



INSTRUCTION MANUAL FOR AIR PLASMA CUTTING MACHINE

MODEL –WAP 50

WARPP ENGINEERS PVT.LTD.

**B-1005, Western Edge II, Near Metro Mall, Off. Western Express Highway,
Borivali (E), Mumbai-400 066.**

Tel: 91-22-28542272/ 73/74. Fax: 91-22-28542275.

E-mail: sales@warpp.co.in Web Site: www.warpp.co.in

TABLE OF CONTENTS

1	THE PROCESS	1
2	SAFETY PRECAUTIONS	1
3	EQUIPMENT DESCRIPTION	1
4	FRONT PANEL CONTROL	2
5	THE TORCH	2
6	THE CONSUMABLE	3
7	PRE INSTALLATION REQUIRMENTS	3
8	PRE STARTING CHECKLIST	4
9	CUTTING PROCEDURE	4
10	MAINTENANCE	5
11	FAULT FINDING	6
12	SPARE PART LIST	7

ILLUSTRATIONS

1)	TORCH ASSEMBLY (A-151)	8
2)	INSTALLATION DIAGRAM	9
3)	PLASMA CONTROL WIRING DIAGRAM	10
4)	D.C.WIRING DIAGRAM	11
5)	POWER CIRCUIT WIRING DIAGRAM	12



1. **THE PROCESS:**

Plasma is the fourth state of matter, others being the solid, liquid and gaseous. When a gas is heated to high temperature it changes from molecular state to ionic state. Plasma is electrically conductive as it contains charged particles.

2. **SAFETY PRECAUTIONS:**

- The mains connection must be properly grounded and the supply lines be fitted with fuses of specified ratings. The mains cable must be properly secured to prevent possible damage.
- High voltage exists on the torch when power is applied and the pilot arc is struck and when the main arc is cutting.
- The nozzle should not be touched when the power is applied to the torch.
- All Adjustments and replacements of the parts should be undertaken with the unit switched off.
- The torch should not be used in excessively wet conditions.
- Power supply to the unit should be switched off before removing any panel of the machine. Keep the work area clear from all inflammable materials. Ensure that any material or spark ejected from the cut is not a source of danger to the operator or others.
- Protection is necessary from the ultraviolet radiation emitted by the arc. A helmet with shade glass and gloves should be used while cutting. Adequate screening should be provided to protect others working in the vicinity from ultraviolet radiation.

3. **EQUIPMENT DESCRIPTIONS:**

The unit consists of following.

- **Power Transformer.**

The power transformer used in this unit is a constant current type transformer with drooping characteristics. The transformer is made of copper coils and F class insulation is used for safety and trouble free performance for a long time. Interlayer air gap is provided in the coils for sufficient cooling.

- **Rectifier.**

Three phase full wave silicon rectifier stack is used to convert the AC output of the transformer to DC. Heat sink of proper rating is employed to see that the diodes doesn't heat up and cause damage to the rectifier.

- **Central Processing Unit (CPU).**

This unit is an electronic PCB which is the brain of the system. This unit controls the sequence of operation and also detects any malfunctioning in the system. In the event of this occurring this will automatically shut down the machine to prevent any damage to the torch or operator.

- **Arc Starting System.**

When the switch on the torch is initiated an arc is created between the electrode and the nozzle in the torch. This arc which ejects out of the nozzle is called pilot arc. When this pilot arc comes in to contact with the job, main arc is created and the cutting starts.

4. **FRONT PANEL CONTROLS.**

- ON-OFF-TEST three way selector switches.
- MAIN ON/OFF Switch
- High/Low Selector Switch
- Mains Power indicator, Panel Fuse.
- Air Failure indicator / water failure indicator.
- Thermal overload indicator.
- Air Pressure gauge.
- Air Line to the torch with power manifold.
- Pilot arc connection to the torch.
- Remote control socket (Torch Trigger).
- Job Power Return Cable (Job Earth).

5. **THE TORCH:-**

The torch is a precision tool precisely molded with internal parts perfectly aligned. Although the torch has been designed to withstand normal workshop abuse care should be taken to ensure that the torch is not excessively knocked about and is maintained properly.

