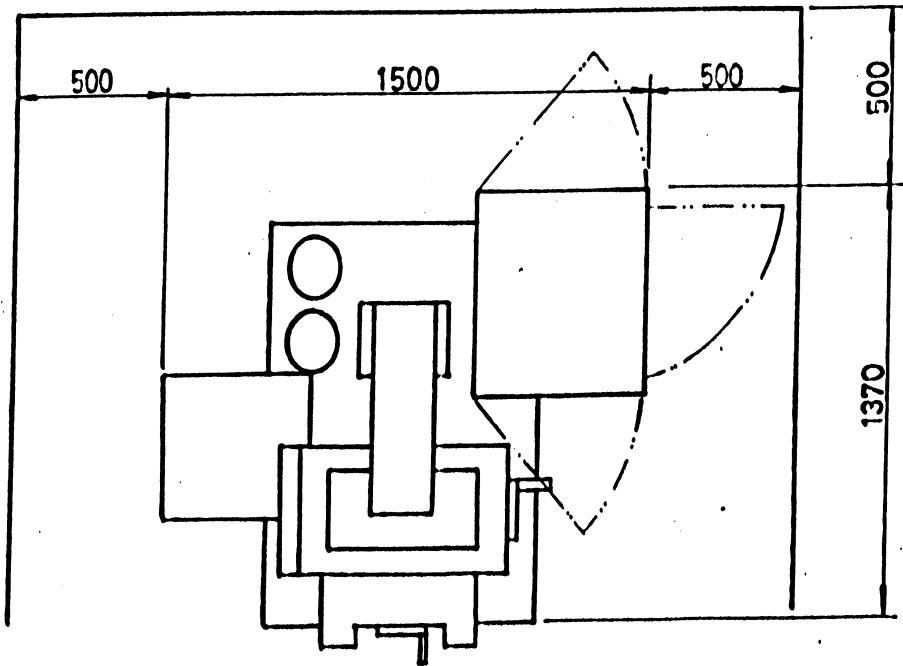
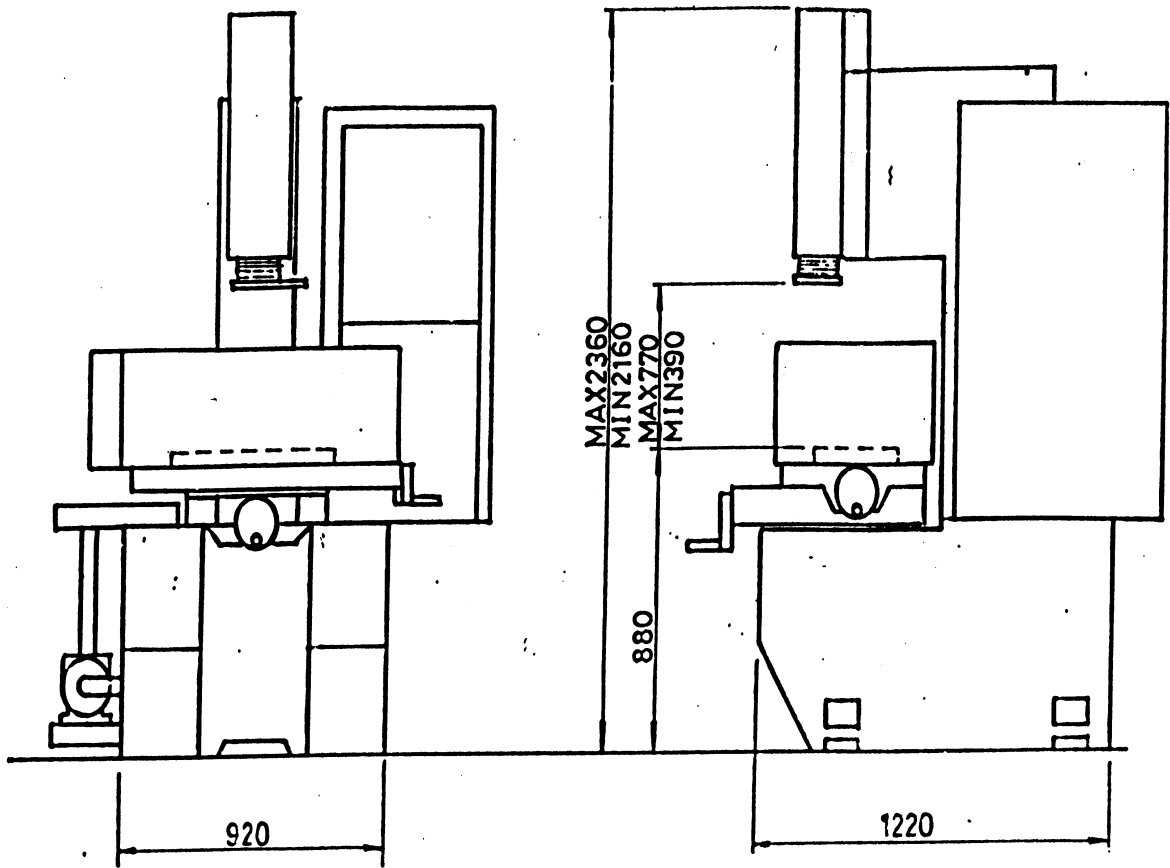
Internet <http://www.anotronic.com>

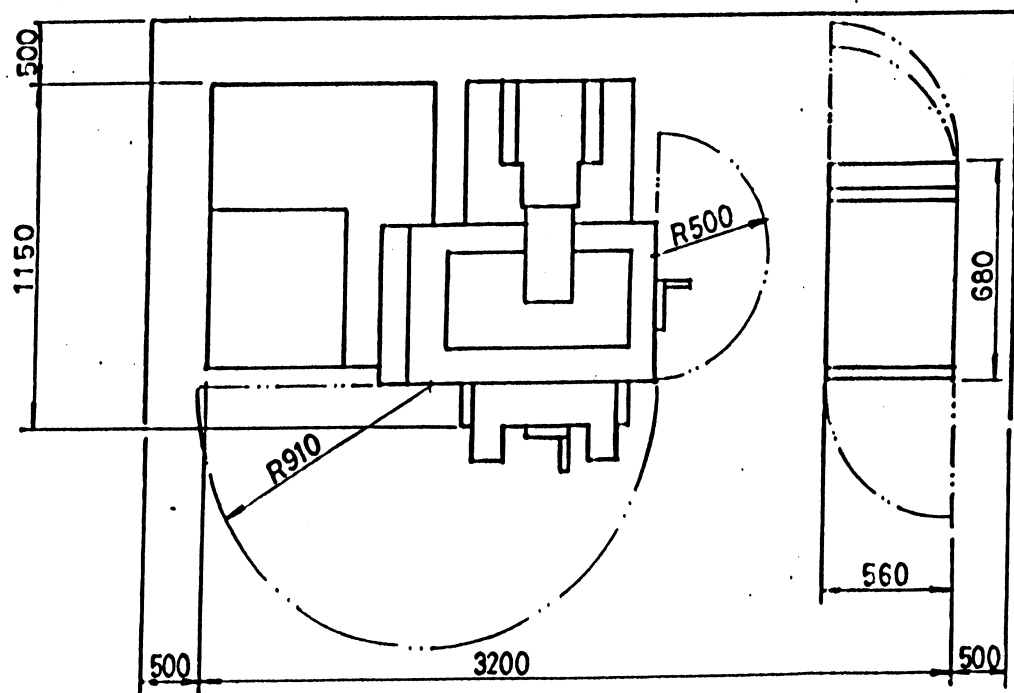
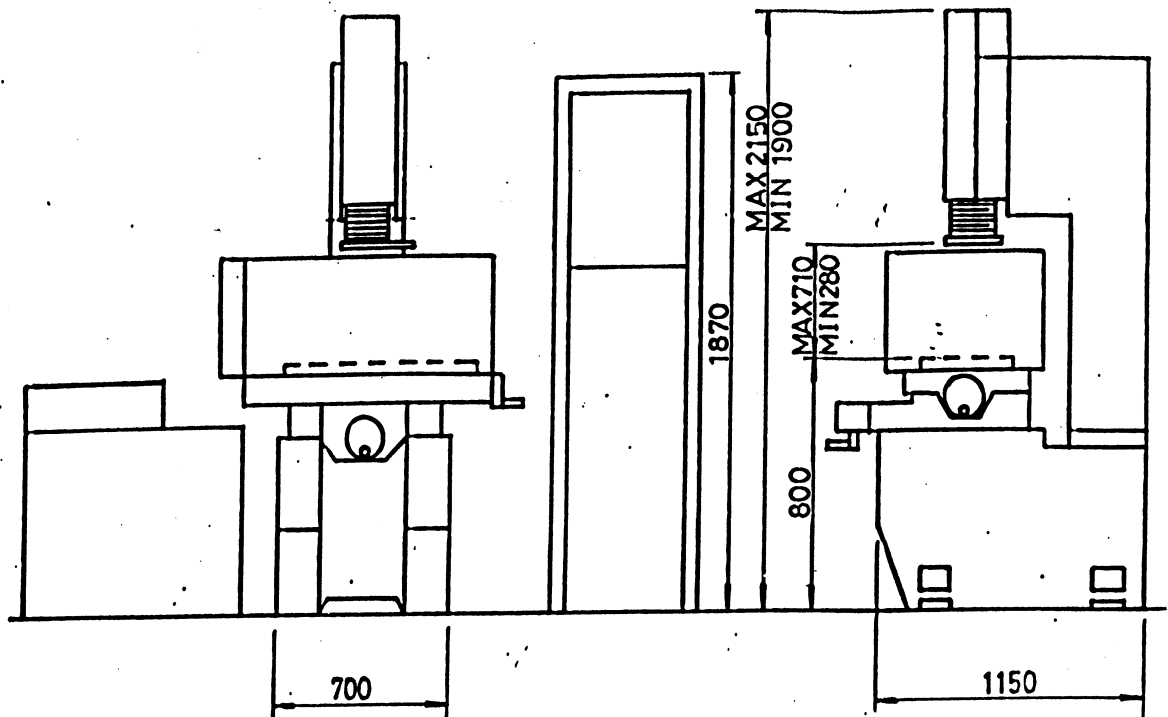


