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IT	02 / 87-100 / 115-124
PL	02 / 101-114 / 115-124

PROTIG 221 DC FV TIG 300 DC

Poste à souder TIG et MMA
TIG (GTAW) and MMA (SMAW) welding machine
Schweissgerät für WIG und E-Hand (MMA)
Equipo de soldadura TIG y MMA
Сварочный аппарат ТИГ и MMA
TIG en MMA lasapparaat
Dispositivo saldatura TIG e MMA
Spawarka TIG i MMA

FIG-1

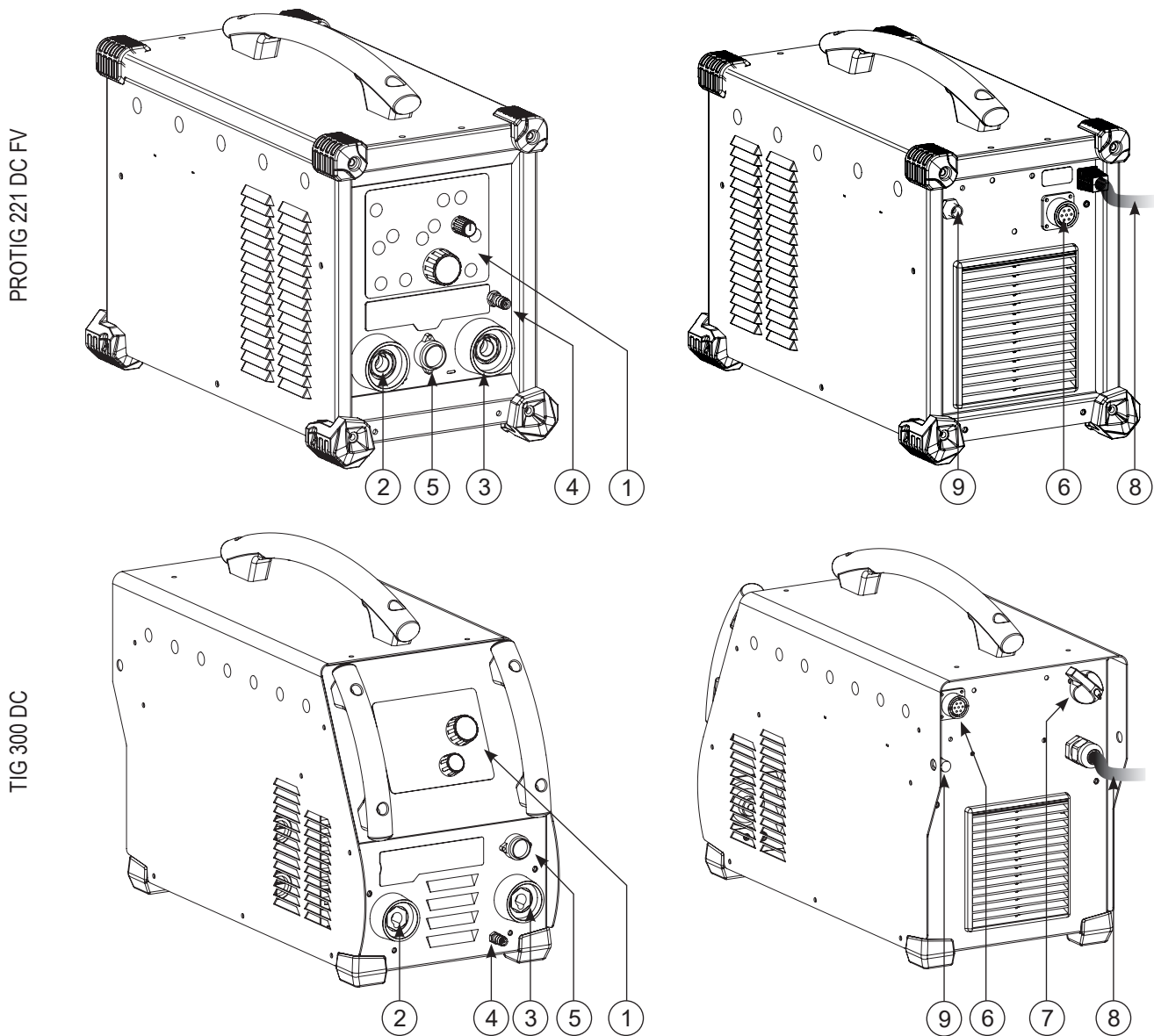
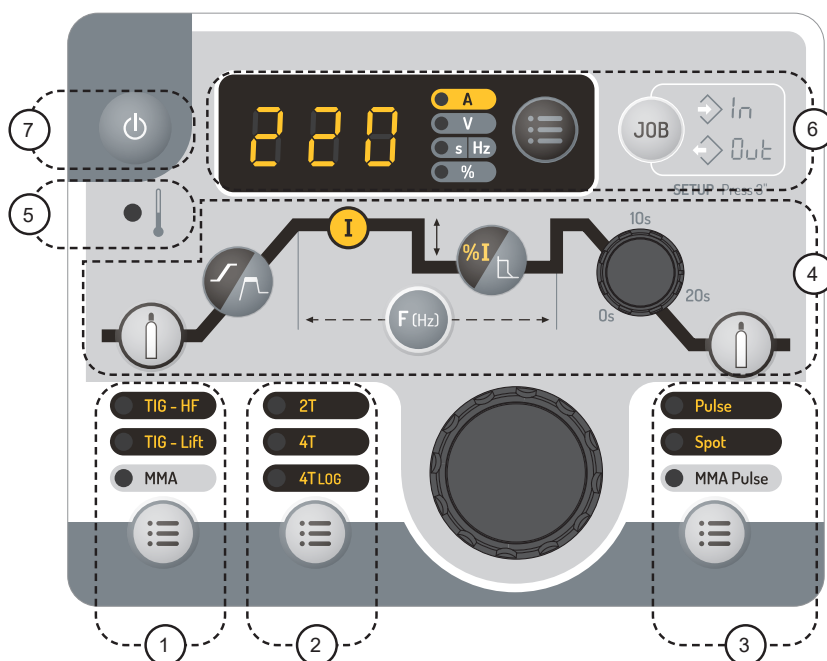


FIG-2



WARNINGS - SAFETY RULES

GENERAL INSTRUCTIONS



These instructions must be read and fully understood before using the equipment. Do not make any alterations or undertake any maintenance procedures that are not explicitly mentioned in this user manual.

The manufacturer cannot be held responsible for any bodily injury or material damage resulting from use that does not comply with the instructions in this manual. In the event of a problem or query, please consult a qualified person to properly set up the machine.

THE WORKING ENVIRONMENT

This equipment must only be used for welding operations within the limits shown on the indicator plate and/or in the manual. All safety guidelines must be followed. The manufacturer cannot be held responsible if the machine is used improperly or dangerously.

This equipment must be set up in an area free from dust, acid, flammable gases or other corrosive substances. The same is true for its storage. Ensure good air circulation when in using the machine.

Temperature Range:
Use between -10 - 40°C (14 - 104°F).
Store between -20 - 55°C (4 - 131°F).

Air humidity:
Less than or equal to 50% at 40°C (104°F).
Less than or equal to 90% at 20°C (68°F).

Altitude:
Up to 1,000 m above sea level (3,280 feet).

PROTECTING YOURSELF AND OTHERS

Arc welding can be dangerous and cause serious injury or death. Welding exposes people to a dangerous heat source, light radiation from the arc, electromagnetic fields (please note that those with pacemakers must be aware of this) and the risk of electrocution, as well as loud noises and gas fumes. To properly protect yourself and others, please observe the following safety instructions:



Wear insulating, dry and flame-retardant clothing without cuffs. Make sure that this clothing is in good condition and that it covers the entire body to protect yourself from burns and radiation.



Wear electrically and thermally insulated gloves.



Take protective measures and / or a welding mask with a sufficient level of protection (this will change depending on the application). Protect your eyes during cleaning operations. Contact lenses are strictly prohibited. It is sometimes necessary to mark out welding zones using flame-retardant curtains to protect the welding area from arc rays, spatter and red-hot waste. Instruct persons in the welding area not to stare at arc rays or molten parts and to wear appropriate protective clothing.



Use a noise-reducing welding mask if the welding process reaches a noise level above the permissible limit (this applies to anyone in the welding area).

Keep your hands, hair and clothing away from moving parts, such as fans. Never remove the cooling unit's protective casing when the welding machine is turned on; the manufacturer cannot be held responsible in the event of an accident.



Parts that have just been welded are hot and can cause burns when handled. When carrying out maintenance on the torch or the electrode holder, ensure that it is sufficiently cold by waiting at least 10 minutes before undertaking any intervention. The cooling unit must be turned on when using a water-cooled torch to ensure that the liquid cannot cause burns. It is important to secure the work area before leaving it in order to protect people and property.

WELDING FUMES AND GASES



The fumes, gases and dust emitted by welding are harmful to your health. Sufficient ventilation must be provided, an additional air supply may sometimes be necessary. An air-fed mask could be a solution in cases where there is insufficient ventilation. Check that the suction is effective by checking it against safety standards.

Attention: Welding in confined spaces requires remote supervision for safety reasons. Furthermore, welding certain materials that contain lead, cadmium, zinc, mercury or even beryllium can be particularly harmful. Also, remember to degrease parts before welding them.

Gas cylinders must be stored in open or well-ventilated rooms. They must be kept in an upright position and held on a support or trolley. Welding is prohibited near grease or paint.

FIRE AND EXPLOSION RISKS



Fully protect the welding area; flammable materials must be kept at least 11 metres away. Firefighting equipment must be present near welding operations.

Beware of hot spatter and sparks as these can cause fires or explosions, even through cracks.

Keep people, flammable objects and pressurised containers at a sufficiently safe distance.

Welding in closed containers or tubes is prohibited. If the container or tube is open, it must be emptied of any flammable or explosive materials (oil, fuel or gas residues, etc.).

Grinding operations must not be directed towards the source of the welding current or towards any flammable materials.

GAS CYLINDERS



The gas coming out of the cylinders can cause suffocation if it becomes too concentrated in the welding area (ventilate well). Transporting the welding machine must be done safely, ensuring all the cylinders and the welding unit are switched off. The gas cylinders and the machine must be stored upright and held in place by a support to limit the risk of falling.

Close the cylinder between uses. Beware of temperature variations and sun exposure.

The gas cylinder must not come into contact with a flame, an electric arc, a torch, a earth clamp or any other source of heat or incandescence.

Be sure to keep it away from electrical and welding circuits and, therefore, never weld a pressurised container.

Be careful when opening the cylinder's valve, keep your head away from the valve and make sure that the gas used is suitable for the welding process.

ELECTRICAL SAFETY



It is crucial that the electrical system used is properly earthed. Use the fuse size recommended on the rating table. Electric shocks can cause serious direct or indirect accidents and even death.

Never touch live parts inside or outside the live current source (torches, clamps, cables or electrodes) because these are connected to the welding circuit.

Before opening the welding machine, disconnect it from the power-supply network and wait a further two minutes so that all the capacitors are fully discharged.

Do not touch the torch or the electrode holder and the earth clamp at the same time.

If the cables or torches become damaged, make sure that they are changed by a qualified and authorised person. Measure the length of cable required according to its intended application. Always use dry, undamaged clothing to insulate yourself from the welding circuit. Wear insulating shoes, whatever the working environment.

THE EQUIPMENT'S EMC CLASSIFICATION

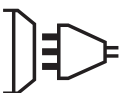


This Class A equipment is not intended for use on residential sites where the electrical current is supplied by the public, low-voltage mains network. There may be difficulties in ensuring electromagnetic compatibility at these sites due to conducted, as well as radiated, radio-frequency disturbances.

PROTIG 221:

This equipment complies with IEC 61000-3-11 and can be connected to a public, low-voltage mains network, providing that the impedance at the common coupling point on the aforementioned network is less than $Z_{max} = 0.29 \text{ Ohms}$. It is the installer or user's responsibility to ensure that the network impedance complies with relevant impedance restrictions by consulting the power network's distribution operator if necessary.

This equipment complies with IEC 61000-3-12.



TIG 300:

This equipment does not comply with IEC 61000-3-12 and is intended to be connected to a private, low-voltage power network or connected to the public mains network, although only at medium and high voltage levels. If it is connected to a public, low-voltage power-supply network, it is the installer or user's responsibility to ensure that the equipment can be safely connected to the power-supply network by consulting with the power-distribution network operator if necessary.

ELECTROMAGNETIC RADIATION



Electric currents passing through any conductor produce localised electric and magnetic fields (EMF). Welding currents produce an electromagnetic field around the welding circuit and welding equipment.

Electromagnetic fields (EMF) can interfere with some implanted medical devices, such as pacemakers. Protective measures should be taken for those

people with implanted medical devices. For example, restricted access for passers-by or an individual risk assessment for welders.