- **Basically there are two types of torches:-**

- A. Hand Torch
- B. Machine Torch

- **Hand cutting torch has three connections:-**

- a) Air line with main power manifold.
- b) Pilot Arc Connection.
- c) Remote (Torch Trigger)

- Machine torch has only the first two connections and a separate ON-OFF remote pendant is required.



6. CONSUMABLES.

The torch carries a number of elements known as spares and consumables which are either eroded or consumed while cutting (Ref to Torch assembly Diagram)

While replacing the consumables procedure should be followed and care must be taken to see that cleanliness is of utmost importance.

CAUTION: THE EQUIPMENT MUST BE SWITCHED OFF BEFORE REPLACING THE CONSUMABLES.

- Unscrew the Nozzle retaining cap
- Unscrew the nozzle (Thread less)
- Remove the Insulating Spacer
- Check the condition of the electrode if it is to be removed then remove it (Thread less) and Fit a New One.

CAUTION: STOP CUTTING IMMEDIATELY IF GREENISH ARC IS OBSERVED WHILE CUTTING OR CUTTING SOUND CHANGES.

This happens when the insertion material in the electrode is consumed.

7. PRE INSTALLATION REQUIREMENT.

Mains Power:-

- Three phase 380-440 Volts 50 Hz switched fuse box with a capacity of 32 (65 Amps for WAP-50 Model) Amps.

Mains Input Cable:-

- Use three cable of 10sq mm each and a separate earthing cable.

Air:-

- External compressor rated 300 liters/min at about 5 kg/cm² (Ideally 5-HP or more Double cylinder Compressor)

8. **PRE STARTING CHECKLIST.**

- Ensure that the fuses in the fuse switch box are of proper rating and have proper contacts
- Ensure that the power cable is tightened at all connections.
- Ensure that the proper earthing is provided to the machine.
- Ensure that job has been firmly connected to the job stud using earthing clamp and cable.
- Make sure that all the consumables and spares are fitted inside the torch.

NOTE: FOR INSTALLATION REFER TO INSTALLATION DIAGRAM IN THIS MANUAL.

9. **CUTTING PROCEDURE.**

Switch on the mains supply from the switch fuse box. The mains indicator will glow irrespective of the position of ON-OFF-TEST selector switch. This is a safety feature which indicates that power is supplied to the unit.

Open the air supply and adjust the air pressure around 75 PSI / 45 PSI for water torch. This adjustment can be done using the regulator connected at the back side of the machine and pressure gauge at the front panel.

Move the selector switch on the front panel to test position, now the sparks can be seen between the electrode and nozzle. This exercise confirms the proper connection of the torch to the machine.

CAUTION: NEVER LEAVE THE SELECTOR SWITCH IN TEST POSITION

Move the selector switch on the front panel to RUN Position

Place the torch at the edge of the plate where the cutting has to be started. Press the initiating button on the torch to get the pilot arc. Main arc will be established when the pilot arc touches the plate. Now the torch can be moved along the plate at a clearance of 3 to 8 mm.

CAUTION: DO NOT TOUCH THE TORCH TO THE PLATE.

Speed of cutting is very important and will determine the quality of the cut, life of consumables and hence the economy of cutting. Always ensure that the arc has penetrated the plate. The torch should be moved evenly ensuring that the arc does not come up but has an angle of 45 degree under the plate and trailing behind the torch.

The arc will shut off automatically when the torch reaches the end of the plate. However if the arc has to be shut off in between then the initiating button on the torch has to be released.

In case of machine torch once the cutting is started the cutting continues even after releasing the START button on the remote control pendant. The cutting stops when it reaches the end of the plate. If the cutting has to be stopped in between then the STOP button on the remote control pendant has to be pressed.

