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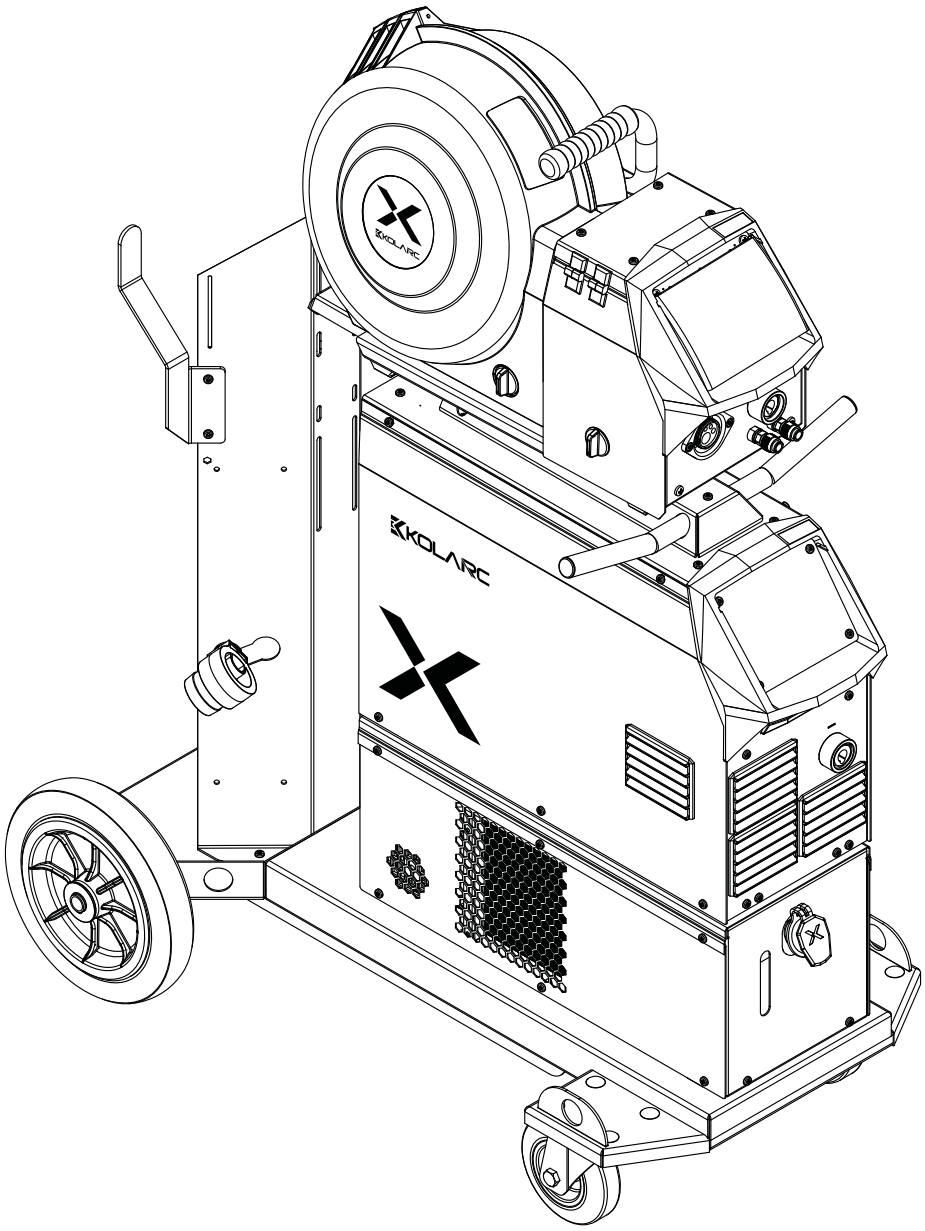
BUILDING THE FUTURE

Operational Manual-OM

2026-01

Processes

Multiprocess Welding



MX400

OPERATION MANUAL

EN

CE

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Safety Instructions

Explanation of Safety Instructions

⚠ DANGER!

Indicates an immediate danger.

► Death or serious injury may result if appropriate precautions are not taken.

⚠ WARNING!

Indicates a possibly dangerous situation.

► Death or serious injury may result if appropriate precautions are not taken.

⚠ CAUTION!

Indicates a situation where damage or injury could occur.

► Minor injury or damage to property may result if appropriate precautions are not taken.

NOTE!

Indicates the possibility of flawed results and damage to the equipment.

General

The device has been manufactured using state-of-the-art technology and according to recognized safety standards. If used incorrectly or misused, however, it can cause
- Injury or death to the operator or a third party
- Damage to the device and other material assets belonging to the operating company
- Inefficient operation of the equipment

All persons involved in the commissioning, operation, maintenance, and servicing of the device must
- Be suitably qualified
- Have knowledge of welding
- Have completely read and followed these Operating Instructions

The Operating Instructions must always be at hand wherever the device is being used. In addition to the Operating Instructions, all applicable local rules and regulations regarding accident prevention and environmental protection must also be followed.

All safety and danger notices on the device must
- Be kept in a legible state
- Not be damaged/marked
- Not be removed
- Not be covered, pasted, or painted over

For the location of the safety and danger notices on the device, refer to the section headed "General" in the Operating Instructions for the device.
Before switching on the device, remove any faults that could compromise safety.

Your personal safety is at stake!

Intended Use

The device is to be used exclusively for its intended purpose.

Safety Symbols



ELECTRIC SHOCK can kill.



HOT PARTS can cause severe burns.



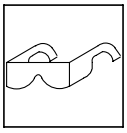
FUMES AND GASES can be hazardous.



ARC RAYS can burn eyes and skin.



WELDING can cause fire or explosion.



FLYING METAL or DIRT can injure eyes.



BUILDUP OF GAS can injure or kill.



MAGNETIC FIELDS can affect Implanted Medical Devices.



NOISE can damage hearing.



CYLINDERS can explode if damaged.



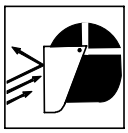
FIRE OR EXPLOSION hazard.



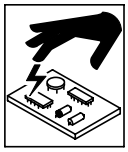
FALLING UNIT can cause injury.



OVERUSE can cause OVERHEATING.



FLYING SPARKS can cause injury.



STATIC (ESD) can damage PC boards.



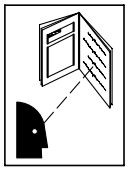
MOVING PARTS can cause injury.



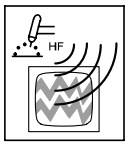
WELDING WIRE can cause injury.



MOVING PARTS can cause injury.



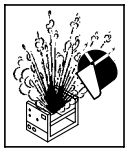
READ INSTRUCTIONS.



H.F. RADIATION can cause interference.



ARC WELDING can cause interference.



EXPLODING PARTS can cause injury.



SHOCK HAZARD from testing.

The device is intended exclusively for the welding process specified on the rating plate. Utilization for any other purpose, or in any other manner, shall be deemed to be "not in accordance with the intended purpose." The manufacturer is not responsible for any damage resulting from improper use.

Proper use also means
- Completely reading and obeying all instructions in the Operating Instructions
- Completely reading and obeying all safety instructions and danger notices
- Carrying out all the specified inspection and servicing work

Never use the device for the following applications:
- Thawing pipes
- Charging batteries
- Starting motors

The device is designed for operation in industry and business. The manufacture shall not be liable for any damage resulting from use in a living area.

The manufacture shall also not be liable for faulty or incorrect work results.

Environmental Conditions

Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended purpose. The manufacturer accepts no liability for any damage resulting from improper use.

Temperature range of the ambient air:
- During operation: -10°C to +40°C (14°F to 104°F)
- During transport and storage: -20°C to +55°C (-4°F to 131°F)

Relative humidity:
- Up to 50% at 40°C (104°F)
- Up to 90% at 20°C (68°F)

Ambient air: free of dust, acids, corrosive gases or substances, etc.
Altitude above sea level: up to 2000 m (6561 ft. 8.16 in.)

Obligations of the Operating Company

The operating company must only allow persons to work with the device if they
- Are familiar with the basic occupational safety and accident prevention regulations and are trained in handling the device
- Have read and understood these Operating Instructions, especially the section "Safety Rules," and have confirmed this with their signature
- Are trained according to the requirements for the work results

The safety-conscious work of the personnel must be checked regularly.

Obligations of Personnel

All persons who are assigned to work with the device must do the following before beginning the work:
- Follow the basic regulations for occupational safety and accident prevention
- Read these Operating Instructions, especially the section "Safety Rules," and confirm that they have understood and will follow them by signing

Before leaving the workplace, ensure that no personal injury or property damage can occur in one’s absence.

Grid Connection

Devices with a high output can influence the energy quality of the grid due to their current consumption.

This may affect a number of device types in terms of:
- connection restrictions
- criteria regarding maximum permissible grid impedance *)
- criteria regarding the minimum required short-circuit power *)

*) both at the interface with the public grid
See technical data

In this case, the operator or the person using the device should check whether or not the device is allowed to be connected, where appropriate through discussion with the power supply company.

IMPORTANT! Ensure secure grounding of the grid connection!

Personal Protection and Protection of Others

You are exposed to numerous hazards while handling the device, for example:
- Flying sparks and pieces of hot metal
- Arc radiation that poses a risk of injury to the eyes and skin
- Hazardous electromagnetic fields that pose a risk of death for individuals with pacemakers
- Electrical risks from grid current and welding current
- Increased noise exposure
- Harmful welding fumes and gases

Wear suitable protective clothing when dealing with the device. The protective clothing must have the following properties:
- Flame resistant
- Insulating and dry
- Covering the entire body and in good condition with no damage
- Safety helmet
- Cuffless pants

Protective clothing involves the following:
- Protecting the face and eyes from UV radiation, heat and flying sparks with a face guard featuring a regulation-compliant filter
- Wearing regulation-compliant protective goggles with side protection behind the face guard
- Wearing rigid, wet-insulating footwear
- Protecting hands with appropriate gloves (featuring electrical insulation and thermal protection)
- Wearing ear protection to reduce noise exposure and protect against injury

Keep persons, especially children, away during the operation of the devices and during the welding process. If persons are in the vicinity, however:
- Instruct them about all hazards (blinding hazard due to arcs, risk of injury from flying sparks, welding fumes hazardous to health, noise exposure, possible hazard due to grid current or welding current, etc.)
- Provide suitable protective equipment or
- Construct suitable protective walls and curtains.

Danger from toxic gases and vapors

Keep your head out of the welding fumes and gases.

Take the following precautionary measures for fumes and harmful gases:
- Do not breathe them in.
- Extract them from the work area using appropriate equipment.

Ensure that there is a sufficient supply of fresh air. Ensure that there is a ventilation flow rate of at least 20 m^3 per hour.

Use a welding helmet with air supply if there is insufficient ventilation.

If there is uncertainty as to whether the extraction capacity is sufficient, compare the measured toxic emission values against the permissible limit values.

The following components are factors that determine how toxic the welding fumes are:
- The metals used for the workpiece
- Electrodes
- Coatings
- Cleaning agents, degreasers, and the like
- The welding process used

Consult the corresponding material safety data sheets and manufacturer's instructions for the components listed above.

Recommendations for exposure scenarios, risk management measures and identifying working conditions can be found on the European Welding Association website under Health & Safety (https://european-welding.org).

Keep flammable vapors (such as solvent vapors) out of the arc radiation range.

When no welding is taking place, close the valve of the shielding gas cylinder or the main gas supply.

Danger from Flying Sparks

Flying sparks can cause fires and explosions.

Never undertake welding near flammable materials.

Flammable materials must be kept at least 11 meters (36 ft. 1.07 in.) from the arc or protected with a certified cover.

Keep suitable, tested fire extinguishers on hand.

Sparks and pieces of hot metal may also get into surrounding areas through small cracks and openings. Take appropriate measures to ensure that there is no risk of injury or fire.

Do not undertake welding in areas at risk of fire and explosion, or on sealed tanks, drums, or pipes if these have not been prepared in accordance with corresponding national and international standards.

Do not undertake welding on containers in which gases, fuels, mineral oils, and the like are/were stored. Residues pose a risk of explosion.

Risks from grid current and welding current

An electric shock can be fatal.

Do not touch voltage-carrying parts inside or outside the device.

During MIG/MAG welding and TIG welding, the welding wire, the wirespool, the feed rollers, as well as all pieces of metal that are in contact with the welding wire, are live.

Always place the wirefeeder on a sufficiently insulated base or use a suitable insulating wirefeeder holder.

Ensure suitable personal protection with dry temporary backing or cover with sufficient insulation against the ground potential. The temporary backing or cover must completely cover the entire area between the body and the ground potential.

All cables and leads must be secured, undamaged, insulated, and adequately dimensioned.
Replace loose connections and scorched, damaged, or inadequately dimensioned cables and leads immediately.
Before every use, check power connections for secure fit by hand.
In the case of power cables with bayonet connectors, turn the power cable by at least 180° around the longitudinal axis and pretension.

Do not wrap cables or leads around your body or parts of the body.

Concerning the electrode (rod electrode, tungsten electrode, welding wire, etc.)
- Never immerse it in liquids to cool it
- Never touch it when the power source is switched on.

The open circuit voltage of a welding system may double, for example, between the electrodes of two welding systems. Touching the potentials of both electrodes at the same time may be life-threatening in some cases.

Have the grid and device supply lead regularly inspected by an electrician to ensure that the ground conductor is functioning properly.

Protection class I devices require a grid with a ground conductor and a connector system with ground conductor contact for proper operation.

Operation of the device on a grid without a ground conductor and on a socket without a ground conductor contact is only permitted if all national regulations for protective separation are observed.
Otherwise, this is considered gross negligence. The manufacturer accepts no liability for any damage resulting from improper use.

Use suitable equipment to ensure that the workpiece is sufficiently grounded if necessary.

Switch off unused devices.

When working at elevated heights, wear a safety harness to prevent falls.

Before working on the device, switch off the device and remove the grid plug.

Secure the device to prevent the grid plug from being connected and switched on again by applying a clearly legible and understandable warning sign.

