



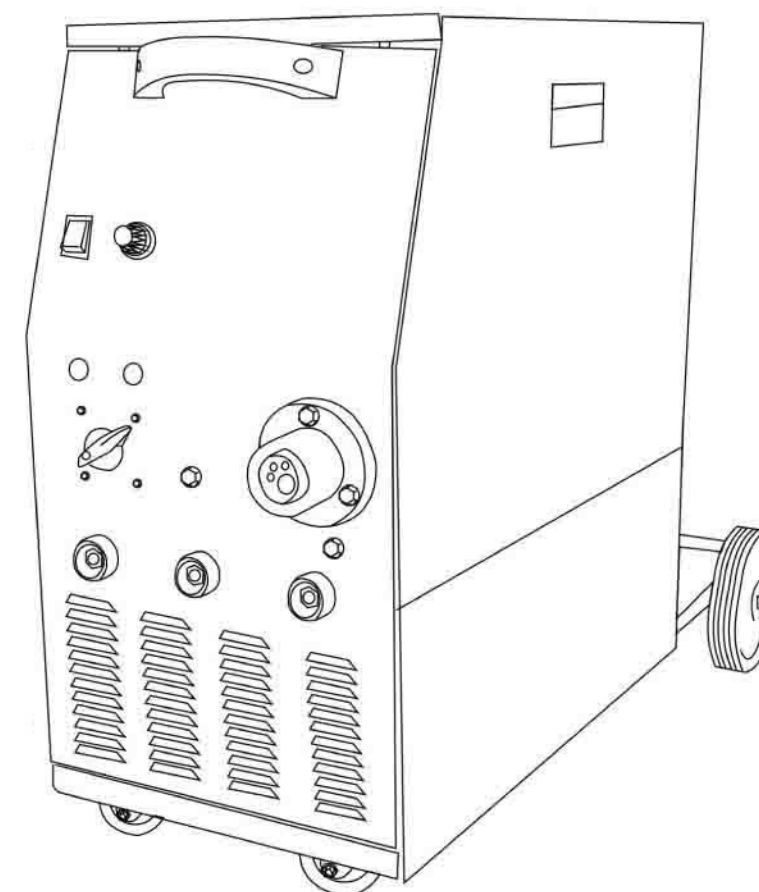
Please dispose of packaging for this product in a responsible manner. It is suitable for recycling. Help to protect the environment, take the packaging to the local amenity tip and place into the appropriate recycling bin.



Never dispose of electrical equipment or batteries in with your domestic waste. If your supplier offers a disposal facility please use it or alternatively use a recognised re-cycling agent. This will allow the recycling of raw materials and help protect the environment.



Autoplus 181DP • 211DP Instruction Manual



FOR HELP OR ADVISE ON THIS PRODUCT PLEASE CALL OUR
CUSTOMER SERVICE HELP LINE : 01509 500400

Please read and fully understand the instructions in this manual before operation. Keep this manual safe for future reference.

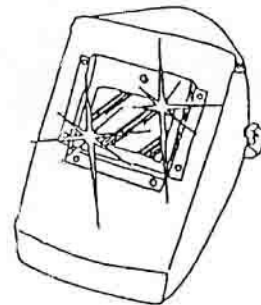
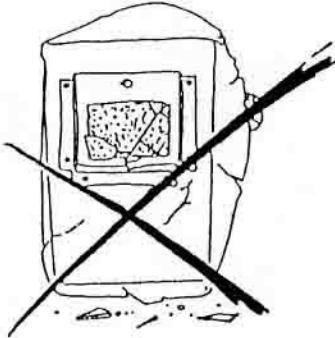
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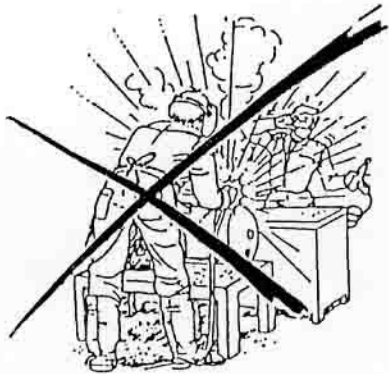
SAFETY OBSERVATION



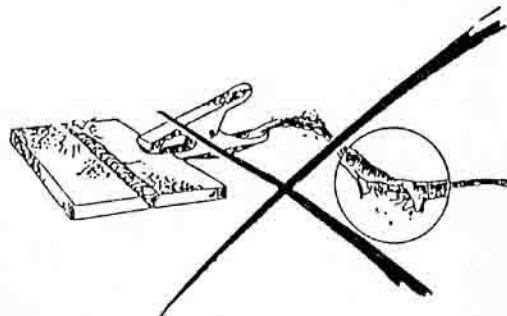
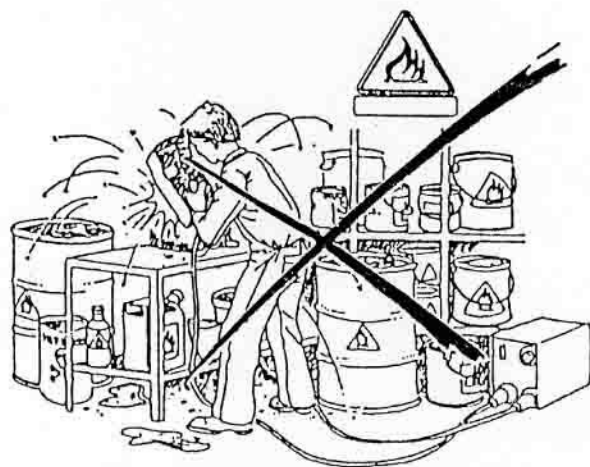
SAFETY OBSERVATION



OK



OK



Instruction Manual

Only first-class material have been used for the development and production of the SIP welding machines. The material are subject to current control and quality supervision and then processed and mounted together into the welding machines.