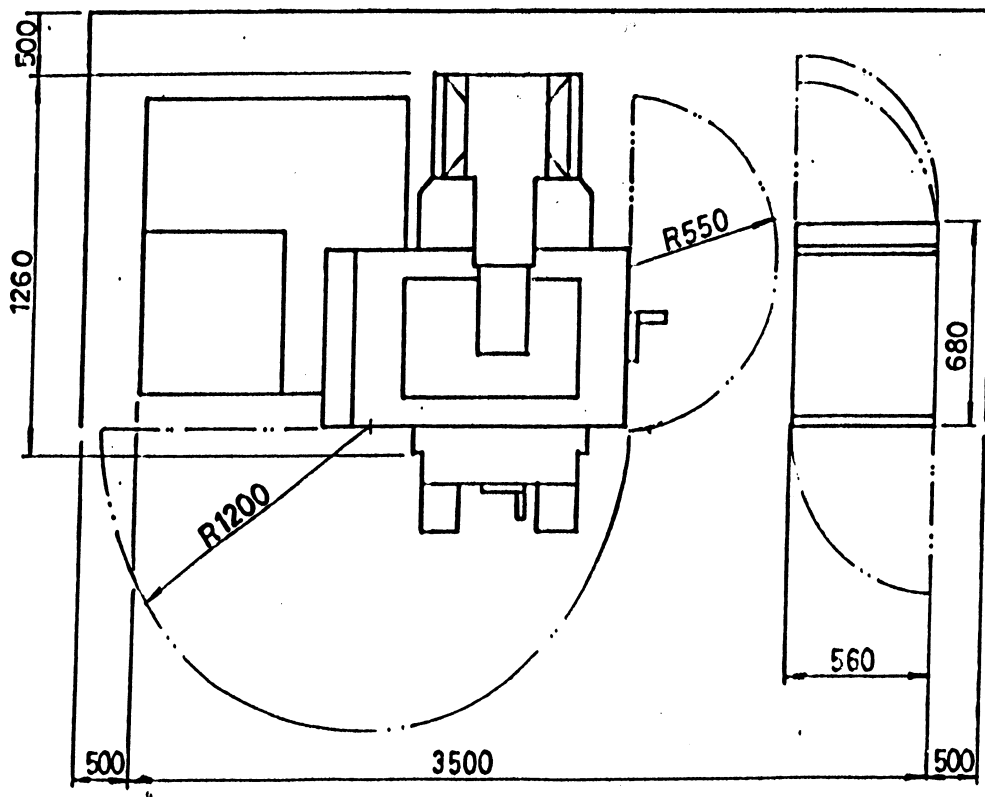
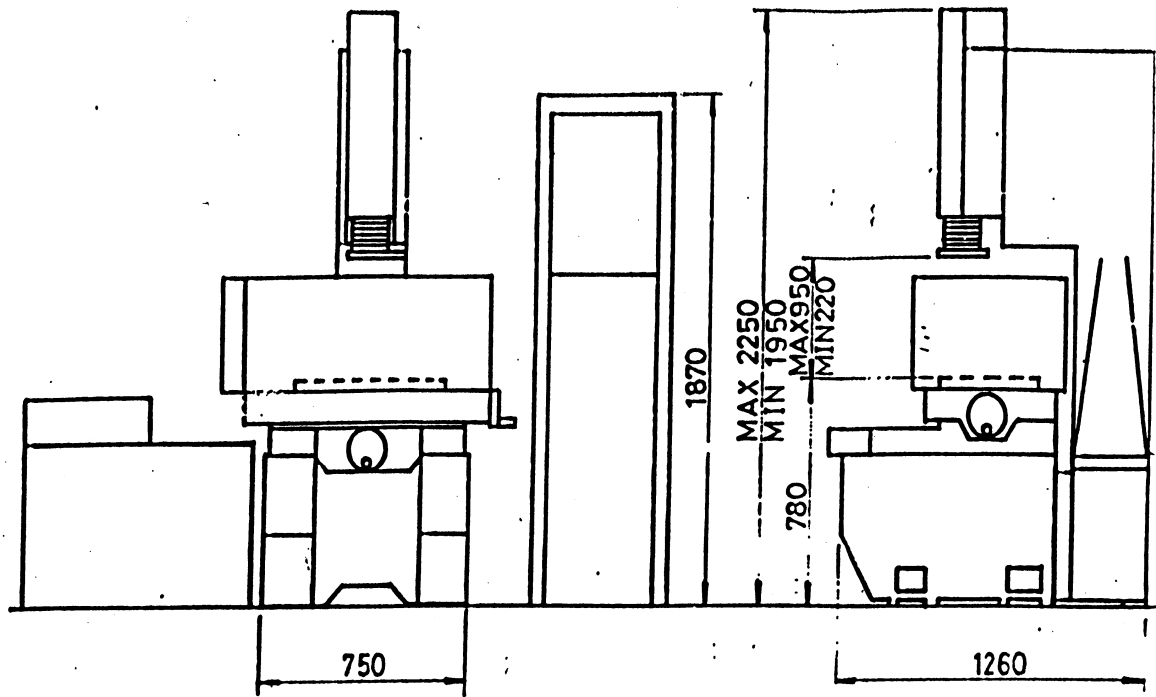
MODEL	V-20	V-25 ZNC-25	V-30 ZNC-30	V-35 ZNC-35	V-45 ZNC-45	V-55 ZNC-55	V-60 ZNC-60	V-68 ZNC-68
TABLE SIZE	400x250	500x250	650x350	700x400	800x450	1000x500	1000x600	1700x800
WORKTANK (L)	530	750	900	1070	1170	1400	1700	2500
INNER (W)	400	450	550	630	630	900	1000	1100
DIMENSIONS (H)	280	280	400	400	400	600	650	750
X AXIS TRAVEL	230	300	350	420	500	600	800	1500
Y AXIS TRAVEL	160	200	300	380	400	500	600	600
Z AXIS	SERVO	300	300	180	180	250	400	450
	AC MOTOR	-	-	200	250	350	-	-
TABLE T-SLOT (NUMBERS x WIDTH)	3x12	3x12	3x14	3x14	4x14	5x18	6x18	6x18
MAX TABLE TOP TO ELECTRODE PLATE SURFACE	450	450	550	650	700	850	850	1000
MAX ELECTRODE WEIGHT(KGS)	30	30	60	80	80	120	250	450
MAX WORKPIECE WEIGHT(KGS)	450	450	700	1000	1200	2000	3000	4500
MACHINE NET WEIGHT(KGS)	800	1000	1300	1400	1600	3000	4000	6500
PACKING DIMENSIONS (L)	1350	1350	1470	1470	1530	COLUMN / BASE 1940 / 2080		2250 / 3000
(W)	1320	1320	1470	1470	1350	850 / 1600		700 / 2270
	2230	2230	2230	2230	2230	1520 / 2080		1780 / 2250
DIELECTRIC TANK CAPACITY(L)	300	300	300	400	450	700	1250	2200
DIELECTRIC TANK WEIGHT(KGS)	-	-	-	150	170	300	450	600x2
PACKING (L)				1340	1340	1820	2200	2230
DIMENSIONS (W)	-	-	-	1140	1140	1520	1320	1260
(H)				1100	1100	1150	1100	1880

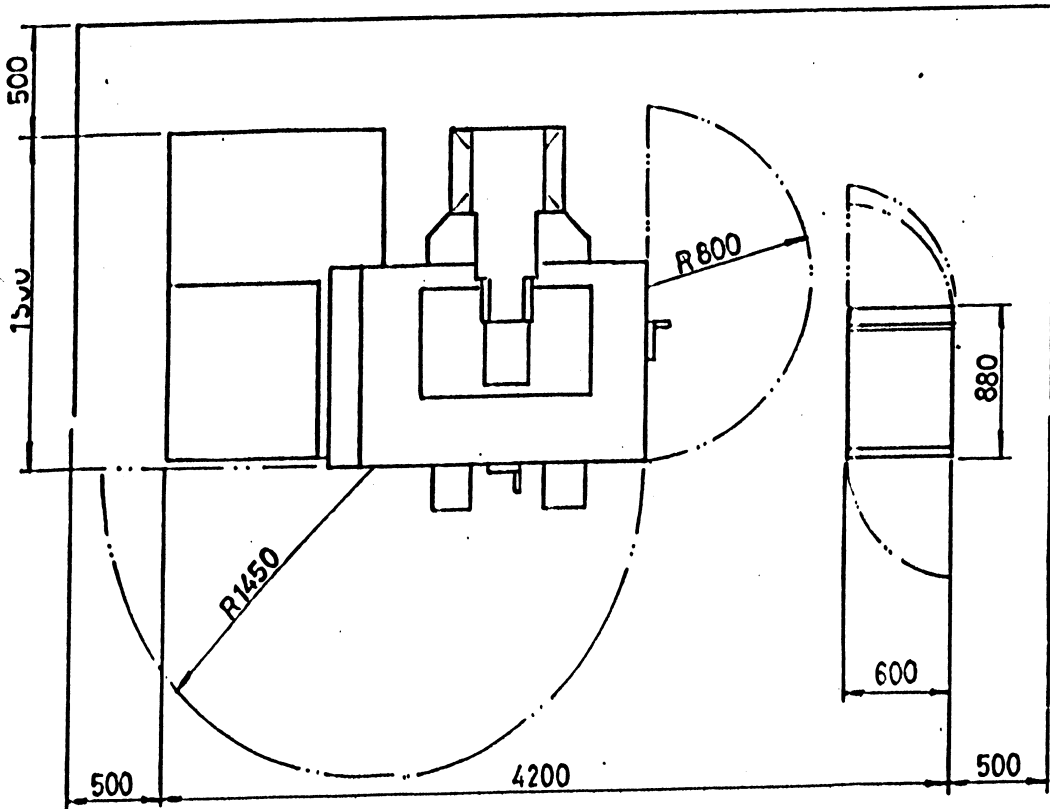
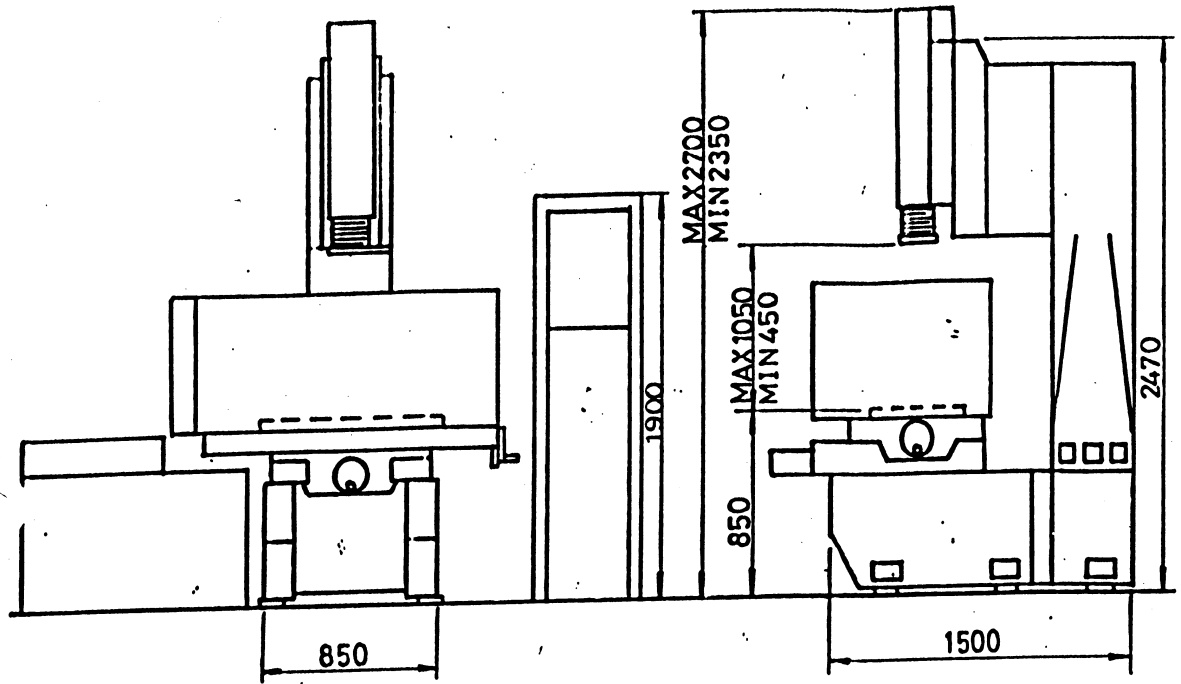
MODEL	MAX.NOMINAL OUT PUT CURRENT (AMP)	MAX.MACHINING SPEED (mm 3 / MIN)	MIN.ELECTRODE WEAR RATIO (UNDER)	BEST SURFACE ROUGHNESS (μ / RMAX)	POWER CONSUMPTION (KVA)	NET WEIGHT (KGS)	PACKING DIMENSIONS LxWxH(MM)
10A	30	250	0.3%	0.3-0.5	3		Mounted On Machine Base
50A	50	350	0.3%	0.3-0.5	4.5	200	950 x 900 x 2 000
75A	75	400	0.3%	0.3-0.5	7	250	950 x 900 x 2 000
100A	100	600	0.5%	0.3-0.5	10	300	950 x 900 x 2 000
150A	150	900	0.5%	0.3-0.5	15	330	1200 x 900 x 2 000
200A	200	1300	0.5%	0.3-0.5	20	400	1600 x 900 x 2 000

