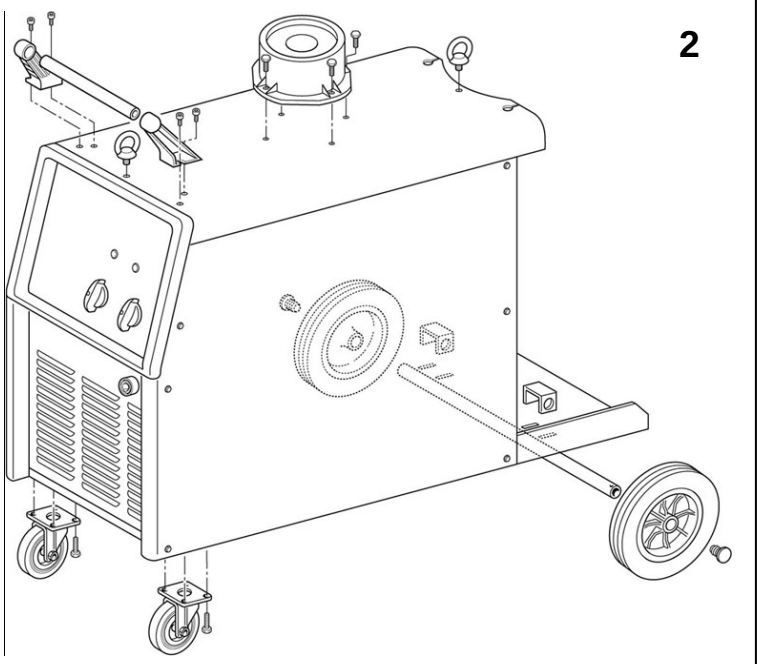
DURALLOY®

INSTRUCTION MANUAL

421 MIG SWF



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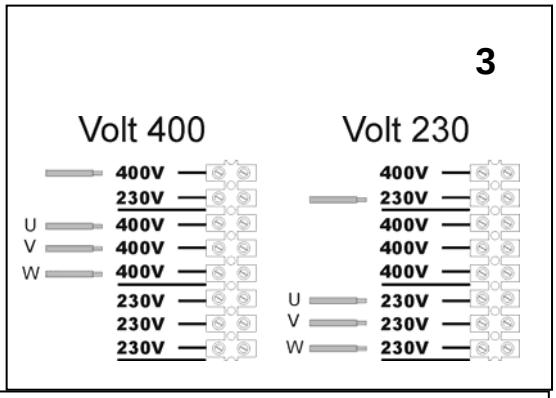