No matter how good materials we have used and no matter how carefully the mounting has been done, an advanced product as a welding machine demands your effort to operate perfectly.

Therefore study carefully this instruction before your initial operating. This should assure a profitable use of your new SIP welding machine.

Equipment Identification

The unit's identification number(specification or part number), model, and serial number usually appear on a nameplate attached to the control panel. Equipment which does not have a control panel such as gun and cable assemblies are identified only by the specification or part number printed on the shipping container. Record these numbers for future reference.

Receipt Of Equipment

When you receive the welding power source, check it against the invoice to make sure it is complete and inspect the power source for possible damage due to shipping.

Include all welding power source identification numbers as described above along with a full description of the parts in error.

Move the equipment to the installation site before uncrating the unit. Use care to avoid damaging the power source when using bars, hammers, etc., to uncrate the the unit.

IMPORTANT

The users are reminded to read carefully the following steps of precaution before carrying out welding jobs.



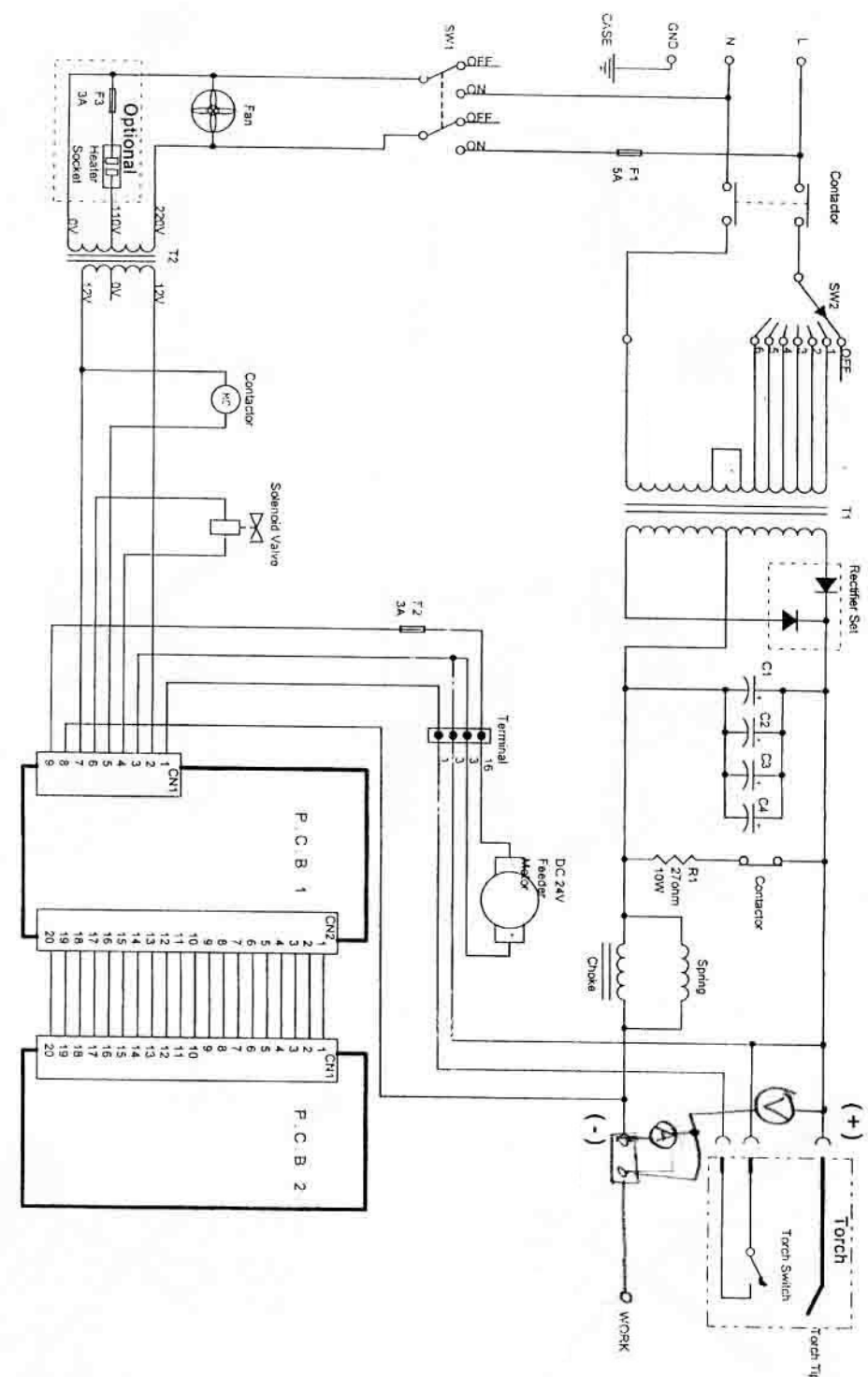
⚠ WARNING

THIS MANUAL HAS BEEN WRITTEN FOR EXPERT OPERATORS AND MUST BE READ ENTIRELY BEFORE OPERATING THE EQUIPMENT. PERSONS NOT CONVERSANT WITH METHODS AND OPERATIONS OF THE EQUIPMENT SHOULD CONSULT THE MANUFACTURER. DO NOT ATTEMPT TO SET UP, OPERATE OR SERVICE EQUIPMENT IF NOT QUALIFIED TO DO SO OR IF THIS MANUAL HAS NOT BEEN READ AND UNDERSTOOD. IF IN DOUBT REGARDING EQUIPMENT INSTALLATION AND USE, CONSULT THE MANUFACTURER (TECHNICAL ASSISTANCE DEPARTMENT). WELDING OPERATIONS ARE A SOURCE OF RADIATION, NOISE, HEAT AND NOXIOUS FUMES; FOR THIS REASON THE PROTECTION OF THE OPERATOR AND OF THIRD PERSONS MUST BE GUARANTEED WITH SUITABLE SAFETY DEVICES AND PRECAUTIONS. NEVER APPROACH ARC RAYS OR HOT METAL WITHOUT PROTECTION. FAILURE TO OBSERVE THESE REGULATIONS DURING OPERATION COULD LEAD TO SERIOUS HEALTH RISKS.

SAFETY REGULATIONS

1. All installation and maintenance of equipment must be performed in compliance with local safety standards.
2. Operate the welding power source only on power supply with an reliable earth leakage breaker and well protected connection point.
3. Avoid operating the welding power source near flammable material such as gas dust etc.
4. Always USE an appropriate welding mask/helmet, gloves and shoes etc. to protect eyes and any bare skin.
5. Always wear safety glasses with side shield, particularly during manual or mechanical removal of slag. High temperature slag may be projected to great distances. Pay attention to fellow workers in the vicinity.
6. Make sure the welding cables and the mains lead are in good condition before each operation.