All welders should use the following procedures to minimise exposure to electromagnetic fields from the welding circuit:

- Position the welding cables together, securing them with a tie if possible.
- Position yourself (torso and head) as far as possible from the welding circuit.
- Never wrap welding cables around your body.
- Do not position your body between the welding cables.
- Keep the two welding cables on the same side of your body.
- Connect the return cable to the workpiece as close as possible to the area being welded.
- Do not work near the welding machine and certainly do not sit on it or lean against it.
- Do not weld when transporting the welding machine or wire feeder.



People with pacemakers should consult a physician before using this equipment.
Exposure to electromagnetic fields while welding may have other health effects that are not yet known.

ASSESSING THE WELDING AREA AND EQUIPMENT

General information

The user is responsible for installing and using the arc-welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected, it is the user's responsibility to resolve the situation with technical assistance from the manufacturer. In some cases, this corrective action may be as simple as earthing the welding circuit. In other cases, it may be necessary to build an electromagnetic shield around the welding equipment, as well as the entire workspace complete with entry filters. In all cases, electromagnetic disturbances must be reduced until they are no longer bothersome.

Assessing the welding area

Before setting up any arc-welding equipment, the user must assess potential electromagnetic problems in the surrounding area. The following must be taken into account:

- a) Check for other power cables, control cables, signalling cables or telephone cables either above, below or next to the arc-welding equipment.
- b) Check for radio and television receivers and transmitters.
- c) Check for computers and other control equipment.
- d) Check for critical safety equipment around the welding equipment to protect industrial equipment.
- e) Check the health condition of people nearby, for example, confirm that no one is fitted with a pacemaker or hearing aid device.
- f) Check that all the welding equipment has been properly calibrated or measured.
- g) Check that equipment in the surrounding area will not be damaged.

It is up to the user to ensure that all other equipment used in the surrounding area is compatible with this welding machine. This may require additional protective measures.

- h) Check the time of day when welding activities, or other activities, are to be carried out.

The size of the surrounding area to be taken into account depends on the structure of the building and the other activities that take place there. The surrounding area may extend beyond the boundaries of the facility in which you are working.

Assessing the welding equipment

In addition to assessing the area, an assessment of the arc-welding equipment can identify and resolve disruptions. The emissions assessment should include in situ readings as specified in Article 10 of CISPR 11. In situ readings can also confirm the effectiveness of mitigation measures.

HOW TO REDUCE ELECTROMAGNETIC RADIATION

a. The public mains network: Arc-welding equipment should be connected to the public mains network according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional preventive measures such as filtering the public power-supply network. Consideration should be given to shielding the power cable inside a metal conduit or similar device for permanently installed arc-welding equipment. The shielding used must be electrically continuous along its entire length. The shield should be connected to the welding machine's power source to ensure good electrical contact between the conduit and the power source's casing.

b. Maintaining arc-welding equipment: Arc-welding equipment should be routinely maintained according to the manufacturer's recommendations. All access points, service doors and protective covers must be closed and properly locked when the arc-welding equipment is in use. Arc-welding equipment should not be modified in any way, except for modifications and adjustments stated within the manufacturer's instructions. In particular, the ignition system's spark gap and arc-stabilisation features must be calibrated and serviced in accordance with the manufacturer's recommendations.

c. Welding cables: Cables should be as short as possible and placed close to each other. They should be close to, or directly on, the ground.

d. Equipotential bonding: Consideration should be given to bonding all metal objects in the surrounding area. However, metal objects attached to the workpiece increase the risk of electric shocks if the operator touches both these metallic parts and the electrode at the same time. The operator must be electrically insulated from any such metallic objects.

e. Earthing the workpiece: When the workpiece is not electrically earthed for electrical safety reasons or due to its size and location (a ship's hull or a building's structural metal framework), an earthed connection can, in some cases but not always, reduce radiation. Care should be taken to avoid earthing component parts which could increase the risk of injury to users or damage to other electrical equipment. If necessary, the workpiece's earth connection should be made directly, however, in certain countries a direct connection is not allowed. Therefore, the connection should be made with a suitable capacitor chosen according to national regulations.

f. Protection and shielding: Selective protection, as well as the shielding of other cables and equipment in the surrounding area, can limit interference problems. For special applications, the entire welding area can be protected.

TRANSPORTING THE WELDING MACHINE



The welding machine is equipped with an upper handle allowing it to be carried by hand. Be careful not to underestimate its weight. The welding machine is not designed to be hung up from this handle.
Do not use the cables or the torch to move the welding unit. It must be transported in an upright position.

Never lift a gas cylinder and the welding machine at the same time. Their transport requirements are different. Do not carry or transport this welding machine over people or objects.

SETTING UP THE EQUIPMENT

- Place the welding machine on a floor with a maximum slope of 10°.
 - Provide a large enough area to ventilate the welding machine and provide access to the controls.
 - Do not use in environments with conductive metal dust.
 - This welding unit must be protected from heavy rain and not exposed to direct sunlight.
 - This equipment is rated as IP21, meaning that it is:
 - protected against solid objects with a diameter more than 12.5 mm entering the machine
 - protected against vertically falling water droplets
- Power-supply cables, extension leads and welding cables must be fully unwound to avoid overheating.



The manufacturer assumes no responsibility for damage caused to persons and objects due to the incorrect or dangerous use of this equipment.

MAINTENANCE / ADVICE



- Maintenance should only be performed by a qualified person.
- Annual maintenance is recommended.
- Disconnect the power supply by unplugging the plug from the socket and wait two minutes before beginning any work on the equipment. Inside the machine, the voltages and currents are high and dangerous.

- Regularly remove the machine's protective cover and dust with a compressed-air blower. Take this opportunity to have the electrical connections checked with an insulated tool by qualified personnel.
- Regularly check the condition of the power cable. If the power cable becomes damaged, it must be replaced by the manufacturer, their after-sales service team or a similarly qualified person in order to avoid any danger.
- Leave the welding machine's openings free for proper air circulation.
- Do not use this welding unit to thaw pipes, recharge batteries/accumulators or to start engines.

SET-UP - OPERATING THE EQUIPMENT

Only skilled staff, authorised by the manufacturer, may carry out the machine's set-up. During set-up, make sure that the machine's power source is disconnected from the power-supply network. Series and parallel power-source connections are prohibited. Please use the welding cables supplied with the device in order to obtain the optimal product settings.

EQUIPMENT DIAGRAM (FIG-1)

This machine is an inverter welding unit designed for tungsten inert gas (TIG) welding, direct current (DC) welding and coated-electrode (MMA) welding.

The TIG welding process requires gas shielding (argon gas).

The MMA welding process allows any type of electrode to be used for welding: rutile, basic, stainless steel and cast iron.

This equipment can be controlled with a manual remote control (PN: 045675) or with a foot pedal (PN: 045682).

- | | |
|----------------------------------|--------------------------|
| 1 - Keypad and increment buttons | 5 - Trigger connector |
| 2 - Positive polarity terminal | 6 - Remote control input |
| 3 - Negative polarity terminal | 7 - On / Off switch |
| 4 - Torch's gas connection | 8 - Power cable |
| | 9 - Gas connection |

HUMAN MACHINE INTERFACE (HMI) (FIG-2)

- | | |
|--------------------------------|----------------------------------|
| 1 - Selecting a process | 5 - Thermal protection indicator |
| 2 - Choosing a trigger mode | 6 - Display and options |
| 3 - Selecting process options | 7 - Sleep button |
| 4 - Welding parameter settings | |

START-UP POWER SUPPLY

• The TIG 300 DC is supplied with a three-phase, five-prong (3P+N+PE) 400 V/16 A EN 60309-1 plug and is powered by a 400 V (50-60 Hz), three-phase electrical system with an earth connection. This equipment should only be used on a three-phase, four-wire power system with the neutral wire properly earthed. *

• The PROTIG 221 DC FV is delivered with a single-phase, three-prong (P+N+PE) 230 V/16 A CEE17 plug and is equipped with 'Flexible Voltage' technology. It is powered by a 1110 - 240 V (50 - 60 Hz) earthed power-supply system.

The effective absorbed current (I_{1eff}) is indicated on the welding machine, as well as the most suitable operating conditions. Check that the power supply and its protections (fuse and/or circuit breaker) are compatible with the electrical current required. In some countries, changing the plug might be necessary in order to reach the machine's ideal operating conditions. The user must ensure that the machine's outlets are accessible.

• The welding unit will go into protection mode if the supply voltage is more than 15% lower or higher than the specified voltage (a fault code will appear on the display screen).

• The TIG 300 DC is started up by turning the on/off switch (7) to position I. Conversely, to turn the machine off, turn the switch back to position O.

• The PROTIG 221 DC FV is switched on by pressing the ON/OFF button . **Please note, never turn off the power when the welding machine is on charge.**

- Fan performance: in MMA welding mode, the fan will work continuously. In TIG mode, the fan will only operate during the welding phase, then it will stop after cooling.
- **Warning:** Increasing the length of the torch or return cables beyond the maximum length indicated by the manufacturer will increase the risk of electric shocks.
- The arc-starting and stabilising features are designed for both manual and mechanically guided operations.

CONNECTING TO THE POWER SOURCE

These welding machines can be used with a battery-based power source provided that the auxiliary power meets the following requirements:
 - The voltage must be alternating, set as stipulated and with a peak voltage of less than 700 V for the TIG 300 DC and 400 V for the PROTIG 221 DC FV.
 - The frequency must be between 50 - 60 Hz.
 It is imperative to check these conditions as many battery-based power sources produce high voltage spikes that can damage the welding unit.

USING EXTENSION LEADS

All extension leads should be the correct size and diameter for the equipment's voltage requirements. Use an extension lead that complies with national regulations.

	Input voltage	Extension lead length	
		< 45 m	< 100 m
TIG 300 DC	400 V	2.5 mm ²	
PROTIG 221 DC FV	230 V	2.5 mm ²	
	110 V	2.5 mm ²	4 mm ²

GAS SUPPLY





This equipment is equipped with two connection points. A gas cylinder connection point to allow shielding gas to enter the machine and a gas torch connection point allowing gas to escape through the end of the torch. In order to guarantee ideal connections, we recommend that you use the adaptors that come supplied with the machine.

REBOOTING THE WELDING MACHINE

It is possible to restore the welding unit's factory settings. You can access this advanced setting by pressing the 'JOB' button for longer than three seconds. You must then select 'Ini'. The screen will then display the numbers '3', '2' and '1' before rebooting the device.

DESCRIPTION OF FEATURES, MENUS AND ICONS

FEATURES	ICON	DC TIG WELDING	MMA WELDING	Comments
HF ignition	TIG - HF	✓		TIG welding with HF ignition
Lift-Arc ignition	TIG - Lift	✓		TIG welding with Lift-Arc ignition
Pre-Gas		✓		Time taken to purge the torch and create a gas shield before ignition.
Rising current		✓		Rising current ramp
Welding current	I	✓		Second welding current
Cold current		✓		In 4TLOG or pulsed-welding mode, the second current is called the 'cold' welding current
PULSE frequency	F (Hz)	✓	✓	The PULSED mode's pulse frequency (Hz)
Current fading		✓		Descent ramp to avoid crater cracks (S)
Post-Gas		✓		The amount of time the gas shielding is sustained after the arc is extinguished. It protects the part and the electrode against oxidation (S)
Hot Start			✓	The overcurrent is fully adjustable at the start of the welding process (%)
Arc Force			✓	An overcurrent is delivered during the welding process to prevent the electrode from sticking to the weld pool

PULSED TIG WELDING	Pulse	✓		The TIG-welding process in pulsed mode
TIG SPOT WELDING	Spot	✓		Spot-welding mode
PULSED MMA WELDING	MMA Pulse		✓	The MMA-welding process in pulsed mode
2T	2T	✓		2T torch mode
4T	4T	✓		4T torch mode
4T LOG	4TLOG	✓		4T LOG torch mode
Ampere (unit)	A	✓	✓	Amperes are used for showing the welding current settings and display
Volt (unit)	V	✓	✓	Volts are the unit used for displaying the welding voltage
Seconds or Hertz (units)	s Hz	✓	✓	Seconds or Hertz are the units of measurement for time or frequency
Percentage (unit)	%	✓	✓	Percentages are the unit used for proportional settings
Switching between an A or V display screen		✓	✓	Switching the display between current and voltage during and after the welding process
Accessing the program		✓	✓	Accessing the programming menu (SAVE, JOB, etc.)
Thermal protection		✓	✓	The standard symbol indicating the machine's level of thermal protection
Standby mode		✓	✓	Putting the product on standby

COATED-ELECTRODE WELDING (MMA-WELDING MODE)

CONNECTIONS AND ADVICE

- Connect the cables, electrode holder and earth clamp to their plug connections.
- Respect the welding polarities and currents indicated on the electrodes' packaging.
- Remove the electrode from the electrode holder when the welding machine is not in use.

CHOOSING COATED ELECTRODES

- Rutile electrodes: very easy to use in any position with a direct current.
- Basic electrodes: suitable for all welding positions with a direct current, ideal for safety work due to its increased mechanical properties.