After opening the device:
- Discharge all electrically charged components
- Ensure that all components are disconnected from the power supply.

If work is needed on voltage-carrying parts, bring in a second person who will switch off the main switch at the correct time.

Stray welding currents

If the following instructions are not observed, stray welding currents may occur, which pose a risk of the following:
- Fire
- Overheating of components connected to the workpiece
- Destruction of ground conductors
- Damage to the device and other electrical equipment

Ensure that the workpiece terminal is securely connected to the workpiece.

Secure the workpiece terminal as close to the spot to be welded as possible.

Position the device with sufficient insulation against electrically conductive environments, e.g., insulation against electrically conductive floors or electrically conductive mounts.

Observe the following when using electrical distributors, double-headed retainers, etc.:
Even the electrode of the welding torch/electrode holder not in use carries electric potential.
Ensure that there is sufficient insulation when the unused welding torch/electrode holder is stored.

In automated MIG/MAG applications, only guide the wire electrode from the welding wire drum, large spool or wirespool to the wirefeeder with insulation.

EMC Device Classifications

Devices in emission class A:
- Are only designed for use in industrial settings
- Can cause line-bound and radiated interference in other areas

Devices in emission class B:
- Satisfy the emissions criteria for residential and industrial areas. This is also true for residential areas in which the energy is supplied from the public low-voltage grid.

EMC device classification as per the rating plate or technical data.

EMC Measures

In certain cases, even though a device complies with the standard limit values for emissions, it may affect the application area for which it was designed (e.g., when there is sensitive equipment at the same location, or if the site where the device is installed is close to either radio or television receivers). If this is the case, then the operating company is obliged to take appropriate action to rectify the situation.

Test and assess the immunity of equipment in the vicinity of the device in accordance with national and international provisions. Examples of interference-prone equipment that could be affected by the device:
- Safety devices
- Grid power lines, signal lines and data transfer lines
- EMC and telecommunications equipment
- Devices for measuring and calibrating

Supporting measures to avoid EMC problems:
1. Grid power supply
- If electromagnetic interference occurs despite a grid connection that complies with regulations, take additional measures (e.g., use a suitable grid filter).

2. Welding power-leads
- Keep them as short as possible
- Route them close together (also to avoid EMF problems)
- Route them far from other lines

3. Equipotential bonding
4. Workpiece grounding
- If necessary, establish grounding using suitable capacitors

5. Shield, if necessary
- Shield other devices in the vicinity
- Shield the entire welding installation

EMF measures

Electromagnetic fields may cause health problems that are not yet known:
- Effects on the health of persons close by, e.g., those with pacemakers and hearing aids
- Persons with pacemakers must seek advice from their doctor before staying in the immediate vicinity of the device and the welding process
- Keep distances between welding cables and the head/torso of the welder as large as possible for safety reasons
- Do not carry welding cables and hosepacks over one's shoulder or wrap them around one's body or body parts

Particular Hazard Areas

Keep hands, hair, loose clothing, and tools away from moving parts, such as:
- fans
- gears
- rollers
- shafts
- wirespools and welding wires.

Do not reach into rotating gears of the wire drive or into rotating drive parts.

Covers and side parts must only be opened/removed during maintenance and repair work.

During operation:
- Ensure that all covers are closed, and all side parts have been mounted properly.
- Keep all covers and side parts closed.

The protrusion of welding wire from the welding torch represents a high risk of injury (cuts to the hand, facial and eye injuries, etc.)

Therefore always hold the welding torch away from the body (devices with wirefeeder) and use suitable protective goggles.

Do not touch the workpiece during or after welding—burning hazard.

Slag may fly off cooling workpieces. Therefore, also wear regulation-compliant protective equipment when reworking workpieces and ensure that other persons are sufficiently protected.

Leave the welding torch and other parts with a high operating temperature to cool before working on them.

Special regulations apply in areas at risk of fire or explosion
- follow the appropriate national and international regulations.

Power sources for work in areas with increased electrical hazard (e.g. boilers) must be labeled with the symbol (Safety). However, the power source may not be located in such areas.

Risk of scalding due to leaking coolant. Switch off the cooling unit before disconnecting connections for the coolant supply or return.

When handling coolant, observe the information on the coolant safety data sheet. The coolant safety data sheet can be obtained from your service center or via the manufacturer’s website.

Only use suitable load-carrying equipment from the manufacturer when transporting devices by crane.
- Attach chains or ropes to all designated attachments of the suitable load-carrying equipment.
- Chains or ropes must be the smallest angle possible from vertical.
- Remove gas cylinder and wirefeeder (MIG/MAG and TIG devices).

In the event of crane attachment of the wirefeeder during welding, always use a suitable, insulating wirefeeder hoisting attachment (MIG/MAG and TIG devices).

If the device is equipped with a carrier belt or handle, then this is used exclusively for transport by hand. The carrier belt is not suitable for transport by crane, counterbalanced lift truck or other mechanical lifting tools.

All lifting equipment (belts, buckles, chains, etc.), which is used in association with the device or its components, must be checked regularly (e.g. for mechanical damage, corrosion, or changes due to other environmental influences). The test interval and scope must at least comply with the respective valid national standards and guidelines.

There is a risk of colorless, odorless shielding gas escaping without notice if an adapter is used for the shielding gas connection. Use suitable Teflon tape to seal the thread of the shielding gas connection adapter on the device side before installation.

Requirement for the shielding gas

Especially with ring lines, contaminated shielding gas can cause damage to equipment and reduce welding quality.
Meet the following requirements regarding shielding gas quality:

- Solid particle size < 40 µm
- Pressure condensation point < -20 °C
- Max. oil content < 25 mg/m³

Use filters if necessary.

Danger from Shielding Gas Cylinders

Shielding gas cylinders contain compressed gas and may explode if damaged. Shielding gas cylinders are an integral part of the welding equipment, so they must be handled very carefully.

Protect shielding gas cylinders with compressed gas from excessive heat, mechanical impact, slag, open flames, sparks, and arcs.

Mount the shielding gas cylinders vertically and secure them in accordance with instructions so they cannot fall over.

Keep shielding gas cylinders away from welding or other electrical circuits.

Never hang a welding torch on a shielding gas cylinder.

Never touch a shielding gas cylinder with an electrode.

Risk of explosion: Never weld on a compressed shielding gas cylinder.

Always use suitable shielding gas cylinders for the application in question and the correct matching accessories (controller, hoses, and fittings, etc.) Only use shielding gas cylinders and accessories that are in good condition.

If a valve on a shielding gas cylinder is open, turn your face away from the outlet.

When no welding is taking place, close the valve of the shielding gas cylinder.

Leave the cap on the valve of the shielding gas cylinder when the cylinder is not connected.

Follow the manufacturer's instructions and applicable national and international provisions for shielding gas cylinders and accessories.

Danger Posed by Shielding Gas Leak

Risk of asphyxiation due to uncontrolled shielding gas leak

Shielding gas is colorless and odorless and may suppress the oxygen in the ambient air in the event of leakage.

- Ensure there is a sufficient supply of fresh air with a ventilation flow rate of at least 20 m^3 per hour.
- Please observe the safety and maintenance information for the shielding gas cylinder or the main gas supply.
- When no welding is taking place, close the valve of the shielding gas cylinder or the main gas supply.
- Always check the shielding gas cylinder or main gas supply for uncontrolled gas leakage before each start-up.

Safety Measures at the Setup Location and During Transport

A toppling device can be deadly! Set up the device securely on an even, solid surface

- The maximum permitted tilt angle is 10°.

Special regulations apply in areas at risk of fire or explosion

- Follow the appropriate national and international regulations.

Use instructions and checks within the company to ensure that the vicinity of the workplace is always clean and organized.

Only set up and operate the device in accordance with the protection class shown on the rating plate.

When setting up the device, ensure that there is an all-round clearance of 0.5 m (1 ft. 7.69 in.) to allow cooling air to circulate unhindered.

Take care to ensure that the applicable national and regional guidelines and accident prevention regulations are observed when transporting the device, especially guidelines concerning hazards during transport and shipment.

Before transporting the device, completely drain the coolant and dismantle the following components:

- wirefeeder
- wirespool
- shielding gas cylinder

It is essential to conduct a visual inspection of the device to check for damage after it has been transported but before commissioning. Have any damage repaired by trained service technicians before commissioning the device.

Safety Measures in Normal Operation

Only operate the device when all safety devices are fully functional. If the safety devices are not fully functional, there is a danger of:

- Injury or death to the operator or a third party
- Damage to the device and other material assets belonging to the operating company
- Inefficient operation of the device

Safety devices that are not fully functional must be repaired before the device is switched on.

Never bypass or disable safety devices.

Before switching on the device, ensure that no one can be put in danger.

The device must be examined at least once a week for externally detectable damage and functionality of the safety devices.

Always secure the shielding gas cylinder well and remove before transporting by crane.

Only the original coolant from the manufacturer is suitable for use in our devices due to its properties (electrical conductivity, anti-freeze, material compatibility, flammability, etc.)

Only use appropriate original coolant from the manufacturer.

Do not mix original coolant from the manufacturer with other coolants.

Only connect system components from the manufacturer to the cooling unit circuit.

If there is damage due to use of other system components or other coolants, the manufacturer accepts no liability for this and all warranty claims are forfeited.

Cooling Liquid FCL 10/20 is not flammable. The ethanol-based coolant is flammable in certain conditions. Only transport the coolant in closed original containers and keep away from sources of ignition.

Properly dispose of used coolant according to national and international regulations. The coolant safety data sheet can be obtained from your service center or via the manufacturer's website.

When the system is cool, always check the coolant level before starting welding.

Maintenance and repair

It is impossible to guarantee that bought-in parts are designed and manufactured to meet the demands made of them, or that they satisfy safety requirements.

- Use only original spare and wearing parts (also applies to standard parts).
- Do not carry out any modifications, alterations, etc. to the device without the manufacturer's consent.
- Components that are not in perfect condition must be replaced immediately.
- When ordering, please give the exact designation and part number as shown in the spare parts list, as well as the serial number of your device.

The housing screws provide the ground conductor connection for earthing the housing parts. Only use original housing screws in the correct number and tightened to the specified torque.

Safety Inspection

The manufacturer recommends that a safety inspection of the device be performed at least every 12 months.

The manufacturer recommends calibrating power sources within the same 12-month interval.

A safety inspection by a certified electrician is recommended:

- After changes
- After alterations
- After repair, care, and maintenance
- At least every 12 months

For the safety inspection, follow the appropriate national and international standards and guidelines.

You can obtain more information about the safety inspection and calibration from your service center. The service center will provide the necessary documents upon request.

Disposal

Do not dispose of this device with normal domestic waste! To comply with the European Directive on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device that you no longer require must be returned to your dealer, or you must locate the approved collection and recycling facilities in your area. Ignoring this European Directive may have potentially adverse affects on the environment and your health!

BUILDING THE FUTURE

DECLARATION OF CONFORMITY

for European Community (CE marked) products.

KOLARC MAKİNE İMALAT SAN. VE TİC. A.Ş. : 2014. Cd. No: 8/1, 06930 Alcı OSB/Sincan/Ankara, declares that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Standard(s).

Product/Apparatus Identification:

Product Name	Stock Number
MX400	M2407 I M2418

Standards/Directives:

- **IEC 60974 -1:2021** Arc welding equipment - Part 1: Welding power sources
- **IEC 60974 -10:** Arc welding equipment - Part 10: Electromagnetic compatibility (EMC) requirements
- **2014/35/EU** Low voltage Drictive
- **2014/30/EU** Electromagnetic Compatibility Drective

Signatory:

2025-04-21

İlker OLUCAK

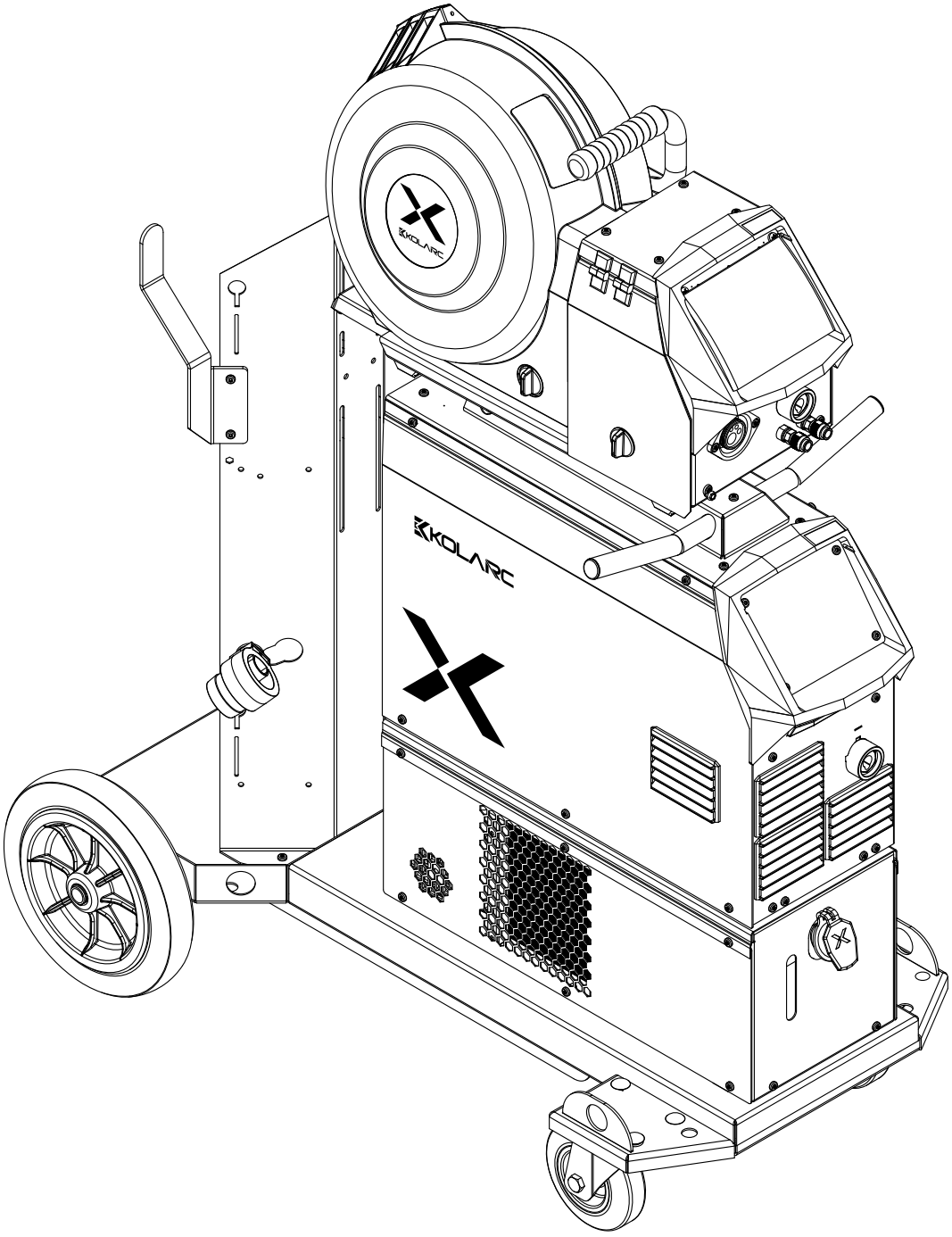
General Manager

Date of Declaration

Kolarc Makine İmalat San. ve Tic. A.Ş.
+90 (312) 577 18 18
+90 (312) 577 19 19
Alcı OSB Mahallesi 2014. Cadde No:8/1 06909 Sincan/ANKARA