7. Use the welding power source only in a dry indoor / outdoor. location and in a place of limited exposure to sunlight, rain etc. Never use welding equipment near water. Ensure that the surrounding area, including any objects there in and the equipment, is dry.
8. Repair water leakage immediately. Do not spray water or other liquids on the machine.
9. Make sure objects do not obstruct the fan cooling system of the welding power source. Always keep the welding power source well ventilated.
10. Before carrying out a service or repair, always make sure that the main power source is disconnected from outlet.

AUTOPLUS 211 CIRCUIT DIAGRAM

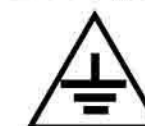


AUTOPLUS 181DP PARTS LIST

NO.	DESCRIPTION	QTY.
1	MIG TORCH ADAPTOR INSULATOR	1
2	INDICATOR LIGHT	2
3	SWITCH KNOB	1
4	WELDING POWER SOCKET	1
5	POWER SELECTOR SWITCH	1
6	ON/OFF SWITCH	1
7	WIRE FEED CONTROL KNOB	1
8	CASTOR	2
9	CHOKE	1
10	RECTIFIER	1
11	CONTACTOR	1
12	WIRE FEED MOTOR	1
13	WIRE SPOOL HOLDER	1
14	PCB	1
15	GAS VALVE	1
16	MAIN TRANSFORMER	1
17	RESISTOR	1
18	WHEEL	2
19	FAN	1

Do's and Don'ts during installation

1. Pay attention to the state of wear of socket and plug wiring; renew if necessary. Service the equipment periodically. Use adequately sized wiring.



2. Connect the ground lead as near as possible to the operating area. Earth connections to structural parts of the building or to other places distant from the operating area will reduce their effectiveness and increase the danger of electric shock. Do not pass equipment cables through or near lifting chains, crane cables or electrical lines.
3. Avoid all the direct contact between the skin or wet garments with live metal parts. Check that gloves and protections are dry!
4. Always wear gloves and rubber soled shoes when working in damp areas or standing on metal surfaces.



5. Always turn off equipment when not being used or in the event of power failure. Accidental earth discharge may cause overheating and fire hazards. Do not leave the machine unattended when it is turned on.

User's liability and protection

The user of this welding power source should obey the following terms and regulation.

Welding operations are a source of radiation, noise, heat and noxious fumes; for this reason, the protection of the operator and of third persons must be guaranteed with suitable safety devices and precautions. Never approach arc rays or hot metal without protection. Failure to observe these regulations during operation could lead to serious health risks.

1. The welding power source will perform in conformity with the description contained in the instruction manual provided.
2. It is recommended only the qualified persons are allowed to carry out the repairs and replacement of this machine.
3. Any modifications of the parts of this machine are **not encouraged**.
4. The user of this welding power source shall have sole liability for any malfunctioning which may result from improper use or unauthorized modification from standard specifications, faulty maintenance, damage or improper repair by any one other than qualified persons approved by the equipment manufacturer or its representative.