STANDARD MMA WELDING

Standard MMA welding is suitable for most applications. All types of coated, rutile and basic electrodes can be used on any material in MMA welding including steel, stainless steel and cast iron.



STANDARD MMA WELDING

The greyed-out fields cannot be used in this mode.

Description	Settings	Description and advice
Hot Start percentage	0 - 100%	Hot Start is an ignition overcurrent that prevents the electrode from sticking to the part being welded. Its current level and operation time are both preset.

Welding current	10 - I _{max}	The welding current is adjusted according to the type of electrode being used (refer to the electrodes' packaging for more information).
Arc Force	0 - 100%	Arc Force is an overcurrent delivered when the electrode or a tack-weld comes into contact with the weld pool in order to prevent it from sticking.

PULSED MMA WELDING

Pulsed MMA welding is suitable for vertical-up (PF) welding. The pulsed feature allows the weld pool to be kept cool whilst also allowing the transfer of material. Without pulsing, vertical-up welding requires a 'Christmas tree' movement, in other words a complicated triangular movement. Thanks to pulsed MMA welding, this difficult technique is no longer necessary because, depending on the thickness of the part, a straight upward movement may be sufficient. If, however, the weld pool needs to be enlarged, this can be done with a simple, lateral movement similar to that of flat-position welding. Therefore, this process offers greater control of vertical welding operations.



PULSED MMA WELDING

The greyed-out fields cannot be used in this mode.

Description	Settings	Description and advice						
Hot Start percentage	0 - 100%	Hot Start is an ignition overcurrent that prevents the electrode from sticking to the part being welded. Its current level and operation time are both preset.						
Welding current	10 - I _{max}	The welding current is adjusted according to the type of electrode being used (refer to the electrodes' packaging for more information).						
Pulse rate	1 - 20 Hz	PULSED mode's pulse frequency (Hz) The increment step will vary depending on the frequency range: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Pulse rate</th> <th>Increment steps</th> </tr> </thead> <tbody> <tr> <td>1 - 3 Hz</td> <td>0.1 Hz</td> </tr> <tr> <td>3 - 20 Hz</td> <td>1 Hz</td> </tr> </tbody> </table>	Pulse rate	Increment steps	1 - 3 Hz	0.1 Hz	3 - 20 Hz	1 Hz
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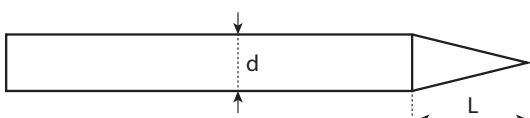
TUNGSTEN-ELECTRODE WELDING UNDER INERT GAS (TIG WELDING MODE)

CONNECTIONS AND ADVICE

- TIG DC welding requires gas shielding (argon gas).
- Connect the earth clamp to the positive plug connection (+). • Connect the torch's power cable to the negative plug connection (-), as well as the torch's control and gas connections.
- Make sure that the torch is properly fitted and that the consumables (vise grip, collar support, diffuser and nozzle) are not damaged.
- The choice of electrode will depend on the current of the DC TIG process.

SHARPENING THE ELECTRODE

For optimal use, a sharpened electrode should be used in the following way:



L = 3 x d for a low current.
 L = d for a high current.

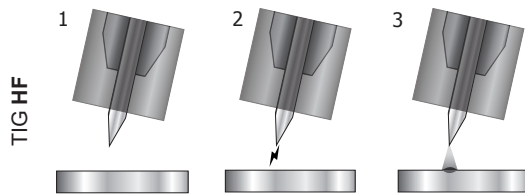
CHOOSING THE CORRECTLY SIZED ELECTRODE

□ Electrode (mm)	DC TIG WELDING	
	Pure tungsten	Tungsten with oxides
1	10 > 75	10 > 75
1.6	60 > 150	60 > 150
2	75 > 180	100 > 200
2.5	130 > 230	170 > 250
3.2	160 > 310	225 > 330
4	275 > 450	350 > 480
Approx = 80 A per mm of Ø		

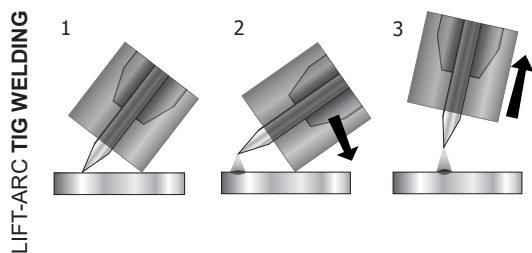
CHOOSING THE IGNITION TYPE

HF TIG: high-frequency, contactless ignition.

LIFT-ARC TIG: contact ignition (for environments sensitive to HF disturbances).



- 1- Place the torch in the correct welding position above the workpiece (maintaining a distance of about 2-3 mm between the electrode's tip and the workpiece).
- 2- Press the torch button (the arc is ignited without contact using high-voltage and high-frequency starting pulses).
- 3- The initial welding current will now begin to circulate. The welding process will continue according to the welding cycle.

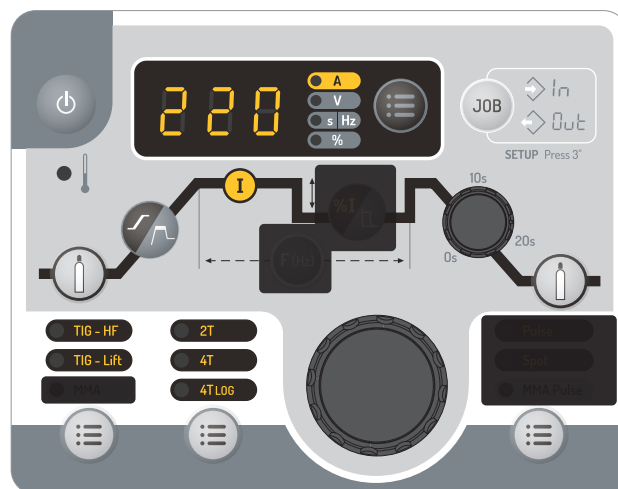


- 1- Position the torch's nozzle and the tip of the electrode on the workpiece and activate the torch button.
- 2- Tilt the torch until a gap of about 2-3 mm separates the tip of the electrode from the part being welded. The arc will ignite.
- 3- Return the torch to its normal position to start the welding cycle.

WARNING: Increasing the length of the torch or return cables beyond the maximum length indicated by the manufacturer will increase the risk of electric shocks.

STANDARD DC TIG WELDING

Standard DC TIG welding allows high-quality welding on most ferrous materials such as steel and stainless steel, but also titanium, copper and its alloys, etc. The various ways of managing both the current and gas allow users to perfectly control the welding operation, from the first ignition to the final cooling of your weld bead.



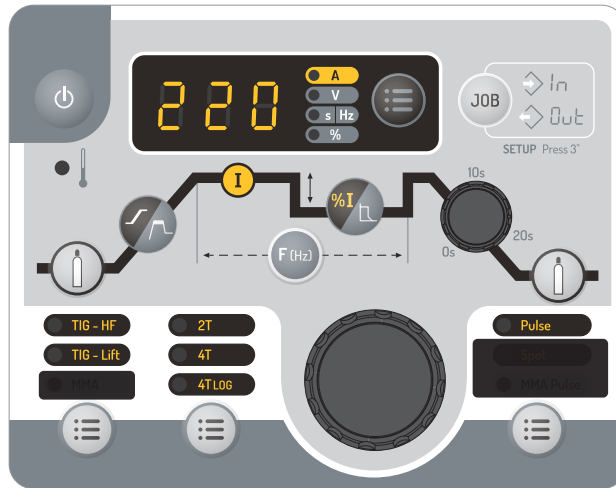
STANDARD DC TIG WELDING
The greyed-out fields cannot be used in this mode.

PULSED DC TIG WELDING

This pulsed-current welding mode alternates high-current pulses (I, welding pulse) and low-current pulses (I_Cold, a pulse that cools the workpiece). This pulsed mode makes it possible to assemble parts whilst limiting the temperature rise.

Example:

If the I (welding pulse) is set at 100 A and the % (I_Cold) is set at 50%, then the cold current = 50% of 100 A = 50 A. If the frequency (Hz) is set to 2 Hz, the signal period will be 1/2 Hz = 500 ms. This means that a 100 A welding pulse will be alternated with a 50 A cold-current pulse every 250 ms.



PULSED DC TIG WELDING

The greyed-out fields cannot be used in this mode.

Advice:

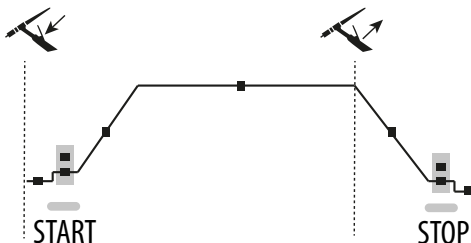
Choosing a frequency:

- If welding with manual filler metal, then F (Hz) is synchronised with the welding motion.
- If welding thin sheet metal without using filler metal (< 0.8 mm), then F (Hz) should be > 10 Hz.

Description	Settings	Description and advice
Pre-Gas	0 - 60 s	Time taken to purge the torch and create a gas shield before ignition
Current rise	0 - 60 s	Rising current ramp
Welding current	5 - I _{max}	Welding current
Cold current	20 - 99%	The second so-called 'cold' welding current
Pulse rate	0.1 - 2,000 Hz	Pulse rate
Fade out time	0 - 60 s	Descending current ramp
Post-Gas	0 - 60 s	The amount of time the gas shielding is sustained after the arc is extinguished. It protects the part, as well as the electrode, against oxidation (S).

TIG - Advanced menu

It is possible to set the welding cycle's Start and Stop stages.



One can access these advanced settings by pressing the 'JOB' button for longer than three seconds until 'SET', and then 'UP', is displayed on the screen. Once the button is released, use the central turn dial to select 'SET' in the drop-down menu. Validate this by pressing the 'JOB' button.

By scrolling the machine's turn dial, the advanced settings can be accessed in the following way:

Settings	Description	Configuration
I_Start	Current level when starting up the welding machine.	10 - 200%
T_Start	Time required for the welding start-up stage	0 - 10 s
I_Stop	Current level when welding is stopped	10 - 100%
T_Stop	Time taken to stop the welding process	0 - 10 s

The setting that you wish to adjust can be selected by pressing the 'JOB' button. Once it has been changed using the central turn dial (I), it is validated by pressing the 'JOB' button again.

The advanced menu can be exited by pressing 'ESC'.

SPOT WELDING

This welding mode allows the parts to be pre-assembled before welding. Spot welding can be done manually using the machine's trigger or timed with a predefined spot-welding timing feature. This timed spot-welding feature makes spot-welds easily reproducible and allows users to carry out unoxidised spot welding (accessible with the F (Hz) button).



TIG SPOT WELDING

The greyed-out fields cannot be used in this mode.

Description	Settings	Advice
Pre-Gas	0 - 25 s	Time taken to purge the torch and create a gas shield before ignition.
Welding current	5 - I _{max}	Welding current.
Spot welding	0 - 25 s	Manual or a preset duration.
Post-Gas	0 - 25 s	The amount of time the gas shielding is sustained after the arc is extinguished. It protects the part, as well as the electrode, against oxidation (S).

SAVING AND RECALLING WELDING CONFIGURATIONS

There are 10 stored MMA welding modes as well as another 10 for DC TIG welding. The menu can be accessed by pressing the 'JOB' button.

Saving a new configuration

Once in programme mode, select 'IN' and press the access button. Select a programme number from P1 to P10. Press the access button and the new configuration is saved.

Finding an existing configuration

Once in program mode, select 'IN' and press the access button. Select a program number from P1 to P10. Press the access button and the configuration will be recalled.

RECOMMENDED COMBINATIONS

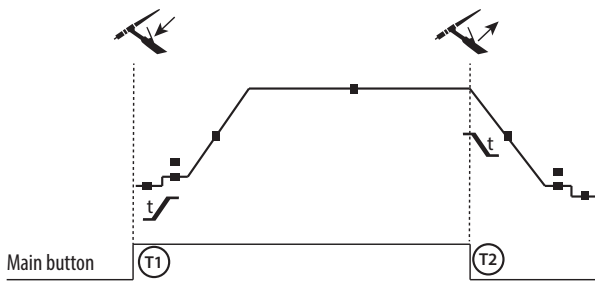
	Current (Amps)	Electrode (mm)	Nozzle (mm)	Argon flow (L/min)
0.3 - 3 mm	5 - 75	1	6.5	6 - 7
2.4 - 6 mm	60 - 150	1.6	8	6 - 7
4 - 8 mm	100 - 160	2.4	9.5	7 - 8

COMPATIBLE TORCHES AND TRIGGER ACTIONS

Trigger	Double buttons	Double buttons and a potentiometer
✓	✓	✓

For the one-button torch, the button is referred to as the 'main button'.
For the two-button torch, the first button is called the 'main button' and the second button is called the 'secondary button'.