Introduction

Overview

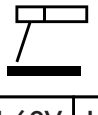


(1) Wirefeeder (MX4)
(2) Power source (MX400)
(3) Cooling unit (WX)

A modular design and ability to easily extend the system guarantee a high degree of flexibility. The device is designed for the following welding processes:

- MIG/MAG Manual
- TIG (Lift Arc)
- MMA
- Gouging

Power Lobel

KOLARC			Made in TÜRKİYE	
Manufacturer:	Kolarc Makine İmalat Sanayi ve Ticaret A.Ş. Alcı OSB Mahallesi 2014.cadde No: 8/1 Sincan / Ankara			
Model:	MX400			
Stock No:		Serial No:		
		IEC 60974-1 IEC 60974-10		
		10A 14.5V / 400A 34V		
	X	40%	60%	100%
	I_2	400A	360A	300A
	U_2	34V	32V	29V
		10A 10.4V / 400A 26V		
	X	40%	60%	100%
	I_2	400A	360A	300A
	U_2	26V	24.4V	22V
		10A 20.4V / 400A 36V		
	X	40%	60%	100%
	I_2	400A	360A	300A
	U_2	36V	34.4V	32V
U_o 60V	U_r 14V	U_1		I_1 max	I_1 eff
	IP21S	400 V	32 A	25.7 A	17.2 A
~3 50/60 Hz		S_{1max} = 17.8 kVA		S CE	



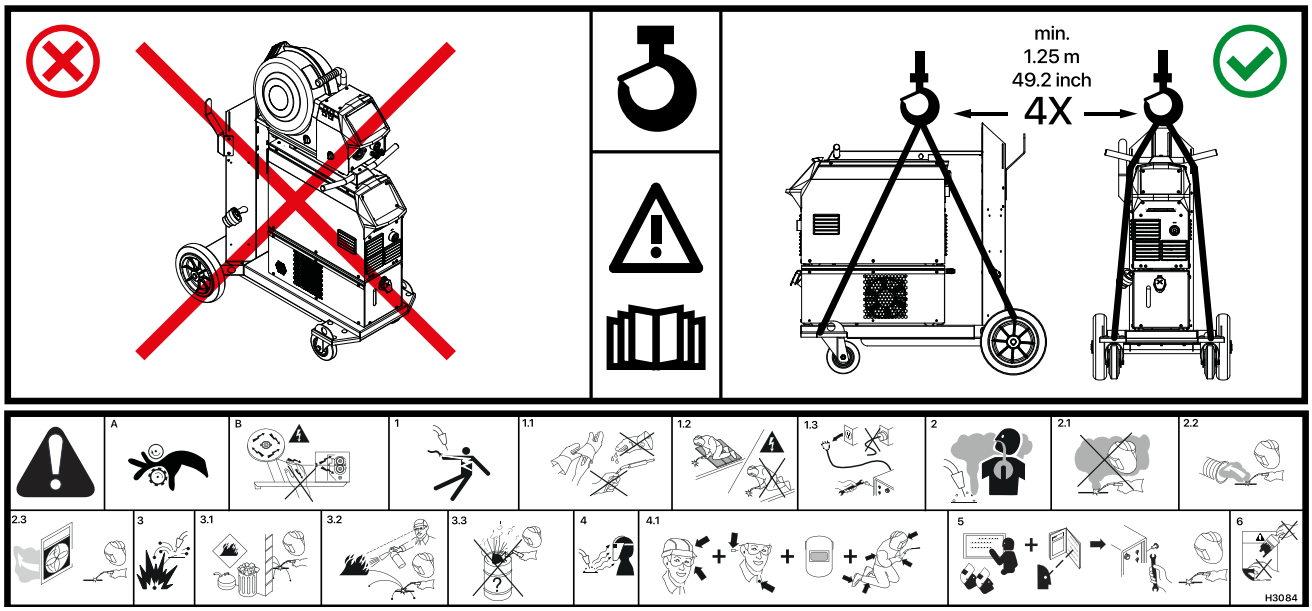
Welding is dangerous. The following basic requirements must be met

- Adequate welding qualifications
- Appropriate protective equipment
- Exclusion of unauthorized persons



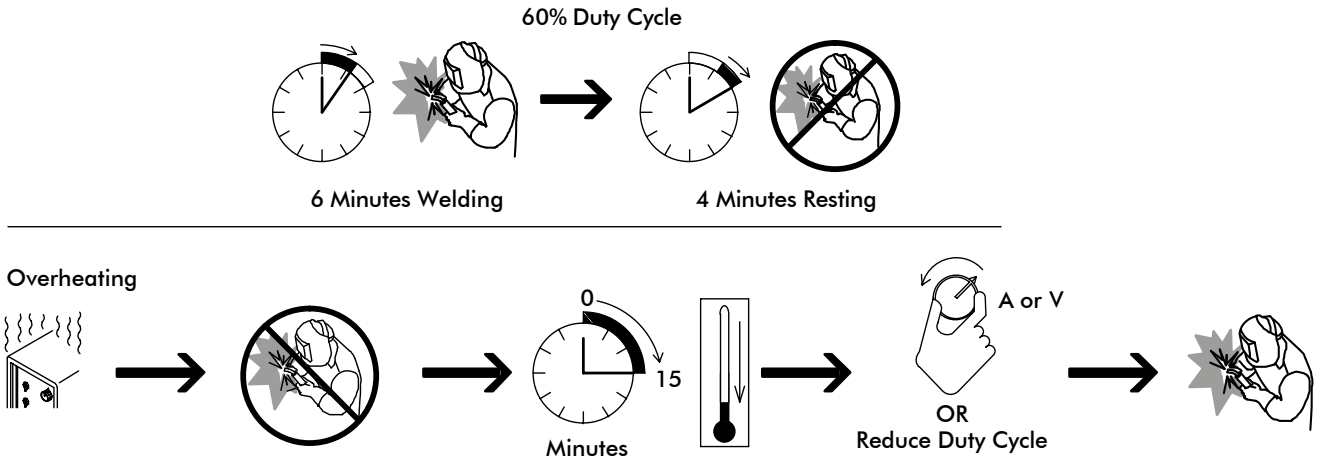
Do not use the functions described here until you have fully read and understood the following documents:

- These Operating Instructions
- All system component Operating Instructions, especially the safety rules

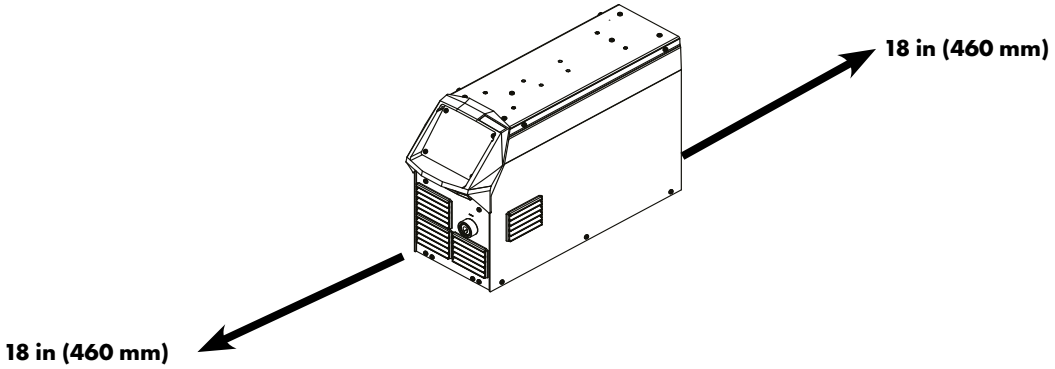


Duty Cycle

Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating. If unit overheats, output stops, a Help message is displayed and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.



Selecting a Distance



Connecting Input Power

General

If no mains cable is connected, a mains cable that is suitable for the connection voltage must be fitted before commissioning.
A strain-relief device for the following cable cross-sections is fitted to the power source:

Power source	Cable cross-section	
MX400 Pulse	AWG 10 *)	4x4

Strain-relief devices for other cable cross-sections must be designed accordingly.

Safety

⚠ WARNING!

Danger from work that is not carried out properly.
This can result in severe personal injury and damage to property.

► The work described below may only be performed by trained specialist personnel.

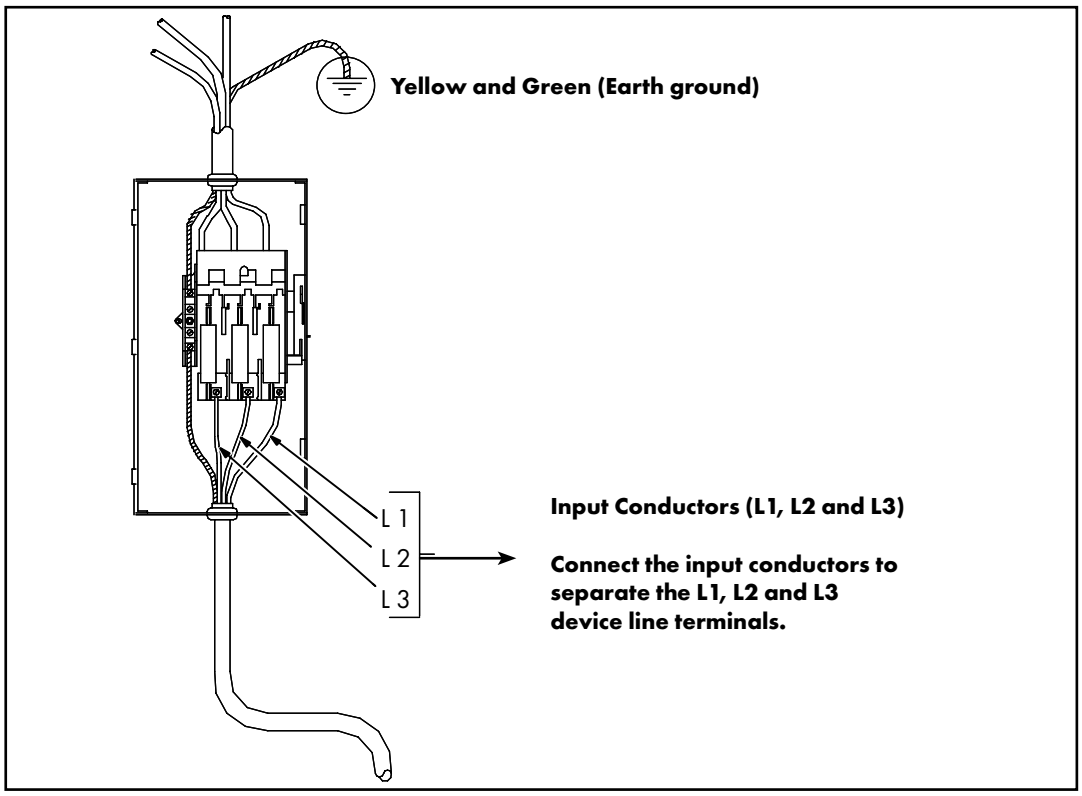
► Follow national standards and guidelines.

⚠ CAUTION!

Danger from improperly prepared mains cable.
Short circuits and damage to property may result.

► Fit ferrules to all phase conductors and the ground conductor of the stripped mains cable.

Connect the mains cable



Generator-Powered Operation

Generator powered operation

The power source is generator-compatible.

The maximum apparent power S1max of the power source must be known in order to select the correct generator output.
The maximum apparent power S1max of the power source is calculated for 3-phase devices as follows:

$$S_{1max} = I_{1max\ x}\ U1 \times \sqrt{3}$$

I1max and U1 according to the device rating plate and technical data

The generator apparent power SGEN needed is calculated using the following rule of thumb:

$$S_{GEN} = S_{1max} \times 1.35$$

A smaller generator can be used when not welding at full power.

IMPORTANT! The generator apparent power SGEN must not be less than the maximum apparent power S1max of the power source!

NOTE!

The voltage delivered by the generator must never fall outside of the mains voltage tolerance range.
The mains voltage tolerance is specified in the "Technical data" section.

Commissioning

Safety

⚠ **WARNING!**

An electric shock can be fatal.
If the power source is connected to the grid during installation, there is a danger of serious personal injury and property damage.

► Only carry out work on the device when the power source's power switch is in the - O - position.

► Only carry out work on the device when the power source has been disconnected from the grid.

⚠ **WARNING!**

Danger of electrical current due to electrically conductive dust in the device.
This can result in severe personal injury and damage to property.