10. MAINTENANCE:-

Check the following

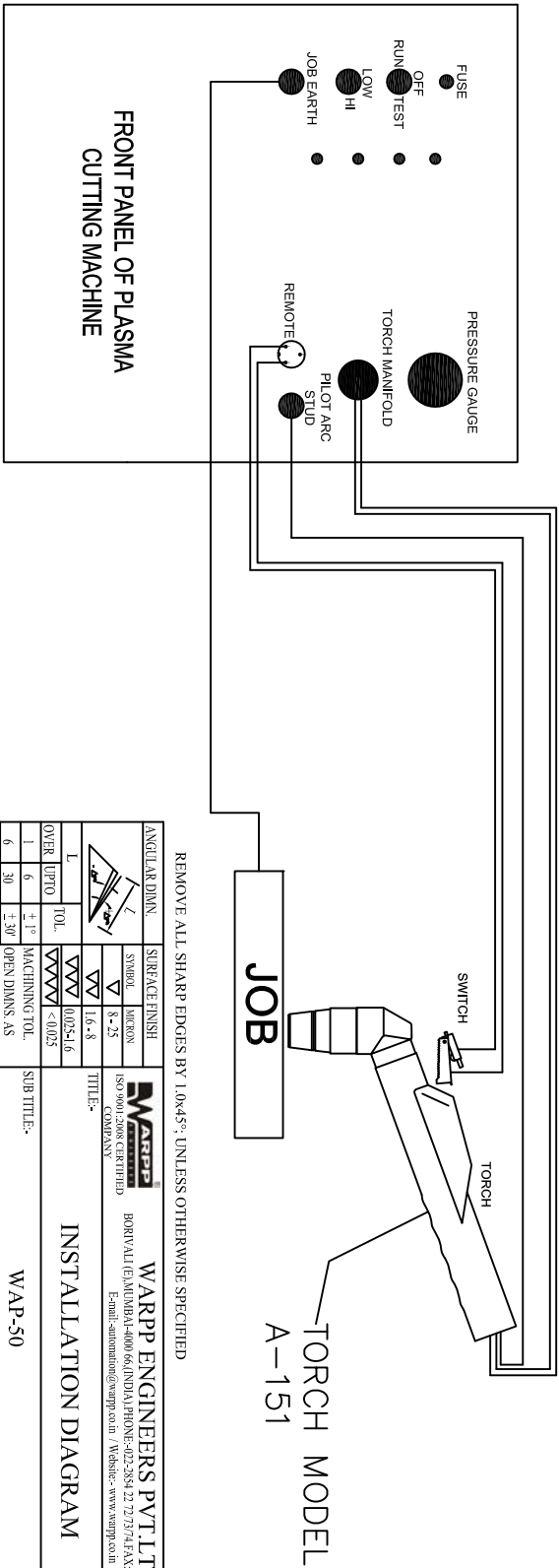
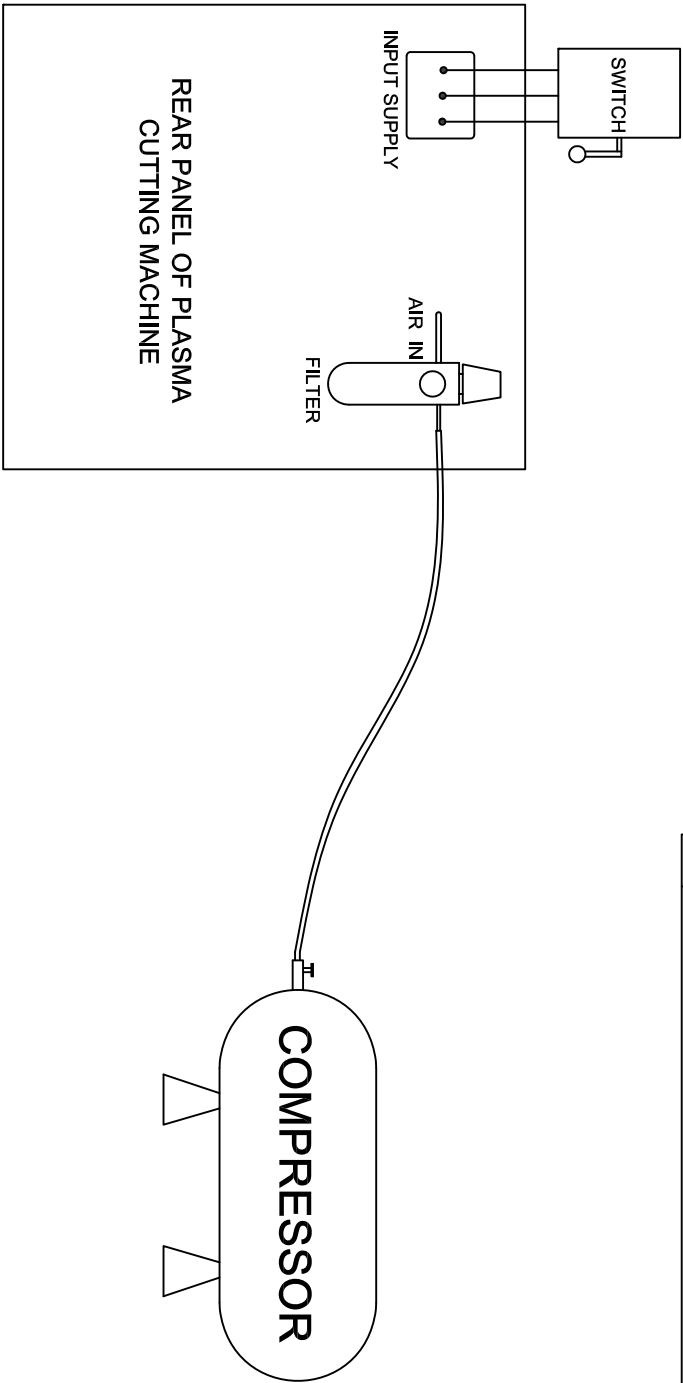
- **Daily**
 - Condition of the torch consumables.
 - Drain the air filter.
 - Ensure that drain cork is tightened properly.
 - Check for air leaks.
 - Check the air pressure setting to be around 75PSI.
- **Annually**
 - Air intake filters Maximum Air delivery.
 - Free running of Fan.
 - Tightness of all electrical connections.
 - Operation of all control indicators.
 - Blow away all the dust inside the machine by Blower.