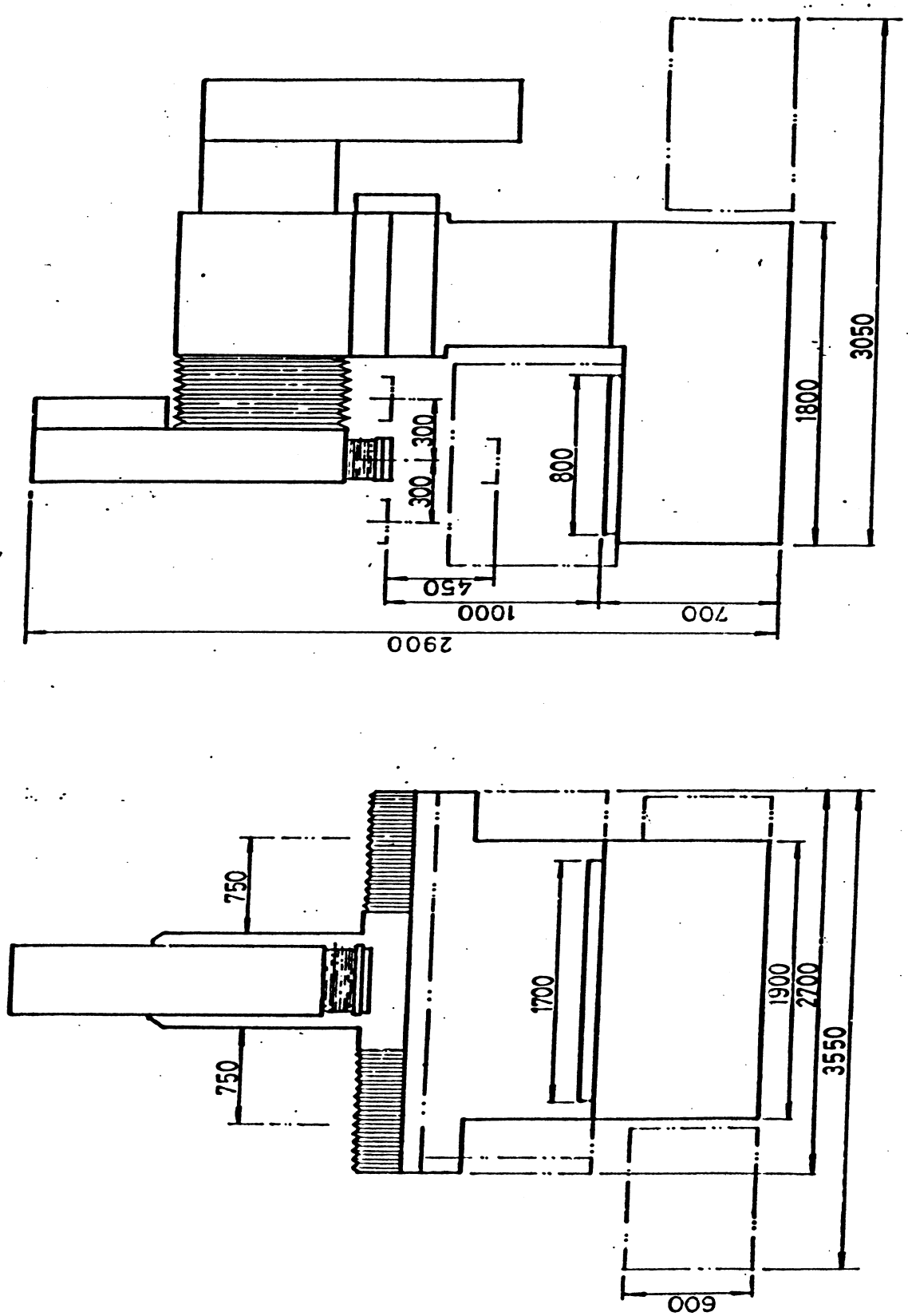


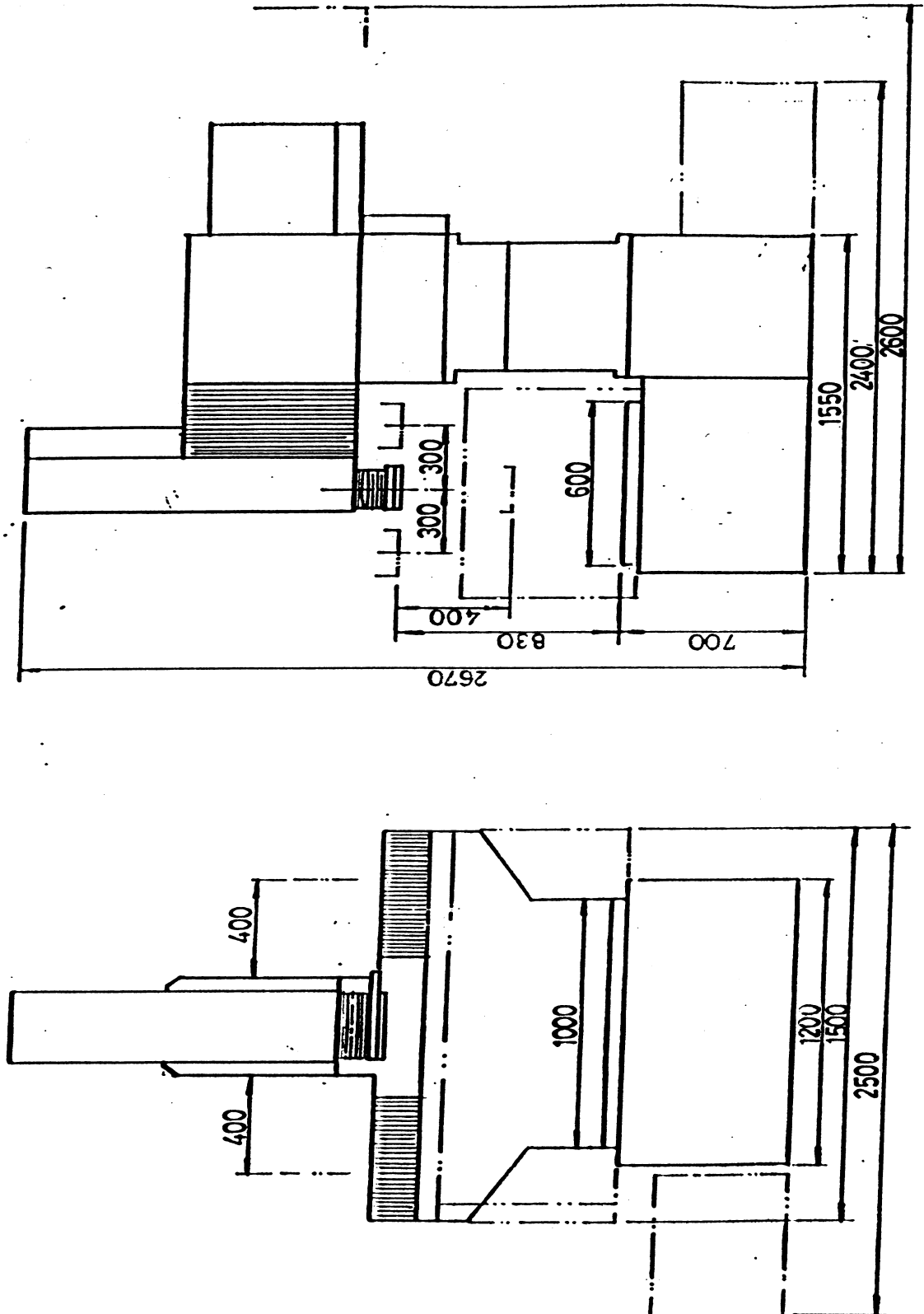






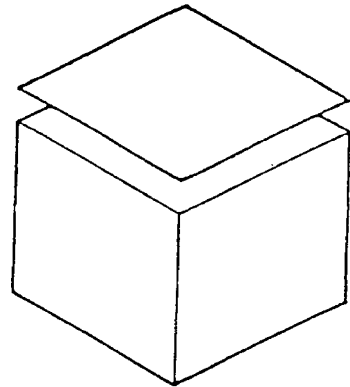




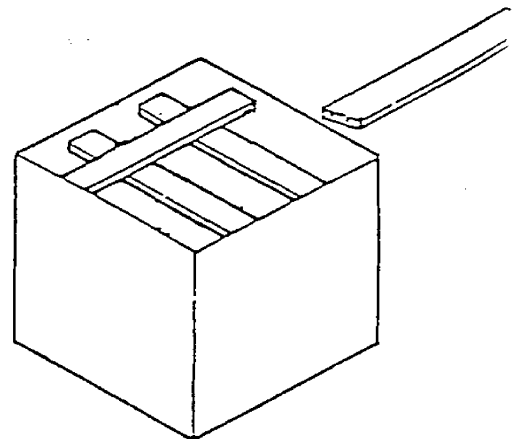


UNPACKING

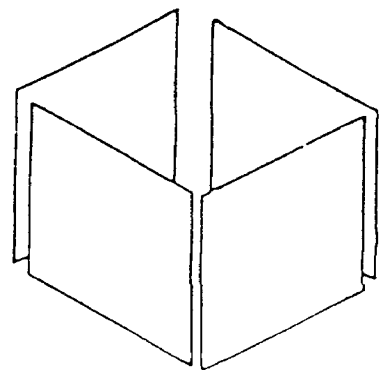
REMOVE THE TOP COVER



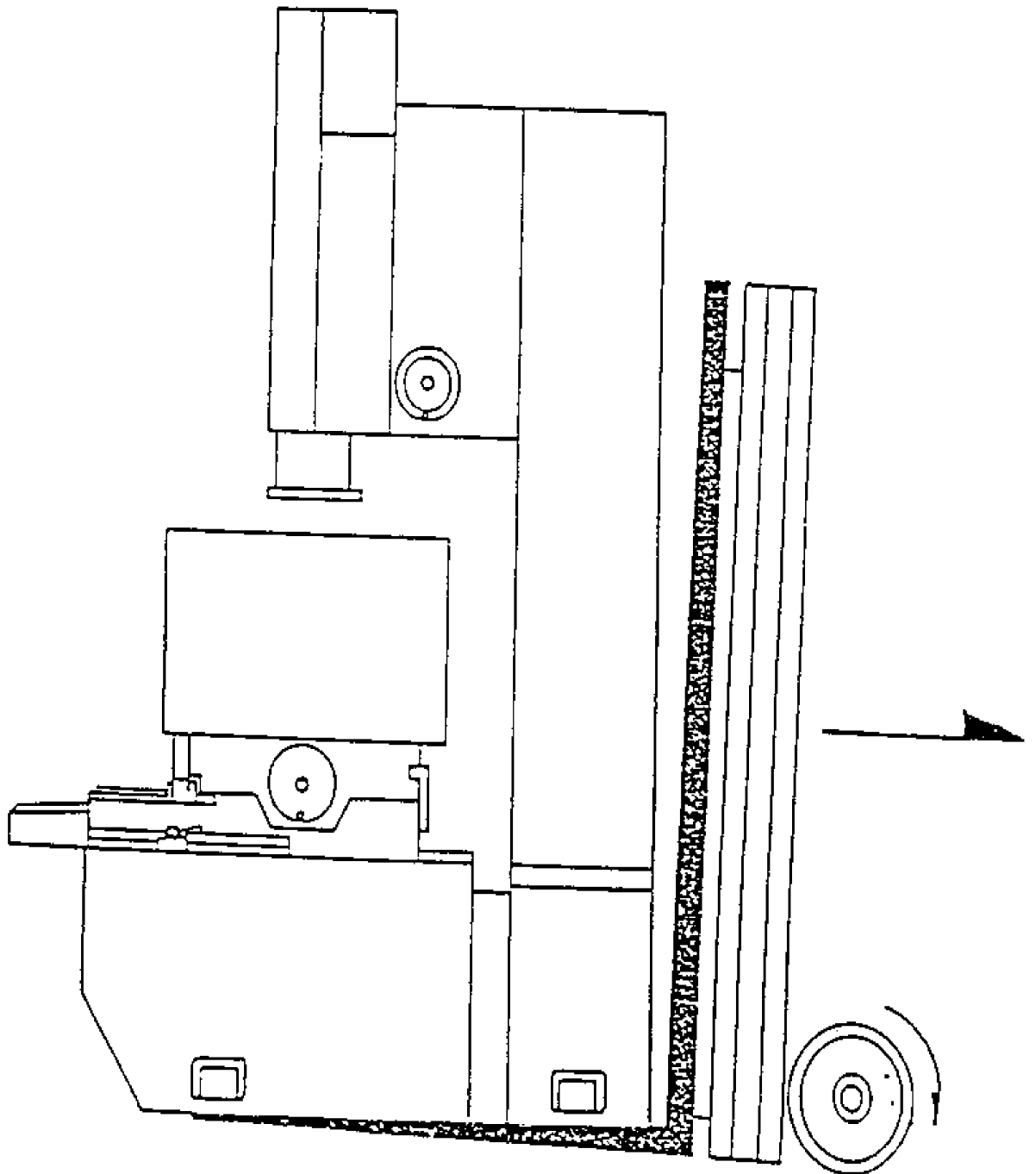
REMOVE THE WOODEN BEAMS



REMOVE THE FOUR SIDES OF THE CASE



LIFTING



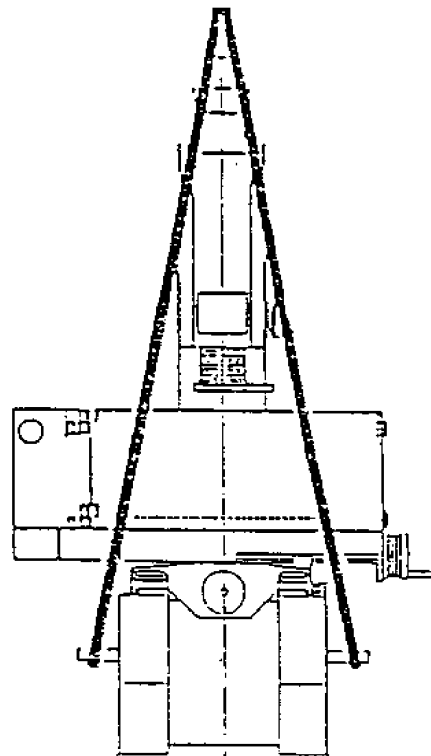
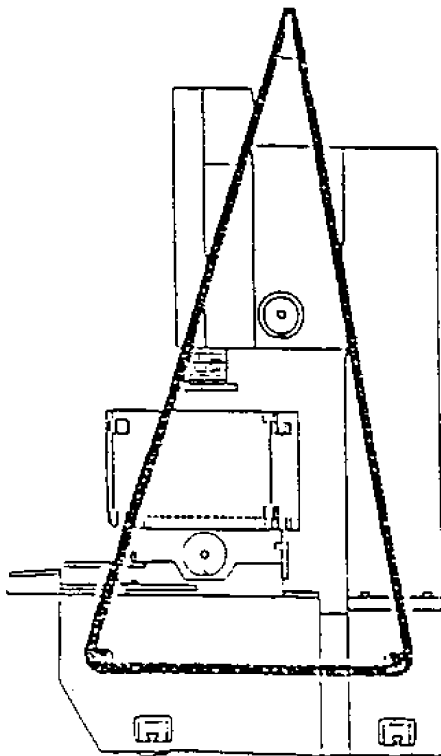
TRANSPORTATION

When moving the packing cases, make sure that they are kept upright.

1. The correct way to move the Machine
 - A. There are two holes through the machine base to insert steel bars. Place slings around the bars and lift using a crane.
 - B. Using the four leveling bolts provided, raise the machine and move by fork lift.

CAUTION :- DO NOT ALLOW ANY PRESSURE ON THE WORK TABLE OR SADDLE.

2. Moving the Power Unit.
 - A. Hoist by fastening a rope through the eye bolts on top of the unit.
 - B. Manually on the four built-in castors.
3. Moving the Oil Tank
Either by fork lift or on the four built-in castors.



INSTALATION

1. Enviroment.

To obtain the best working conditions for the Machine :-

- A. A cool ventilated, clean room, well protected from dust and dirt will prolong the life of the machine.
- B. Placing the machine on a stable concrete foundation will reduce vibration which can seriously affect precision.