5. Wear fire-resistant work gloves, a heavy-duty long-sleeved shirt, trousers without turn-ups and shoes with high uppers or boots to protect the skin from arc rays and metal sparks and a welder's helmet or cap to protect the hair.
6. Use a protective mask with suitable glass filter (at least NR10) to protect eyes. Take measures to protect face, ears and neck. Advise other persons in the vicinity to look away and stand clear of arc rays and hot metal.
7. Wear ear protectors; welding operations are often noisy and may disturb other persons in the work area.
8. Always wear safety glasses with side shield, during manual or mechanical removal of slag. High temperature slag may be projected to great distances. Pay attention to fellow workers in the vicinity.

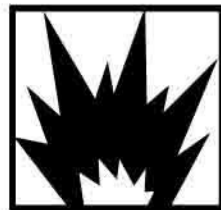


9. Position a fire-resistant screen around the welding area to protect persons in the vicinity from is rays, sparks and slag.



10. Compressed gas cylinders are potentially dangerous; consult the supplier for correct handling procedures. Always protect cylinders from direct sunlight, flames, sudden temperature changes and low temperatures.

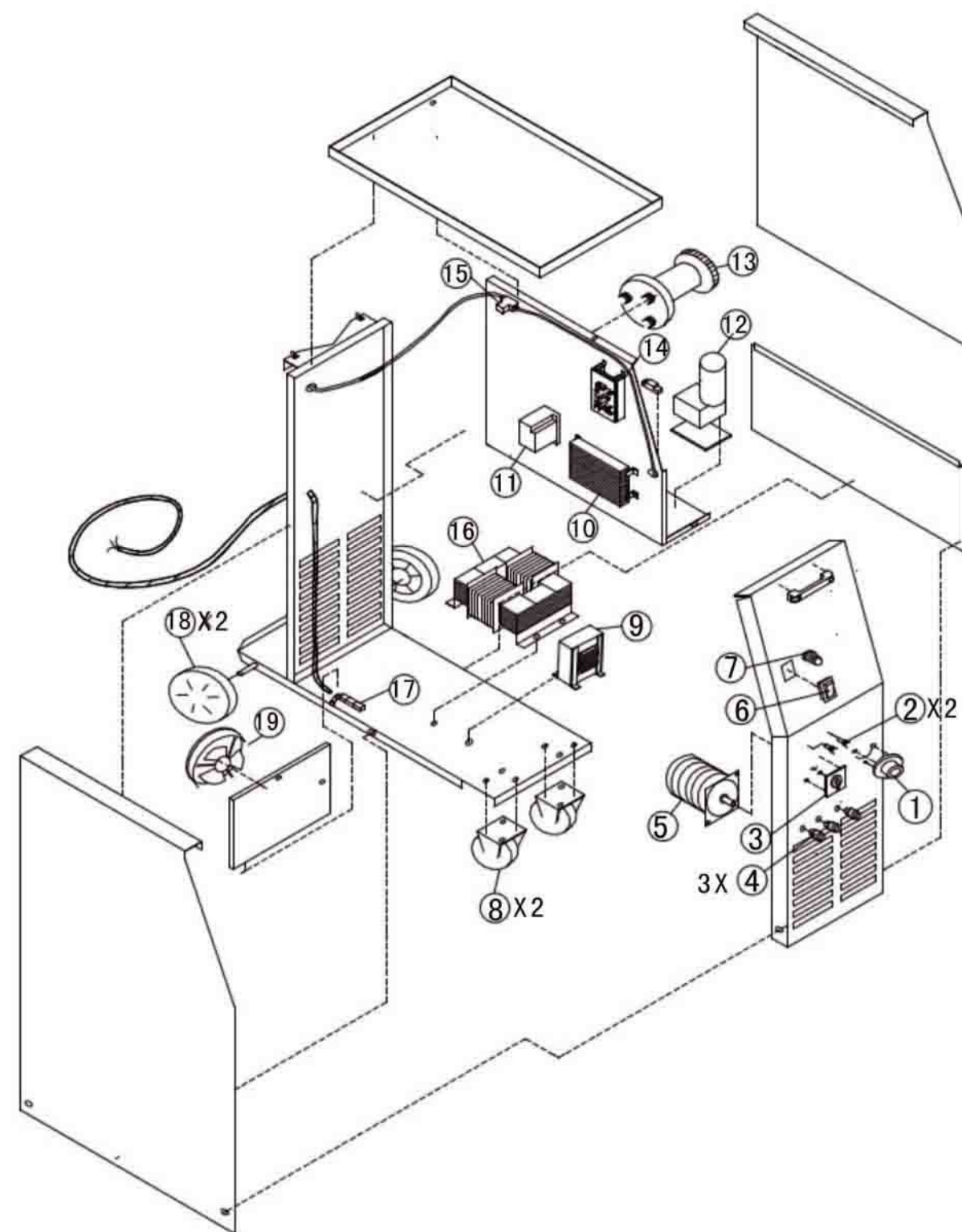
Fire and explosion prevention



Hot slag and sparks can cause fire outbreaks. Explosions and fires can be prevented by following the procedure described below: Clear away or protect Inflammable objects and substances (wood, saw dust, clothing, paints, solvents, Patrol kerosene, natural gas, acetylene, propane, etc) with fire proof material.