CAUTION: IF THE POWER CABLE INSIDE THE NYLON BREADED PIPE IS EXPOSED IMMEDIATELY REPLACE THE ENTIRE PIPE. DO NOT TRY TO PATCH UP THE PIPE; THIS WILL GIVE RISE TO SAFETY HAZARD.

11. FAULT FINDINGS

FAULT	CAUSE	REMEDY
Main indicator does not glow when the power is supplied to the Unit.	Mains Fuse is Blown off Panel Fuse is blown off	Replace the main fuse Replace the panel fuse (5 Amps)
Put the selector switch in RUN position and the initiating button on the torch is pressed but no Pilot Arc.	Improper connection of the remote control socket	Make proper connection
	Air Pressure	Adjust the air pressure and make sure that air failure indicator does not glow.
	Transformer gives a huge humming Noise	Diodes have been blow off, Replace diodes.
	Check electrode and nozzle for bad condition	Replace if necessary
	Electrode nozzle Shorting	Properly fit the electrode.
No Sparking in the torch	Check the loose connection at the pilot arc stud	Make proper connection.
	Open the top cover and see the spark in the spark plug is bright enough	Clean the spark plug adjust the gap to 2mm (Approx) or replace the spark plug.
No Sparking in the spark plug itself	Loose connection at the auxiliary point of the main contactor	Make firm connection
Pilot Arc is coming but no cutting	Check for the proper fitting of JOB EARTH	Make firm connection
	Main fuse is blown off (Even two phase may give you pilot arc but no cutting is possible)	Replace the fuse.
	Input power Supply	Input supply must be between 380-440 Volts
	Loose connection in the input supply	Make firm connection
Rough Cutting/ bad Finish	Cutting Speed is not proper	Maintain proper speed
	Air Pressure	Keep proper air pressure
	Moisture in the air	Drain the air filter and compressor tank
	Bad condition of Nozzle	Replace the nozzle
Electrode and nozzle is consumed at high rates	Moisture in the air	Drain the filter and compressor tank.
	Leakage in air line	Correct the air leakage
	Improper fitting of contact tube	Properly fit the contact tube.