- C. For easier operation and maintenance the machine should be positioned with at least 1 metre all-round clearance.

2. Degreasing the Machine.

To protect the machine against corrosion during delivery, all unpainted areas, slideways, handles, etc. are coated with grease.

- A. Degrease using paraffin, dielectric fluid or a suitable solvent cleaner.
- B. The slideways should be then lightly oiled.

3. Levelling the Machine.

After positioning the machine the worktable should be levelled.

- A. There are four levelling bolts at the base of the machine.
- B. Level the machine using a spirit level on the worktable.
- C. Tighten the lock nuts after adjustment.

4. Inspection Before Operation

A. Power Supply.

Connect the machine tool and the dielectric unit to the control cabinet using the cables supplied.
Connect the control cabinet to a three phase supply, suitably fused and earthed.

NOTE:- THIS SHOULD ONLY BE CARRIED OUT BY A COMPETENT ELECTRICIAN.

B. Dielectric System.

- a. Check and fill the dielectric tank. This should be filled to at least 80% of capacity.
- b. Check the flow and drainage of dielectric fluid to the work tank.
- c. Check the rotation direction of the dielectric pump.

C. Work Tank

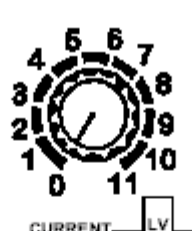
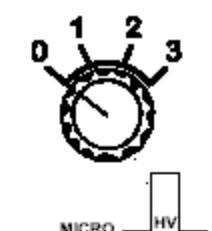
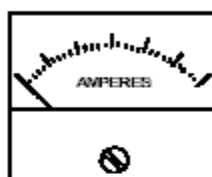
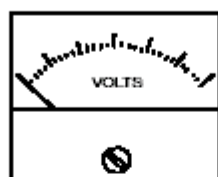
Lock the work tank door, slowly fill the tank and check for leaks.