General

Commissioning is described with reference to a manual, Liquid-cooled MIG/MAG application.

Information on system components

The steps and activities described below include references to various system components, such as
- Trolley
- Upright bracket
- Cooling units
- Wirefeeders
- Interconnecting hosepacks
- Welding torches, etc.

For more detailed information about installing and connecting the system components, please refer to the appropriate Operating Instructions for the system components.

Welding processes and procedures for MIG/MAG welding

General

In order to process a wide range of materials effectively, various welding processes, procedures, and welding characteristics are available on the KM4 wire feeder.

MIG/MAG standard

MIG/MAG standard welding is a MIG/MAG welding process covering the entire power range of the power source with the following arc types:

Dip transfer arc
Droplet transfer occurs in the lower power range during the short circuit.

Intermediate arc
The droplet increases in size at the end of the wire electrode and is transferred in the mid power range during the short circuit.

Spray arc
A short circuit-free transfer of material in the high power range.

Brief description of MIG/MAG pulsed synergic welding

MIG/MAG pulsed synergic

MIG/MAG pulsed synergic welding is a pulsed arc process with a controlled material transfer. In the base current phase, the energy input is reduced to such an extent that the arc barely burns steadily and the surface of the workpiece is preheated. In the pulsing current phase, an accurately timed current pulse guarantees a precise detachment of the weld material droplet.
This principle guarantees low-spatter welding and precise operation throughout the entire power range.

Brief description of Duo Pulse / Position welding

Duo Pulse is used for standard synergic and pulsed synergic processes. Position is used in vertical-up and over head welding positions.

With the cyclic variation of the welding power between the two operating points, with Duo Pulse and Position, an aesthetic seam appearance and a discontinuous one input are obtained.

Brief description of the gouging (Arc Air Gouging)

In arc air gouging, an arc is ignited between a carbon electrode and the workpiece; the parent material is melted and blown out with compressed air.
The operating parameters for arc air gouging are defined in a special characteristic.

Applications:
- Removal of shrink holes, pores, or slag inclusions from workpieces
- Detaching sprues or the processing of entire workpiece surfaces in foundries
- Edge preparation for heavy plates
- Preparation and repair of weld seams
- Finishing of roots or defects
- Production of air gaps

System Components

General

The functions are all arranged in an intuitive way on the control panel. The individual parameters required for welding can be
- Selected by means of buttons
- Changed using buttons or the selection dial
- Shown on the digital display during welding.

Due to the synergic function, all other parameters are also adjusted if a single parameter is changed.

NOTE!

Because of software updates, certain functions may be available for your device but not described in these Operating Instructions or vice versa.

In addition, individual figures may also differ slightly from the operating elements of your device. However, the function of these operating elements is identical.

Safety

⚠ **WARNING!**

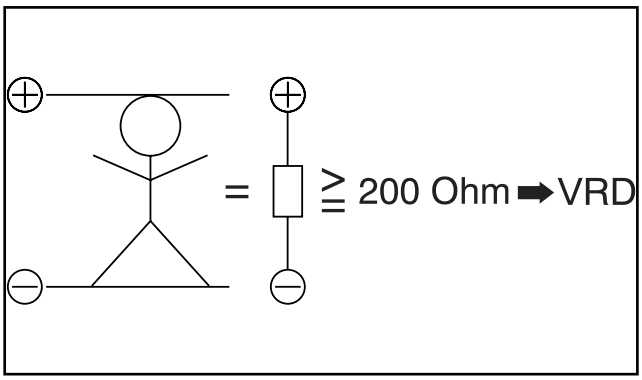
Danger from incorrect operation and work that is not carried out properly.

Serious personal injury and damage to property may result.

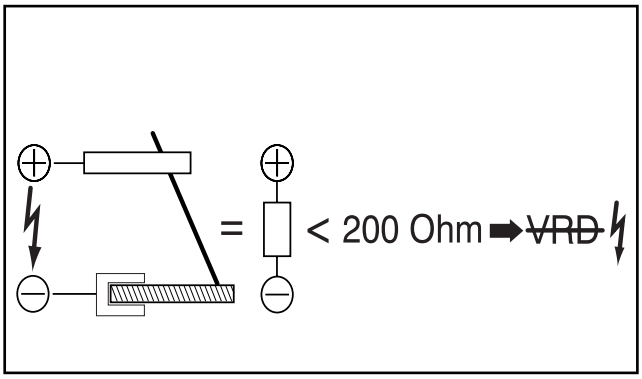
► Read and understand this document.

► Read and understand all the Operating Instructions for the system components, especially the safety rules.

VRD: Safety principle



The welding circuit resistance is greater than the minimum body resistance (greater than or equal to 200 ohms):
- VRD is active
- Open circuit voltage is limited to 35 V
- Unintentional contact with the output voltage does not pose any danger



The welding circuit resistance is less than the minimum body resistance (less than200 ohms):
- VRD is inactive
- No limitation of the output voltage to ensure adequate welding power
- Example: welding start

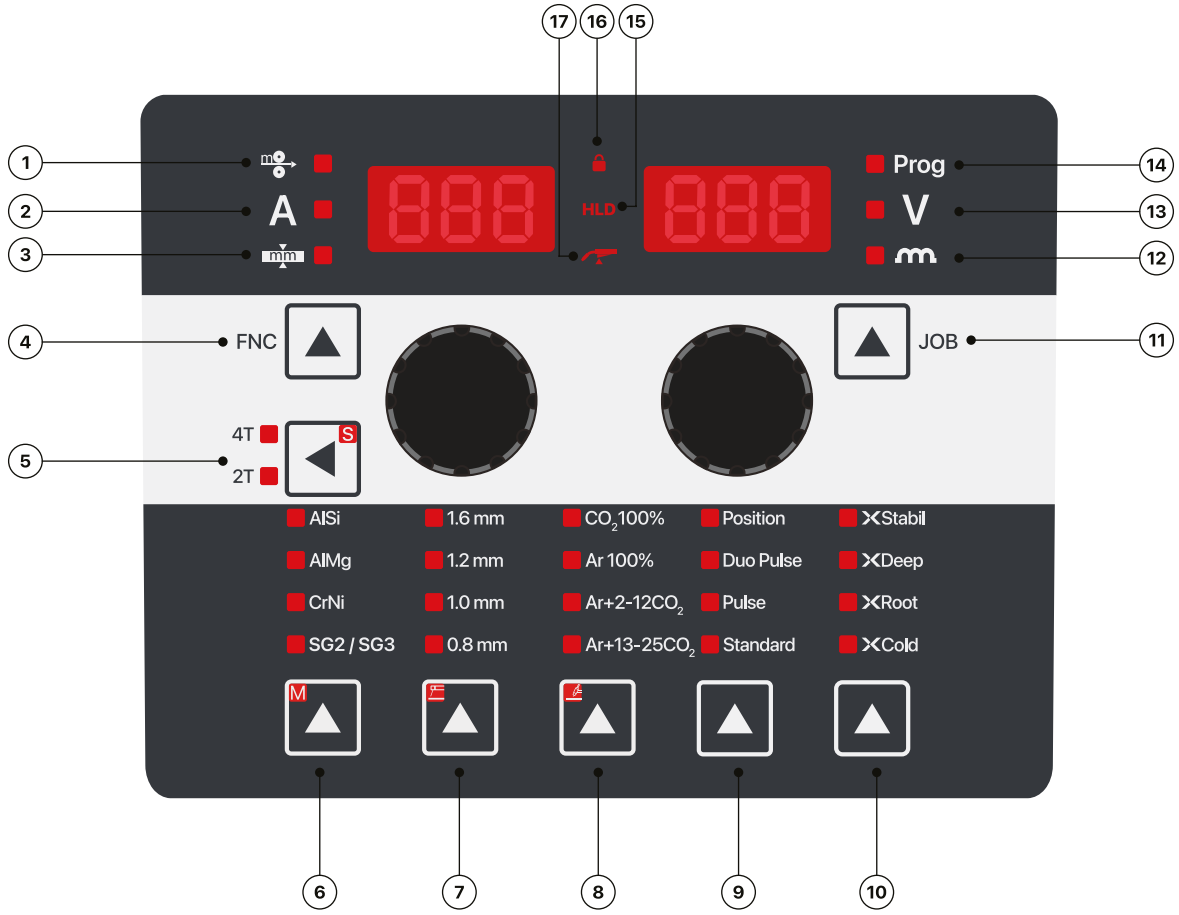
Applies to MMA welding mode:
Within 0.3 seconds of the end of welding:

- VRD is active again
- Restriction of the output voltage to 35 V is ensured again

NOTE!

MX400 power sources comes with the standard VRD safety parameters.

Front panel



(1) Wire Feed Speed

(2) Welding Current

(3) Material Thickness Selection

(4) Above Menu Selection / Function Settings

(5) Trigger Selection

(6) Material Type Selection / Press and Hold for Manual Welding

(7) Wire Diameter Selection / Press and Hold for TIG Welding

(8) Shielding Gas Selection / Press and Hold for MMA Welding

(9) Standard Process Selection

(10) X Process Selection

(11) Above Menu Selection / Job Settings

(12) Inductance

(13) Voltage

(14) Program Memory

(15) Hold Indicator

(16) Lock Indicator

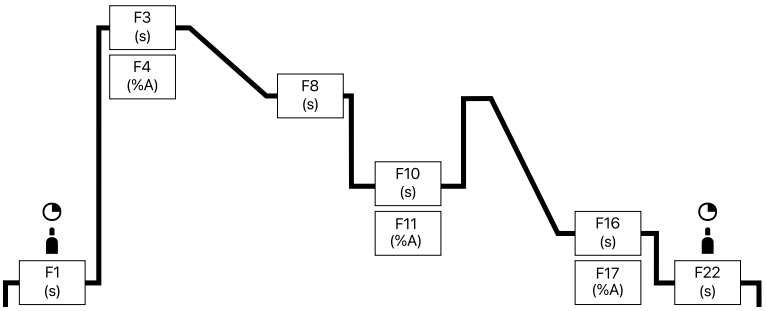
(17) Trigger Indicator

Job Table

Job List ←

Standard - Pulse			0.8	1.0	1.2	1.6
SG2 / SG3		Ar+18%CO_2	8	10	12	16
		Ar+10%CO_2	18	20	22	26
		CO_2 100%	28	30	32	36
CrNi	308 / 316 / 318 / 19 9 / 19 12 3	Ar+2.5%CO_2	68	70	72	76
CuSi		Ar100%	178	180	182	186
CuAl		Ar100%	188	190	192	196
AlMg4,5 Mn		Ar100%	118	120	122	126
AlSi		Ar100%	138	140	142	146
Flux Cored			0.8	1.0	1.2	1.6
Steel / FC Metal		Ar+18%CO_2	238	240	242	246
Steel / FC Rutil		Ar+18%CO_2	248	250	252	256
		CO_2 100%			262	266
Steel / FC Basic		Ar+18%CO_2			602	
CrNi / FC Metal		Ar+2.5%CO_2			272	276
CrNi / FC Rutil		Ar+18%CO_2			282	286
CrNi / FC Rutil		CO_2 100%			292	296
Steel / FC High Str.		Ar+18%CO_2			592	
Steel / FC Rutil		Self Shielded		720	722	
XDeep - Pulse			0.8	1.0	1.2	1.6
SG2 / SG3		Ar+18%CO_2	298	300	302	306
		Ar+10%CO_2	308	310	312	316
CrNi	308 / 316 / 318 / 19 9 / 19 12 3	Ar+2.5%CO_2		640	642	646
AlMg4,5 Mn		Ar100%			332	336
AlSi		Ar100%			342	346
XRoot - Pulse			0.8	1.0	1.2	1.6
SG2 / SG3		Ar+18%CO_2		360	362	
		CO_2 100%		370	372	
		Ar+10%CO_2		500	502	
XCold - Pulse			0.8	1.0	1.2	1.6
SG2 / SG3		Ar+18%CO_2	378	380	382	386
		CO_2 100%	388	390	392	
		Ar+10%CO_2		510	512	
CrNi	308 / 316 / 318 / 19 9 / 19 12 3	Ar+2.5%CO_2	398	400	402	
Application						
MIG/MAG Manual			4			
TIG (Lift Arc)			5			
MMA			6			
Gouging			7			

Function Graphic ←



Function List ←

	Function	Description	Min	Max
MIG/MAG	F1	Gas pre-flow (s)	0	10
	F2	Start wire speed (m/min)	20	100
	F3	Start time (s)	0	10
	F4	Start current (%)	1	200
	F5	Start arc correction(V)	-9.9	+9.9
	F7	Start slope (s)	0	5
	F8	Duo peak time (s)	0.05	10
	F10	Duo base time (s)	0.05	10
	F11	Duo base amper (%)	1	100
	F12	Duo base arc correction (v)	-9.9	+9.9
	F15	End down slope (s)	0	10
	F16	End time (s)	0	10
	F17	End current (%)	1	200
	F18	End arc correction (V)	-9.9	+9.9
	F20	End burn back (-)	0	15
	F21	End wire cut mode (-)	0	2
	F22	Gas post-flow (s)	0	10
	F23	Smart trigger (-)	0	10
	F24	Penetration stabilizer (m/min)	0	10

	Function	Description	Min	Max
MMA	F25	Hot start time (s)	0	10
	F26	Hot start current (%)	1	200
	F27	Arc force (-)	0	+50
	F28	Antistick (s)	0	2
	F29	VRD function (-)	0	1
OTHERS	F34	Tack/stich mode (-)	0	2
	F35	Cooling mode (-)	0	4
	F36	Motor current (A)	0	4
	F37	Motor current limit (A)	0.7	7
	F38	Auto load default values (-)	0	1
	F39	Motor control firmware (-)	-	-
	F40	Power control firmware (-)	-	-
	F41	Arc on time (h)	0	4
	F42	Machine on time (h)	0	4
	F45	Wire speed correction (m/min)	-2	+2
	F48	Status light template	0	4
	F49	Controller mode	0	9
	F50	RL cable calibration (mOhm)	0	30
TIG	F31	TIG V stop limit (V)	18	18
	F32	TIG comfort stop sensitivity (V)	-2	+2

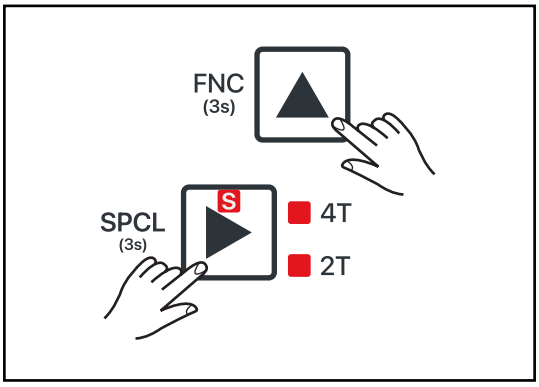
FNC

FNC key is pressed and hold for three seconds helps you to select the functions as given on the Function Table (given on page number 27)

SPCL

SPCL key if pressed and hold for three seconds helps you to select between 2T/4T and S2T/S4T functions. Once the SPCL or special 2T/4T is activated the LED denoted by letter S starts blinking.