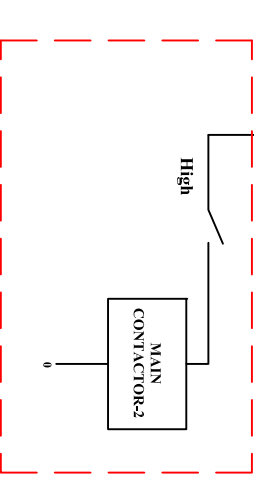
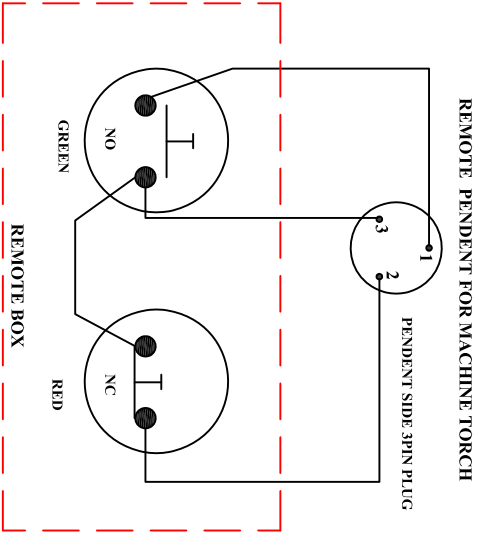
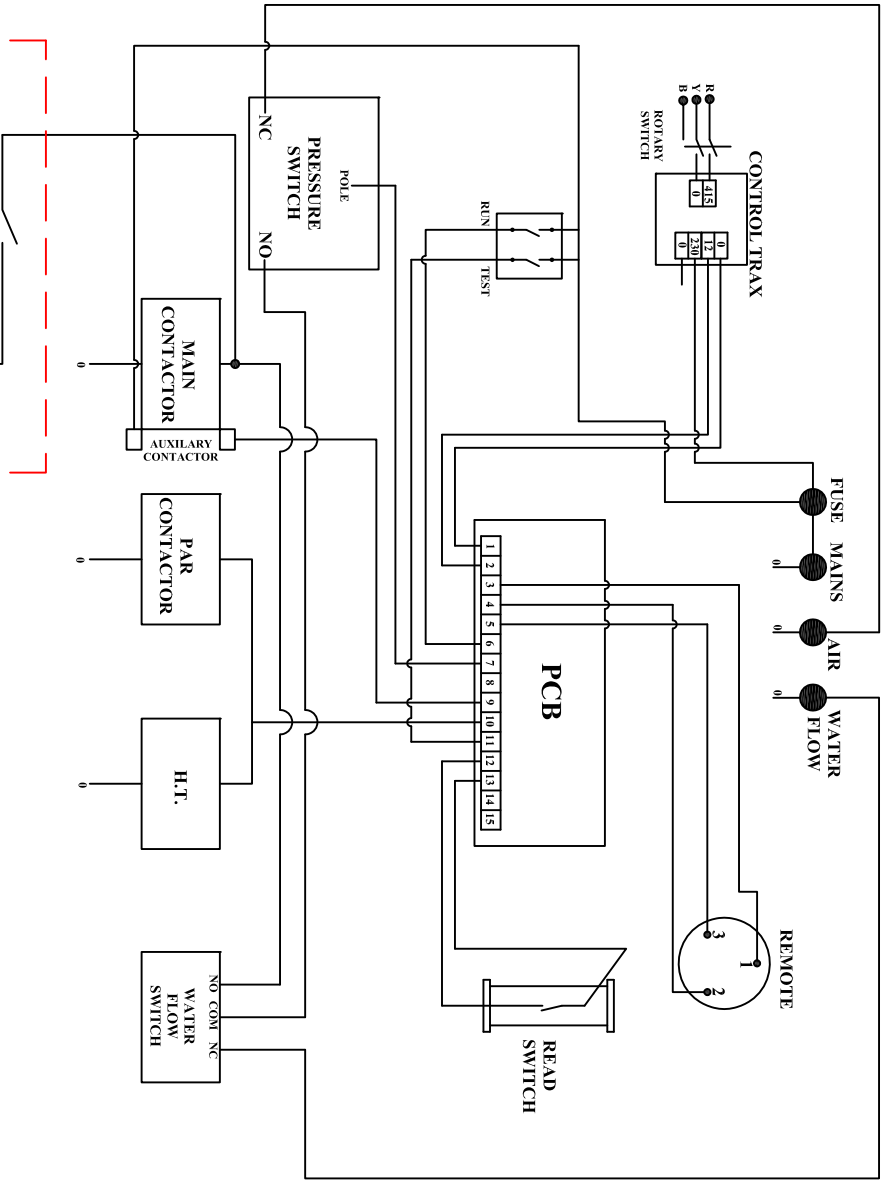
R.NO.	4	3	2	1
REVISIONS				
R. DATE				
R. BY				
R. CHD.				