D. Machine Head

Check the Auto / Manual up and down movements of the electrode (Quill)

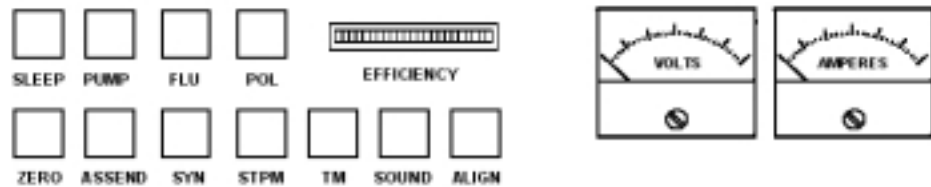
30A

ANOTRONIC



50 - 75A

ANOTRONIC



GAP



ANTI-ARC HEIGHT



SENS



ARC STOP



SPEED



WORKING TIME



ON TIME



OFF TIME



MICRO



CURRENT



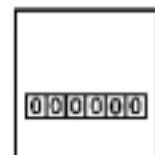
BUZZER



POWER

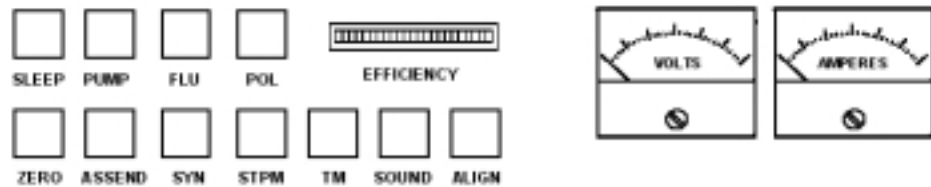


DEEP HOLE



HOUR METER

ANOTRONIC



GAP



ANTI-ARC HEIGHT



SENS



ARC STOP



SPEED



WORKING TIME



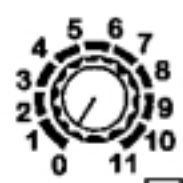
ON TIME



OFF TIME



MICRO



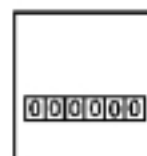
CURRENT LV1



CURRENT LV2



POWER



HOUR METER



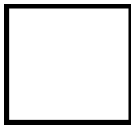
BUZZER

GENERATOR CONTROL PANEL



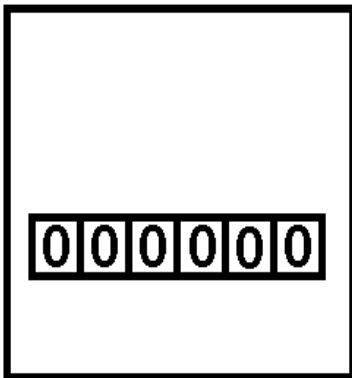
Push hard on this button to switch off the power supply completely.

Turn in the arrowed direction to reset.



POWER

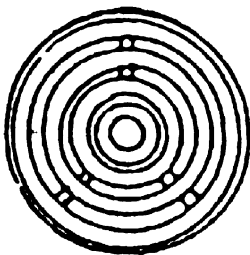
This controls the main power supply.



HOUR METER

Records the total machine working hours.

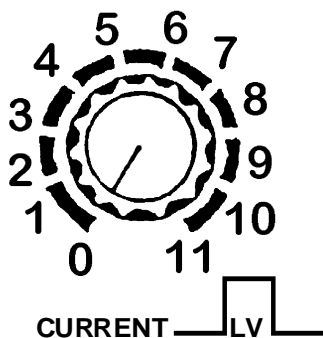
✧ *NOT ON 30A INTEGRAL GENERATOR*



BUZZER

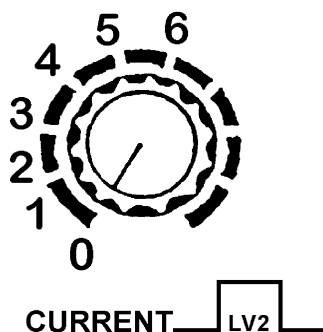
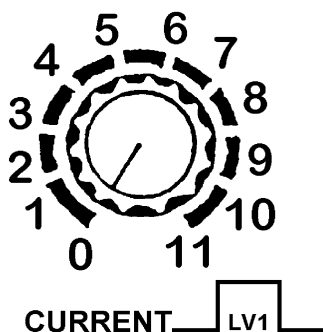
The BUZZER will sound as an alarm in conjunction with the SOUND switch.

The BUZZER will also sound when the electrode touches the workpiece giving the edge detect function.



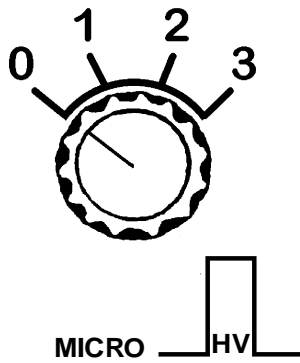
The discharge current required depends on the workpiece dimensions. A general rule of thumb is not to exceed 6 Amps cm². Choose a high current for roughing, lower for finishing. See the appropriate EDM Discharge Data sheet for the equivalent current / switch settings.

☆ **ONLY ON GENERATORS UP TO 75A**



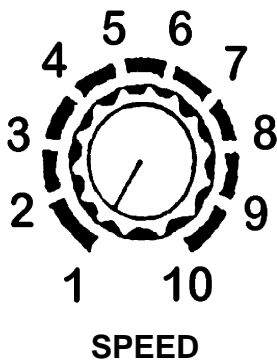
☆ **ONLY ON GENERATORS 100A AND ABOVE**

GENERATOR CAPACITY	LV / LV1 SCALE										
	1	2	3	4	5	6	7	8	9	10	11
30 AMP	1.2	2	3	5	7.2	9.2	12.2	21	24.2	28.2	30.2
50 AMP	1.2	2	3	5	8	12	17	23	36.2	48.2	54.2
75 AMP AND ABOVE	1.2	2	4.2	8	12	20	26	38	56	68	78.2
	LV2 SCALE										
	1	2	3	4	5						
100 AMP	102.2										
150 AMP	102.2	126.2	150.2								
200 AMP	102.2	126.2	150.2	174.2	198.2						

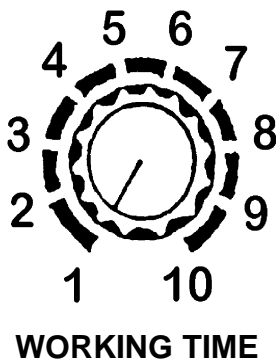


High voltage current / Micro spark current.
For micro fine finishing

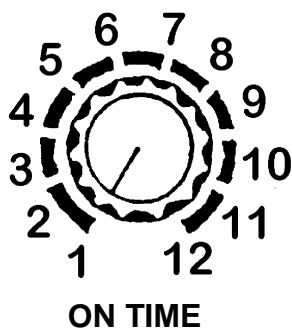
SCALE	VOLTS	AMPS
0	100	0
1	150	0.5
2	200	0.8
3	260	1.2



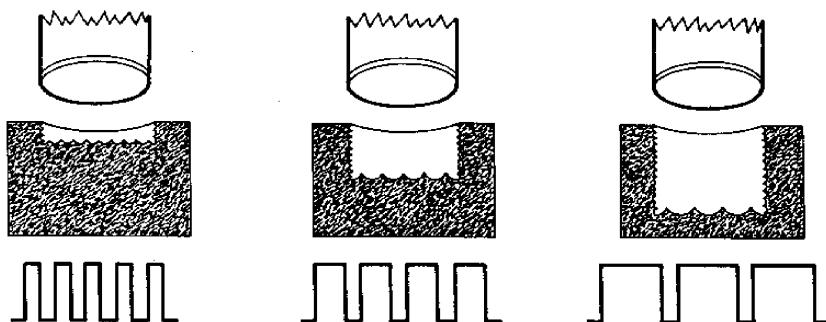
The Servo speed control should be set so that the quill returns to the sparking position after lifting, as quickly and steadily as possible. Too slow will waste time, while too fast could cause vibration when discharging and lower working efficiency.



The discharge time between lifts. Used in conjunction with ANTI ARC HEIGHT.



1 = 10 μ S	5 = 60 μ S	9 = 350 μ S
2 = 15 μ S	6 = 100 μ S	10 = 500 μ S
3 = 25 μ S	7 = 150 μ S	11 = 650 μ S
4 = 40 μ S	8 = 250 μ S	12 = 850 μ S

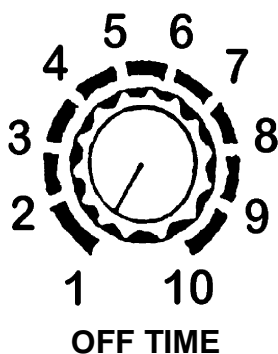


The ON TIME is the pulse duration or the length of the spark measured in microseconds.

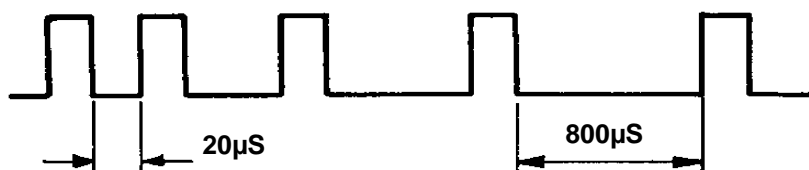
1 - 4 for fine and micro finishing.

5 - 8 for semi rough cutting.

9 - 12 for rough cutting.



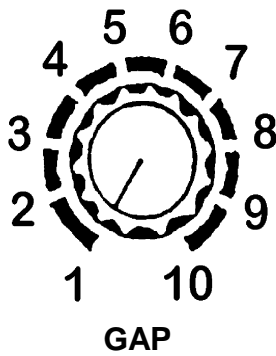
1 = 20 μ S	5 = 350 μ S	9 = 750 μ S
2 = 30 μ S	6 = 450 μ S	10 = 800 μ S
3 = 150 μ S	7 = 550 μ S	
4 = 250 μ S	8 = 650 μ S	



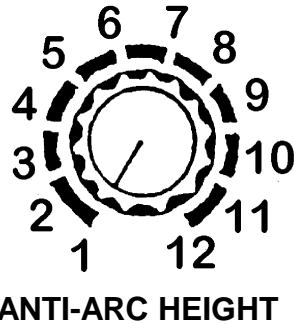
The OFF TIME or interval is the time between sparks measured in microseconds. Used in conjunction with the ON TIME control to give the correct discharge efficiency ratio.

1 - Gives high erosion efficiency but bad flushing.

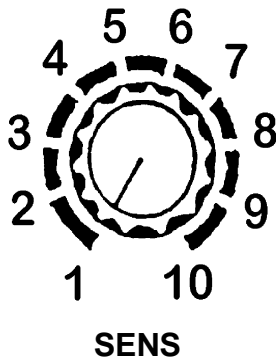
10 - Gives low erosion efficiency but good flushing.



For adjusting the discharge voltage.
 30 - 50V for high efficiency.
 50 - 100V for a difficult workpiece.
 100 - 200V for micro finish or a difficult workpiece.

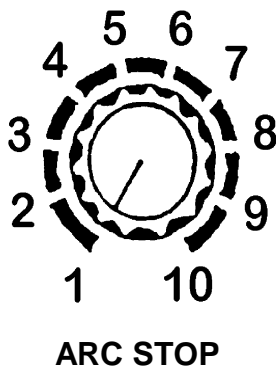


The lift time between discharge periods. Used in conjunction with WORKING TIME



Fine adjustment to the anti-arc sensitivity to debris in the work gap which may cause arcing.
 10 is more sensitive.

⊗ NOT ON INTEGRAL 30A GENERATOR
 FUNCTION INTERNALLY PRE-SET



To adjust the stopping time of the anti arc when a build up of debris is detected in the work gap.
 1 is fastest.

⊗ NOT ON INTEGRAL 30A GENERATOR
 FUNCTION INTERNALLY PRE-SET



ZERO

The quill will descend slowly until the electrode touches the workpiece. The operator can then accurately set the working depth.

