



Welding machine

Picomig 305 D2 puls
Picomig 305 D3 puls

099-005266-EW501

07.05.2014

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General instructions

CAUTION



Read the operating instructions!

The operating instructions provide an introduction to the safe use of the products.

- Read the operating instructions for all system components!
- Observe accident prevention regulations!
- Observe all local regulations!
- Confirm with a signature where appropriate.

NOTE



In the event of queries on installation, commissioning, operation or special conditions at the installation site, or on usage, please contact your sales partner or our customer service department on +49 2680 181-0.

A list of authorised sales partners can be found at www.ewm-group.com.

Liability relating to the operation of this equipment is restricted solely to the function of the equipment. No other form of liability, regardless of type, shall be accepted. This exclusion of liability shall be deemed accepted by the user on commissioning the equipment.

The manufacturer is unable to monitor whether or not these instructions or the conditions and methods are observed during installation, operation, usage and maintenance of the equipment.

An incorrectly performed installation can result in material damage and injure persons as a result. For this reason, we do not accept any responsibility or liability for losses, damages or costs arising from incorrect installation, improper operation or incorrect usage and maintenance or any actions connected to this in any way.

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2 Safety instructions

2.1 Notes on the use of these operating instructions

DANGER

Working or operating procedures which must be closely observed to prevent imminent serious and even fatal injuries.

- Safety notes include the "DANGER" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol on the edge of the page.

WARNING

Working or operating procedures which must be closely observed to prevent serious and even fatal injuries.

- Safety notes include the "WARNING" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol in the page margin.

CAUTION

Working or operating procedures which must be closely observed to prevent possible minor personal injury.

- The safety information includes the "CAUTION" keyword in its heading with a general warning symbol.
- The risk is explained using a symbol on the edge of the page.

CAUTION

Working and operating procedures which must be followed precisely to avoid damaging or destroying the product.

- The safety information includes the "CAUTION" keyword in its heading without a general warning symbol.
- The hazard is explained using a symbol at the edge of the page.

NOTE








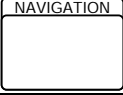





Special technical points which users must observe.

- Notes include the "NOTE" keyword in the heading without a general warning symbol.

Instructions and lists detailing step-by-step actions for given situations can be recognised via bullet points, e.g.:

- Insert the welding current lead socket into the relevant socket and lock.

2.2 Explanation of icons

Symbol	Description
	Press
	Do not press
	Turn
	Switch
	Switch off machine
	Switch on machine
	ENTER (enter the menu)
	NAVIGATION (Navigating in the menu)
	EXIT (Exit the menu)
	Time display (example: wait 4s/press)
	Interruption in the menu display (other setting options possible)
	Tool not required/do not use
	Tool required/use

2.3 General

DANGER



Electromagnetic fields!

The power source may cause electrical or electromagnetic fields to be produced which could affect the correct functioning of electronic equipment such as IT or CNC devices, telecommunication lines, power cables, signal lines and pacemakers.

- Observe the maintenance instructions! (see Maintenance and Testing chapter)
- Unwind welding leads completely!
- Shield devices or equipment sensitive to radiation accordingly!
- The correct functioning of pacemakers may be affected (obtain advice from a doctor if necessary).



Do not carry out any unauthorised repairs or modifications!

To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!

The warranty becomes null and void in the event of unauthorised interference.

- Appoint only skilled persons for repair work (trained service personnel)!



Electric shock!

Welding machines use high voltages which can result in potentially fatal electric shocks and burns on contact. Even low voltages can cause you to get a shock and lead to accidents.

- Do not touch any live parts in or on the machine!
- Connection cables and leads must be free of faults!
- Switching off alone is not sufficient!
- Place welding torch and stick electrode holder on an insulated surface!
- The unit should only be opened by specialist staff after the mains plug has been unplugged!
- Only wear dry protective clothing!
- Wait for 4 minutes until the capacitors have discharged!

WARNING



Risk of injury due to radiation or heat!

Arc radiation results in injury to skin and eyes.

Contact with hot workpieces and sparks results in burns.