2T MODE

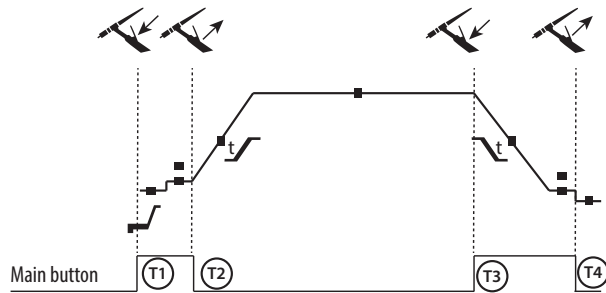


T1 - The main button is pressed, the welding cycle starts (Pre-Gas, I_Start and UpSlope, as well as the general welding mode).

T2 - The main button is released, the welding cycle is stopped (DownSlope, I_Stop and Post-Gas).

For the double-button torch in 2T mode, the secondary button works in the same way as the main button.

4T MODE



T1 - The main button is pressed, the cycle starts from the Pre-Gas stage and stops in the I_Start phase.

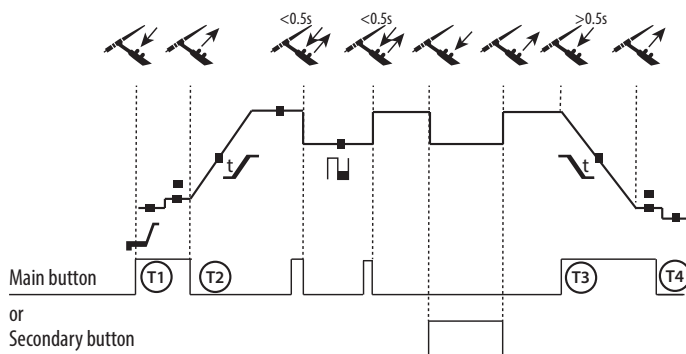
T2 - The main button is released, the cycle continues into UpSlope and then into the welding phase.

T3 - The main button is pressed, the cycle switches to DownSlope and stops in the I_Stop phase.

T4 - The main button is released, the cycle ends with Post-Gas.

For the double-button torch, the secondary button is inactive.

4T LOG MODE



T1 - The main button is pressed, the cycle starts from the Pre-Gas stage and stops in the I_Start phase.

T2 - The main button is released, the cycle continues into UpSlope and then into the welding phase.

LOG, this operating mode is used during the welding phase:

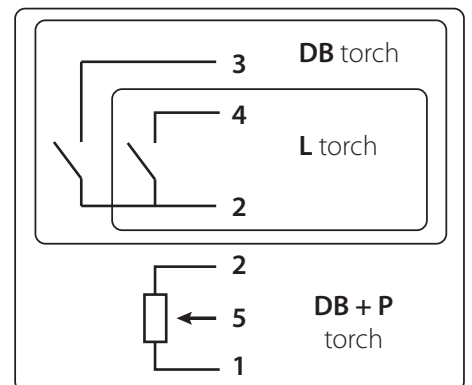
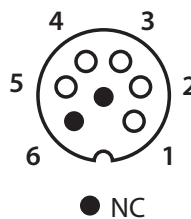
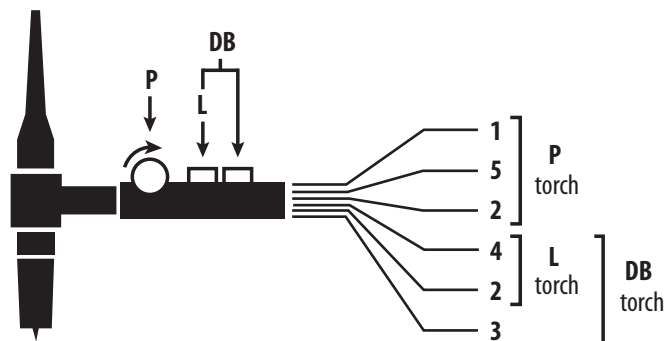
- by briefly pressing the main button ($< 0.5 s$), it switches the current from I_Welding to I_Cold and vice versa.
- when the secondary button is held down, the current switches from I_Welding to I_Cold.
- if the secondary button is not pressed, the current will switch from I_Cold to I_Welding.

T3 - Holding down the main button ($> 0.5 s$) will progress the cycle to DownSlope and then stop the cycle in the I_Stop phase.

T4 - When the main button is released, the cycle ends with Post-Gas.

For double-button torches or double-trigger torches with with a potentiometer, the 'upper' trigger does the same thing as the single trigger. The 'lower' trigger allows the user to switch over to the cold current when it is held down. The torch's potentiometer, when activated, allows the welding current to be adjusted from 50% to 100% of the displayed value.

TRIGGER-CONTROL CONNECTOR



Wiring diagrams for different types of torches.

Electrical diagrams for different types of torches.

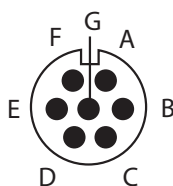
Torch types		Wire type	Associated connector pin	
Double-button torches with a potentiometer	Double-button torch	Trigger torch	Common / Earth	2
			Button 1	4
			Button 2	3
			Common / Potentiometer earthing	2
			10 V	1
			Runner	5

REMOTE CONTROL

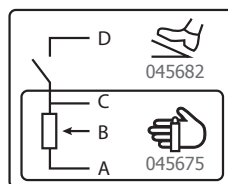
An analogue remote control will work with TIG and MMA welding processes.



PN: 045699



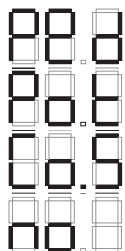
External view



Electrical diagrams for remote controls.

Connections

- 1- Connect the remote control to the welding unit's rear panel.
- 2- The HMI will detect the presence of a remote control and will offer the user a range of options that can be browsed using the turn dial.



- Choosing the correct foot pedal.
- Selecting which type of remote control to use for the potentiometer.
- Selecting CONNECT-5 mode (PLC-robot).
- The switch is present but not active.

Terminals

This product is equipped with a female remote control terminal. The purposely designed, seven-prong, male connector (optional extra, PN: 045699) allows different types of remote control to be connected. For wiring, follow the diagram below.

REMOTE CONTROL TYPE		Wire type	Associated connector pin	
CONNECT-5	Foot pedal	Manual remote control	10 V	A
			Runner	B
			Common / Earth	C
			Switch	D
			AUTO-DETECT	E
			ARC ON	F
			REG I	G

Using the remote control

- Manual remote control (optional extra, PN: 045675).**
 The manual remote control allows the current to be varied from 50% to 100% of the set intensity. In this configuration, all the welding machine's modes and features can be accessed and adjusted.
- Foot pedal (optional extra, PN: 045682).**
 The foot pedal allows the current to be altered from its minimum level to 100% of its set intensity. When TIG welding, the welding unit will only operate in 2T mode. What's more, the rise and fall of the current will no longer be controlled by the welding unit (unavailable features) but by the user via the foot pedal instead.

• Connect 5 - PLC mode (TIG 300 DC only):

This mode is used to control the TIG 300 DC from a console or a PLC thanks to its five stored, pre-recorded welding programs. Based on the foot pedal's mechanism, the 'Switch (D)' can be used to start or stop the welding process according to the selected cycle. The level of voltage applied to 'Cursor (B)' is controlled by the welding program or by the current welding settings.

This voltage must be between 0 and 10.0 V, rising in increments of 1.6 V, which matches that of a program rerun:

- Background context: 0 - 1.6 V
- Program 1: 1.7 - 3.3 V
- Program 2: 3.4 - 5.0 V
- Program 3: 5.1 - 6.6 V
- Program 4: 6.7 - 8.3 V
- Program 5: 8.4 - 10.0 V

An additional potentiometer allows the current to be varied during and after welding by +/- 15%. The ARC ON data allows the PLC to synchronise itself (100 kΩ Pull Up input on the PLC's side). Earthing the AUTO_DETECT pin allows the product to be started without going through the remote-control selection screen.

The five stored welding programs represent the first five recorded programs (from P1 to P5). Signal I / Os are protected.

Additional instructions can be downloaded from our website (<https://goo.gl/i146Ma>).

COOLING UNIT (OPTIONAL EXTRA)

PROTIG 221 DC FV		
WCU0.5kW_A	P 1L/min = 500 W Capacity = 1.5 L U1 = 185 - 265 V	The cooling unit is activated when the machine's supply-voltage range is between 185 - 265 V. The cooling unit is always active when the supply-voltage range is between 85 - 185 V.
WCU1kW_A	P 1L/min = 1,000 W Capacity: 3 L U1 = 85 - 265 V	The cooling unit is controlled across the entire voltage-supply range of 85 - 265 V.
TIG 300 DC		
WCU1kW_B	P 1L/min = 1,000 W Capacity: 3 L U1 = 400 V +/- 15%	The cooling unit is controlled across the entire voltage-supply range.

The cooling unit will be automatically detected by the product. This cooling unit can be disabled in the 'OPTION' menu. Holding down the 'JOB' button for longer than three seconds will allow access to the cooling unit's menu.



Make sure that the cooling unit is switched off before disconnecting the input tubes and the torch's liquid outlet. The coolant is harmful and irritates the eyes, mucous membranes and skin. Hot liquid can cause burns.

ERROR MESSAGES, DEFECTS, CAUSES AND SOLUTIONS

This equipment includes a failure-control system. A series of messages on the display screen will allow errors and anomalies to be diagnosed.

DEFECTS AND HMI DISPLAYS	CAUSES	SOLUTIONS
Welding power source		
' dEF ' ' 1 '	Lack of communication	Check the internal wiring between the HMI and the power board
' dEF ' ' 2 '	Defective HMI buttons	Replace the HMI device
' dEF ' ' 3 '	The torch's trigger (or triggers) is faulty	Replace the torch
' dEF ' ' 4 '	The foot pedal's switch is defective or still active	Replace the pedal or check that the switch has not been pressed down
' E r r ' ' Co.5 '	An operation fault is detected in PLC mode	Check the PLC control's wiring
' - - - '	A network surge has occurred	An overvoltage has caused this message, for example, engine-load release or lightning, etc
' P h '	The three-phase network is missing one phase	This machine requires a three-phase power supply (3P + N + Earth)

' d E '	Imbalanced welding-current source detected	Contact your distributor
SOURCE OF THE WELDING CURRENT AND COOLING UNIT		
' Pb.1 '	Cooling unit detection fault	Check the connections between the source of the welding current and the cooling unit
' Pb.2 '	Coolant level fault	Fill the cooling unit's tank
' Pb.3 '	Coolant flow fault	Check the torch's coolant circuit for leaks

WARRANTY CONDITIONS

The warranty covers any manufacturing defects or general faults for two years from the date of purchase (parts and labour).

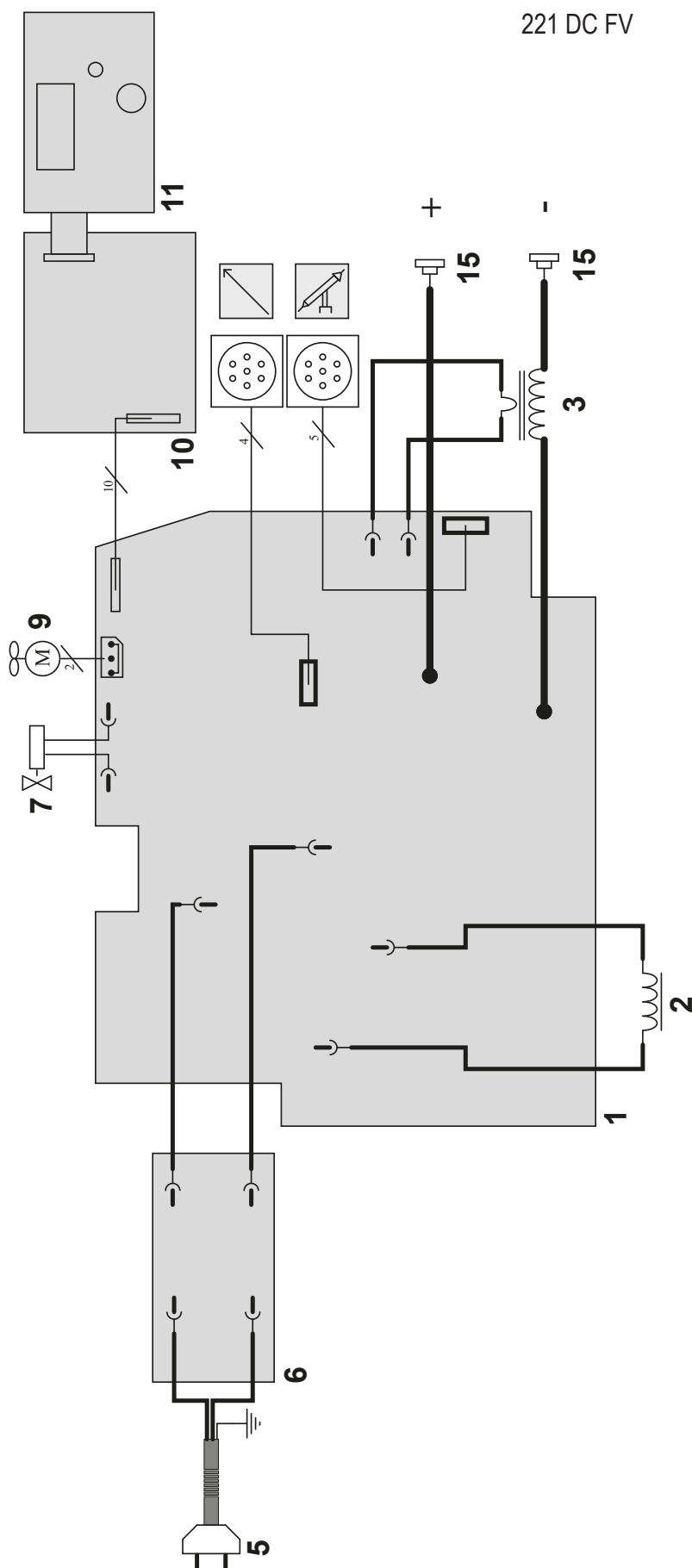
The warranty does not cover:

- Any transportation damage.
- The usual wear and tear of component parts (e.g. cables and clamps, etc.).
- Incidents due to improper use (power-supply errors, falls or dismantling the machine, etc.).
- Environmentally related faults (pollution, rust or dust, etc.).