Activating/deactivating the FNC/2T/4T/S2T/S4T :

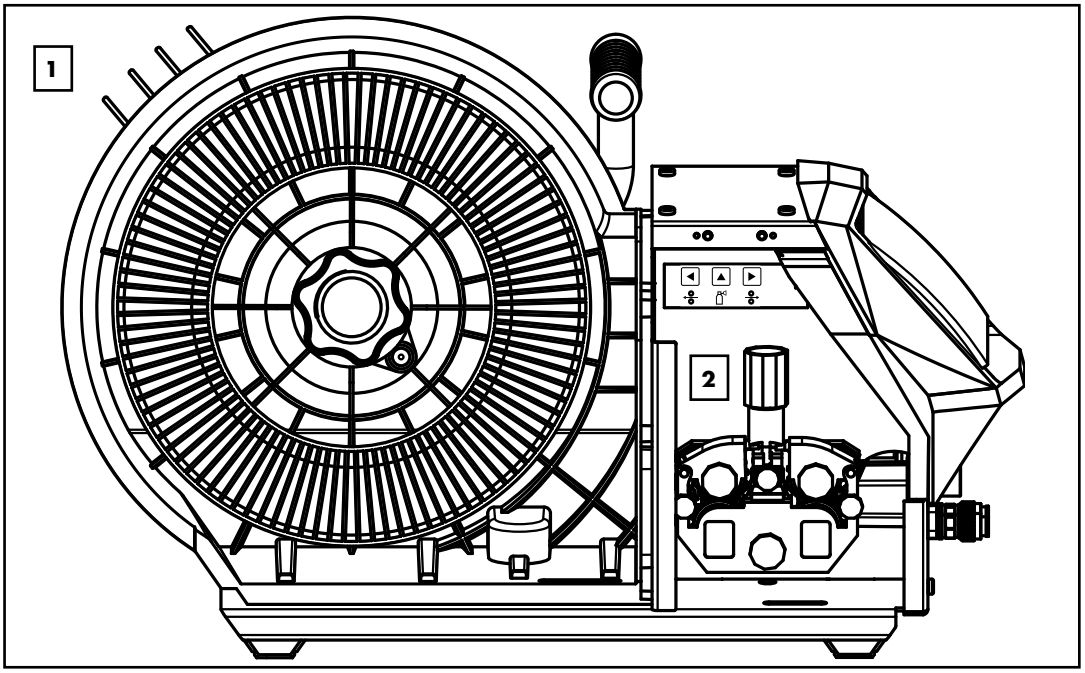


Connections, switches and mechanical components

Side view

wire feed buttons

gas test buttons



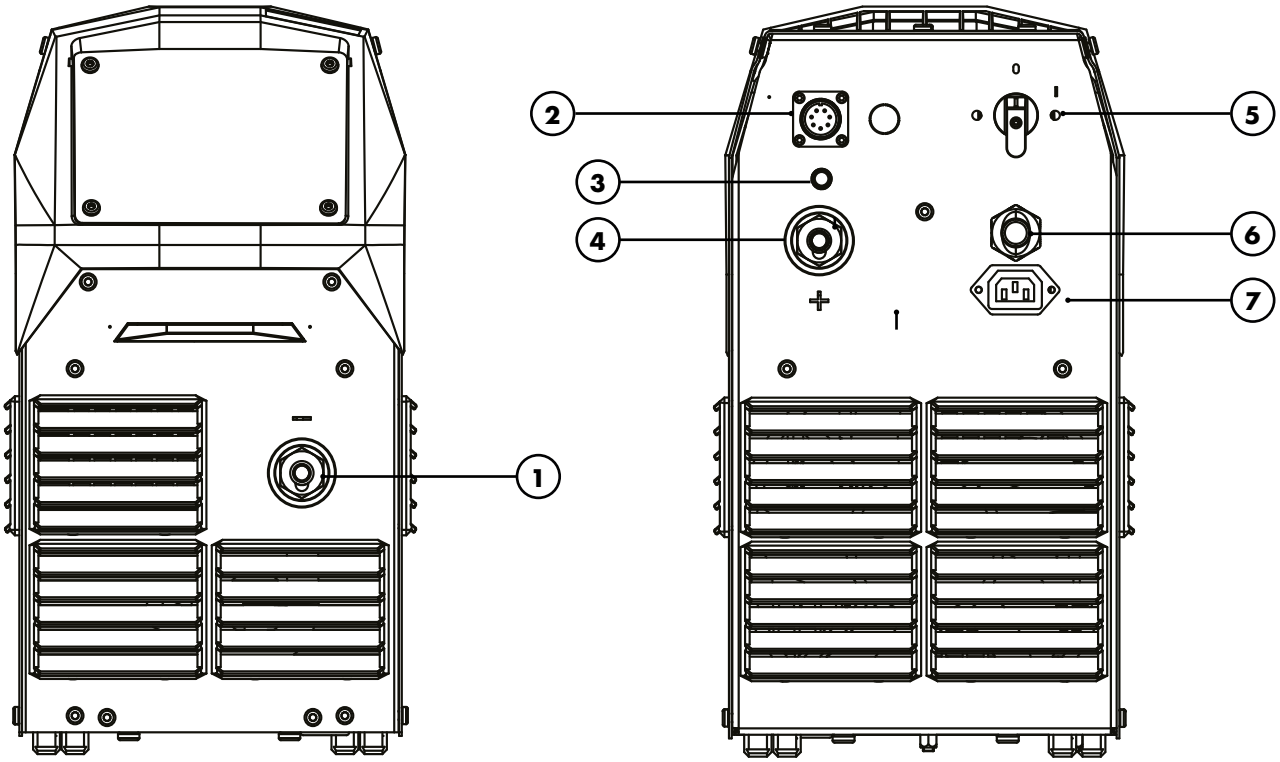
(1) Wire spool holder with brake max. 300 mm (11.81 in.) diameter and max. 19 kg (41.89 lb.) standard wire spool for slot

(2) 4 roller drive

This button when pressed and hold helps you to feed wire

This button when pressed and hold helps you to feed gas

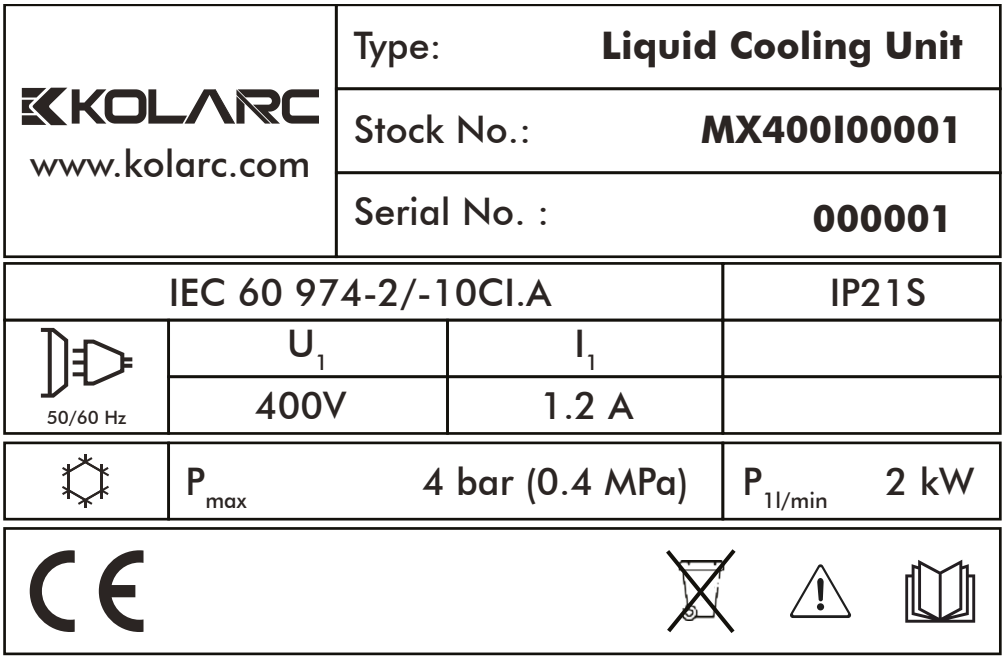
MX400 power supply front rear view



(1)	Ground Bayonet Socket
(2)	Interconnection Hose Socket
(3)	10 AMP Glass Fuse- Wirefeeder Cominication
(4)	Welding Power Positive Bayonet Socket
(5)	On/Off Switch: To enable and disable the power supply.
(6)	Cable Gland
(7)	CO_2 gas heater socket (220V, 45 Watt Maximum)

Cooling Unit Technical Data

Standard Cooling Unit Label



The technical specification of MX-series cooling units:

Input voltage: U1 = 1 x 400 V

Input current: I1 = 0.8 A

Cooling capacity (1 l/min, +25 °C): 1360 W

Max. liquid hose length: 40 m

Max. liquid flow (bypassed): 7 l/min

Max. liquid flow (torch 4 m 501-type): 3.35 l/min

Max pump pressure: 4 bar

Pump: single-impeller peripheral pump

Coolant capacity: 5 l

Coolant type: 30 glycole-type; ethanol- / isopropanol-based

Protection degree: IP21s

Dimensions (L x W x H):

WX: 693 mm x 265 mm x 238 mm

WXS: 623 mm x 265 mm x 238 mm

Weight (no coolant): 16 kg

Declaration of conformity: CE

Minimum Equipment For Welding Operations

General

Depending on the welding process, a minimum level of equipment is required to work with the power source.
The following describes the welding processes and the corresponding minimum equipment for welding operations.

Air-cooled MIG/MAG welding

- Power source
- Grounding cable
- Air-cooled MIG/MAG welding torch
- Gas connection (shielding gas supply)
- Wirefeeder
- Air-cooled interconnecting hosepack
- Wire electrode

Liquid-cooled MIG/MAG welding

- Power source
- Cooling unit
- Grounding cable
- Liquid-cooled MIG/MAG welding torch
- Gas connection (shielding gas supply)
- Wirefeeder
- Liquid cooling option
- Liquid-cooled interconnecting hosepack
- Wire electrode

Manual metal arc welding

- Power source
- Grounding cable
- Electrode holder
- Rod electrodes

Minimum equipment for arc air gouging

- MX400 power source
- Grounding cable 70 mm^2
- Welding torch
- Compressed air supply

Before Installation And Initial Operation

Safety

⚠ WARNING!

Operating the device incorrectly can cause serious injury and damage to property.

► Do not use the functions described here until you have fully read and understood the Operating Instructions.

⚠ WARNING!

An electric shock can be fatal.

If the power source is connected to the grid during installation, there is a danger of serious personal injury and property damage.

► Only carry out work on the device when the power source's power switch is in the - O - position.

► Only carry out work on the device when the power source has been disconnected from the grid.

Intended use

The power source is intended exclusively for MIG/MAG, MMA, and TIG welding.
Utilization for any other purpose, or in any other manner, shall be deemed to be not in accordance with the intended purpose.
The manufacturer shall not be held liable for any damages arising from such use.

Intended use also means
- Following all the instructions in these Operating Instructions
- Carrying out all the specified inspection and maintenance work

Setup regulations

The device has been tested according to degree of protection IP 21. This means:
- Protection against penetration by solid foreign bodies with diameters > 12 mm (0.49 in.)
- Protection against spraywater at any angle up to 60° from the vertical
  The device can be set up and operated outdoors in accordance with degree of protection IP 21.
  Direct moisture (e.g., from rain) must be avoided.

⚠ WARNING!

Toppling or falling devices can be deadly.

► Place devices on a solid, level surface so that they remain stable.

⚠ WARNING!

Danger of electrical current due to electrically conductive dust in the device.

This can result in severe personal injury and damage to property.