To stop press STOP on the remote control.

✳ **NOT ON INTEGRAL 30A GENERATOR**



ASSEND

When the pre-set depth is reached, the quill will lift 10 - 30mm from the workpiece.

When used in conjunction with SOUND the quill will lift to the top and the BUZZER will sound continuously.



SYN

Synchronised flushing. Then the quill lifts with ANTI-ARC HEIGHT flushing is delivered through the synchronised flushing nozzle. During discharge flushing is stopped.

✳ **NOT ON INTEGRAL 30A GENERATOR**



STPM

Stops the quill servo motor.

Used in conjunction with orbiting devices.



TM

Turns the timers, WORKING TIME and ANTI-ARC HEIGHT off.



SOUND

With **SOUND OFF** a short alarm will sound to alert the operator.

With **SOUND ON** this is latched on.

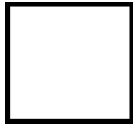


ALIGN

Turns off the reference voltage between the electrode and workpiece.

Used when clocking electrodes.

Note. With this on the electrode can hit the workpiece causing damage !.



SLEEP

When the pre-set depth is reached, the machine stops and the main power is turned off.

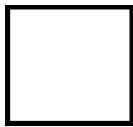
NOTE!

The machine should not be left unattended while running.



PUMP

Turns the dielectric pump on and off.



FLU

Synchronises the dielectric pump on and off with discharge power.



POL

Normally the electrode is positive and the work-piece is negative. This reverses the polarity.



EFFICIENCY

Indicates the discharge efficiency during eroding. The larger the GAP between the electrode and work-piece, the more lights displayed.



**DEEP
HOLE**

Activate this switch for Deep Holes and difficult cavities. When activated the cutting speed and output current will be reduced, this is normal because the Deep Hole circuit increases the Off Time after a number of cycles to produce more stable sparking conditions.

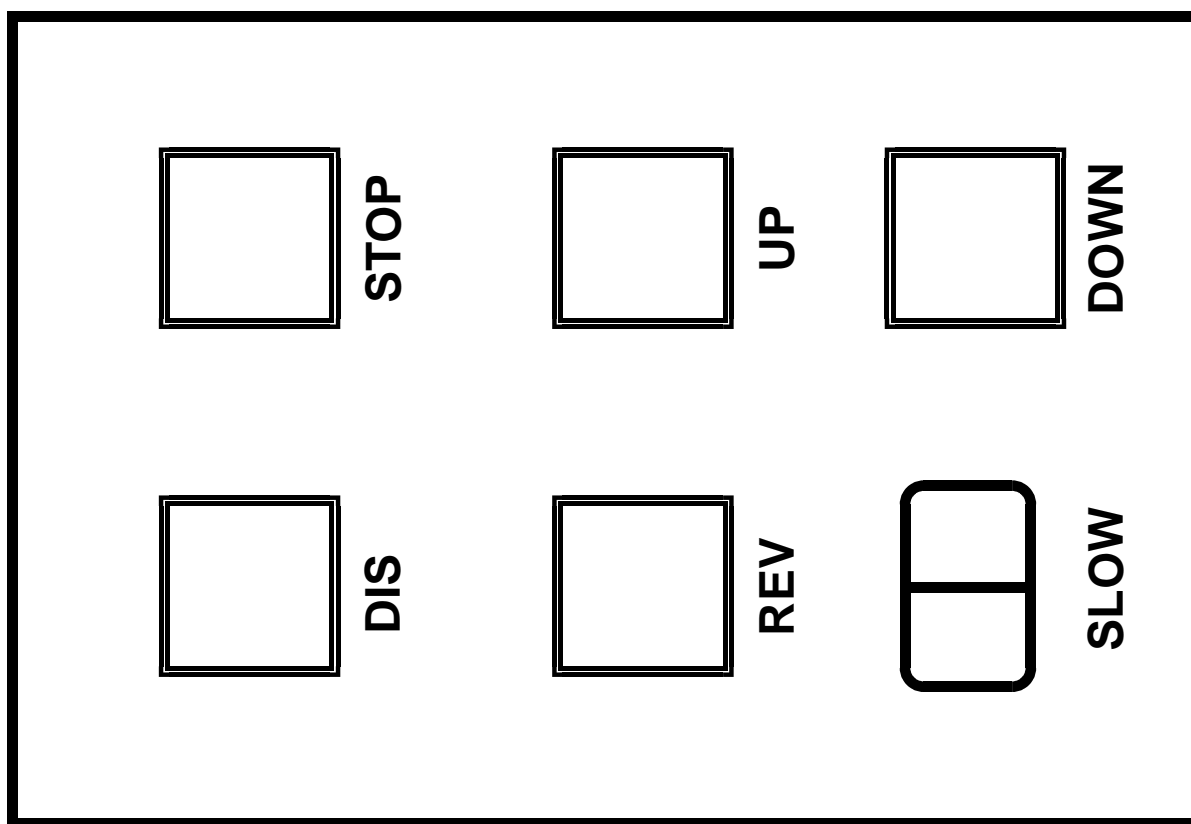
REMOTE CONTROL PANEL

Discharge Stop Button.
Press to stop machining.

If the LED is not on, oil level low, oil hot or the quill at top limit etc., discharging will not start.

Quill up button.
Press to manually move the quill up.

Quill down button.
Press to manually move the quill down.

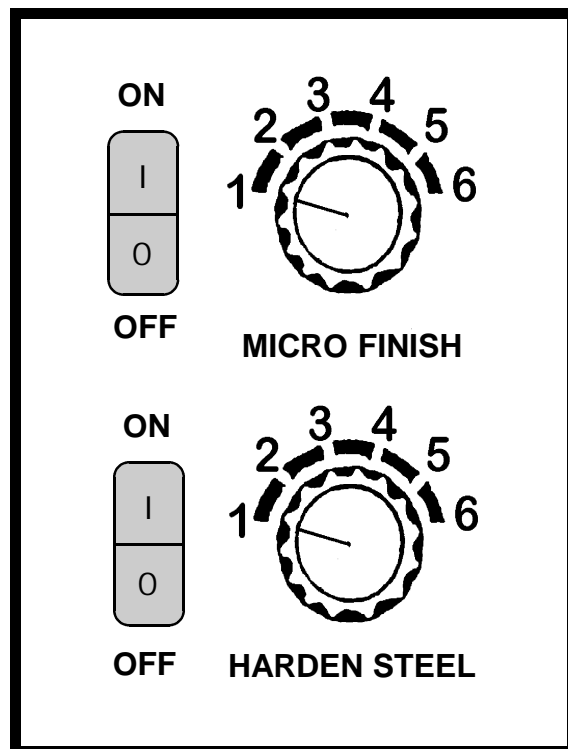


Discharge start button.
Press to start machining.

Reverse Sparking Button.
Press to spark upwards.
Do not use UP or DOWN
buttons during reverse
sparking.
☆ *Optional Extra.*

Manual servo speed.
On for slow speed.

C-BOX



C-BOX (Optional Extra)

The C-BOX has two functions,

A. MICRO FINISH - For extra fine finishing

This function overrides the Harden Steel function.

1 is the lowest current to 5 highest (5 & 6 are the same)

Before using this function set the ON TIME and OFF TIME to fine finish settings.

Using this function switches out the HV & LV functions of the generator.

B. HARDEN STEEL

This function is for machining extra hard materials, i.e. Tungsten Carbide.

1 is the lowest current to 5 highest (5 & 6 are the same)

Using this function switches out the HV & LV functions of the generator.

OPERATION

1. Machine Head and Quill Up and Down Movement

Raise or lower the machine head by using the Z Axis manual travel handwheel. On larger machines with this function is motorised, use the up and down buttons on the side of the column.

This is not available on V20 size machines.

Raise or lower the quill by using the up and down buttons on the remote control.

2. X and Y Axis Movement.

Engage the locking pin into the handwheel to enable movement of the table or saddle.

3. Fastening the Workpiece.

Fasten the workpiece to the table , clocking the datum edge square, using the clamps provided.

4. Mounting Electrodes.

Whatever electrode holder is used, securely fasten the electrode, clocking vertical and square.

5. Edge Locating.

When the electrode touches the workpiece the BUZZER will sound (Make sure that ALIGN is not on). This can be used to position the electrode in the X and Y axis using the appropriate datum of the workpiece.

Make sure that the electrode and workpiece are clean and free from burrs . Repeat this several times to be sure of an accurate touch position.

6. Depth Setting.

Bring the electrode down close to the workpiece using the DOWN button on the remote control. Use 0 amps set on the current control and press the discharge button, the quill will move slowly down and spark lightly.

Set the required depth using the micrometer.

Note. Be sure that the fire detection sensor is clean at all times.
It is very important to guard against fire.

Consistent flushing is essential. It has a direct effect on machining speed and efficiency.

Suction can be used in certain applications and is very effective when machining large or deep cavities.

Safety Guide

Part		Page
1.	DEFINITION OF RISKS	29
2	BASIC PRECAUTIONS	30
3	ENVIRONMENTAL CONDITIONS	34
4	INSTRUCTIONS RELATING TO HEALTH	34
5	FIRE PREVENTION	34
6	INSPECTION	35
7	REPLACEMENT & SERVICING INTERVALS	36
8	WARNING LABELS	39

Safety Guide

**» »THINK SAFETY AND WORK SAFELY!!!
PRECAUTION FOR SAFE WORKING**

THIS MACHINE IS EQUIPPED WITH VARIOUS SAFETY FEATURES FOR GUARDING PERSONNEL AND THE MACHINE FROM UNFORESEEN ACCIDENTS.

HOWEVER THERE IS A POSSIBILITY THAT CARELESSNESS OR MISS-OPERATION OF MACHINE CAN CAUSE AN ACCIDENT.

WORKERS SHOULD NOT DEPEND ON THE SAFETY EQUIPMENT ALONE. THEY SHOULD FAMILIARIZE THEMSELVES WITH ALL OF THE ATTACHED INSTRUCTION MANUALS AND HAVE A SUFFICIENT UNDERSTANDING OF THE MACHINE BEFORE OPERATING AND MAINTAINING IT.

Safety Guide

1 DEFINITION OF RISKS

THE DEGREE OF DANGER IS CLASSIFIED AS DANGER, WARNING, CAUTION.

DANGER

INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.

WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.

CAUTION

INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, **MAY** RESULT IN MINOR OR MODERATE INJURY. ALSO INDICATES A HAZARDOUS SITUATION WHICH MAY RESULT IN MACHINE DAMAGE.

CONTENTS DESCRIBED IN THE FOLLOWING PRECAUTIONS ARE ITEMS IN WHICH EXTREME CARE MUST BE TAKEN FOR THE MACHINE OPERATION AND MAINTENANCE.