- Use welding shield or welding helmet with the appropriate safety level (depending on the application)!
- Wear dry protective clothing (e.g. welding shield, gloves, etc.) according to the relevant regulations in the country in question!
- Protect persons not involved in the work against arc beams and the risk of glare using safety curtains!



Explosion risk!

Apparently harmless substances in closed containers may generate excessive pressure when heated.

- Move containers with inflammable or explosive liquids away from the working area!
- Never heat explosive liquids, dusts or gases by welding or cutting!

 **WARNING****Smoke and gases!**

Smoke and gases can lead to breathing difficulties and poisoning. In addition, solvent vapour (chlorinated hydrocarbon) may be converted into poisonous phosgene due to the ultraviolet radiation of the arc!

- Ensure that there is sufficient fresh air!
- Keep solvent vapour away from the arc beam field!
- Wear suitable breathing apparatus if appropriate!

**Fire hazard!**

Flames may arise as a result of the high temperatures, stray sparks, glowing-hot parts and hot slag produced during the welding process.

Stray welding currents can also result in flames forming!

- Check for fire hazards in the working area!
- Do not carry any easily flammable objects such as matches or lighters.
- Keep appropriate fire extinguishing equipment to hand in the working area!
- Thoroughly remove any residue of flammable substances from the workpiece before starting welding.
- Only continue work on welded workpieces once they have cooled down.
Do not allow to come into contact with flammable material!
- Connect welding leads correctly!

**Risk of accidents if these safety instructions are not observed!**

Non-observance of these safety instructions is potentially fatal!

- Carefully read the safety information in this manual!
- Observe the accident prevention regulations in your country.
- Inform persons in the working area that they must observe the regulations!

**Danger when coupling multiple power sources!**

Coupling multiple power sources in parallel or in series has to be carried out by qualified personnel and in accordance with the manufacturer's guidelines. Before bringing the power sources into service for arc welding operations, a test has to verify that they cannot exceed the maximum allowed open circuit voltage.

- Connection of the machine may be carried out by qualified personnel only!
- When decommissioning individual power sources, all mains and welding current leads have to be safely disconnected from the welding system as a whole. (Danger due to inverse voltages!)
- Do not couple welding machines with pole reversing switch (PWS series) or machines for AC welding, as a minor error in operation can cause the welding voltages to be combined.

 **CAUTION****Noise exposure!**

Noise exceeding 70 dBA can cause permanent hearing damage!

- Wear suitable ear protection!
- Persons located within the working area must wear suitable ear protection!

CAUTION



Obligations of the operator!

The respective national directives and laws must be observed for operation of the machine!

- National implementation of the framework directive (89/391/EWG), as well as the associated individual directives.
- In particular, directive (89/655/EWG), on the minimum regulations for safety and health protection when staff members use equipment during work.
- The regulations regarding work safety and accident prevention for the respective country.
- Setting up and operating the machine according to IEC 60974-9.
- Check at regular intervals that users are working in a safety-conscious way.
- Regular checks of the machine according to IEC 60974-4.



Damage due to the use of non-genuine parts!

The manufacturer's warranty becomes void if non-genuine parts are used!

- Only use system components and options (power sources, welding torches, electrode holders, remote controls, spare parts and replacement parts, etc.) from our range of products!
- Only insert and lock accessory components into the relevant connection socket when the machine is switched off.



Damage to the machine due to stray welding currents!

Stray welding currents can destroy protective earth conductors, damage equipment and electronic devices and cause overheating of components leading to fire.

- Make sure all welding leads are securely connected and check regularly.
- Always ensure a proper and secure electrical connection to the workpiece!
- Set up, attach or suspend all conductive power source components like casing, transport vehicle and crane frames so they are insulated!
- Do not place any other electronic devices such as drillers or angle grinders, etc., on the power source, transport vehicle or crane frames unless they are insulated!
- Always put welding torches and electrode holders on an insulated surface when they are not in use!



Mains connection

Requirements for connection to the public mains network

High-performance machines can influence the mains quality by taking current from the mains network. For some types of machines, connection restrictions or requirements relating to the maximum possible line impedance or the necessary minimum supply capacity at the interface with the public network (Point of Common Coupling, PCC) can therefore apply. In this respect, attention is also drawn to the machines' technical data. In this case, it is the responsibility of the operator, where necessary in consultation with the mains network operator, to ensure that the machine can be connected.