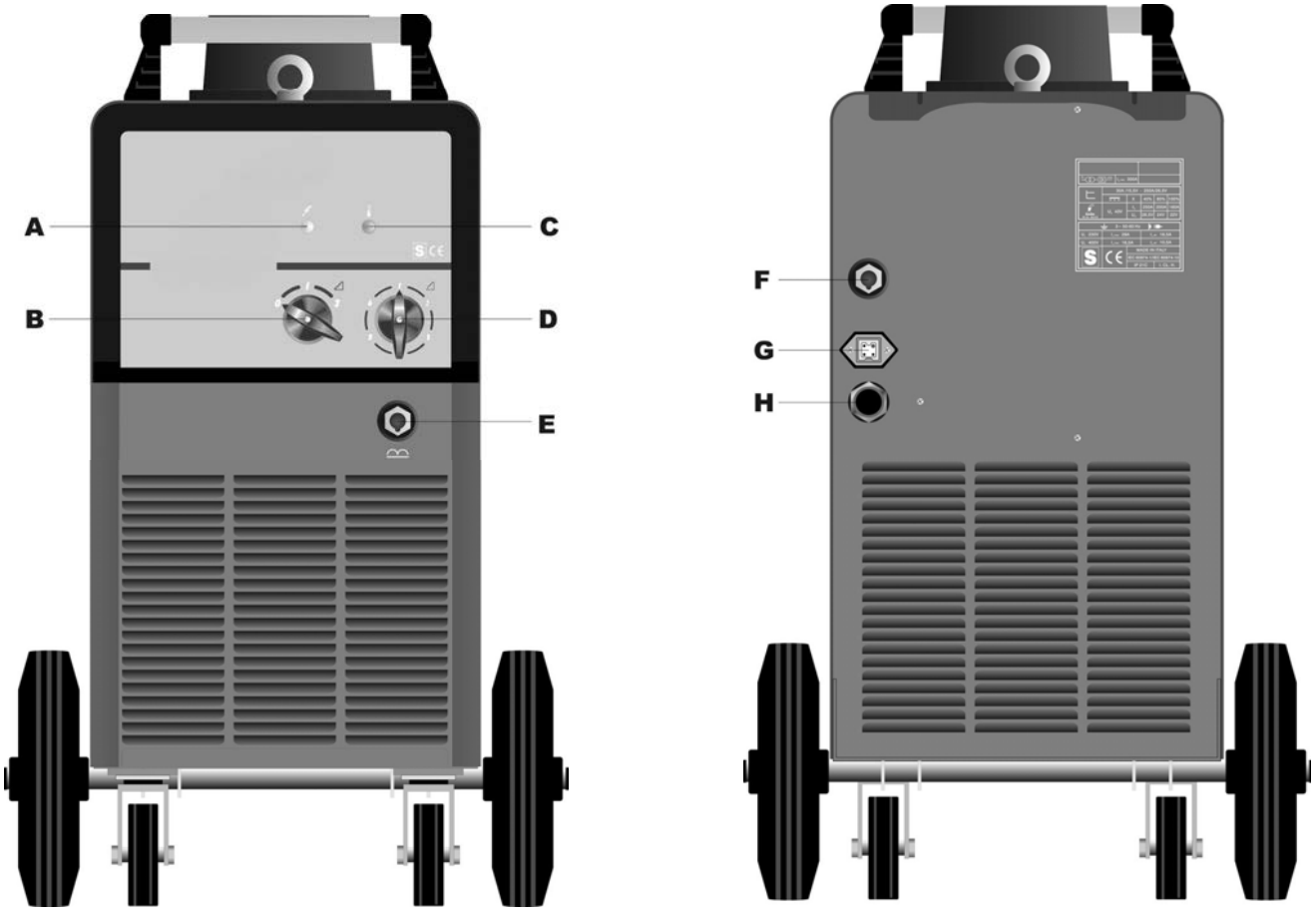

Artt. / Items DA421MIGSWF

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INSTRUCTION MANUAL FOR WIRE WELDING MACHINE

IMPORTANT
READ THIS MANUAL AND THE SAFETY RULES MANUAL CAREFULLY BEFORE INSTALLING, USING, OR SERVICING THE WELDING MACHINE, PAYING SPECIAL ATTENTION TO SAFETY RULES. CONTACT YOUR DISTRIBUTOR IF YOU DO NOT FULLY UNDERSTAND THESE INSTRUCTIONS.

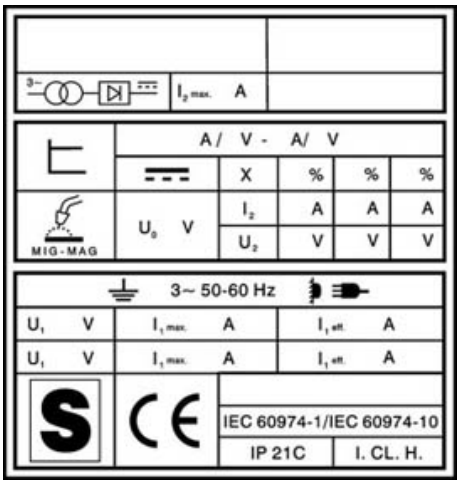
This machine must be used for welding only. It must not be used to defrost pipes.
It is also essential to pay special attention to the "SAFETY RULES" Manual. The symbols next to certain paragraphs indicate points requiring extra attention, practical advice or simple information.
This MANUAL and the "SAFETY RULES" MANUAL must be stored carefully in a pica familiar to everyone involved in using the machine. They must be consulted whenever doubts arise and be kept for the entire lifespan of the machine; they will also be used for ordering replacement parts.

1 GENERAL DESCRIPTION

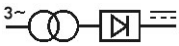
1.1 SPECIFICATIONS

This manual has been prepared for the purpose of educating personnel assigned to install, operate and service the welding machine.
This equipment is a constant-voltage power source, suitable for MIG/MAG and OPEN-ARC welding.
Upon receiving the machine, make sure there are no broken or damaged parts.
The purchaser should address any complaints for losses or damage to the vector. Please indicate the article and serial number whenever requesting information about the welding machine.