Assembling system components (overview)

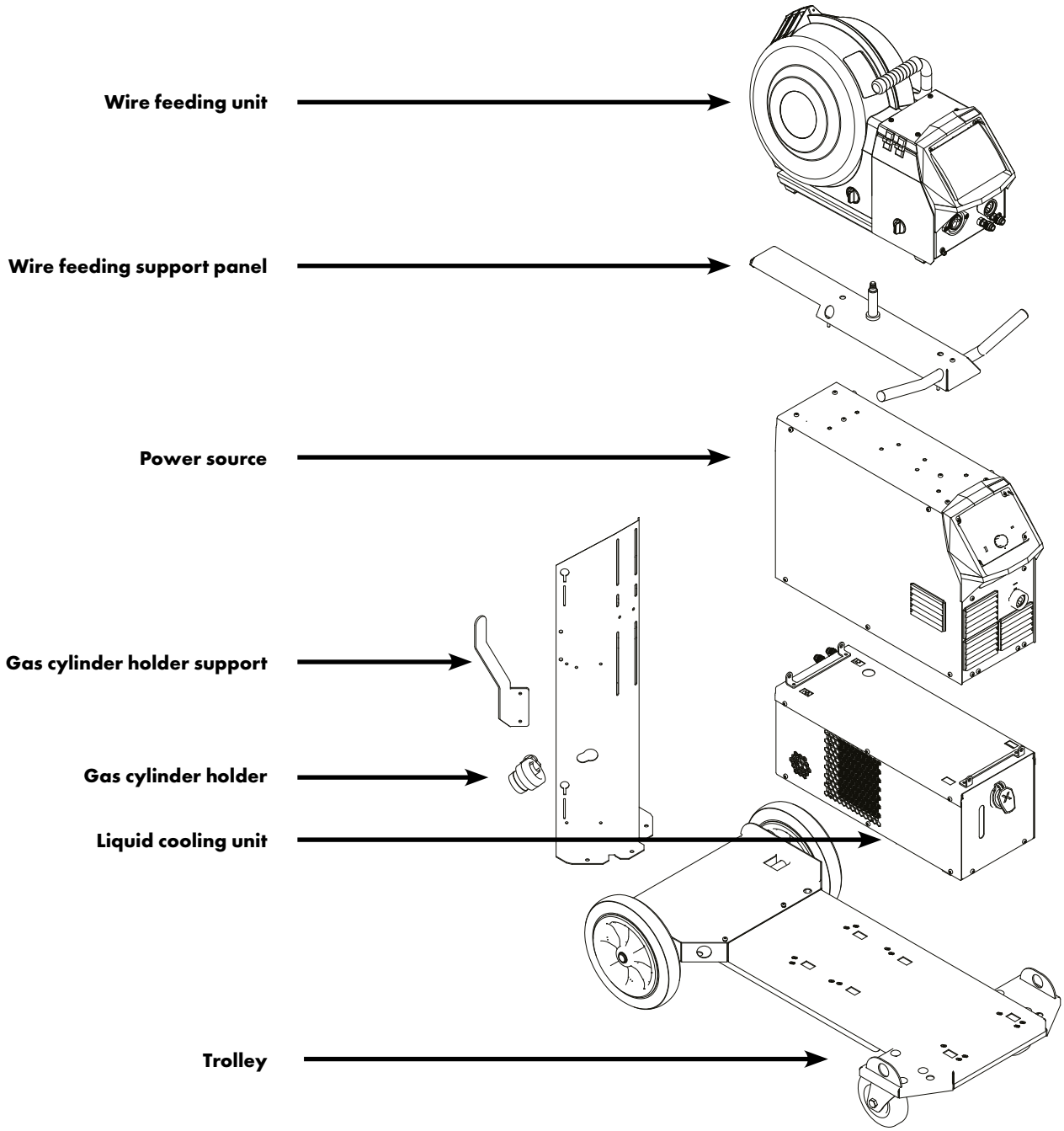
⚠ WARNING!

Work performed incorrectly can cause serious injury and damage.

► The following activities must only be carried out by trained and qualified personnel.

► Please note the information in the “Safety instructions” chapter!

The following diagram is intended to provide you with an overview of how the individual system components are put together.



Place the wirefeeder on the power source

⚠ CAUTION!

Danger of personal injury and damage to equipment due to falling wirefeeder.

► Ensure that the wirefeeder is firmly seated on the pivot pin and that the devices, upright brackets, and trolley are positioned securely.

Connecting the interconnecting hosepack

⚠ WARNING!

Fitting the device incorrectly can cause serious injury and damage to property.

► Do not perform the steps described here until you have fully read and understood the Operating Instructions.

NOTE!

When connecting the interconnecting hosepack, check that

► All connections are connected properly

► All cables, leads, and hosepacks are undamaged and correctly insulated

IMPORTANT! Gas-cooled systems are not fitted with a cooling unit. The liquid connections therefore do not need to be connected for gas-cooled systems

Correct routing of the interconnecting hosepack

IMPORTANT! The duty cycle values (D.C.) of the interconnecting hosepack can only be achieved if it is correctly routed.

Establishing a ground earth connection

NOTE!

When establishing a ground earth connection, observe the following points:

► Use a separate grounding cable for each power source

► Keep positive cables and grounding cables together as long and as close as possible

► Physically separate the welding circuits of individual power sources

► Do not route several grounding cables in parallel;
if parallel routing cannot be avoided, keep a minimum distance of 30 cm between the welding circuits

► Keep the grounding cables as short as possible, provide a large cable cross-section

► Do not cross over grounding cables

► Avoid ferromagnetic materials between the grounding cables and the interconnecting hosepack

► Do not wind long grounding cables - coil effect!
Route long grounding cables in loops

► Do not route grounding cables in iron pipes, metal cable trays, or on steel beams, avoid cable ducts;
(routing positive cables and grounding cables together in an iron pipe does not cause any problems)

► If several grounding cables are used, separate the part's ground points as far as possible and do not allow crossed current paths under the individual arcs.

► Use compensated interconnecting hosepacks (interconnecting hosepacks with integrated grounding cable)

Connecting the gas cylinder

⚠ WARNING!

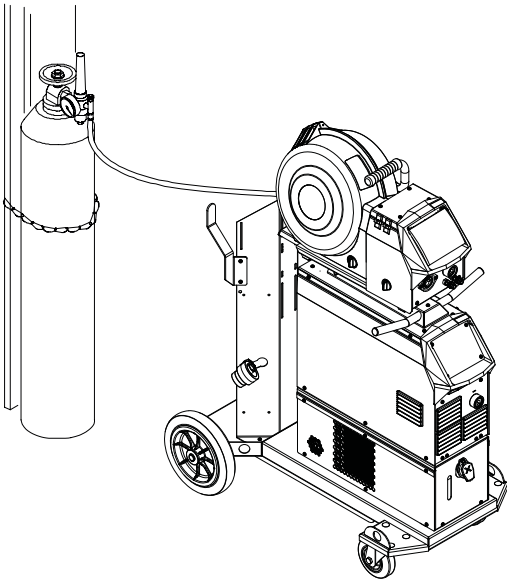
Danger of severe injury and damage to property if gas cylinders fall over.
When using gas cylinders:

► Place them on a solid, level surface in such a way that they remain stable

► Secure the gas cylinders to prevent them from falling over

► Install the VR holder option

► Observe the safety rules of the gas cylinder manufacturer



1- Place the gas cylinder on the base of the trolley

2- Secure the gas cylinder against falling using the cylinder strap in the upper area of the gas cylinder (but not on the neck of the cylinder)

3- Remove the protective cap of the gas cylinder

4- Briefly open the gas cylinder valve to remove any dirt

5- Inspect the seal on the gas pressure regulator

6-Screw the pressure regulator onto the gas cylinder and tighten it

7- Connect the protective gas shield hose of the interconnecting hosepack to the pressure regulator using a gas hose

NOTE!

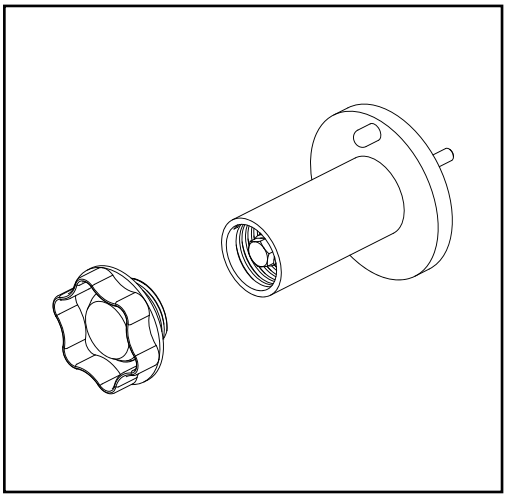
US devices are supplied with an adapter for the gas hose:

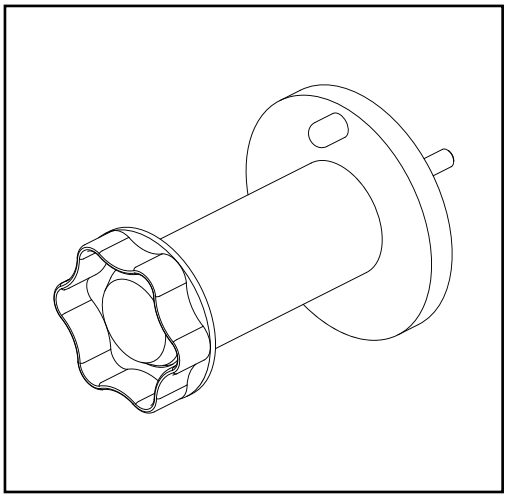
► Seal the outside thread on the gas solenoid valve using suitable means before screwing on the adapter.

► Test the adapter to ensure that it is gas-tight.

Brake Cylinder

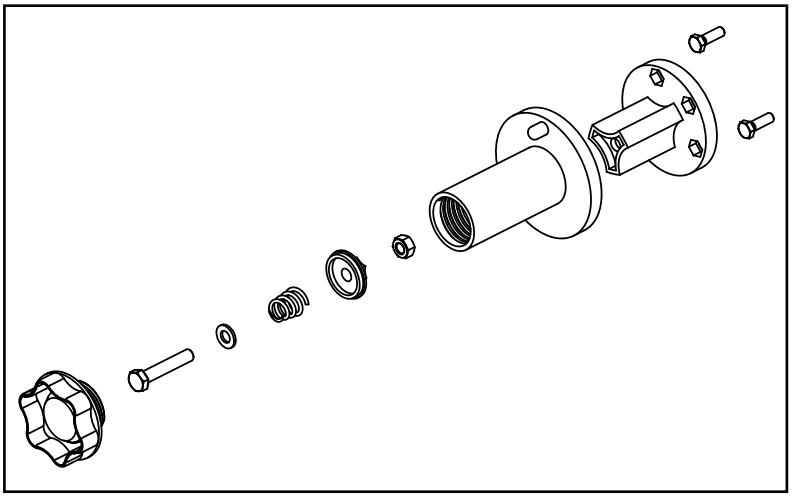
Brake Cylinder Components



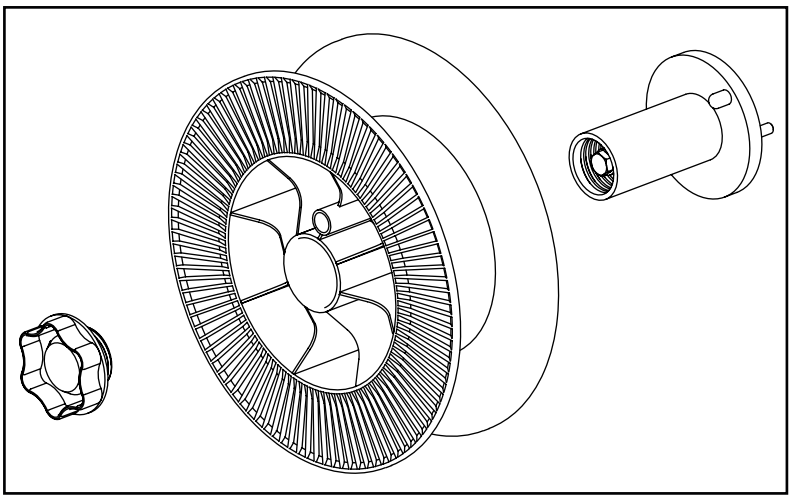


► Place the safety ring on the brake cylinder according to the image on the right.

► Be sure to correctly assemble the brake cylinder components according to the image below.



Wire Feeding Reel



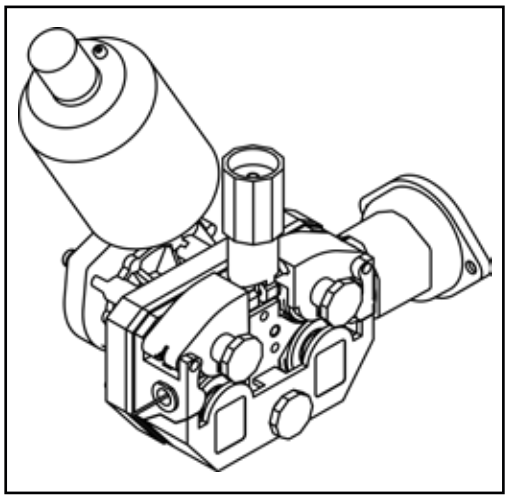
► Assemble the Wire Feed Roller and Brake Cylinder in accordance with the image.

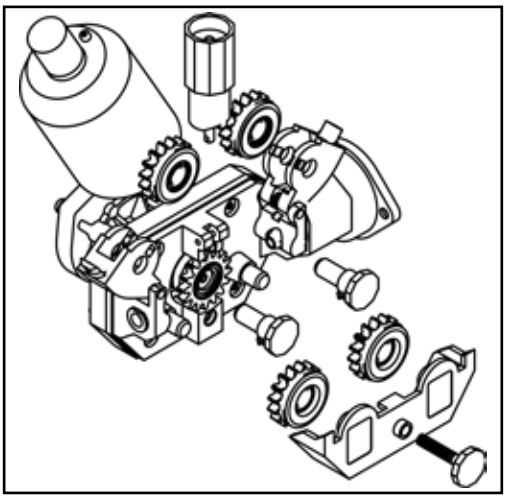
Feed rollers placement / changing

⚠ CAUTION!

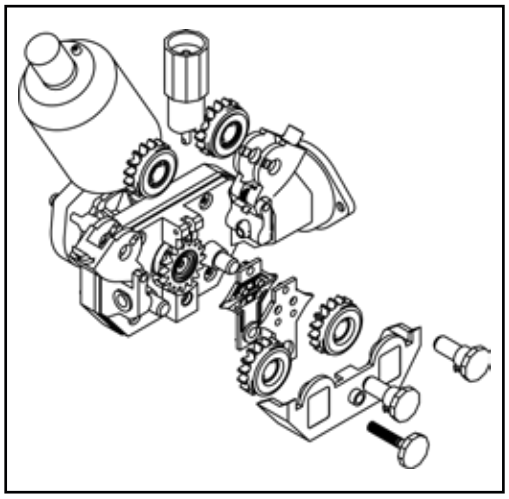
Danger due to sudden raising of the feed rollers.
Serious injuries may occur.