CAUTION

**EMC Machine Classification**

In accordance with IEC 60974-10, welding machines are grouped in two electromagnetic compatibility classes (see technical data):

Class A machines are not intended for use in residential areas where the power supply comes from the low-voltage public mains network. When ensuring the electromagnetic compatibility of class A machines, difficulties can arise in these areas due to interference not only in the supply lines but also in the form of radiated interference.

Class B machines fulfil the EMC requirements in industrial as well as residential areas, including residential areas connected to the low-voltage public mains network.

Setting up and operating

When operating arc welding systems, in some cases, electro-magnetic interference can occur although all of the welding machines comply with the emission limits specified in the standard. The user is responsible for any interference caused by welding.

In order to **evaluate** any possible problems with electromagnetic compatibility in the surrounding area, the user must consider the following: (see also EN 60974-10 Appendix A)

- Mains, control, signal and telecommunication lines
- Radios and televisions
- Computers and other control systems
- Safety equipment
- The health of neighbouring persons, especially if they have a pacemaker or wear a hearing aid
- Calibration and measuring equipment
- The immunity to interference of other equipment in the surrounding area
- The time of day at which the welding work must be carried out

Recommendations for reducing interference emission

- Mains connection, e.g. additional mains filter or shielding with a metal tube
- Maintenance of the arc welding equipment
- Welding leads should be as short as possible and run closely together along the ground
- Potential equalization
- Earthing of the workpiece. In cases where it is not possible to earth the workpiece directly, it should be connected by means of suitable capacitors.
- Shielding from other equipment in the surrounding area or the entire welding system

2.4 Transport and installation

WARNING



Incorrect handling of shielding gas cylinders!

Incorrect handling of shielding gas cylinders can result in serious and even fatal injury.

- Observe the instructions from the gas manufacturer and in any relevant regulations concerning the use of compressed air!
- Place shielding gas cylinders in the holders provided for them and secure with fixing devices.
- Avoid heating the shielding gas cylinder!



Risk of accident due to improper transport of machines that may not be lifted!

Do not lift or suspend the machine! The machine can fall down and cause injuries! The handles and brackets are suitable for transport by hand only!

- The machine may not be lifted by crane or suspended!

CAUTION



Risk of tipping!

There is a risk of the machine tipping over and injuring persons or being damaged itself during movement and set up. Tilt resistance is guaranteed up to an angle of 10° (according to IEC 60974-1).

- Set up and transport the machine on level, solid ground.
- Secure add-on parts using suitable equipment.



Damage due to supply lines not being disconnected!

During transport, supply lines which have not been disconnected (mains supply leads, control leads, etc.) may cause hazards such as connected equipment tipping over and injuring persons!

- Disconnect supply lines!

CAUTION



Equipment damage when not operated in an upright position!

The units are designed for operation in an upright position!

Operation in non-permissible positions can cause equipment damage.

- Only transport and operate in an upright position!

2.4.1 Ambient conditions

CAUTION

**Installation site!**

The machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!

- The operator must ensure that the ground is non-slip and level, and provide sufficient lighting for the place of work.
- Safe operation of the machine must be guaranteed at all times.

CAUTION

**Equipment damage due to dirt accumulation!**

Unusually high quantities of dust, acid, corrosive gases or substances may damage the equipment.

- Avoid high volumes of smoke, vapour, oil vapour and grinding dust!
- Avoid ambient air containing salt (sea air)!

**Non-permissible ambient conditions!**

Insufficient ventilation results in a reduction in performance and equipment damage.

- Observe the ambient conditions!
- Keep the cooling air inlet and outlet clear!
- Observe the minimum distance of 0.5 m from obstacles!

2.4.1.1 In operation

Temperature range of the ambient air:

- -25 °C to +40 °C

Relative air humidity:

- Up to 50% at 40 °C
- Up to 90% at 20 °C

2.4.1.2 Transport and storage

Storage in an enclosed space, temperature range of the ambient air:

- -30 °C to +70 °C

Relative air humidity

- Up to 90% at 20 °C

3 Intended use

WARNING



Hazards due to improper usage!