1.2 EXPLANATION OF TECHNICAL SPECIFICATIONS



Pict. 1

IEC 60974-1 IEC 60974-10	The welding machine is manufactured according to these international standards.
	Three-phase transformer-rectifier.
	Flat characteristic.
	Suitable for continuous wire welding.
I2 max	Unconventional welding current. This value represents the max. limit attainable in welding.
U0	Secondary open-circuit voltage.
X	Duty cycle percentage. The duty cycle expresses the percentage of 10 minutes during which the welding machine may run at a certain current without overheating.
I2	Welding current
U2	Secondary voltage with welding current I2.
U1	Rated supply voltage
3~ 50/60Hz	50- or 60-Hz three-phase power supply.
I1 max	Maximum absorbed current value.
I1 eff	This is the maximum value of the actual current absorbed, considering the duty cycle.
IP21C	Protection rating for the housing. Grade 1 as the second digit means that this equipment is suitable for use outdoors in the rain. The additional letter **C** means that the equipment is protected against access to the live parts of the power supply circuit by a tool (diameter 2.5 mm).
S	Suitable for use in high-risk environments.

NOTES: The welding machine has also been designed for use in environments with a pollution rating of 3. (See IEC 60664).

1.3 OVERLOAD CUT-OUT

This machine is protected by a thermostat, which prevents the machine from operating if the allowable temperatures are exceeded. In these conditions, the fan continues to operate, the wire to flow and the led **C** lights.

2 INSTALLATION

• Only skilled personnel should install the machine.
• All connections must be carried out according to current regulations, and in full observance of safety laws.
Make sure that the supply voltage corresponds to the value indicated on the power cable. If it is not already fitted, connect a plug suited to the power cable, making sure that the yellow/green conductor is connected to the earth pin.
The capacity of the overload cutout switch or fuses installed in series with the power supply must be equivalent to the absorbed current I1 max. of the machine.

2.1 PLACEMENT

Mount the handle, wheels and the wire feeder unit support (pict. 2).
The handle must not be used for lifting the welding machine.
Place the welding machine in a ventilated area.
Dust, dirt, and any other foreign matter entering the welding machine can interfere with ventilation and thus with smooth operation.
Therefore, in relation to the environment and working conditions, it is important to keep the internal parts clean.

Clean using a jet of dry, clean air, being careful to avoid damaging the machine in any way.
Before working inside the welding machine, make sure it is unplugged from the power mains.
Any intervention carried out inside the welding machine must be performed by qualified personnel.

2.2 INTERNAL CONNECTIONS

- **Any intervention carried out inside the welding machine must be performed by qualified personnel.**
- Before working inside the welding machine, make sure that the plug is disconnected from the power mains.
- **After final inspection, the welding machine is connected to the voltage indicated on the panel beside the power supply cable.**
- **To change the supply voltage, remove the right side panel and arrange the voltage change terminal board connections as shown in the picture 3.**
- **The supply voltage may not be changed on single-phase power sources.**
- Do not use the welding machine without its cover or side panels for obvious safety reasons, and to avoid altering the cooling conditions for internal components.

2.3 EXTERNAL CONNECTIONS

2.3.1 Connecting the mass clip

Connect the earth cable terminal to the socket **E** of the welding machine, and connect the earth clamp to the workpiece.

2.3.2 Cylinder placement and connecting the gas hose

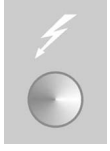
- Position the cylinder on the cylinder holder of the welding machine, using the chains provided to fasten it to the rear panel of the machine.
- Periodically check for wear of chains and order replacements if necessary.
- The cylinder must be equipped with a pressure regulator complete with flow gauge.
- Only after positioning the cylinder, connect the outgoing gas hose from the rear panel of the machine to the pressure regulator.
- Adjust the gas flow to approximately 10/18 liters/minute.

2.3.3 Connecting the wire feeder

This power source works with the wire feeders WF21 and WF41. The performance and operating options of the wire feeder are described in the instructions enclosed with the wire feeder itself.

3 DESCRIPTION OF CONTROLS

3.1 CONTROLS ON THE FRONT OF THE MACHINE (see pict. 4)



A - Light
Main ON/OFF indicator lamp.

C – Light
Thermostat pilot light.