REMOVE ALL SHARP EDGES BY 1.0x45°, UNLESS OTHERWISE SPECIFIED

ANGULAR DIMS.		SURFACE FINISH		WARPP ENGINEERS PVT.LTD.	
SYMBOL		MICRON		BOMBAY (E)MUMBAI-4000 66 (INDIA). PHONE-022-2854 22 72/73/4 FAX-022-2854 22 75.	
▽		8-25		E-mail- automation@warpp.co.in / Website- www.warpp.co.in	
ISO 9001:2008 CERTIFIED COMPANY		TITLE:-		INSTALLATION DIAGRAM	
		16-8			
L		TOL.			
OVER		UP TO			
1		6			
6		30			
30		120			
120		400			
400		± 10°			
DM/LIN mm					
LINEAR DIMS.					
OVER		—			
UP TO		6			
TOL.		± 0.1			
± 0.1		± 0.2			
± 0.2		± 0.3			
± 0.3		± 0.5			
± 0.5		± 0.8			
± 0.8					
CHECKED & APPROVED		P.C.COLLA			
29-06-2008					
		PROJECTION:			
WEP/L/C0008					
R					

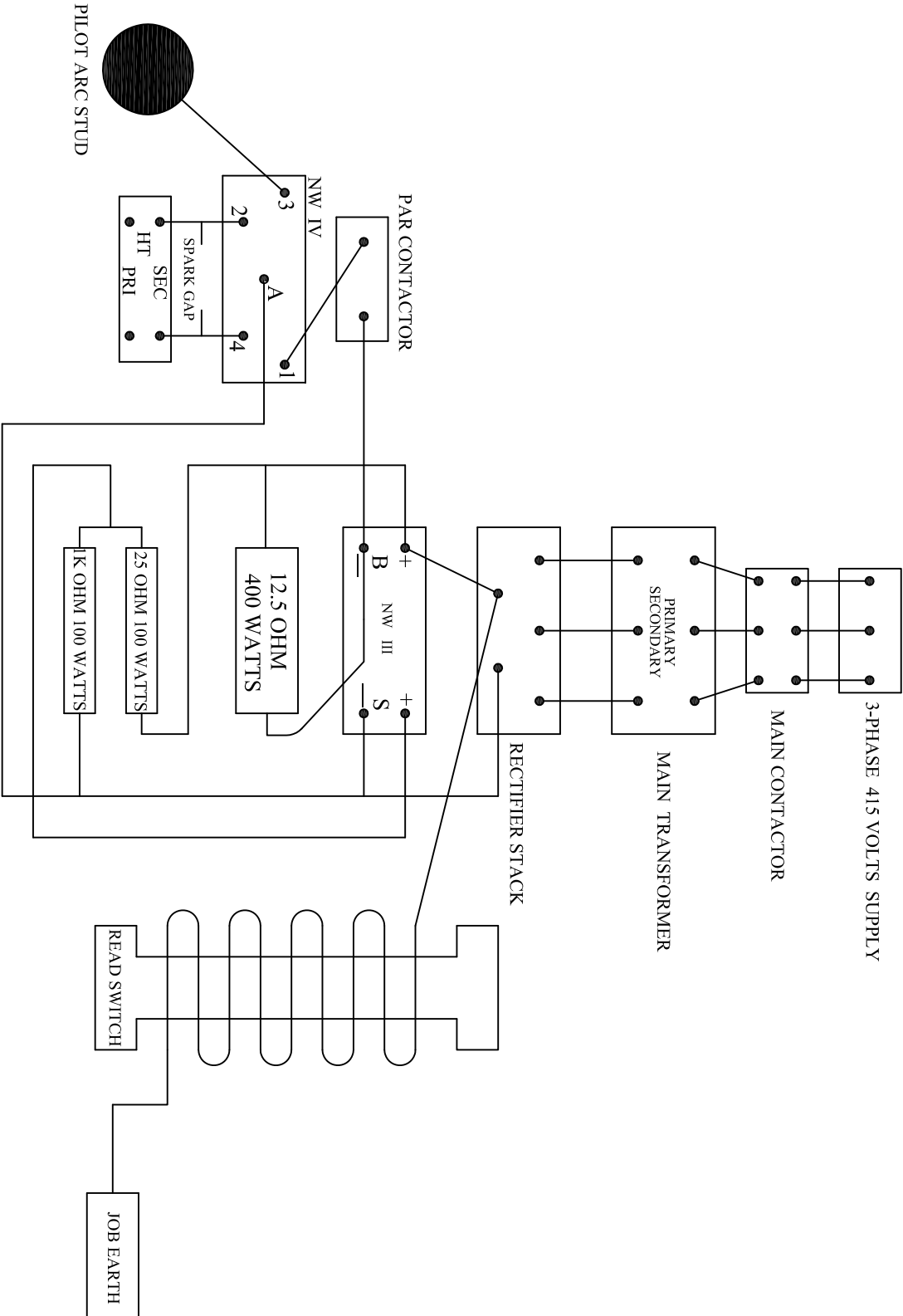
R. NO.		R. DATE		R. BY		R. CHD.	
REVISIONS							