Hazards may arise for persons, animals and material objects if the equipment is not used correctly. No liability is accepted for any damages arising from improper usage!

- The equipment must only be used in line with proper usage and by trained or expert staff!
- Do not modify or convert the equipment improperly!

3.1 Applications

3.1.1 MIG/MAG standard welding

Metal arc welding using a wire electrode whereby gas from an external source surrounds the arc and the molten pool to protect them from the atmosphere.

3.1.2 MIG/MAG pulse welding

Welding process for optimum welding results when joining stainless steel and aluminium thanks to controlled drop transfer and targeted, adapted heat input.

3.1.2.1 MIG/MAG cored wire welding

Welding with cored wire electrodes consisting of a metal casing and a powder core.

As with MIG/MAG standard welding, the arc is protected from the atmosphere by shielding gas. The gas is supplied either externally (gas shielded cored wires) or produced in the arc by means of the powder core (self-shielding cored wires).

3.1.2.2 rootArc

Short arc with perfect weld modelling capabilities for effortless gap bridging and positional welding

3.1.3 MMA welding

Manual arc welding or, for short, MMA welding. It is characterised by the fact that the arc burns between a melting electrode and the molten pool. There is no external protection; any protection against the atmosphere comes from the electrode.

3.1.4 TIG (Liftarc) welding

TIG welding process with arc ignition by means of workpiece contact.

3.1.5 Picomig polarity setting

The Picomig polarity setting displays the polarity required for the selected JOB on the machine control (see chapter "Machine control – operating elements"). The required polarity can then be set with the polarity selection plug.

3.2 Documents which also apply

3.2.1 Warranty

NOTE



For further information, please see the accompanying supplementary sheets "Machine and Company Data, Maintenance and Testing, Warranty"!

3.2.2 Declaration of Conformity



The designated machine conforms to EC Directives and standards in terms of its design and construction:

- EC Low Voltage Directive (2006/95/EC),
- EC EMC Directive (2004/108/EC),

This declaration shall become null and void in the event of unauthorised modifications, improperly conducted repairs, non-observance of the deadlines for the repetition test and / or non-permitted conversion work not specifically authorised by the manufacturer.

The original copy of the declaration of conformity is enclosed with the unit.

3.2.3 Welding in environments with increased electrical hazards



In compliance with IEC / DIN EN 60974, VDE 0544 the machines can be used in environments with an increased electrical hazard.

3.2.4 Service documents (spare parts and circuit diagrams)



DANGER



Do not carry out any unauthorised repairs or modifications!

To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!

The warranty becomes null and void in the event of unauthorised interference.

- Appoint only skilled persons for repair work (trained service personnel)!

Original copies of the circuit diagrams are enclosed with the unit.

Spare parts can be obtained from the relevant authorised dealer.

3.2.5 Calibration/Validation

We hereby confirm that this machine has been tested using calibrated measuring equipment, as stipulated in IEC/EN 60974, ISO/EN 17662, EN 50504, and complies with the admissible tolerances. Recommended calibration interval: 12 months