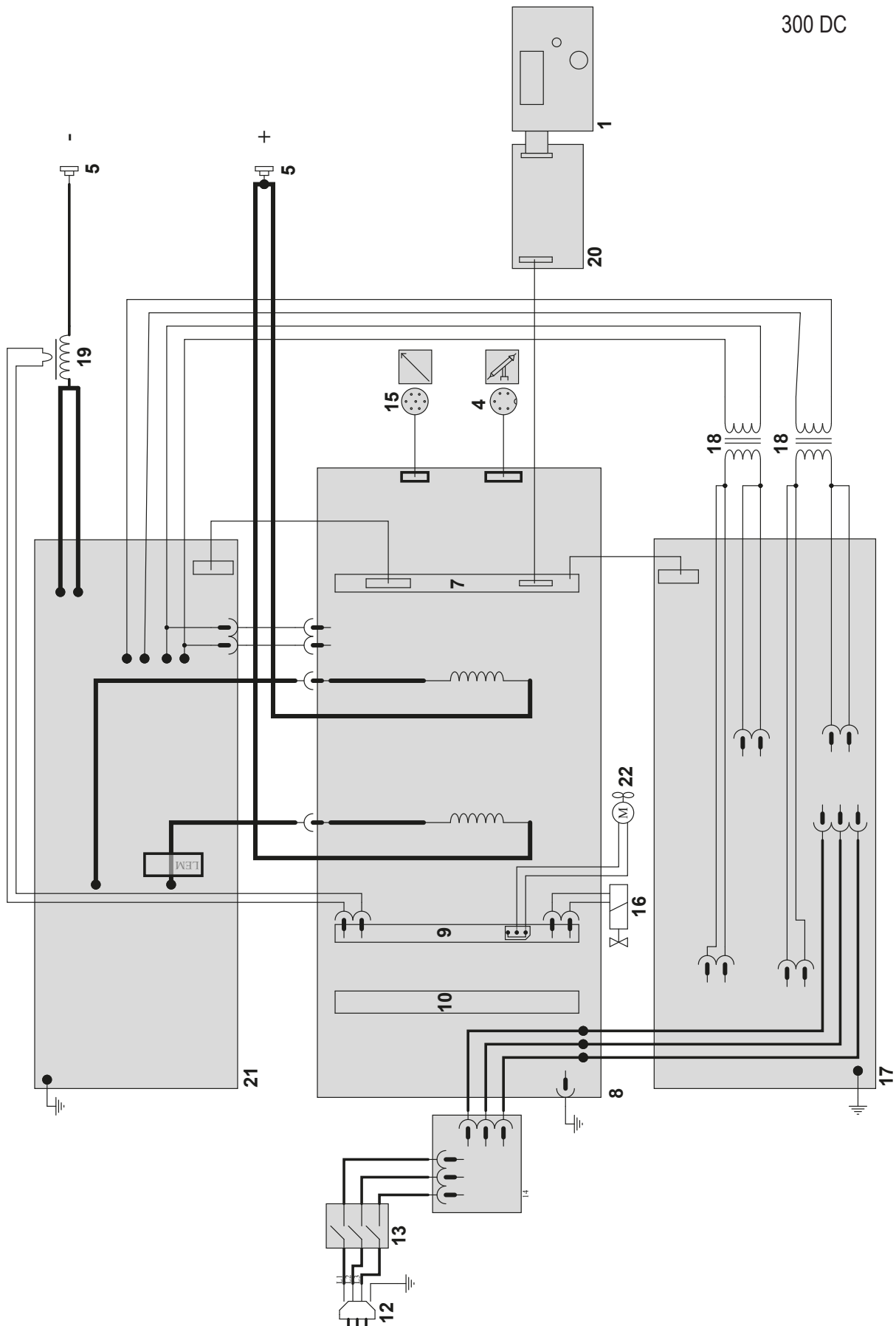
In the event of a fault, return the device to your distributor enclosing:

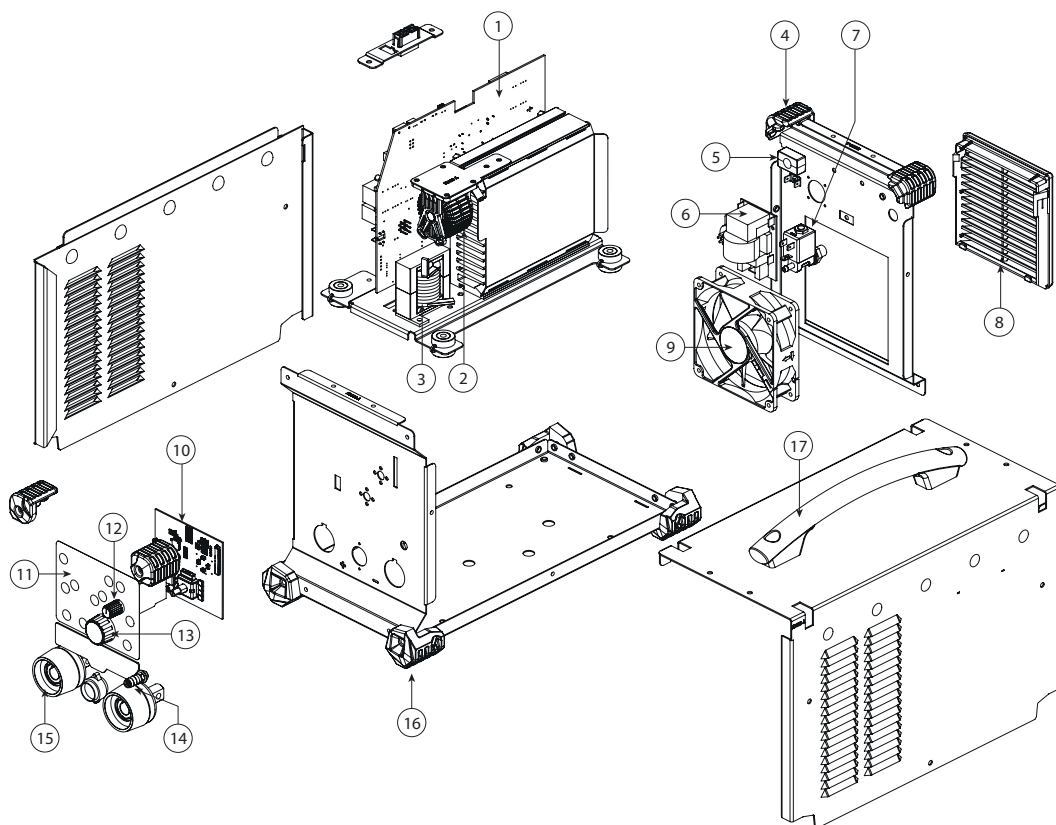
- dated proof of purchase (receipt or invoice, etc.).
- a note explaining the breakdown.

CIRCUIT DIAGRAM / SCHALTPLAN / DIAGRAMA ELECTRICO / ЭЛЕКТРИЧЕСКАЯ СХЕМА / ELEKTRISCHE SCHEMA / SCHEMA ELETTRICO / SCHEMATY ELEKTRYCZNE



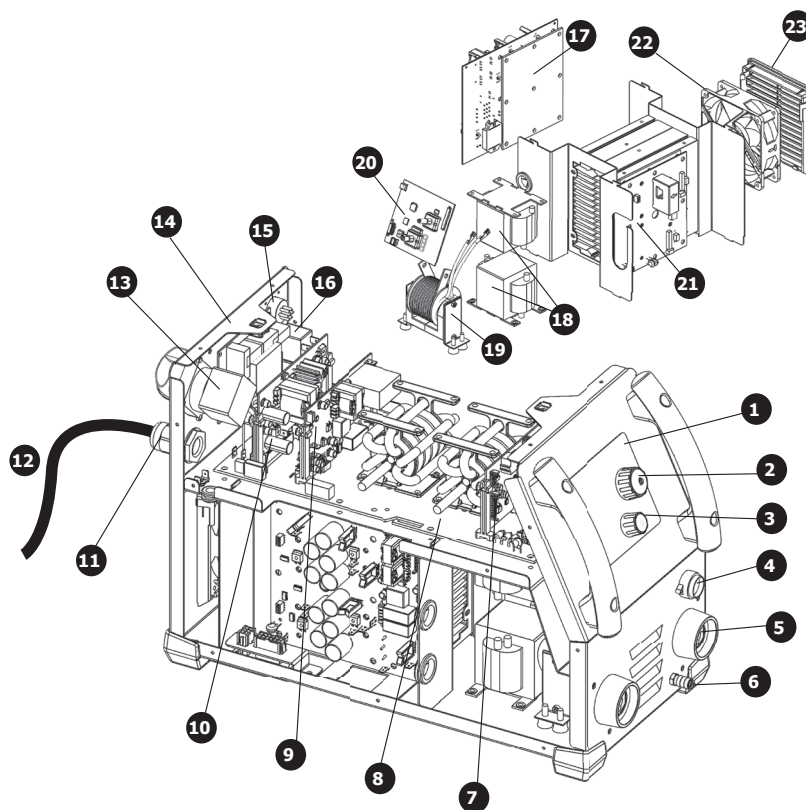
CIRCUIT DIAGRAM / SCHALTPLAN / DIAGRAMA ELECTRICO / ЭЛЕКТРИЧЕСКАЯ СХЕМА / ELEKTRISCHE SCHEMA / SCHEMA ELETTRICO / SCHEMATY ELEKTRYCZNE



**SPARE PARTS / ERSATZTEILE / PIEZAS DE REPUESTO / ЗАПАСНЫЕ ЧАСТИ / RESERVE
ONDERDELEN / PEZZI DI RICAMBIO / CZĘŚCI ZAMIENNE**
PROTIG 221 DC FV


1	Circuit principale / Main circuit / Основная плата / Hoofdcircuit / Circuito principale / Obwód główny	E0118C
2	Self PFC / PFC Choke / Дроссель PFC / Inductie PFC / Self PFC / Self PFC	63691
3	Transformateur HF / HF transformer / Трансформатор ВЧ / Transformator HF / Trasformatore HF / Transformator HF (High Frequency)	96130
4	Patin haut / Upper runner / Верхний накладка / Blokje boven / Pattino alto / Wysoka stopka	56163
5	Cordon secteur / Power cable / Сетевой шнур / Elektrisch netsnoer / Cavo corrente / Główny kabel	21464
6	Circuit CEM / EMC circuit / Плата CEM / EMC Circuit / Scheda CEM / Obwód EMC	63950IND5
7	Electrovanne / Solenoid valve / Электроклапан / Magneetventiel / Elettrovalvola / Zawór elektromagnetyczny	71542
8	Grille / Grid / Решетка / Afrastering / Griglia / Kratka	51010
9	Ventilateur / Fan / Вентилятор / Ventilator / Ventilatore / Wentylator	51021
10	Circuit IHM / HMI circuit / Плата IHM / IHM circuit / Circuito IHM (interfaccia) / Obwód HMI (Interfejs człowiek-maszyna)	97377C
11	Clavier / Keypad / Панель управления / Bedieningspaneel / Tastiera / Klawiatura	51965IND1
12	Bouton Ø15 / Ø 15 mm button / Кнопка Ø15 / Кноп Ø15 / Pulsante Ø15 / Przycisk Ø15	73011
13	Bouton Ø28 / Ø 28 mm button / Кнопка Ø28 / Кноп Ø28 / Pulsante Ø28 / Przycisk Ø28	73016
14	Coupleur mâle / Male coupler / Муфта папа / Mannelijke aansluiting / Commutatore maschio / Łącznik męski	55090
15	Embase texas / Texas baseplate / Разъем Texas / Texas aansluiting / Colletto Texas / Złącze Texas	51528
16	Patin bas / Lower runner / Нижняя накладка / Blokje beneden / Pattino basso / Niska stopka	56120
17	Poignée / Handle / Ручка / Handvat / Impugnatura / Uchwyt	56048