1. Tubes and containers must be opened, emptied and thoroughly cleaned before welding. Welding operations on-these parts must be performed with the utmost caution.
2. Keep extinguishing means, such as fire extinguishers, and sand within easy reach.
3. Never weld or cut closed containers or pipes.

General View of AUTOPLUS 181



AUTOPLUS 211DP PARTS LIST

NO.	DESCRIPTION	QTY.
1	MIG TORCH ADAPTOR INSULATOR	1
2	INDICATOR LIGHT	2
3	SWITCH KNOB	1
4	WELDING POWER SOCKET	1
5	AMP AND VOLT METER	2
6	POWER SELECTOR SWITCH	1
7	WIRE FEED CONTROL KNOB	1
8	CASTOR	1
9	MAIN TRANSFORMER	1
10	CHOKE	1
11	RECTIFIER	1
12	CONTACTOR	1
13	WIRE FEED MOTOR	1
14	WIRE SPOOL HOLDER	1
15	PCB	1
16	CONTROL TRANSFORMER	1
17	GAS VALVE	1
18	CAPACITOR	4
19	RESISTOR	1
20	WHEEL	2
21	FAN	1
22	ON/OFF SWITCH	1
23	FUSE HOLDER	2
24	FUSE 5A	1
25	FUSE 3A	1

- Never weld or cut containers or pipes containing substances that could give rise to explosions, humidity or heat sources.

Metal fume hazards



Welding fumes and gases may be hazardous if inhaled for long periods of Time.

- Install a natural or forced-air ventilation system in the work area.
- Use forced-air ventilation system when welding coated or painted materials wear a protective mask.
- If the ventilation system is inadequate, use an air respirator.
- Beware of gas leaks. Shield gases such as argon are denser than air, and when used in confined spaces will replace it.
- In the event of welding operations in confined places (e. g. inside boilers, trenches), the welder should be externally accompanied by another person. Always observe accident-prevention procedures.
- Keep gas cylinders in a well ventilated area.
- Close the main valve when gas cylinder is not in use.
- Do not perform welding operations near chlorinated hydrocarbon vapors produced by degreasing or painting: the heat generated by arc rays can react to form phosgene a highly toxic gas.
- Irritation of the eyes, nose and throat are symptoms of inadequate ventilation. Take immediate steps to improve ventilation. Do not continue welding if symptoms persist.

Positioning & transporting the power source

Position the equipment in compliance the following indication below.

- The operator must have unobstructed access to controls and equipment connections.
- Do not position equipment in confined, closed places. Ventilation of the power source is extremely important. Avoid dusty or dirty locations, where dust or other debris could be aspirated by the system.
- Equipment (including connecting leads) must not obstruct corridors or work activities of other personnel.

4. Position the power source securely to avoid falling or overturning.
5. Bear in mind the risk of falling of equipment situated in overhead positions.
6. Only use the handle of the machine to move/carry the welder.
7. Always disconnect the power source and accessories from main supply before lifting or handling operations.
8. Do not drag, pull or lift equipment by the cable.