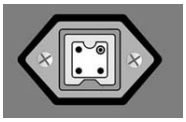
B - Switch
Turns the machine ON or OFF and select the ranges of welding voltage.

D – Switch
Fine-tunes the welding voltage within the range previously selected via selector switch **B**.

E- Earth socket
Socket to which to connect the earth cable.

3.2 CONTROLS ON GENERATOR REAR PANEL (see pict. 4)

H – Input supply socket



G - Socket connector.
For the male connector on extension lead.

F - Socket.
For the extension lead power supply connector (‘+’ pole).

4 WELDING

4.1 INSTALLATION

Make sure that the wire diameter corresponds to the diameter indicated on the wire feeder roller. Use wire feeder rollers with a "U"-shaped groove for aluminium wires, and with a "V"-shaped groove for other wires.

4.2 THE MACHINE IS READY TO WELD

- Connect the earth clamp to the workpiece.
- Set the switch **B** to **1** or **2** position.
- Remove the gas nozzle.

- Unscrew the contact tip.
- Insert the wire in the wire liner of the torch, making sure that it is inside the roller groove and that the roller is in the correct position.
- Press the torch trigger to move the wire forward until it comes out of the torch.
- **Caution: keep your face away from the gun tube assembly while the wire is coming out.**
- Screw the contact tip back on, making sure that the hole diameter is the same as that of the wire used.
- Assemble the gas nozzle.

4.3 WELDING CARBON STEELS WITH GAS PROTECTION.

In order to weld these materials you must:
- Use a welding gas with a binary composition, usually ARGON + CO2 with percentages of Argon ranging from 75% up. With this blend, the welding bead will be well jointed and attractive.
- Using pure CO2 as a protection gas will produce narrow beads, with greater penetration but a considerably increase in splatters.
- Use a welding wire of the same quality as the steel to be welded. It is best to always use good quality wires, avoiding welding with rusted wires that could cause welding defects.
- Avoid welding rusted parts, or those with oil or grease stains.

4.4 WELDING STAINLESS STEEL

Series 300 stainless steels must be welded using a protection gas with a high Argon content, containing a small percentage of O2 or carbon dioxide CO2 (approximately 2%) to stabilize the arc.
Do not touch the wire with your hands. It is important to keep the welding area clean at all times, to avoid contaminating the joint to be welded.

4.5 WELDING ALUMINIUM

In order to weld aluminium you must use:
- Pure Argon as the protection gas.
- A welding wire with a composition suitable for the base material to be welded.
- Use mills and brushing machines specifically designed for aluminium, and never use them for other materials.

5 WELDING DEFECTS

1. DEFECT- - Porosity (within or outside the bead)
CAUSES **-** Electrode defective (rusted surface)
- Missing shielding gas due to:
low gas flow
flow gauge defective
regulator frosted due to no preheating of the CO2 protection gas
defective solenoid valve
contact tip clogged with spatter
gas outlet holes clogged
air drafts in welding area.

2. DEFECT - Shrinkage cracks
CAUSES **-** Wire or workpiece dirty or rusted.
- Bead too small.
- Bead too concave.
- Bead too deeply penetrated.

3. DEFECT - Side cuts
CAUSES **-** Welding pass done too quickly
- Low current and high arc voltages.

4. DEFECT - Excessive spraying
CAUSES **-** Voltage too high.
- Insufficient inductance.
- No preheating of the CO2 protection gas

6 MAINTAINING THE SYSTEM

• Shielding gas nozzle
This nozzle must be periodically cleaned to remove weld spatter. Replace if distorted or squashed.
• Contact tip.
Only a good contact between this contact tip and the wire can ensure a stable arc and optimum current output; you must therefore observe the following precautions:
A) The contact tip hole must be kept free of grime and oxidation (rust).
B) Weld spatter sticks more easily after long welding sessions, blocking the wire flow.
The tip must therefore be cleaned more often, and replaced if necessary.
C) The contact tip must always be firmly screwed onto the torch body. The thermal cycles to which the torch is subjected can cause it to loosen, thus heating the torch body and tip and causing the wire to advance unevenly.
• Wire liner.
This is an important part that must be checked often, because the wire may deposit copper dust or tiny shavings. Clean it periodically along with the gas lines, using dry compressed air.
The liners are subjected to constant wear and tear, and therefore must be replaced after a certain amount of time.
• Gearmotor group.
Periodically clean the set of feeder rollers, to remove any rust or metal residue left by the coils. You must periodically check the entire wire feeder group: hasp, wire guide rollers, liner and contact tip.