TIG 300 DC



1	Clavier TIG / TIG keypad / TIG-bedienfeld / Teclado TIG / Панель управления TIG / Tastiera TIG / Klawiatura TIG	51965INDX
2	Bouton noir 15 mm / Black button 15 mm / schwarzer Druckknopf 15 mm / Botón negro 15 mm / Черная кнопка 15мм / Pulsante nero 15 mm	73011
3	Bouton noir 28 mm / Black button 28 mm / schwarzer Druckknopf 28 mm / Botón negro 28 mm / Черная кнопка 28мм / Pulsante nero 28 mm	73016
4	Connecteur torche / Torch connector / Brenneranschluss / Conector antorcha / Коннектор горелки / Connettore torcia / Złącze palnika	71873
5	Douille mâle Texas 50 / Male socket Texas 50 / Buchse Texasstecker 50 / Conector macho Texas 50 / Гнездо «папа» Texas 50 / Connettore maschio Texas 50 / Gniazdo męskie Texas 50	51461
6	Coupleur gaz BSP20 / Gas coupler BSP20 / Gasanschluss BSP20 / Acople gas BSP20 / Соединитель для газа BSP20 / Accoppiatore gas BSP20	55090
7	Circuit microcontrôleur / Microcontroller circuit / Mikrokontrolplatine / Circuito microcontrolador / Плата микроконтроллера / Micro di controllo	97424C
8	Circuit principal / Main circuit / Hauptplatine / Circuito principal / Основная плата / Circuito principale / Obwód główny	97374C
9	Circuit HF / HF circuit/ HF-Platine / Circuito HF / ВЧ плата / Circuito HF / Obwód HF	97411C
10	Circuit alimentation auxiliaire / Auxilliary power supply circuit / Hilfspeisekreis / Circuito alimentación auxiliar / Вспомогательная плата питания / Circuito alimentazione ausiliaria / Układ zasilania pomocniczego	97227C
11	Presse étoupe PG16 / Cable gland PG16 / Stopfbuchsraum PG16 / Prensaestopas PG16 / Сальник PG16 / Pressacavo PG16 / Dławnica kablowa PG16	71148
12	Cordon secteur 3P + Terre 1.5 mm ² / Power supply cable 3P + Earth 1.5 mm ² / Versorgungskabel 3p + Leiter 1,5mm ² / Cable de red eléctrica 3P + Terre 1.5 mm ² / Сетевой шнур 3 фазы + Земля 1.5мм ² / Cordone presa 3P + Terra 1.5 mm ² / Przewód sektor 3P + Uziemienie 1,5 mm ²	21485
13	Commutateur 2P tri / Tri Switch 2P tri / Schalter 2P TRI / Conmutador 2P tri / Переключатель 2 фазы трехфазный / Commutatore 2P tri	95501
14	Circuit CEM / CEM circuit / EMV-Platine / Tarjeta CEM / Плата CEM / Circuito CEM / Obwód EMC	63959
15	Faisceau connectique commande à distance / Remote control cable connector / Fernregleranschluss / Conector cableado de control a distancia / Подключение дистанционного управления / Fascio connessioni comando a distanza / Wiązka złączy zdalnego sterowania	71483
16	Electrovanne 2 voies 24V / 2 way solenoid valve 24V / Magnetventil 2 Wege 24V / Electroválvula 2 vías 24V / Двойной электромагнитный клапан 24В / Solenoide 2 vie 24V / 2-drożny zawór elektromagnetyczny 24V	71542
17	Circuit primaire / Primary circuit / Primärplatine / Circuito primario / Первичная плата / Circuito primario / Obwód pierwotny	97389C
18	Transformateur de puissance / Power transformer / Trafo / Transformador de potencia / Трансформатор мощности / Trasformatore di potenza	64671
19	Transformateur HF / HF transformer / HF-Trafo / Transformador HF / Trasformatore HF / Transformator HF	63698
20	Circuit IHM / HMI circuit / IHM-Platine / Tarjeta Interfaz / Плата IHM / Circuito IHM / Obwód HMI (Interfejs człowiek-maszyna)	97377C
21	Circuit secondaire / Secondary circuit / Sekundärplatine / Circuito secundario / Вторичная плата / Circuito secundario / Obieg wtórny	97376C
22	Ventilateur 24V / 24V fan / Lüfter 24V / Ventilador 24V / Вентилятор 24В / Ventilatore 24V / Wentylator 24V	51290
23	Grille de protection / Protection grill / Schutzgitter / Rejilla de protección / Защитная решетка / Griglia di protezione / Siatka ochronna	51010
24	Self PFC	-


**TECHNICAL SPECIFICATIONS / TECHNISCHE DATEN / ESPECIFICACIONES TÉCNICAS /
ТЕХНИЧЕСКИЕ СПЕЦИФИКАЦИИ / TECHNISCHE GEGEVENS / SPECIFICHE TECNICHE**


		PROTIG 221 DC FV			
Primaire / Primary / Primär / Primario / Первичка / Primaire / Primario					
Tension d'alimentation / Power supply voltage / Versorgungsspannung / Tensión de red eléctrica / Напряжение питания / Voedingsspanning / Tensione di alimentazione	U1	230 V +/- 15%		110 V +/- 15%	
Fréquence secteur / Mains frequency / Netzfrequenz / Frecuencia / Частота сети / Frequentie sector / Frequenza settore		50 / 60 Hz			
Nombre de phases / Number of phases / Anzahl der Phasen / Número de fases / Количество фаз / Aantal fasen / Numero di fasi		1			
Fusible disjoncteur / Fuse / Sicherung / Fusible disyuntor / Плавкий предохранитель прерывателя / Zekering hoofdschakelaar / Fusibile disgiuntore		16 A	32 A		
Courant d'alimentation effectif maximal I1eff / Maximum effective supply current I1eff / Maximaler effektiver Einspeisestrom I1eff / Corriente de alimentación efectiva máxima I1eff / Максимальный эффективный ток питания I1eff / Maximale effectieve voedingsstroom I1eff / Corrente di alimentazione effettiva massima I1eff		14.5 A	22 A		
Courant d'alimentation maximal I1max / Maximum supply current I1max / Maximaler Netzstrom I1max / Corriente de alimentación máxima I1max / Максимальный ток питания I1max / Maximale voedingsstroom I1max / Corrente di alimentazione massima I1max		29 A	43.5 A		
Section du cordon secteur / Mains cord section / Querschnitt des Netzkabels / Sección del cable de alimentación / Сечение сетевого шнура / Sectie netsnoer / Sezione del cavo di alimentazione		3 x 2.5 mm ²			
Puissance active maximale consommée / Maximum active power consumed / Maximale verbrauchte Wirkleistung / Consumo máximo de energía activa / Максимальная активная потребляемая мощность / Maximale actieve verbruikte vermogen / Potenza attiva massima consumata		6644 W			
Consumption au ralenti / Idle consumption / Verbrauch im Leerlauf / Consumo en ralentizado / Потребление на холостом ходу / Stationair verbruik / Consumo al minimo		9,56 W			
Rendement à I2max / Efficiency at I2max / Wirkungsgrad bei I2max / Eficiencia a I2máx / Эффективность при I2max / Rendement bij I2max / Efficienza a I2max		85 %			
Facteur de puissance à I2max (λ) / Power factor at I2max (λ) / Leistungsfaktor bei I2max (λ) / Factor de potencia a I2max (λ) / Коэффициент мощности при I2max (λ) / Inschakelduur bij I2max (λ) / Ciclo di poyenza a I2max (λ)		0.99			
Classe CEM / EMC classification / EMV-Klasse / Classe CEM / Класс ЭМС / Klasse CEM / Classe CEM		A			
Secondaire / Secondary / Sekundär / Secundario / Вторичка / Secondair / Secundario		TIG (GTAW)	MMA (SMAW)	TIG (GTAW)	MMA (SMAW)
Tension à vide / No load voltage / Leerlaufspannung / Tensión al vacío / Напряжение холостого хода / Nul-lastspanning / Tensione a vuoto	U0	78 V		69 V	
Tension crête du dispositif d'amorçage manuel (EN60974-3) / Manual striking system's maximum voltage (EN60974-3) / Spitzenspannung des manuellen Startgerätes (EN60974-3) / Tensión pico del dispositivo de cebado manual (EN60974-3) / Пиковое напряжение механизма ручного поджига (EN60974-3) / Piekspanning van het handmatige startstelsysteem (EN60974-3) / Tensione di picco del dispositivo di innesco manuale (EN60974-3)	Up	9 kV			
Nature du courant de soudage / Type of welding current / Art des Schweißstroms / Tipo de corriente de soldadura / Характеристика сварочного тока / Lasroom / Natura della corrente di saldatura		DC			
Mode(s) de soudage / Welding mode(s) / Schweißmodus(e) / Modos de soldadura / Режим сварки / Lasmodule(s) / Modalità di saldatura		MMA, TIG			
Courant de soudage minimal / Minimum welding current / Minimaler Schweißstrom / Corriente mínima de soldadura / Минимальный сварочный ток / Minimale lasroom / Corrente minima di saldatura		5 A			
Courant de sortie nominal / Rate current output / nominaler Arbeitsstrom / Corriente de salida nominal / Номинальный выходной ток / Nominale uitgangsstroom / Corrente di uscita nominale	I2	5 → 220 A	10 → 200 A	5 → 180 A	10 → 140 A
Tension de sortie conventionnelle / Conventional voltage output / entsprechende Arbeitsspannung / Условные выходные напряжения / Tensión de salida convencional / Conventionele uitgangsspanning / Tensione di uscita convenzionale	U2	10.2 V → 18.8 V	20.4 V → 28 V	10.2 V → 17.2 V	20.4 V → 25.6 V
* Facteur de marche à 40°C (10 min), Norme EN60974-1 / Duty cycle at 40°C (10 min), Standard EN60974-1. / Einschaltdauer @ 40°C (10 min), EN60974-1-Norm / Ciclo de trabajo a 40°C (10 min), Norma EN60974-1 / ПВ% при 40°C (10 мин), Норма EN60974-1. / Inschakelduur bij 40°C (10 min), Norm EN60974-1, Ciclo di lavoro a 40°C (10 min), Norma EN60974-1.	Imax	35 %	25 %	25 %	19 %
	60%	165 A	135 A	125 A	110 A
	100%	150 A	120 A	110 A	90 A
Température de fonctionnement / Functioning temperature / Betriebstemperatur / Temperatura de funcionamiento / Рабочая температура / Gebruikstemperatuur / Temperatura di funzionamento		-10°C → +40°C (+14°F → 104°F)			
Température de stockage / Storage temperature / Lagertemperatur / Temperatura de almacenaje / Температура хранения / Bewaartemperatuur / Temperatura di stoccaggio		-20°C → +55°C (-4°F → 131°F)			
Degré de protection / Protection level / Schutzart / Grado de protección / Степень защиты / Beschermingsklasse / Grado di protezione		IP21			
Classe d'isolation minimale des enroulements / Minimum coil insulation class / Minimale Isolationsklasse der Wicklungen / Clase mínima de aislamiento del bobinado / Минимальный класс изоляции обмотки / Minimale isolatieklasse omwikkelingen / Classe minima di isolamento degli avvolgimenti		B			

Dimensions (Lxlxh) / Dimensions (LxWxH) / Abmessungen (Lxbxt) / Dimensiones (Lxlxh) / Размеры (ДхШхВ) / Afmetingen (Lxlxh) / Dimensioni (Lxlxh)	23 x 42.5 x 29.5 cm
Poids / Weight / Gewicht / Bec / Peso / Gewicht / Peso	11 kg


TECHNICAL SPECIFICATIONS / TECHNISCHE DATEN / ESPECIFICACIONES TÉCNICAS / ТЕХНИЧЕСКИЕ СПЕЦИФИКАЦИИ / TECHNISCHE GEGEVENS / SPECIFICHE TECNICHE