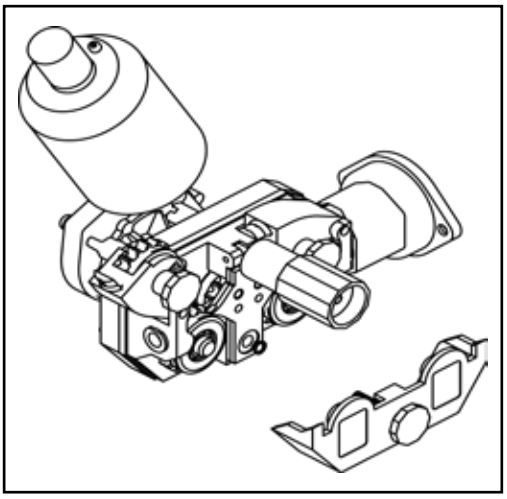
► Keep your fingers away from the left and right areas of the arm when unlocking the handle.
1. In this photograph we can see the wire feeder unit in its proper form
2. After removing the wire feeder motor cover you have to pull the wire feeder handle as indicated by the arrows to replace the rollers.





► Always install the 4 roller drive motor protective cover after replacing the feed roller.
3. Change the wirefeeder rollers, pressure rollers etc as per your needs.
4. Close the wire feeder roller properly





MIG/MAG Welding

Safety

⚠ WARNING!

Operating the device incorrectly can cause serious injury and damage to property.

► Do not use the functions described here until you have fully read and understood the Operating Instructions.

► Do not use the functions described here until you have fully read and understood all of the Operating Instructions of the system components, especially the safety rules.

⚠ WARNING!

An electric shock can be fatal.
If the power source is connected to the grid during installation, there is a danger of serious personal injury and property damage.

► Only carry out work on the device when the power source's power switch is in the - O - position.

► Only carry out work on the device when the power source has been disconnected from the grid.

Preparation

1- Connect the liquid hoses of the welding torch to the corresponding connection sockets on the wirefeeder
(when using the cooling unit and liquid-cooled welding torch)
2- Insert mains plug
3- Set the power switch to ON
- All displays on the control panel briefly illuminate
- If present: The cooling unit starts to work

IMPORTANT! Observe the safety rules and operating conditions in the Operating Instructions for the cooling unit.

Overview

MIG/MAG welding is composed of the following sections:
- MIG/MAG synergic welding
- MIG/MAG standard manual welding
- Spot welding

MIG/MAG Synergic Welding

MIG/MAG synergic welding

1. Press the "Material" button (as denoted by 13 on page number 25) to select the filler metal to be used.
2. Press the "Wire diameter" button (as denoted by 14 on page number 25) to select the diameter of the wire electrode used.
3. Press the "Shielding gas" button (as denoted by 15 on page number 25) to select the shielding gas to be used.
4. Press the "Process" button (as denoted by 16 on page number 25) to select the desired welding process:

MIG/MAG standard synergic welding

MIG/MAG pulsed synergic welding

Or any other process of your choice

IMPORTANT! Under certain circumstances, it may not be possible to change welding parameters that have been set on the control panel of a system component - such as remote control or wirefeeder - on the control panel of the power source.

5. Use the "Parameter selection" button (as denoted by 5 on page number 25) by pressing one time to select the welding parameters to be used to specify the welding power:

Sheet thickness (denoted by 4 on page 25)

Welding current (denoted by 3 on page 25)

Wire speed (denoted by 2 on page 25)

Prog Memory (denoted by 7 on page 25)

V Voltage (denoted by 8 on page 25)

Droplet correction (denoted by 9 on page 25)

6. Use the appropriate selection with the help of the above given instructions and rotating the black knobs to set the welding parameter.
The value of the parameter is displayed on the digital display located on the panel.

The sheet thickness, welding current, wire speed, and welding voltage parameters are directly linked. It is sufficient to change one of the parameters, as the remaining parameters are immediately adjusted accordingly

All welding parameter set values remain stored until the next time they are changed. This applies even if the power source is switched off and on again. To display the actual welding current during welding, select the welding current parameter.

7. Open the gas cylinder valve

8. Adjust quantity of shielding gas:
- Tap the Gas-test button given inside the wire feeding unit
- Turn the adjusting screw on the bottom of the gas pressure regulator until the manometer displays the desired quantity of gas
- Tap the Gas-test button again

9. Press the torch trigger and start welding

⚠ CAUTION!

Danger of injury and damage from electric shock and from the wire electrode emerging from the torch.
When you press the torch trigger:

► Keep the welding torch away from your face and body

► Wear suitable protective goggles

► Do not point the welding torch at people

► Make sure that the wire electrode does not touch any conductive or grounded parts (e.g., housing, etc.)

XDeep

High welding efficiency in thick metals

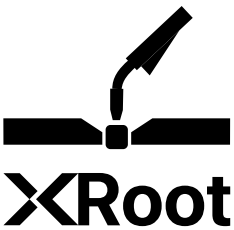
XDeep operates in the spray arc area. With high-frequency and low-amplitude current pulses, it provides high feed rate and low heat input, especially in steel and stainless steel welding applications in the PA and PB positions. This effectively reduces labor time and welding costs.



XRoot

Highly efficient root source

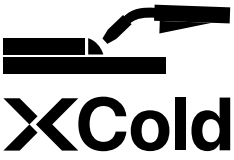
XRoot, performing short circuits at a low current level, provides excellent root penetration with high arc pressure for gap bridging in all positions.



XCold

Eliminate high heat input

XCold, performing short circuits at a low current level, enables high melting power and quality weld seams with low heat input.



XStabil

Uniform welding quality

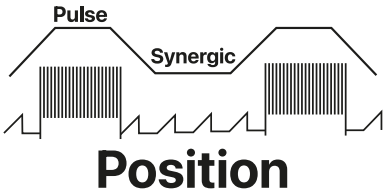
If the free wire length is high (the contact nozzle is too far from the workpiece), the reference current drops and the penetration decreases in order to keep the voltage constant. If the reference current is lower than expected, XStabil increases the wire speed to prevent the reference current from dropping and keep the penetration constant.



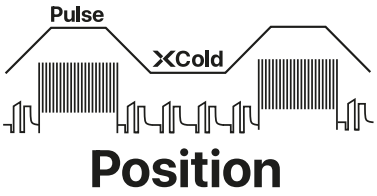
Position

Easy control in vertical and overhead welding positions

Position works effectively in both high and low welding power cycles, providing penetration at high power and cooling the weld pool at low power. These features enhance control and confidence when working in vertical and overhead welding positions.



Position



Position

Duo Pulse

Flawless welding of thin materials

Duo Pulse effectively performs in high and low welding power cycles, providing penetration at high power and cooling the weld pool at low power. These features enable achieving flawless results in thin materials, corner welds, and high precision applications.



Duo Pulse

Corrections during welding

The arc length correction and arc-force dynamic parameters can be used to optimize the welding result.

Arc length correction:
- = shorter arc, reduced welding voltage
0 = neutral arc
+ = longer arc, increased welding voltage

Pulse / arc-force dynamic correction
For continuous correction of the droplet detachment force in MIG/MAG pulsed synergic welding
- reduced droplet detachment force
0 neutral droplet detachment force
+ increased droplet detachment force

For influencing the short-circuiting dynamic at the instant of droplet transfer during MIG/MAG standard synergic welding
- = soft, low-spatter arc
0 = neutral arc
+ =hard, stable arc

IMPORTANT! Under certain circumstances, it may not be possible to change welding parameters that have been set on the control panel of a system component - such as remote control or wirefeeder - on the control panel of the power source.

The welding parameter values are shown in the digital display located above.

All welding parameter set values remain stored until the next time they are changed. This applies even if the power source is switched off and on again. To display the actual welding current during welding, select the welding current parameter.

To display the actual welding current during welding:
- Press the “Parameter selection” button to select the welding current parameter
- The actual welding current is shown on the digital display during welding.

7- Open the gas cylinder valve
8- Adjust quantity of shielding gas:
- Tap the Gas-test button
- Turn the adjusting screw on the bottom of the gas pressure regulator until the manometer displays the desired quantity of gas
- Tap the Gas-test button again

9- Press the torch trigger and start welding

⚠ CAUTION!

Danger of injury and damage from electric shock and from the wire electrode emerging from the torch.
When you press the torch trigger:

► Keep the welding torch away from your face and body

► Wear suitable protective goggles

► Do not point the welding torch at people

► Make sure that the wire electrode does not touch any conductive or grounded parts (e.g., housing, etc.)

Corrections during welding

To obtain the best possible welding results, the arc-force dynamic parameter will sometimes need to be adjusted.

1- Press the “Parameter selection” button to select the arc-force dynamic parameter

2- Use the selection dial to set the desired arc-force dynamic value

The welding parameter value is shown in the digital display located above it.

Manual Metal Arc (MMA) Welding

Safety

⚠ WARNING!

Operating the device incorrectly can cause serious injury and damage to property.

► Do not use the functions described here until you have fully read and understood the Operating Instructions.

► Do not use the functions described here until you have fully read and understood all of the Operating Instructions of the system components, especially the safety rules.

⚠ WARNING!

An electric shock can be fatal.
If the unit is connected to the grid during installation, there is a danger of serious injury and damage to property.

► Only carry out work on the device if the power switch is in the - O - position.

► Only carry out work on the device when it has been disconnected from the grid.

Preparation

1- Set the job 6 from the front panel

2- The job can be selected by holding and pressing the job button from the front panel for minimum 3 seconds

3- Once the parameters are selected the MMA mode is redy to work

IMPORTANT! Check the rod electrode packaging to determine whether the rod electrodes are for (+) or (-) welding.

4- Depending on the type of electrode, insert the grounding cable into the (-) current socket or into the (+) current socket and lock (on wire feeder)

5- Connect the other end of the grounding cable to the workpiece

6- Depending on the type of electrode, insert the bayonet connector of the electrode holder cable into the free current socket with opposite polarity and twist it clockwise to lock

7- Insert mains plug

Manual metal arc (MMA) welding

⚠ CAUTION!

Danger of injury and damage from electric shock.
When the power switch is switched to position ON, the rod electrode in the electrode holder is live.

► Ensure that the rod electrode is not touching any people or electrically conductive or grounded parts (housing, etc.)

1- Set the Job 6 for the MMA process and the front panel screens will show the electrode welding
2 - Once the "Process" is selected the electrode welding is ready

The welding voltage is applied to the welding socket with a three second time lag.

If the MMA welding process is selected, a cooling unit, if present, is automatically deactivated. It is not possible to turn it on.

IMPORTANT! Under certain circumstances, it may not be possible to change welding parameters that have been set on the control panel of a system component - such as remote control or wirefeeder - on the control panel of the power source.

3- Press the "Parameter selection (FNC)" button from the front panel to select the amperage parameter.
4- Use the selection knob from the left side of the panel to set the desired amperage.

The amperage value is displayed on the left-hand digital display.

All parameter set values that are set using the selection dial are saved until their next alteration. This applies even if the power source is switched off and on again.

5- Initiate welding process

To display the actual welding current during welding:
- Press the "Parameter selection (FNC)" button from the front panel to select the welding current (A) parameter
- The actual welding current is shown on the digital display during welding.

Corrections during welding

To obtain the best possible welding results, the arc-force dynamic parameter will sometimes need to be adjusted.

The welding parameter value is shown in the digital display located above it.

To influence the short-circuiting dynamic at the instant of droplet transfer:
- = soft, low-spatter arc
0 = neutral arc
+ = hard, stable arc

HotStart function (F25)

To obtain the best possible welding result, the HotStart function will sometimes need to be adjusted.

Advantages

- Improved ignition properties, even when using electrodes with poor ignition properties
- Better fusion of the parent material during the start-up phase, meaning fewer coldshut defects
- Slag inclusions largely avoided

Function

F25 Hot-current time,
0 - 2 s,
Factory setting 0.5 s

F26 HotStart current,
100 - 200%,
Factory setting 150%

Function

During the specified hot-start time (F25), the welding current is increased to a certain value. This value (F26) is higher than the selected welding current.

The Hot Start feature ensures that sufficient heating occurs on the base metal, which is still cold, while starting the welding process. In this way, the electrode is easily ignited and it is prevented from sticking to the workpiece

Anti-Stick function (F28)

As the arc becomes shorter, the welding voltage may also fall so that the rod electrode is more likely to stick to the workpiece. This may also cause the rod electrode to burn out.

Electrode burn-out is prevented by activating the anti-stick function. If the rod electrode begins to stick, the power source immediately switches the welding current off. The welding process can be resumed without problems once the rod electrode has been detached from the workpiece.

The anti-stick (Ast) function can be activated and deactivated in the Setup menu for the setup parameters for MMA welding.

Thanks to its anti-stick feature, the annealing of the electrode and the burning of alloy components are prevented blocking damage to the electrode in case of unwanted material contact. In contact with the electrode and the work-piece, the welding current is turned off for a short time.

Arc Air Gauging

Safety

⚠ WARNING!

Operating the device incorrectly can cause serious injury and damage to property.

► Do not use the functions described here until you have fully read and understood the Operating Instructions.

► Do not use the functions described here until you have fully read and understood all of the Operating Instructions of the system components, especially the safety rules.

⚠ WARNING!

An electric shock can be fatal.
If the unit is connected to the grid during installation, there is a danger of serious injury and damage to property.

► Only carry out work on the device if the power switch is in the - ON - position.

► Only carry out work on the device when it has been disconnected from the grid.

Preparation

IMPORTANT! A grounding cable with a cable cross-section of 120 mm² is required for arc air gouging.
1- Set the power switch to - ON -
2- Unplug the mains plug
3- Remove the MIG/MAG welding torch
4 - Insert the grounding cable into the (-) current socket and lock
5- Connect the other end of the grounding cable to the workpiece
6 - Insert the bayonet connector of the arc air gouging torch into the (+) current socket and twist it clockwise to lock
7- Connect the compressed air connection of the arc air gouging torch to the compressed air supply
Working pressure: 5 - 7 bar (constant)
8- Clamp the carbon electrode so that the electrode tip protrudes approx. 100 mm from the arc air gouging torch; the air outlet openings of the arc air gouging torch must be at the bottom
9- Insert the mains plug
10- To open the job long press Job button for 3 seconds on the front pael and set job 7 by turning the right knob.