INSTRUCTION MANUAL FOR WIRE FEEDER FOR WIRE WELDING MACHINE

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1 GENERAL DESCRIPTION

1.1 SPECIFICATIONS

This manual has been prepared for the purpose of educating personnel assigned to install, operate and service the welding machine.
The purchaser should address any complaints for losses or damage to the forwarding company. Please indicate the article and serial number whenever requesting information about the welding machine.

2 INSTALLATION

- Only skilled personnel should install the machine.
- All connections must be carried out according to current regulations, and in full observance of safety laws.

2.1 PLACEMENT

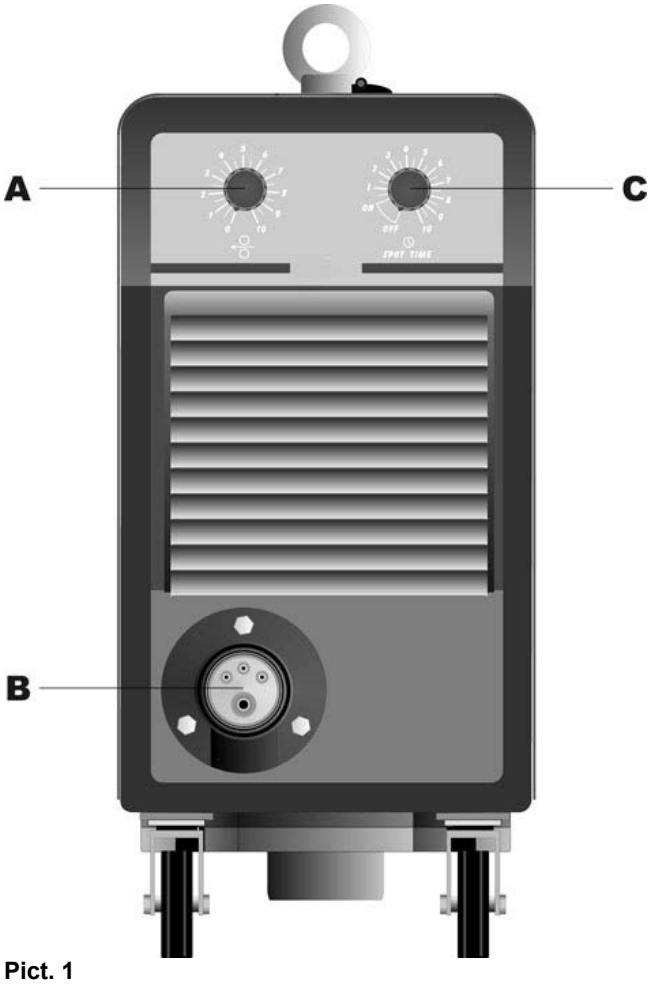
Unpack the wire feeder and place it above the welding machine, using the flexible rotating cylinder provided.
Once the generator has been connected to the carriage by means of the connector, the machine can be started.

3 DESCRIPTION OF CONTROLS

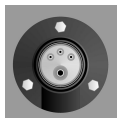
3.1 CONTROLS ON THE FRONT OF THE MACHINE

A - Setting knob.
Adjusting this knob changes the welding wire speed.

C - Setting knob.
Turning this knob adjusts the spot welding time. The machine begins welding when the torch trigger is pressed. The spot welding time is set via the knob. To start the cycle over, release and press the torch trigger again.



Pict. 1



B – Central adapter.
This is where the welding torch is to be connected.

4 START-UP

Assemble the welding torch on the central adapter **B**.
Make sure that the wire diameter corresponds to the one indicated on the wire feed roller, and load the wire reel. Make sure that the welding wire passes through the groove in the roller.
Before connecting the generator power cable, make sure that the supply voltage corresponds to that of the welding machine, and that the earth socket functions properly.
Turn on the generator.
Remove the tapered gas nozzle.
Unscrew the contact tip.
Press the torch trigger and release it only when the welding wire comes out.
Welding wire can cause puncture wounds.
Never aim the torch at parts of the body when loading the welding wire.
Screw the contact tip back on, making sure that the hole diameter corresponds to the wire used.
Slide the tapered gas welding nozzle back on.