		TIG 300 DC	
Primaire / Primary / Primär / Primario / Первичка / Primaire / Primario			
Tension d'alimentation / Power supply voltage / Versorgungsspannung / Tensión de red eléctrica / Напряжение питания / Voedingsspanning / Tensione di alimentazione	U1	400 V +/- 15%	
Fréquence secteur / Mains frequency / Netzfrequenz / Frecuencia / Частота сети / Frequentie sector / Frequenza settore		50 / 60 Hz	
Fusible disjoncteur / Fuse / Sicherung / Fusible disyuntor / Плавкий предохранитель прерывателя / Zekering hoofdschakelaar / Fusibile disgiuntore		16 A	
Secondaire / Secondary / Sekundär / Secundario / Вторичка / Secondair / Secundario		TIG (GTAW)	MMA (SMAW)
Tension à vide / No load voltage / Leerlaufspannung / Tensión al vacío / Напряжение холостого хода / Nullastspanning / Tensione a vuoto	U0	70 V	
Tension crête du dispositif d'amorçage manuel (EN60974-3) / Manual striking system's maximum voltage (EN60974-3) / Spitzenspannung des manuellen Startgerätes (EN60974-3) / Tensión pico del dispositivo de cebado manual (EN60974-3) / Пиковое напряжение механизма ручного поджига (EN60974-3) / Piekspanning van het handmatige startsysteem (EN60974-3) / Tensione di picco del dispositivo di innesco manuale (EN60974-3)	Up	9 kV	
Courant de sortie nominal / Rate current output / nominaler Arbeitsstrom / Corriente de salida nominal / Номинальный выходной ток / Nominale uitgangsstroom / Corrente di uscita nominale	I2	5 → 300 A	10 → 250 A
Tension de sortie conventionnelle / Conventional voltage output / entsprechende Arbeitsspannung / Условное выходные напряжения / Tensión de salida convencional / Conventionele uitgangsspanning / Tensione di uscita convenzionale	U2	10.2 V → 22 V	20.4 V → 30 V
* Facteur de marche à 40°C (10 min), Norme EN60974-1 / Duty cycle at 40°C (10 min), Standard EN60974-1. * Einschaltdauer @ 40°C (10 min), EN60974-1-Norm / Ciclo de trabajo a 40°C (10 min), Norma EN60974-1 / ПВ% при 40°C (10 мин), Норма EN60974-1. / Inschakelduur bij 40°C (10 min), Norm EN60974-1, Ciclo di lavoro a 40°C (10 min), Norma EN60974-1.	Imax	35 %	30 %
	60%	255 A	220 A
	100%	240 A	210 A
Consumption à vide / Idle mode consumption / Leerlaufleistung / Consumo en vacío / Потребление при холостом ходе / Verbruik apparaat in stand-by / Consumo a vuoto		7.90 W	
Rendement / Efficiency / Maximalleistung / Rendimiento / Производительность / Rendement / Rendimento	Imax	84 %	
Température de fonctionnement / Functioning temperature / Betriebstemperatur / Temperatura de funcionamiento / Рабочая температура / Gebruikstemperatuur / Temperatura di funzionamento			
		-10°C → +40°C (+14°F → 104°F)	
Température de stockage / Storage temperature / Lagertemperatur / Temperatura de almacenaje / Температура хранения / Bewaarstemperatuur / Temperatura di stoccaggio			
		-25°C → +55°C (-4°F → 131°F)	
Degré de protection / Protection level / Schutzart / Grado de protección / Степень защиты / Beschermingsklasse / Grado di protezione			
		IP23	
Dimensions (Lxlxh) / Dimensions (LxWxH) / Abmessungen (Lxbxt) / Dimensiones (Lxlxh) / Размеры (ДхШхВ) / Afmetingen (Lxlxh) / Dimensioni (Lxlxh)			
		40 x 52 x 25 cm	
Poids / Weight / Gewicht / Bec / Peso / Gewicht / Peso			
		20 kg	

*Les facteurs de marche sont réalisés selon la norme EN60974-1 à 40°C et sur un cycle de 10 min.
Lors d'utilisation intensive (supérieur au facteur de marche) la protection thermique peut s'enclencher, dans ce cas, l'arc s'éteint et le témoin  s'allume.
Laissez l'appareil alimenté pour permettre son refroidissement jusqu'à annulation de la protection.
La source de courant de soudage décrit une caractéristique de sortie de type tombante.


*The duty cycles are measured according to standard EN60974-1 at 40°C and on a 10 min cycle.
While under intensive use (> to duty cycle) the thermal protection can turn on, in that case, the arc switches off and the indicator  switches on.
Keep the machine's power supply on to enable cooling until thermal protection cancellation.
The welding power source describes an external drooping characteristic.

* Einschaltdauer gemäß EN60974-1 (10 Minuten - 40°C).
Bei sehr intensivem Gebrauch (>Einschaltdauer) kann der Thermoschutz ausgelöst werden. In diesem Fall wird der Lichtbogen abgeschaltet und die entsprechende Warnung  erscheint auf der Anzeige.
Das Gerät zum Abkühlen nicht ausschalten und laufen lassen bis das Gerät wieder bereit ist.
Das Gerät entspricht in seiner Charakteristik einer Spannungsquelle mit fallender Kennlinie.

*Los ciclos de trabajo están realizados en acuerdo con la norma EN60974-1 a 40°C y sobre un ciclo de diez minutos.
Durante un uso intensivo (superior al ciclo de trabajo), se puede activar la protección térmica. En este caso, el arco se apaga y el indicador  se enciende.
Deje el aparato conectado para permitir que se enfríe hasta que se anule la protección.
La fuente de corriente de soldadura posee una salida de tipo corriente constante.













*ПВ% указаны по норме EN60974-1 при 40°C и для 10-минутного цикла.
При интенсивном использовании (> ПВ%) может включиться тепловая защита. В этом случае дуга погаснет и загорится индикатор .
Оставьте аппарат подключенным к питанию, чтобы он остыл до полной отмены защиты.
Аппарат описывает падающую характеристику на выходе.

*De inschakelduur is gemeten volgens de norm EN60974-1 bij een temperatuur van 40°C en bij een cyclus van 10 minuten.
Bij intensief gebruik (superieur aan de inschakelduur) kan de thermische beveiliging zich in werking stellen. In dat geval gaat de boog uit en gaat het beveiligingslampje  gaat branden.
Laat het apparaat aan de netspanning staan om het te laten afkoelen, totdat de beveiliging afslaat.
Het apparaat heeft een uitgaande dalende eigenschap.

*I cicli di lavoro sono realizzati secondo la norma EN60974-1 a 40°C e su un ciclo di 10 min.
Durante l'uso intensivo (> al ciclo di lavoro) la protezione termica può attivarsi, in questo caso, l'arco si spegne e la spia  si illumina.
Lasciate il dispositivo collegato per permetterle il raffreddamento fino all'annullamento della protezione.
La fonte di corrente di saldatura presenta una caratteristica di uscita spiovente.

SYMBOLS / ZEICHENERKLÄRUNG / ICONOS / СИМВОЛЫ / PICTOGRAMMEN / ICONE / ÍCONES / IKONY / IKONER / IKONER / IKONER / KUVAKKEET / IKONOK / VYSVĚTLENÍ SYMBOLŮ / アイコン / 图示 / ΕΙΚΟΝΙΔΙΑ / ICOANE

	FR Attention ! Lire le manuel d'instruction avant utilisation. EN Warning ! Read the user manual before use. DE ACHTUNG ! Lesen Sie diese Anleitung sorgfältig durch vor Inbetriebnahme des Geräts. ES ¡Atención! Lea el manual de instrucciones antes de su uso. RU Внимание! Прочтите инструкцию перед использованием. NL Let op! Lees aandachtig de handleiding. IT Attenzione! Leggere il manuale d'istruzioni prima dell'uso. PL Uwaga! Przed użyciem należy uważnie przeczytać instrukcję obsługi.
	FR Symbole de la notice EN User manual symbol DE Symbole in der Bedienungsanleitung ES Símbolo del manual RU Символы, использующиеся в инструкции NL Symbool handleiding IT Simbolo del manuale. PL Symbol instrukcji
	FR Source de courant de technologie onduleur délivrant un courant continu. EN Undulating current technology based source delivering direct current. DE Invertergleichstromquelle. ES Fuente de corriente de tecnología ondulador que libera corriente continua. RU Источник тока с технологией преобразователя, выдающий постоянный ток. NL Stroombron met UPS technologie, levert gelijkstroom. IT Fonte di corrente con tecnologia inverter che rilascia una corrente continua. PL Źródło prądu technologii falownika dostarczającego prąd stały.
	FR Source de courant de technologie onduleur délivrant un courant continu. EN Undulating current technology based source delivering direct current. DE Invertergleichstromquelle. ES Fuente de corriente de tecnología ondulador que libera corriente continua. RU Источник тока с технологией преобразователя, выдающий постоянный ток. NL Stroombron met UPS technologie, levert gelijkstroom. IT Fonte di corrente con tecnologia inverter che rilascia una corrente continua. PL Źródło prądu technologii falownika dostarczającego prąd stały.
	FR Soudage à l'électrode enrobée - MMA (Manual Metal Arc) EN MMA welding (Manual Metal Arc) DE Schweißen mit umhüllter Elektrode (E-Handschweißen) ES Soldadura con electrodo revestido (MMA - Manual Metal Arc) RU Сварка электродом с обмазкой: MMA (Manual Metal Arc) NL Lassen met beklede elektrode - MMA (Manual Metal Arc) IT Saldatura all'elettrodo rivestito - MMA (Manual Metal Arc). PL Spawanie elektrodami otulonymi (MMA - Manual Metal Arc)
	FR Soudage TIG (Tungsten Inert Gaz) EN TIG welding (Tungsten Inert Gas) DE TIG- (WIG-)Schweißen (Tungsten (Wolfram) Inert Gas) ES Soldadura TIG (Tungsten Inert Gaz) RU Сварка TIG (Tungsten Inert Gaz) NL TIG lassen (Tungsten Inert Gaz) IT Saldatura TIG (Tungsten Inert Gaz). PL Spawanie TIG (Wolfram Gazu Obojętnego)
	FR Convient au soudage dans un environnement avec risque accru de choc électrique. La source de courant elle-même ne doit toutefois pas être placée dans de tels locaux. EN Suitable for welding in an environment with an increased risk of electric shock. However this a machine should not be placed in such an environment. DE Geeignet für Schweißarbeiten im Bereich mit erhöhten elektrischen Risiken. ES Adaptado para soldadura en lugar con riesgo de choque eléctrico. Sin embargo, la fuente eléctrica no debe estar presente en dichos lugares. RU Подходит для сварки в среде с повышенным риском удара током. В этом случае источник тока не должен находиться в том же самом помещении. NL Geschikt voor het lassen in een ruimte met verhoogd risico op elektrische schokken. De voedingsbron zelf moet echter niet in dergelijke ruimte worden geplaatst. IT Conviene alla saldatura in un ambiente a grande rischio di scosse elettriche. L'origine della corrente non deve essere localizzata in tale posto. PL Nadaje się do spawania w środowisku o zwiększonym ryzyku porażenia prądem. Samo źródło prądu nie może jednak być umieszczone w tego typu pomieszczeniach.
	FR Courant de soudage continu EN Direct welding current DE Gleichschweißstrom ES Corriente de soldadura continua. RU Постоянный сварочный ток NL Gelijkstroom IT Corrente di saldatura continuo PL Stały prąd spawania
U0	FR Tension assignée à vide EN Open circuit voltage DE Leerlaufspannung ES Tensión asignada en vacío RU Номинальное напряжение холостого хода NL Nulllastspanning IT Tensione nominale a vuoto PL Znamionowe napięcie próżniowe
X(40°C)	FR Facteur de marche selon la norme EN60974-1 (10 minutes – 40°C). EN Duty cycle according to standard EN 60974-1 (10 minutes – 40°C). DE Einschaltdauer: 10 min - 40°C, richtlinienkonform EN60974-1. ES Ciclo de trabajo según la norma EN60974-1 (10 minutos – 40°C). RU ПВ% согласно норме EN 60974-1 (10 минут – 40°C). NL Inschakelduur volgens de norm EN60974-1 (10 minuten – 40°C). IT Ciclo di lavoro conforme alla norma EN60974-1 (10 minuti – 40°C). PL Cykl pracy zgodnie z normą EN60974-1 (10 minut - 40 ° C).
I2	FR Courant de soudage conventionnel correspondant EN Corresponding conventional welding current DE Entsprechender Schweißstrom ES Corriente de soldadura convencional correspondiente. RU Соответствующий номинальный сварочный ток NL Corresponderende conventionele lasstroom IT Corrente di saldatura convenzionale. PL Odpowiedni prąd spawania konwencjonalnego.
A	FR Ampères EN Amperes DE Ampere ES Amperios RU Амперы NL Ampère IT Amper PL Ampery
U2	FR Tensions conventionnelles en charges correspondantes EN Conventional voltage in corresponding loads. DE Entsprechende Arbeitsspannung ES Tensiones convencionales en cargas correspondientes. RU Номинальные напряжения при соответствующих нагрузках. NL Conventionele spanning in corresponderende belasting IT Tensioni convenzionali in cariche corrispondenti PL Napięcie konwencjonalne do odpowiednich kosztów
V	FR Volt EN Volt DE Volt ES Voltio RU Вольт NL Volt IT Volt PL Wolt
Hz	FR Hertz EN Hertz DE Hertz ES Hercios RU Герц NL Hertz IT Hertz PL Herc
	FR Alimentation électrique monophasée 50 ou 60Hz EN Single phase power supply 50 or 60 Hz DE Einphasige Netzversorgung mit 50 oder 60Hz ES Alimentación eléctrica monofásica 50 o 60Hz RU Однофазное электропитание 50 или 60Гц NL Enkelfase elektrische voeding 50Hz of 60Hz. IT Alimentazione elettrica monofase 50 o 60Hz. PL Zasilanie jednofazowe 50 lub 60Hz
	FR Alimentation électrique triphasée 50 ou 60Hz. EN Three-phase power supply 50 or 60Hz. DE Dreiphasige Netzversorgung mit 50 oder 60 Hz ES Alimentación trifásica de 50 o 60 Hz. RU Трёхфазное электропитание 50 или 60Гц. NL Driefasen elektrische voeding 50Hz of 60Hz. IT Alimentazione elettrica trifase 50 o 60Hz PL Trójfazowe zasilanie elektryczne 50 lub 60Hz
U1	FR Tension assignée d'alimentation EN Assigned voltage DE Netzspannung ES Tensión asignada de alimentación eléctrica. RU Номинальное напряжение питания NL Nominale voedingspanning IT Tensione nominale d'alimentazione PL Napięcie znamionowe zasilania
I1max	FR Courant d'alimentation assigné maximal (valeur efficace) EN Maximum rated power supply current (effective value). DE Maximaler Versorgungsstrom ES Corriente de alimentación eléctrica asignada máxima (valor eficaz). RU Максимальный сетевой ток (эффективное значение) NL Maximale nominale voedingsstroom (effectieve waarde) IT Corrente d'alimentazione nominale massima (valore effettivo) PL Maksymalny prąd znamionowy zasilania (wartość skuteczna)
I1eff	FR Courant d'alimentation effectif maximal EN Maximum effective power supply current. DE Maximaler effektiver Versorgungsstrom ES Corriente de alimentación eléctrica máxima. RU Максимальный эффективный сетевой ток NL Maximale effectieve voedingsstroom IT Corrente effettivo massimo di alimentazione PL Maksymalny skuteczny prąd zasilania
	FR Matériel conforme aux Directives européennes. La déclaration UE de conformité est disponible sur notre site (voir à la page de couverture). EN Device complies with European directives, The EU declaration of conformity is available on our website (see cover page). DE Gerät entspricht europäischen Richtlinien. Die Konformitätserklärung finden Sie auf unserer Webseite. ES Aparato conforme a las directivas europeas. La declaración de conformidad UE está disponible en nuestra página web (dirección en la portada). RU Устройство соответствует директивам Евросоюза. Декларация о соответствии доступна для просмотра на нашем сайте (ссылка на обложке). NL Apparaat in overeenstemming met de Europese richtlijnen. De verklaring van overeenstemming is te downloaden op onze website (adres vermeld op de omslag). IT Materiale in conformità alle Direttive europee. La dichiarazione di conformità è disponibile sul nostro sito (vedere sulla copertina). PL Urządzenie(a) zgodne z dyrektywami europejskimi. Deklaracja zgodności dostępna jest na naszej stronie internetowej.