Arc air gouging

⚠ **CAUTION!**

Danger of injury and damage from electric shock.
When the power switch is switched to position - I -, the electrode in the arc air gouging torch is live.

► Ensure that the electrode is not touching any people or electrically conductive or grounded parts (housing, etc.).

Querying The Source Circuit Inductance

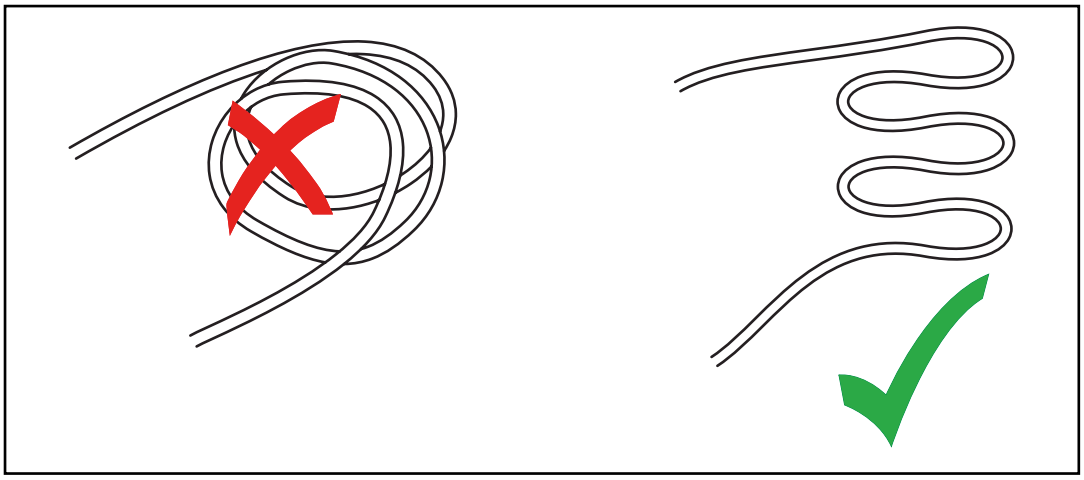
General information

Significant effects of the placement of the hose packages on the welding circuit inductance has an impact on the welding process. The best possible welding result
It is important to position the hosepack correctly in order to obtain

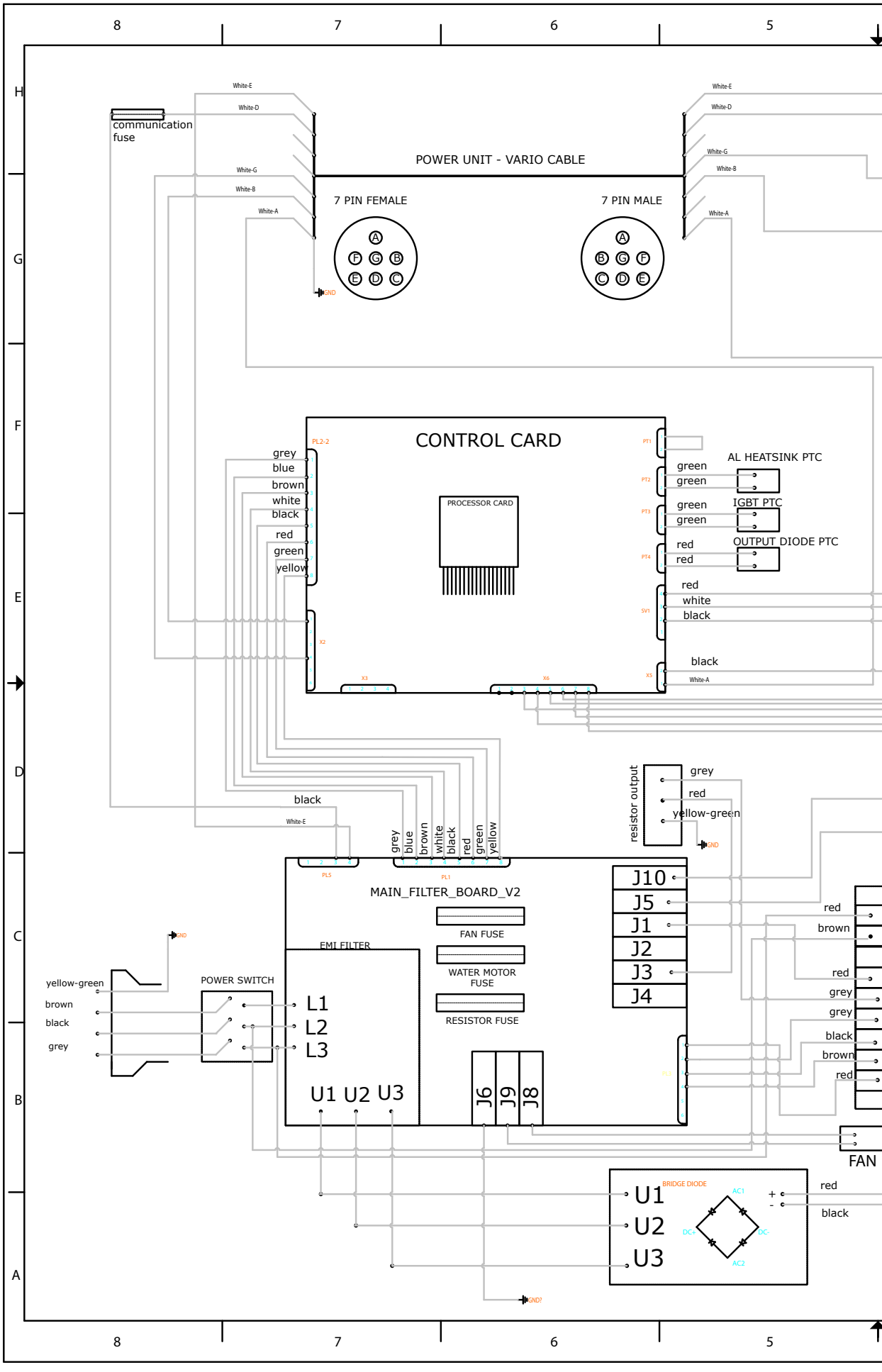
Welding circuit its inductance shows

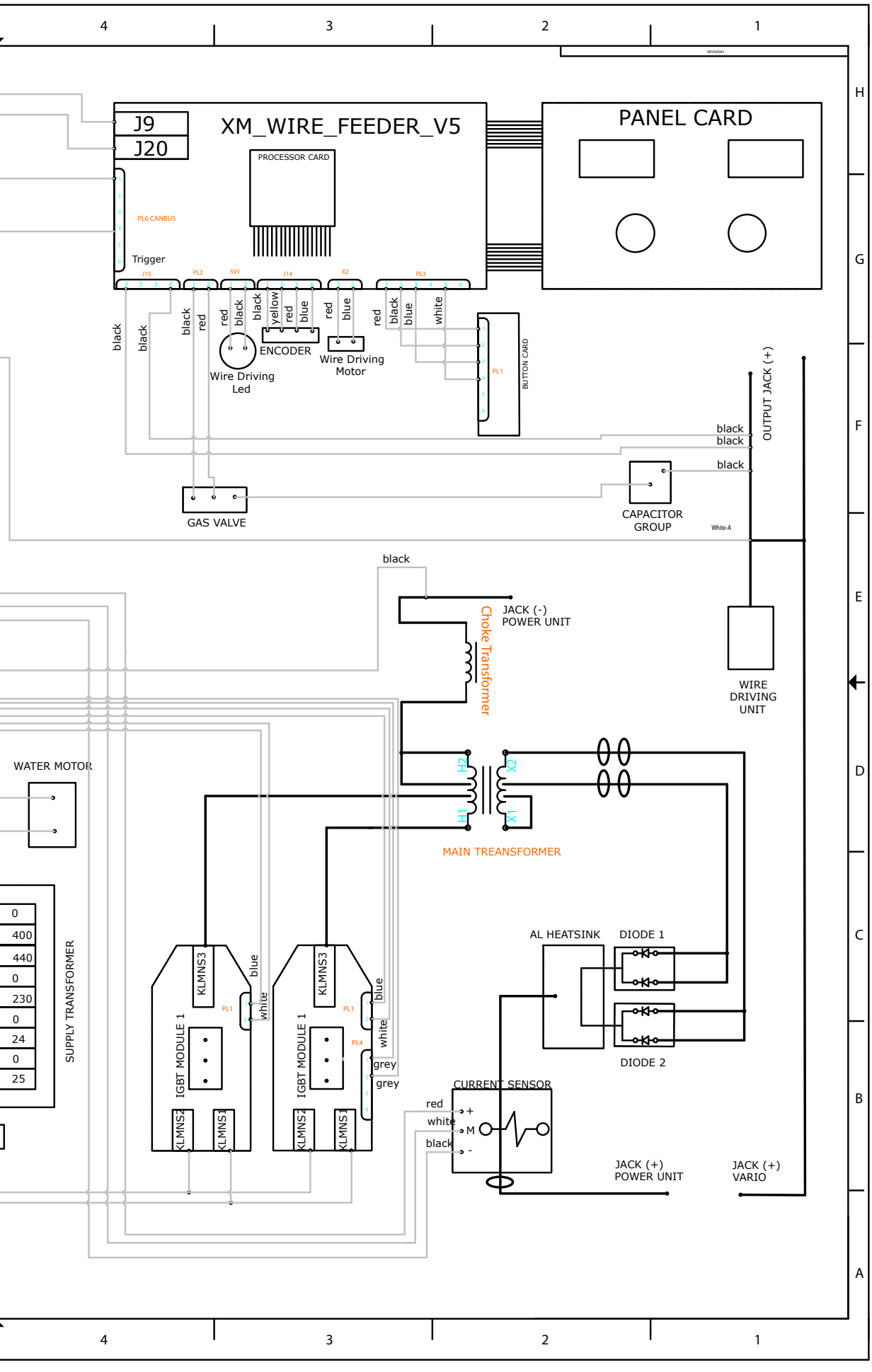
Welding circuit inductance finally calculated by means of setting parameter " " is displayed. The actual setting of the welding circuit inductance is by calculation of the welding circuit resistance carried out simultaneously. By inductance symbol on the menu, you can calculate the inductance.

Of the hose package correctly positioned



Electrical Diagram




J9
J20
XM_WIRE_FEEDER_V5
PROCESSOR CARD
PL6 CANBUS
Trigger
PANEL CARD
ENCODER
Wire Driving Led
Wire Driving Motor
BUTTON CARD
GAS VALVE
CAPACITOR GROUP
OUTPUT JACK (+)
JACK (-) POWER UNIT
Choke Transformer
WIRE DRIVING UNIT
WATER MOTOR
MAIN TREANSFORMER
SUPPLY TRANSFORMER
IGBT MODULE 1
KLMNS1
KLMNS2
KLMNS3
AL HEATSINK
DIODE 1
DIODE 2
CURRENT SENSOR
JACK (+) POWER UNIT
JACK (+) VARIO

Troubleshooting

General

The devices are equipped with an intelligent safety system, which largely negates the need for melting-type fuses. Melting-type fuses therefore no longer need to be replaced. After a possible malfunction has been remedied, the device is ready for use again.

Safety

⚠ WARNING!

Work that is performed incorrectly can cause serious injury and damage to property.

► Only trained and qualified personnel may carry out the activities described in the following.

► Follow the safety rules in the power source Operating Instructions

⚠ WARNING!

An electric shock can be fatal.
Before opening the device:

► Set the power switch to - O -

► Unplug the device from grid power

► Attach a clear warning sign advising others not to switch the power source back on

► Use a suitable measuring instrument to ensure that electrically charged components (e.g., capacitors) are discharged

⚠ WARNING!

Danger due to insufficient ground conductor connection!
This can result in severe personal injury and damage to property.

► The housing screws provide an adequate ground conductor connection for grounding the housing and should not be replaced under any circumstances by other screws that do not provide a reliable ground conductor connection.

Error Resolution Table

A	V	
Err	01	**Error-1** Phase error. Occurs when any of the phases does not reach the machine.
Err	03	**Error-3** IGBT thermal error. Occurs when the IGBTs overheat or when the fan is not operating. (Used in SAW models only.)
Err	04	**Error-4** Flow sensor error. Triggered when the machine runs out of coolant or when the connectors are not properly inserted.
Err	05	**Error-5** IGBT thermal error. Occurs when the IGBTs overheat or the fan is not operating.
Err	06	**Error-6** Diode thermal error. Triggered when the output diode overheats.
Err	08	**Error-8** Panel board communication error. Occurs when the panel board fails to communicate with the motor board.
Err	09	**Error-9** Motor board communication error. Occurs when the motor board fails to communicate with the control board.
Err	10	**Error-10** Con trol board communication error. Triggered when the control board fails to communicate with the panel.
Err	12	**Error-12** Overcurrent error. Occurs when the machine attempts to draw excessive current or when one of the phases is missing.
Err	14	**Error-14** Overcurrent protection error. Usually triggered by an IGBT malfunction.
Err	15	**Error-15** It occurs when there is a problem at +15 or -5 volts. It can also trigger this error if the current sensor is faulty.
Err	20	**Error-20** Robot board communication error. Occurs when the robot board fails to communicate with the control board.
Err	30	**Error-30** Motor overcurrent error. Triggered when the motor current exceeds its defined limit.
Err	40	**Error-40** Memory read/write error. Occurs when the panel fails to read or write data. When this error occurs, the panel automatically resets after 5 seconds and attempts to read/write again.

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+90 (312) 577 18 18

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100. Yıl Mah. İzci Sok. Ekin Apt. No:24/5 06709 Çankaya/ANKARA

www.kolarc.com

Kolarc BV

+31 (0)180 650 650

Bergen 2b, 2993 LR Barendrecht - The Netherlands

www.kolarc.com