REMOVE ALL SHARP EDGES BY 1.0x45°, UNLESS OTHERWISE SPECIFIED

WARP ENGINEERS PVT.LTD.									
BORIVALI (E),MUMBAI-400066(INDIA).PHONE:402-2854,22-7737/4.FAX:402-2854-22735.									
E-mail:- autumation@warp.co.in / WebSite:- www.warp.co.in									
ISO 9001:2008 CERTIFIED COMPANY									
TITLE:-									
CONTROL WIRING DIAGRAM									
SUB TITLE:-									
WAP-50									
NAME		DATE		SIGN		SCALE		SHEET OF	
S.CHOGGALE		24-06-2008				N.T.S		DRG. NO.	
P.GOLLA		29-06-2008						WEPL/C0008	
CHECKED & APPROVED		APPROVED						R	
4		3		2				1	
OVER		—		6		30		120	
UP TO		6		30		120		315	
TOL.		± 0.1		± 0.2		± 0.3		± 0.5 ± 0.8	
ANGULAR DIMS.									
									
SURFACE FINISH									
SYMBOL									
MICRON									
8-25									
16-8									
VVVV									
0.025-16									
OVER									
UP TO									
TOL.									
VVVV									
0.025									
LINEAR DIMS.									
120									
400									
± 10' DIA IN mm									
MACHINING TOL.									
OPEN DIMS. AS PER IS:2102 1969.									

R.NO.		REVISIONS		R. DATE		R. BY		R. CHD.	