IF THESE PRECAUTIONS ARE NOT OBSERVED, IT IS CONSIDERED THAT SERIOUS INJURY MAY BE CAUSED. THEREFORE, BE SURE TO HANDLE THE MACHINE ACCORDING TO THE INSTRUCTIONS.

Safety Guide

2 BASIC PRECAUTIONS

DANGER SITUATIONS

1. **DO NOT** SOIL, DAMAGE OR REMOVE WARNING LABELS. IF THE LABEL BECOMES HARD TO READ OR IS LOST, PLACE AN ORDER TO ANOTRONIC OR YOUR LOCAL AGENT.
2. **DO NOT** TOUCH THE SWITCHES WITH WET HANDS THIS CAN CAUSE AN ELECTRIC SHOCK.
3. SINCE THERE ARE HIGH VOLTAGE TERMINALS IN THE ELECTRIC CABINET(GENERATOR), TRANSFORMER, MOTOR, RELAY BOX, ETC. NEVER TOUCH THEM BECAUSE OF DANGER OF AN ELECTRIC SHOCK.
4. PREPARE A FIRE PREVENTION FACILITY IN THE WORKING AREA.
5. AVOID CONTACT VOLTAGES HIGHER THAN 25 VEFF.
6. THE CUSTOMERS APPOINTED ELECTRICIAN SHALL PERFORM THE ELECTRICAL CONNECTIONS TO THE POWER SUPPLY.

DAMAGED CABLE AND WIRE COVERINGS CAN CAUSE DANGER ELECTRIC SHOCK. CHECK THAT THE CABLE AND WIRE ARE SAFE.

8. WHEN LIFTING THE MACHINE, FOLLOW THE FOLLOWING PRECAUTIONS.
 - A) WHEN LIFTING THE MACHINE WITH THE FORK LIFT TRUCK, THE LICENSER OF THE FORK LIFT TRUCK SHALL PERFORM THE WORK.
 - B) CHECK THAT EACH PART IS FIXED BEFORE LIFTING THE MACHINE.
 - C) CHECK THAT UNNECESSARY MATTERS SUCH AS TOOLS, WASTE ,ETC., ARE NOT LEFT INSIDE OF THE MACHINE.
 - D) WHEN WORKING TOGETHER WITH TWO MEN OR MORE, COMMUNICATE WITH EACH OTHER AND TAKE EXTREME CARE.

Safety Guide

9. ELECTRIC APPARATUS IS TO BE MAINTAINED BY THE ELECTRICAL SERVICE ENGINEERS APPOINTED BY THE CUSTOMER.
10. MAINTENANCE WHICH IS IN DANGEROUS IF THE POWER IS TURNED ON, BE SURE TO TURN OFF THE POWER SUPPLY AND LOCK THE MAIN SWITCH OFF.

WARNING SITUATIONS

1. UNDERSTAND WHERE THE EMERGENCY STOP PUSH BUTTON IS POSITIONED SO THAT IT CAN ACCESSED AT ALL TIMES.
2. DO NOT REMOVE OR MODIFY ANY SAFETY EQUIPMENT.
3. BE SURE TO TURN OFF THE POWER SUPPLY BEFORE REPLACING A FUSE.
4. FAMILIARIZE YOURSELF WITH THE WORKING AREA SO AS NOT TO PLACE YOURSELF IN A DANGEROUS SITUATION.
5. IF WATER OR OIL DROPS ON FLOOR, IMMEDIATELY WIPE IT UP TO PREVENT SLIPPAGE.
6. CHECK THE SWITCH BEFORE OPERATING CORRECTLY.
7. DO NOT TOUCH THE SWITCH UNCONSCIOUSLY.
8. THE MACHINE AND ZNC DEVICE IS NOT TO BE EXPOSED BY A DIRECT SUNLIGHT. DO NOT PLACE A HEAT SOURCE NEAR THE MACHINE.
9. DO NOT PLACE THE MACHINE IN AN AREA LIKELY TO BE SUBJECT TO LARGE VIBRATIONS.
10. PLACE THE MACHINE ON A SUFFICIENTLY STRONG, FLAT AND LEVEL SURFACE.
11. DO NOT PLACE THE MACHINE WHERE DUST OR MIST CAN BE SUCKED INTO THE MACHINES COOLING FANS.
12. AN EXCESSIVE VOLTAGE DROP BY THE INSUFFICIENT CAPACITY OF THE SHOP POWER SUPPLY CAN CAUSE AN OPERATIONAL ERROR OF THE MACHINE

Safety Guide

13. GROUND THE MACHINE TO THE PE TERMINAL INSIDE THE ELECTRIC CABINET (GENERATOR) TO PREVENT ELECTRICAL LEAKAGE AND ELECTRICAL NOISE. THUS, USE SEPARATE EARTH LINES TO EQUIPMENT SUCH AS ELECTRIC WELDERS, ETC.
14. ARRANGE THE MAINTENANCE SCHEDULE AND WORKING ENVIRONMENT, AND ALSO, WIPE OIL AND WATER TO MAKE THE WORK AREA SAFE.
15. UNNECESSARY PARTS AND WASTE OIL ARE TO BE ABANDONED BY THE INSTRUCTION OF SUPERVISOR.
16. REPLACE OR REFILL FIRE EXTINGUISHERS AS OUR DIRECTION OF PAGE .
17. FOLLOW THE OPPOSITE PROCEDURES OF ASSEMBLY TO DISMANTLE THE MACHINE.
18. DO NOT USE THE SAME ELECTRIC POWER SUPPLY WITH OTHER MACHINES, E.G. ELECTRIC WELDERS, MILLING MACHINES, ETC.

Safety Guide

CAUTION SITUATIONS

1. LUBRICATION OIL, DIELECTRIC, ETC., USED ARE TO BE TO SPECIFICATION.
2. DO NOT HIT OPERATION PANEL, POWER CONTROL PANEL, ETC.
3. DO NOT DROP WATER OR DUST ONTO THE, OPERATION PANEL, ELECTRIC CABINET (GENERATOR), ETC. BE SURE TO CLOSE DOORS AND COVERS, ETC.
4. THE FUSE RATING IS CORRECT.
REPLACE WITH A NEW ONE AS NECESSARY.
5. AVOID LEAKAGE OF THE WORKING FLUID.
6. HANDLE THE DISPOSAL OF FILTER AND WORKING FLUID ACCORDING TO LOCAL REGULATIONS.
7. THE PACKAGES (CRATES) MUST NOT BE DROPPED OR TIPPED.
8. THE EARTH LINE USED IS THE SAME SIZE AS INPUT LINE AND AS SHORT AS POSSIBLE.
9. IF RUST PREVENTIVE IS COATED ON SLIDE WAYS, THOROUGHLY REMOVE IT.
10. THE OPERATION AFTER MAINTENANCE IS TO BE CHECKED PERSON RESPONSIBLE FOR MAINTENANCE.
11. BE SURE TO REFER TO THE SPECIFICATIONS OF MACHINE, DIELECTRIC, LUBRICATION OIL, AND ETC., TO CARRY OUT THE MAINTENANCE WORK.

Safety Guide

3 ENVIRONMENTAL CONDITIONS

- A. AMBIENT AIR TEMPERATURE: +5°C. TO + 40°C.
- B. HUMIDITY : 30% TO 95%.

4 INSTRUCTIONS RELATING TO HEALTH

- A. ONLY THE SKILLED OR TRAINED PERSONS CAN OPERATE THE MACHINE.
- B. MAINTENANCE AREA SHOULD BE FREE FROM OBSTRUCTIONS AND GREASY DIRT.
- C. ENSURE THE WORKSHOP HAS EFFECTIVE LOCAL AND GENERAL VENTILATION TO AVOID INHALING THE EROSION FUMES AND THE DIELECTRIC VAPOR.
- D. THE CONTACT BETWEEN SKIN AND DIELECTRIC SHOULD BE KEPT TO A MINIMUM.
- E. CONSULT AND COMPLY WITH THE RELEVANT PRODUCT INFORMATION.
- F. WEAR A PROTECTIVE MASK TO AVOID THE DUST OR EXHAUST GAS.

5 FIRE PREVENTION

THE ROOM EQUIPPED WITH SPARK EROSION MACHINE IS CONSIDERED AS HAVING A FIRE HAZARD WHILE THE MACHINE IS OPERATED WITH FLAMMABLE DIELECTRIC.

- A. THE WORKSHOPS THAT MAY HAVE A FIRE OR EXPLOSION HAZARD SHOULD NOT HAVE THE ELECTRICAL INSTALLATION.
- B. THE PRESENCE OF NAKED FLAMES AND SMOKING IS TO BE PROHIBITED IN THE VICINITY OF THE SPARK EROSION SYSTEM.
- C. THE WORKSHOP MUST BE PROVIDED WITH ADEQUATE OF FIRE EXTINGUISHERS.
- D. THE INFORMATION MUST BE PROVIDED BY THE REVENANT SUPPLIER FOR THE STORAGE OF DIELECTRIC.
- E. IT IS RECOMENDED THAT FIRE EXTINGUISER SYSTEMS APROVED BY ANOTRONIC BE FITTED TO THE MACHINE

Safety Guide

6 INSPECTION

A. BEFORE POWER ON

PLEASE MAKE SURE OF THE FOLLOWING:

1. THE POWER SOURCE OF THE MACHINE.
2. OUTSIDE GROUNDING IS INSTALLED.
3. THE ELECTRICAL CABINET IS WELL CLOSED.
4. THE LUBRICATION OIL IS FULL IN THE LUBRICATION POT.
5. THE WORKING FLUID IS FILLED IN ACCORDING TO INDICATION LEVEL.
6. THE PROTECTING GUARD AND SAFETY DOOR ARE WELL CLOSED.
7. ALL PRESSURE INDICATOR IS AT "0" POSITION.
8. THE PIPES OR HOSES HAVE NO BREAKAGE OR LOOSENESS.

B. AFTER POWER ON

PLEASE MAKE SURE OF THE FOLLOWING AND REFER TO THE OPERATION PROCEDURE OF ALL BUTTON FUNCTIONS IN THE PANEL CONTROL OPERATING MANUAL:

1. THERE IS NO ALARM MESSAGE.
2. THE OUTPUT CABLE IS NORMAL.
3. ALL THE MOVING COMPONENTS FUNCTION NORMALLY.
4. THE WORKING FLUID MAIN PRESSURE IS INDICATED AS 1.5 KGB/C.
5. TURN OFF THE LIGHT WHEN THE USER IS NOT AROUND WORK PLACE.