RECOMMENDATION OF REDUCING EMISSIONS

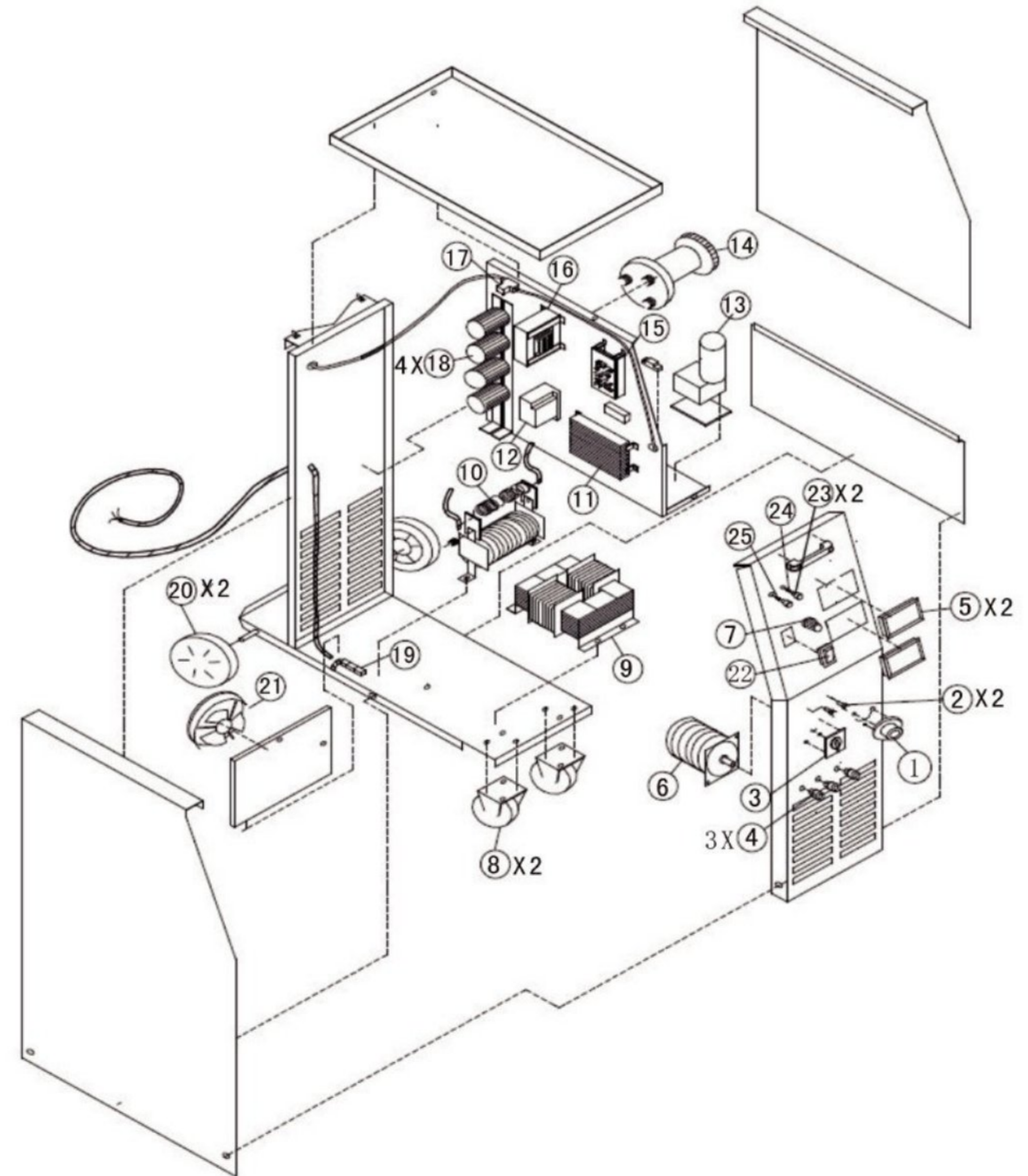


1. **WARNING.** The user is responsible for installing and using the welding equipment according to the manufacturer instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the user of the welding equipment to resolve the situation with the technical assistance of the dealer or authorized service centre. In some cases this remedial action may be as simple as earthing the welding circuit, see **ATTENTION**. In other cases it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases electromagnetic disturbances must be reduced to the point where they are no longer troublesome.
2. **ATTENTION.** The welding circuit may or may not be earthed for safety reasons. Changing the earthing arrangements should only be authorized by a person who is competent to assess whether the changes will increase the risk of injury, e.g. by allowing parallel welding current return paths which may damage the earth circuits of other equipment.
3. **WARNING.** Extra precaution may be required when the welding power source is used in a domestic establishment.

ELECTROMANGNETIC FIELD AROUND WORKING AREA



General View of AUTOPLUS 211DP



Guarantee :

This welder is fully guaranteed against manufacturing defects for a period of 12 months from the date of purchase. The unit will be repaired free of charge if deemed under warranty. Warranty does not cover items that are damaged or worn due to a lack of proper maintenance, misuse or unauthorised tampering with the unit. Items which are subject to wear and tear such as torches, tips, shrouds, liners etc., are considered consumable and are not covered by the warranty.

In the unlikely event that your welder develops a fault during the guarantee period it should be returned to the place of purchase along with the original receipt.

THE WARRANTY

1) General:

our products are warranted for one(1) year following date of shipment to the original user, with exception of items listed in paragraphs 2 through 7 below.

2) Major Power Components:

Main power transformers are warranted for one(1) years following date of shipment to the original user.

3) Major Power Rectifiers:

Silicon diodes and power SCRs used in the welding output circuits of equipment are warranted for one year following date of shipment to original user.

4) Major PCB component:

Main control board will be warranted for a period of twelve(12) months for the date of purchase (verified by reference to your proof of purchase).

5) Expendable Items:

Primary and secondary switch contacts, cable connectors, fuses, bulbs, nozzle, contact tips, liners, insulator head, gas diffuser, tip, torch switch and swan neck are worn or consumed in the normal process of welding are therefore warranted only if found to be defective prior to use.

6) Semiautomatic Items:

MIG torch body and cable are warranted for fourteen(14) days from the date of purchase (verified reference to your proof of purchase).

7) Modification and Misuse:

This warranty does not apply to products which have been modified in any way by any party other than SIP; nor to products which have not been installed and operated in accordance with applicable industry standards; nor to products which have been used other than under the usual conditions for which designed; nor to products that have not received proper care, lubrication, protection, and maintenance under supervision of competent personnel. Use of a product after discovery of a defect voids all warranties.

Before installing welding equipment the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account:

1. Other supply cables, control cables, signaling and telephone cables; above, below and adjacent to the welding equipment.
2. Radio and television transmitters and receivers.
3. Computer and other control equipment. industrial equipment.
4. Safety critical equipment, may require additional protection measures.

5. The health of the people around, e.g. the use of pacemakers and hearing aids.
6. The immunity of other equipment in the environment.
7. The time of day that welding or other activities are to be carried out.
8. The size of the surrounding area to be considered will depend on the structure of the building.
9. Other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

WORKING ENVIRONMENT










1. Mains supply. Welding equipment should be connected to the mains supply according to the manufacturers recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the main supply. It should be taken measures to shielding the supply cable of permanently installed welding equipment, in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the welding power source enclosure.
2. Maintenance of the welding equipment. The welding equipment should be routinely maintained according to the manufacturer recommendations. All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustments covered in the manufacturers instructions. In particular, the spark gaps of arc striking and stabilizing devices should be adjusted and maintained according to the manufacturer recommendations.
3. Welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

QUALIFIED PERSONS MUST PERFORM INSTALLATION AND MAINTENANCE OPERATIONS ONLY.