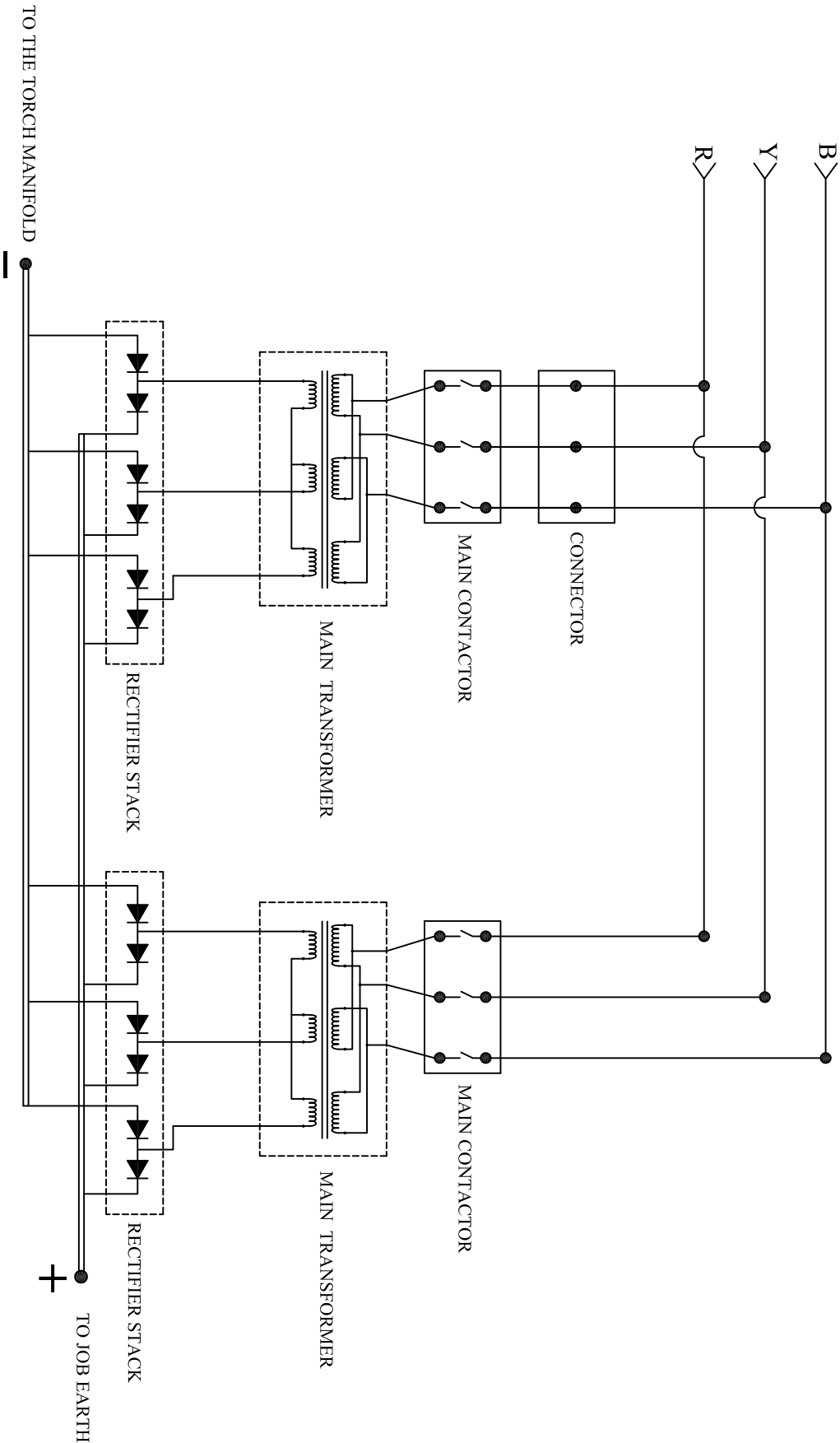



REMOVE ALL SHARP EDGES BY 1.0x45°. UNLESS OTHERWISE SPECIFIED

ANGULAR DIMS.		SURFACE FINISH				WARPP ENGINEERS PVT.LTD.	
		SYMBOL		8-25		BORIVALI (E) MIDC-4000 66/INDIA. PHONE: 022-2854 12 77/74.FAX: 022-2854 12 75.	
		MICRON		16-8		E-mail: automation@warpp.co.in / Website: www.warpp.co.in	
		TOL.		0.025-1.6		DC WIRING DIAGRAM	
		OVER (PTO)		MACHINING TOL.			
1		6		± 1°		SUB TITLE:- WAP-50	
6		30		± 30'			
30		120		± 20'			
120		400		PER IS:2102 1969.			
D20		400		± 10'		DMLIN mm	
LINEAR DIMS.		DRAWN		NAME		DATE	
OVER		30		120		315	
PTO		6		120		315	
TOL.		± 0.1		± 0.2		± 0.3	
		± 0.5		± 0.5		± 0.8	
		CHECKED & APPROVED		P.GOLLA		29-06-2008	
							
		PRODUCTION:					
		DRG. NO.		SHEET		OF	
		WEPL/C0008		R			

R. NO.		R. DATE		R. BY		R. CHD.	

REVISIONS



ANGULAR DIMS.		SURFACE FINISH		 WARP ENGINEERS PVT.LTD. BORIVALI (E), MUMBAI-400066, INDIA. PHONE-022-2854 22 72/73/74 FAX-022-2854 22 75. E-mail: autuminate@warp.co.in / Website: www.warp.co.in	
SYMBOL		MICRON		SUB TITLE:- POWER CIRCUIT DIAGRAM	
L		TOL.			
OVER		UP TO			
1		6			
6		30			
30		120			
120		400			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			
120		120			
400		315			
TOL.		± 0.1 ± 0.2 ± 0.3 ± 0.5 ± 0.8			
LINEAR DIMS.		NAME			
OVER		6			
UP TO		30			