C. BEFORE TESTING

1. MAKE SURE THE SAFETY SYSTEM WHICH INCLUDE FLUID TEMPERATURE LIMITING SYSTEM, THE DETECTORS FOR THE SURFACE-LEVEL OF THE WORKING-FLUID, FIRE SENSOR SYSTEM ARE NORMAL.
2. MAKE SURE THAT THE ELECTRODE HOLDER IS WELL LOCKED.
3. MAKE SURE THE WORKPIECE IS WELL LOCKED ON THE TABLE.
4. MAKE SURE THE FLUID IN THE WORK TANK IS ABOVE 50 MM OF THE TOP OF WORK PIECE.
5. MAKE SURE THE PUMP IS FILLED WITH WORKING FLUID.

Safety Guide

7 REPLACEMENT AND SERVICING INTERVALS

WORKING FLUID

THE PURPOSE OF DIELECTRIC ARE AS FOLLOWING:

1. INSULATION
2. COOLING
3. FLUSHING

TO SATISFY THOSE PURPOSES, PLEASE CHOOSE THE DIELECTRIC ACCORDING TO THE RECOMMENDED SPECIFICATIONS BELOW OR EQUIVALENT BRAND. (THE FLASH POINT OF WORKING FLUID MUST BE OVER 60° C.

A. UNIVERSAL USE

Product	Max Removal	Min Wear	Viscosity (20/68)	Density (20/68)	Flash Point Deg.C	Aromatic Contents %
AGIP LAMIMUM 14	●	●	3.32	0.77	109/228.2	0.5
AGRALUX MF	●	●	3.6	0.79	125/257	0
AVIA IMA 82	●	●	3.2	0.78	82/179.6	0.3
BP 200 T	●	●	2.9	0.76	104/219.2	0
CASTROL SE	●	●	3.25	0.81	106/222.8	0.9
FLUID 180						
CMT COLL 7-22	●	●	3.5	0.76	112/233.6	0
COMMONWEALTH	●		3.7	0.75	117/242.6	<1
OIL EDM 244						
ESSO DE-FLUID	●	●	3.27	0.76	117/242.6	0.01
38						
FUCHS		●	3	0.78	75/167	0
RATARK FEL-S						
MILL SOREPIM	●	●	3.48	0.79	88/190.4	0.3

Safety Guide

B. ROUGHING

Product	Max Removal	Min Wear	Viscosity (20/68)	Density (20/68)	Flash Point Deg.C	Aromatic Contents %
AVIA IMA 126	●		5.8	0.82	126/258.8	1
BP 250	●	●	6	0.81	125/257	2
ESSO DE-FLUID	●	●	7.37	0.82	124/255.2	0.65
SHELL 5585	●		6.2	0.81	106/222.8	0.2

C. FINISHING

Product	Max Removal	Min Wear	Viscosity (20/68)	Density (20/68)	Flash Point Deg.C	Aromatic Contents %
ESSO SOMENTOR 31	●	●	2	0.8	78/172.4	0.6
FLUXELF 1	●	●	2.53	0.79	90/194	1
FUCHS RATAK FEL		●	2	0.75	72/161.6	0
ZELLER U. GMEHLIN MULTIC. FU LIECHT			1.9	0.75	80/176	0.01

Safety Guide

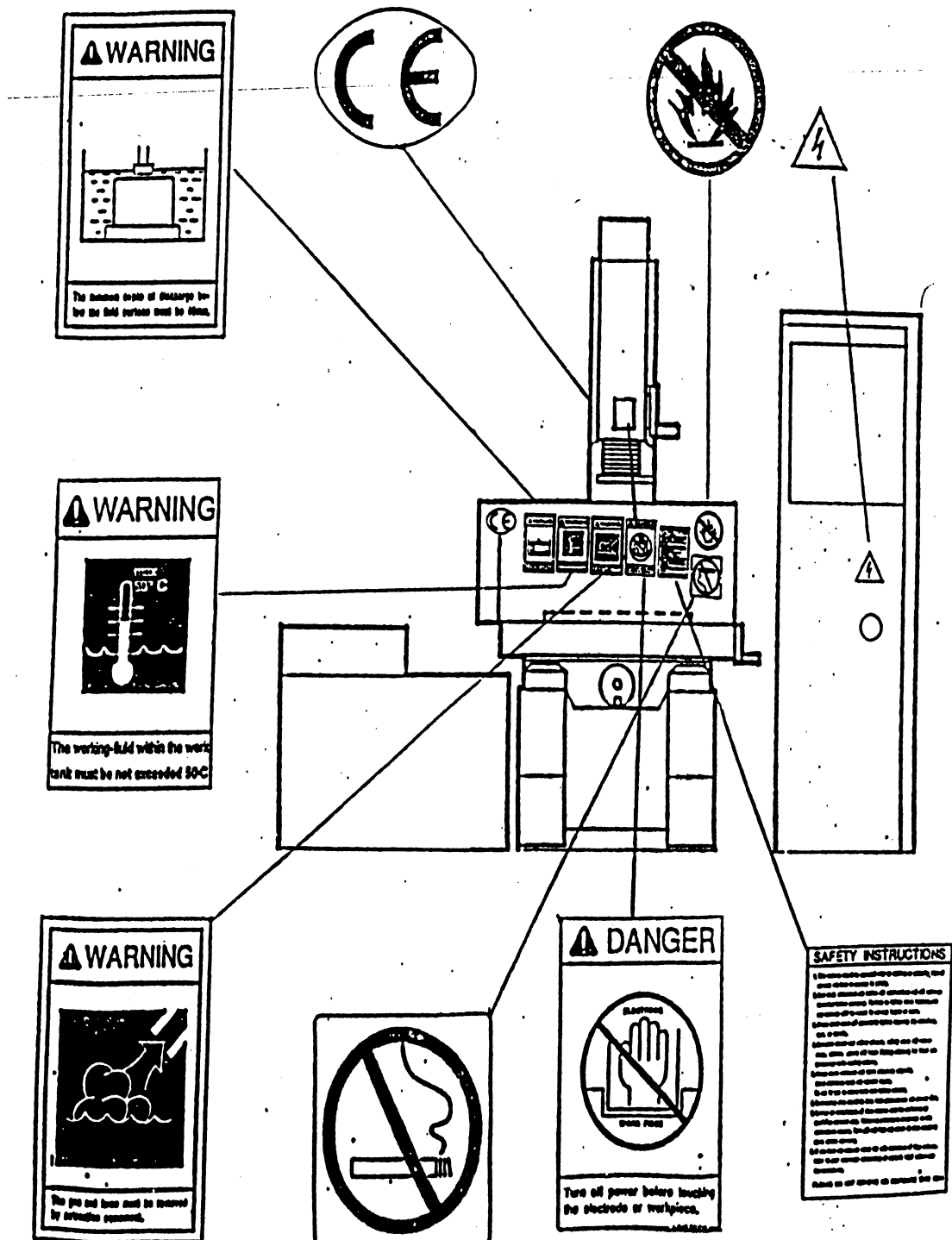
SERVICING INTERVALS

Regularly or when necessary	Weekly	Monthly	Half - year or 1000 hr	Yearly or 2000 hr	Description
●					General upkeep of machine
●					Drain and clean out the clean tank
●					Drain and clean out the sludge tank
●					Change filters
●					Check that all safety devices function
●					Check the fire protection system
●					Check the extraction equipment
●					Pull the handle of the lubrication pot daily
●					Check the workpiece and electrode are securely clamped
●					Change the dielectric if dirty
	●				Clean oil wipers on head
	●				Clean generator filter
		●			Grease clamping chuck
		●			Clean work tank float switches
		●			Check pressure gauge and sensor on fire extinguisher
		●			Clean work tank door seal
			●		Clean outlet valves on flushing distribution block
				●	Replenish centralized lubrication system

--GENERAL MACHINE UPKEEP OF THE ANOTRONIC EDM MACHINE:

YOUR MACHINE MUST BE REGULARY CLEANED AND MAINTAINED. CLEANING FREQUENCY IS MAINLY DEPENDENT ON TYPE OF WORK AND ENVIRONMENT. PLEASE REFER TO THE SERVICING INTERVALS FOR MAINTENANCE .

Safety Guide





SAFETY INSTRUCTIONS

- 1 This machine should only be operated by properly trained persons.
- 2 The operator must read, understand and follow all instructions and warnings.
- 3 This machine should not be operated by anyone fitted with a pacemaker.
- 4 Always check the sparking power is off before touching the workpiece or electrode.
- 5 Operators should wear safety glasses, safety shoes and should remove rings, watches, jewellery and loose fitting clothing for their own protection while operating the machine.
- 6 Always clamp the workpiece and electrode securely.
- 7 Maintenance area should be kept free from obstructions, grease and dirt.
- 8 Service or installation of this machine must be performed by qualified personnel only. Follow procedures described in the operating manuals. Turn off and lock out power at the main electrical panel before servicing.
- 9 This machine should be situated at least 3 Metres from other equipment.
- 10 This machine may interfere with radio broadcast equipment.
- 11 If you have any problems about the safe operation of the machine, refer to your supervisor immediately or consult Anotronic Limited.

PLEASE DO NOT REMOVE OR DISFIGURE THIS SIGN



Anotronic-SKM EDMs
Manual, ZNC, CNC



Anotronic-Ocean
EDM Drilling Machines
Manual, ZNC, CNC



CNC Wire EDM Sub-Contract
On The Latest Technology
Machines



Anotronic Electrochemical
Deburring Machines (ECD)



CNC CMM inspection



Multi axis CNC Turning



Fully Automated 5axis cnc Milling



5axis cnc Milling

Perhaps You Did Not Realise How Much

Anotronic Has To Offer!

- Full High capacity Machine Shop including fully Automated 5axis cnc Milling, Multi axis CNC Turning, Grinding etc.
- Laser Part marking
- CNC CMM inspection
- Sale of Standard Electric Discharge Machines (Manual, ZNC & CNC) to take components up to 2500mm x 1200mm x 700mm.
- Design, Manufacture & Sale of Electrochemical Deburring Machines (ECM)
- Comprehensive After Sales Service.
- Design, Manufacture & Sales of EDM & ECM Tooling and Electrodes.
- Multi axis CNC EDM & ECM Sub-Contract Service.
- ECM Sub-Contract Service.
- Wire EDM Sub-Contract Service with cutting areas up to 500mm x 320mm x 420mm HIGH.
- EDM small hole drilling Machines and Sub-Contract Service.
- EDM/ECM Consultancy Service.

Anotronic Ltd.

Unit 3, Hollingdon Depot, Stewkley Road, Soulbury,

Nr. Leighton Buzzard, Beds., LU7 0DF. England.

Telephone +44 (01525) 270261 Fax +44 (01525) 270235

E-Mail sales@anotronic.com Internet <http://www.anotronic.com>

Anotronic Ltd is a company registered in England & Wales with company number 1658055
Registered at the above address. • VAT number 382-1697-32 • © copyright Anotronic Ltd. 1999-2013