- > BEFORE INSTALLING the Power source, check that the power socket satisfies ampere and voltage requirement(see technical data table)
- > ENSURE that appropriate fuses and automatic switches protect the socket.
- > CONNECT an approved standard plug corresponding to the system socket to the power supply cable.



EQUIPMENT INSTALLATION AND MAINTENANCE MUST BE PERFORMED IN COMPLIANCE WITH LOCAL SAFETY STANDARDS.

 <p>Electric shock could be fatal.</p> <ul style="list-style-type: none"> Never touch exposed electrical parts. Switch off and disconnect the power source before installing or opening. Qualified persons may perform installation only. Installation procedures must comply with national electricity standards and all other relevant regulations. 	 <p>Use a protective mask with suitable glass filter(at least NR10)to safeguard eyes.</p> <ul style="list-style-type: none"> Wear appropriate eye, ear and body protection equipment. Protect face, ears and neck 	 <p>Fumes and gases may represent a safety hazard. Fumes and gases generated during welding may be dangerous if inhaled.</p> <ul style="list-style-type: none"> Keep clear of fumes. Ventilate welding area or wear a breathing mask. Install a natural or forced air ventilation system in the work area.
 <p>Welding wire may cause injury.</p> <ul style="list-style-type: none"> Do not point the torch toward any part of the body, other persons or any type of metal when unwinding welding wire. 	 <p>Moving parts may cause injury.</p> <ul style="list-style-type: none"> Keep clear of Hazardous areas, such as moving rollers. Keep all doors, panels and covers closed and in place. 	 <p>Hot areas may cause injury.</p> <ul style="list-style-type: none"> Let the power source cool before performing any maintenance or servicing.
 <p>A falling power source or other equipment may cause serious injury to persons or damage to objects.</p> <ul style="list-style-type: none"> Always make use of the handle to lift power source(applyes to portable models). 	 <p>WELDING MAY CAUSE FIRES OR EXPLOSIONS. Never weld near inflammable materials.</p> <ul style="list-style-type: none"> Beware of weld flame. Always keep a fire extinguisher close at hand. Never place welding equipment on inflammable surfaces. Do not weld in closed containers. Let welding equipment and material cool before handling them. 	 <p>The positioning of welding equipment</p> <ul style="list-style-type: none"> Never position equipment on combustible or inflammable surfaces. Do not install equipment in the vicinity of inflammable liquids.

MAINTENANCE

Checking Items

The following items demand special attention:

(A) Wire feed unit.

This unit is to be checked regularly at the wire feed roller and the wire nozzles, as it is of great importance for a satisfactory welding result and a minimum of wear and tear that the wire passes through the mechanism without any deformations of the wire or the wire feed roller. The wire nozzle should often be checked and changed if the copper coating of the wire is damaged on its way through the nozzles. Copper dust may totally hinder free passage through the wire liner.

A weekly check and cleaning of the nozzles as well as the wire feed roller is recommended.

(B) Welding hose.

Great care should be taken that the welding hose is not overloaded. It should not be pulled over sharp edges, and other heavy machines should not run over it as it may damage the wire lines. The hose should be dismantled regularly and blown out with dry air .

(C) Welding torch.

There are many parts in the welding torch that have to be cleaned regularly. the main ones are the contact tip and the gas nozzle. During the welding process, these parts are bombarded with spatter that sticks in the nozzles. This may disturb the shielding gas flowing from the gas nozzle down to the molten pool. Other wise, if the gas nozzle is blocked up with spatter, there is a danger that a short-circuit will occur between the contact tip and the gas nozzle. The spatter should therefore be removed regularly and spatter remover applied in order to prevent spatter from burning into the nozzles. During the cleaning process, the gas nozzle must be removed.

REMEMBER:DO NOT CLEAN BY BEATING THE TORCH.

(D) Power source.

The rectifier and transformer should be blown out with dry air occasionally, otherwise the air circulation will be affected by the dust.

TYPE DATA	181		211	
	TECHNICAL DATA			
Mains supply	1-phase 50Hz/60Hz			
Voltage	230Vac			
Max.input current	34Amp		41Amp	
Fuse				
Cable cross-sectional area	4~10mm ²			
Permissible loading				
Duty cycle %	Duty cycle %		Duty cycle %	
	15	180A/23.2V	25	210A/24.5V
	60	90A/18.5V	60	135A/20.8V
	100	70A/17.5V	100	105A/19.3V
Output control				
Voltage adjustment	8 steps		6 steps	
Open circuit voltage	26~53Vdc		22~41Vdc	
Maximum welding output	180A/23.2V		210A/24.5V	
Minimum welding output	30A/15.5V		30A/15.5V	
Filler wire dimensions	0.6~1.0Ømm		0.6~1.0Ømm	
Wire feeding speed	1~17m/min			
Static characteristic	Flat(constant voltage)			
Phsical properties				
Dimensions(LxWxH)	800x320x600mm		800x320x600mm	
Weight	59Kg		64Kg	
Temperature class	H 180°C			
Degree of prtecton	IP21S			

GENERAL DESCRIPTION

Autoplus welding machines have been developed for thin plate welding and car body repair, they are designed to normal single-phase 220-240V mains supply. The main parts of the machine are the main transformer, the contactor, the rectifier for welding current, the control transformer, the wire feed motor, the solenoid valve and the electronic control.