	FR Matériel conforme aux exigences britanniques. La déclaration de conformité britannique est disponible sur notre site (voir à la page de couverture). EN Equipment in compliance with British requirements. The British Declaration of Conformity is available on our website (see home page). DE Das Gerät entspricht den britischen Richtlinien und Normen. Die Konformitätserklärung für Grossbritannien ist auf unserer Internetseite verfügbar (siehe Titelseite). ES Equipo conforme a los requisitos británicos. La Declaración de Conformidad Británica está disponible en nuestra página web (véase la portada). RU Материал соответствует требованиям Великобритании. Заявление о соответствии для Великобритании доступно на нашем веб-сайте (см. главную страницу). NL Materiaal conform aan de Britse eisen. De Britse verklaring van overeenkomst is beschikbaar op onze website (zie omslagpagina). IT Materiale conforme alle esigenze britanniche. La dichiarazione di conformità britannica è disponibile sul nostro sito (vedere pagina di copertina). PL Sprzęt spełnia wymagania brytyjskie. Brytyjska deklaracja zgodności jest dostępna na naszej stronie internetowej (patrz strona tytułowa).
	FR Matériel conforme aux normes Marocaines. La déclaration C ₊ (CMIM) de conformité est disponible sur notre site (voir à la page de couverture). EN Equipment in conformity with Moroccan standards. The declaration C ₊ (CMIM) of conformity is available on our website (see cover page). DE Das Gerät entspricht die marokkanischen Standards. Die Konformitätserklärung C ₊ (CMIM) ist auf unserer Webseite verfügbar (siehe Titelseite). ES Equipamiento conforme a las normas marroquíes. La declaración de conformidad C ₊ (CMIM) está disponible en nuestra página web (ver página de portada). RU Товар соответствует нормам Марокко. Декларация C ₊ (CMIM) доступна для скачивания на нашем сайте (см на титульной странице). NL Dit materiaal voldoet aan de Marokkaanse normen. De verklaring C ₊ (CMIM) van overeenstemming is beschikbaar op onze internet site (vermeld op de omslag). IT Materiale conforme alle normative marocchine. La dichiarazione C ₊ (CMIM) di conformità è disponibile sul nostro sito (vedi scheda del prodotto). PL Urządzenie zgodne ze standardami Marokańskimi. Deklaracja zgodności C ₊ (CMIM) jest dostępna na naszej stronie internetowej (patrz strona tytułowa).
IEC 60974-1 IEC 60974-10 Class A	FR L'appareil respecte la norme EN60974-1 et EN60971-10 appareil de classe A. EN The device is compliant with standard EN60974-1 and EN60971-10 class A device. DE Das Gerät erfüllt die Norm EN 60974-1 und EN 60971-10 der Geräteklasse A. ES El aparato se ajusta a la norma EN60974-1 y EN 60971-10, aparato de clase A. RU Аппарат соответствует нормам EN60974-1 и EN60971-10 аппарат класса А. NL Dit klasse A apparaat voldoet aan de EN60974-1 en EN60971-10 normen. IT Il dispositivo rispetta la norma EN60974-1 e EN 60971-10 dispositivo classe A. PL Źródło prądu spawania, zgodne jest z normami EN60974-1/-10 i klasą A
IEC 60974-3	FR L'appareil respecte la norme EN 60974-3. EN This product is compliant with standard EN 60974-3. DE Das Gerät entspricht der Norm EN 60974-3. ES El aparato es conforme a las normas EN60974-3. RU Аппарат соблюдает нормы EN 60974-3. NL Het apparaat voldoet aan de norm EN 60974-3. IT Il dispositivo rispetta la norma EN 60974-3. PL Źródło prądu spawania jest zgodne z normami EN60974-3
	FR Ce matériel faisant l'objet d'une collecte sélective selon la directive européenne 2012/19/UE. Ne pas jeter dans une poubelle domestique ! EN This hardware is subject to waste collection according to the European directives 2012/19/EU. Do not throw out in a domestic bin ! DE Für die Entsorgung Ihres Gerätes gelten besondere Bestimmungen (sondermüll) gemäß europäische Bestimmung 2012/19/EU. Es darf nicht mit dem Hausmüll entsorgt werden! ES Este material requiere una recogida de basuras selectiva según la directiva europea 2012/19/UE. ¡No tirar este producto a la basura doméstica! RU Это оборудование подлежит переработке согласно директиве Евросоюза 2012/19/UE. Не выбрасывать в общий мусоросборник! NL Afzonderlijke inzameling vereist volgens de Europese richtlijn 2012/19/UE. Gooi het apparaat niet bij het huishoudelijk afval ! IT Questo materiale è soggetto alla raccolta differenziata seguendo la direttiva europea 2012/19/UE. Non smaltire con i rifiuti domestici! PL Urządzenie to podlega selektywnej zbiórce odpadów zgodnie z dyrektywą UE 2012/19/UE. Nie wyrzucać do zwykłego kosza!
	FR Produit recyclable qui relève d'une consigne de tri. EN This product should be recycled appropriately. DE Recyclingprodukt, das gesondert entsorgt werden muss. ES Producto reciclable que requiere una separación determinada. RU Этот аппарат подлежит утилизации. NL Product recyclebaar, niet bij het huishoudelijk afval gooien. IT Prodotto riciclabile soggetto a raccolta differenziata. PL Produkt nadaje się do recyklingu zgodnie z instrukcjami sortowni.
	FR Marque de conformité EAC (Communauté économique Eurasienne) EN EAEC Conformity marking (Eurasian Economic Community). DE EAC-Konformitätszeichen (Eurasische Wirtschaftsgemeinschaft) ES Marca de conformidad EAC (Comunidad económica euroasiática). RU Знак соответствия EAC (Евразийское экономическое сообщество) NL EAC (Euraziatische Economische Gemeenschap) merkteken van overeenstemming IT Marca di conformità EAC (Comunità Economica Eurasiatica) PL Znak zgodności EaWG (EAC) - Euroazjatycka Wspólnota Gospodarcza
	FR Information sur la température (protection thermique) EN Temperature information (thermal protection) DE Information zur Temperatur (Thermoschutz) ES Información sobre la temperatura (protección térmica) RU Информация по температуре (термозащита). NL Informatie over de temperatuur (thermische beveiliging) IT Informazioni sulla temperatura (protezione termiche) PL Informacja o temperaturze (ochrona termiczna).
	FR Entrée de gaz EN Gas input DE Gaseingang ES Entrada de gas RU Подача газа NL Ingang gas IT Entrata di gas PT Entrada gás PL Wlot gazu
	FR Commande à distance EN Remote control DE Fernregler ES Control a distancia RU Дистанционное управление NL Afstandsbediening. IT Telecomando a distanza PL Zdalne sterowanie
	FR Polarité (+) / (-) EN Polarity (+) / (-) DE Polarität (+) / (-) ES Polaridad (+) / (-) RU Полярность (+) / (-) NL Polariteit (+) / (-) IT Polarità (+) / (-) PL Polaryzacja (+) / (-)
	FR Le dispositif de déconnexion de sécurité est constitué par la prise secteur en coordination avec l'installation électrique domestique. L'utilisateur doit s'assurer de l'accessibilité de la prise. EN The safety disconnection device is a combination of the power socket in coordination with the electrical installation. The user has to make sure that the plug can be reached. DE Die Stromunterbrechung erfolgt durch Trennen des Netzsteckers vom häuslichen Stromnetz. Der Gerätanwender sollte den freien Zugang zum Netzstecker immer gewährleisten. ES El dispositivo de desconexión de seguridad se constituye de la toma de la red eléctrica en coordinación con la instalación eléctrica doméstica. El usuario debe asegurarse de la accesibilidad de la toma de corriente. RU Устройство безопасности отключения состоит из вилки, соответствующей домашней электросети. Пользователь должен обеспечить доступ к вилке. NL De veiligheidsontkoppeling van het apparaat bestaat uit de stekker samen met de elektrische installatie. De gebruiker moet zich ervan verzekeren dat de elektrische aansluitingen goed toegankelijk zijn. IT Il dispositivo di scollimento di sicurezza è costituito dalla presa in coordinazione con l'installazione elettrica domestica. L'utente deve assicurarsi dell'accessibilità della presa. PL Urządzenie wyłącznika bezpieczeństwa jest złożone z wtyczki sieciowej skoordynowanej z instalacją domową. Użytkownik musi się upewnić, że ma odpowiedni dostęp do gniazdka.
IP21	FR Protégé contre l'accès aux parties dangereuses des corps solides de diam>12,5mm (équivalent doigt de la main) et contre les chutes verticales de gouttes d'eau. EN Protected against access to dangerous parts of solid bodies with a diameter >12,5mm (equivalent to the finger of the hand) and against vertical drops of water. DE Schutz vor Eindringen von festen Fremdkörpern (Durchmesser >12,5mm = Finger einer Hand). Schutz gegen Berühren mit einem Finger und senkrecht fallendes Tropfwasser. ES Protegido contra el acceso a partes peligrosas de cuerpos sólidos de diámetro > 12,5mm (equivalente al dedo de la mano) y contra gotas verticales de agua. RU Защищен против доступа твердых тел диаметром > 12,5 мм (размером с палец руки) в опасные места. Защищен против доступа пальцев в опасные места и против вертикального попадания капель воды. NL Beschermd tegen de toegang tot gevaarlijke delen van vaste lichamen met een diameter >12,5 mm (gelijk aan de vinger van de hand) en tegen verticale waterdruppels. IT Protetto contro l'accesso a parti pericolose di corpi solidi di diam>12,5mm (equivalente al dito della mano) e contro le gocce d'acqua verticali. PL Zabezpieczone przed dostępem do niebezpiecznych części ciał stałych o średnicy > 12,5mm (odpowiednik palca ręki) oraz przed pionowymi kroplami wody.
	FR Compatible groupe électrogène EN Compatible with generators DE Kompatibel mit Stromaggregat ES Compatible con el grupo electrógeno RU Совместимость с генераторной установкой NL Compatibel met generatorset IT Compatibile con il gruppo elettrogeno. PL Kompatybilny z agregatem prądowtórczym
	FR Groupe froid EN Cooling unit system DE System der Kühleinheit ES Sistema de refrigeración de la unidad RU Система охлаждения NL Koelgroep IT Unità di raffreddamento PL Jednostka chłodząca

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