The welding transformer has been dimensioned to obtain optimum welding capacities, and for a working temperature of 180 c.

Mode of Operation

When the trigger at the welding handle is activated, the contactor will couple voltage to the welding transformer which will give a secondary voltage decided by the position of the voltage switch. In the rectifier this AC voltage is transformed into a DC voltage which is applied between welding torch and return cable. At the same time the flow of protection gas and the wire feed motor are started. The number of revolutions is decided by the adjustment button. When you lift your finger from the trigger the motor will stop and after a short delay the contactor and the welding current are interrupted.

INITIAL OPERATING

Location

For best operating characteristics and longest unit life: take care in selecting an installation site. Avoid locations exposed to high humidity, dust, high ambient temperature, or corrosive fumes. Moisture can condense on electrical components, causing corrosion or shorting of circuits. Dirt on components helps retain this moisture. Adequate air circulation is needed at all times in order to assure proper operation. Make sure that the ventilator openings are not obstructed.

Mains Connection

Input voltage should be as stated on the type plate of the machine.

First make sure that the power supply is appropriately fused.

When connecting the mains plug, it is absolutely essential that the green(or green/yellow) wire of the mains cable is connected to the earth terminal of the plug.

The brown wire should be connected to the terminal marked L(live) and the blue wire should be connected to the terminal marked N (neutral).

Electrical connections should only be made by a fully qualified person.

Shielding Gas Connection

The shielding gas bottle is mounted on the machine and the regulator on the bottle. If the

regulator is equipped with flowmeter, the flow rate is adjusted on 5-15 litres/min.

Welding Torch Connection

The mig torch plug is pushed into the the euro socket on the front of the welder and the locking ring around the plug tightened.

Fitting the Welding Wire

Turn the tension spring aside and tip it up. Check that the wire feed roller, the wire guide liner and the contact tip correspond to the wire diameter, the wire feed roller is designed for one wire size . The following wire guide liner is recommended.

WIRE DIAMETER(FE.WIRE)	WIRE GUIDE LINER INT.DIAMETER
Dia.0.6MM Dia.1.0MM	Dia.1.0-(-1.5)MM
WIRE DIAMETER(AL.WIRE)	
Dia.0.8MM Dia.1.0MM	Dia.1.5MM Dia.1.5MM

When using aluminium wire use a special guide liner where the internal liner goes the way through the inlet nozzle.This prevent the aluminium wire from being damaged.The reel of wire is put on the hub, and the wire is put through the wire feed unit and few centimeters into the hose. As the wire gulde liner is vulnerable to burrs at the point of the wire, it is important to file the point of the wire in order to remove all burrs and it is equally important to straighten out the first10-15cm.Unscrew contact nozzle .Tip UP THE LEVER. Set the wire speed at 6,press the start button, the wire runs through the hose. When the wire is through the hose, stop the machine and mount the contact nozzle. The pressure of the lever is adjusted to allow the wire feed roller just to skid on the wire when this is stopped at the contact nozzle.

Setting of the Machine

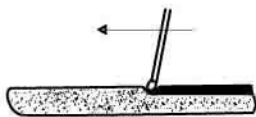
The setting of a welding machine demands some practice from the welder, the machines have two controls these two are the wire feed speed and the welding voltage. The welding current is determined by the wire feed speed, and it should correspond to the workpiece. The current will increase wire speed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the current intensity, but lengthens the arc. By decreasing the voltage a shorten arc is obtained with little change in current intensity. When using CO2 as shielding gas, increase the voltage by about 5 volts per 100 Amp.

When changing the wire diameters, different control settings are required. A thinner wire needs more speed to acquire the same current strength. A satisfactory weld cannot be obtained if extreme values are exceeded. If the feed speed is too high for the welding voltage, blockage will occur in the torch as the wire dips into the molten pool and does not melt. Welding in these conditions normally gives faults due to lack of fusion. If, however, the welding voltage is too high, large drops will form on thh end of the wire, causing spatter. The correct setting of voltage and speed can be seen in an even and calm arc.

Influence of the Welding Position

The position of the torch and the work piece is important for quality and appearance of the seam. The diagrams show some of the many possibilities and indicate schematically the importance of these positions. In practice one of course uses all combinations of welding positions, torch directions and positions of the workpiece. Together with the figures, the diagram below may help when an estimation of the importance of separate factors when welding. The terms drawing weld and thrusting weld mean. Drawing weld: torch sloped in direction of weld. Thrusting weld: torch sloped away from direction of weld. Drawing weld is sometimes designated“dragging welding”and thrusting weld “stabbing welding”.

	Thrusting weld	Drawing weld
Width of seam	Wider	Narrower
Upper bead	Smaller	Larger
Penetr ation	Decrease	Increase
Tendency to lack of fusion	Greater	Lesser



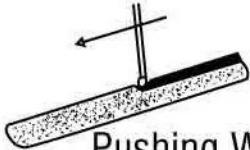
Pushing Weld



Pulling Weld



Pulling Weld sloping downwards



Pushing Weld sloping downwards