4 Machine description – quick overview

4.1 Front view

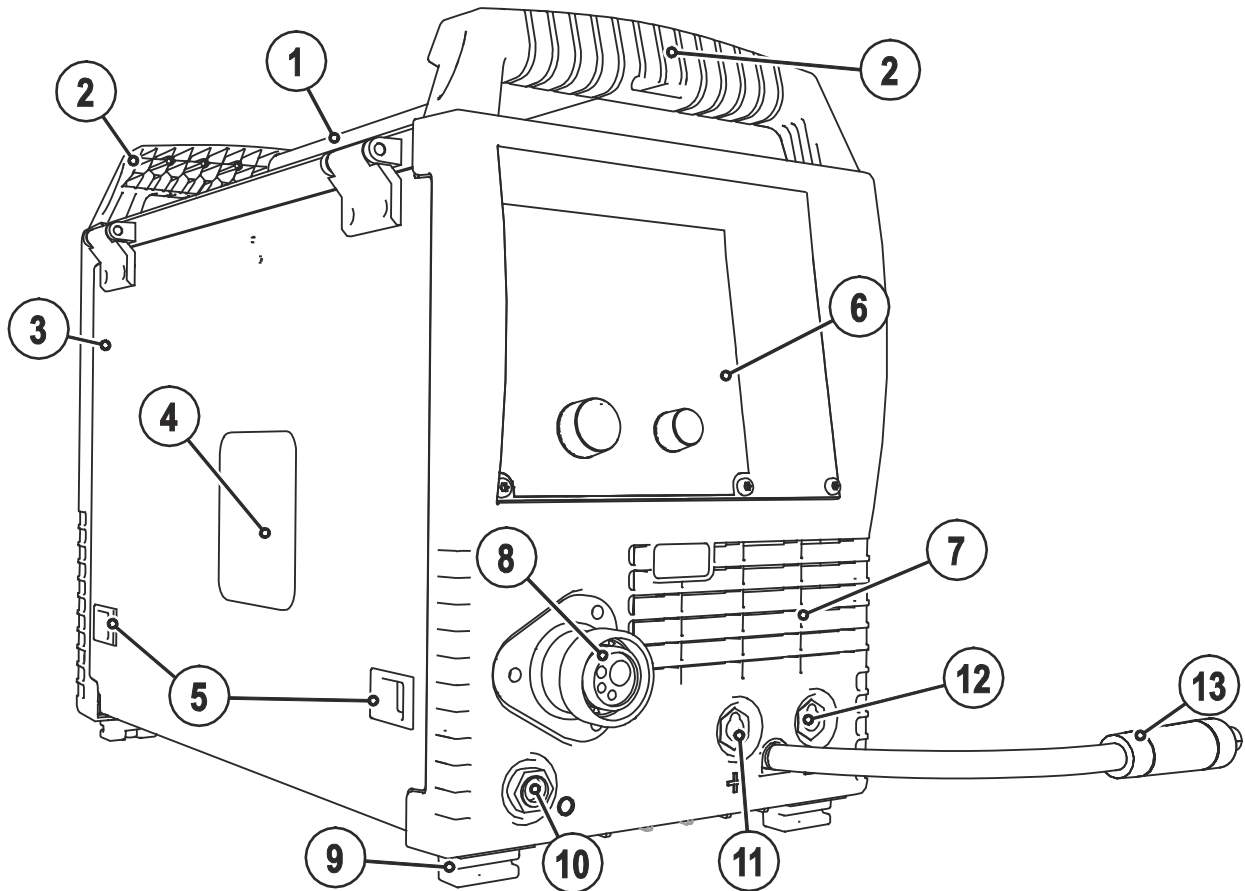





Figure 4-1

Item	Symbol	Description
1		Transport bar
2		Carrying handle
3		Protective cap Cover for the wire feed mechanism and other operating elements. Depending on the machine series, additional stickers with information on the replacement parts and JOB lists will be located on the inside.
4		Wire spool inspection window Check wire supply
5		Slide latch, lock for the protective cap
6		Machine control See Machine control – operating elements chapter
7		Cooling air inlet
8		Welding torch connection (Euro or Dinse torch connector) Welding current, shielding gas and torch trigger integrated
9		Machine feet
10		Park socket, polarity selection plug Retainer for the polarity selection plug in MMA mode or for transport.
11		Connection socket, "+" welding current <ul style="list-style-type: none"> • MIG/MAG cored wire welding: Workpiece connection • TIG welding: Workpiece connection • MMA welding: Workpiece connection
12		"-" welding current connection socket <ul style="list-style-type: none"> • MIG/MAG welding: Workpiece connection • TIG welding: Welding current connection for welding torch • MMA welding: electrode holder connection
13		Welding current cable, polarity selection Welding current to the central connector/torch, enables polarity selection. <ul style="list-style-type: none"> • MIG/MAG: Connection socket for "+" welding current • Self-shielding cored wire/TIG: Connection socket for "-" welding current

4.2 Rear view

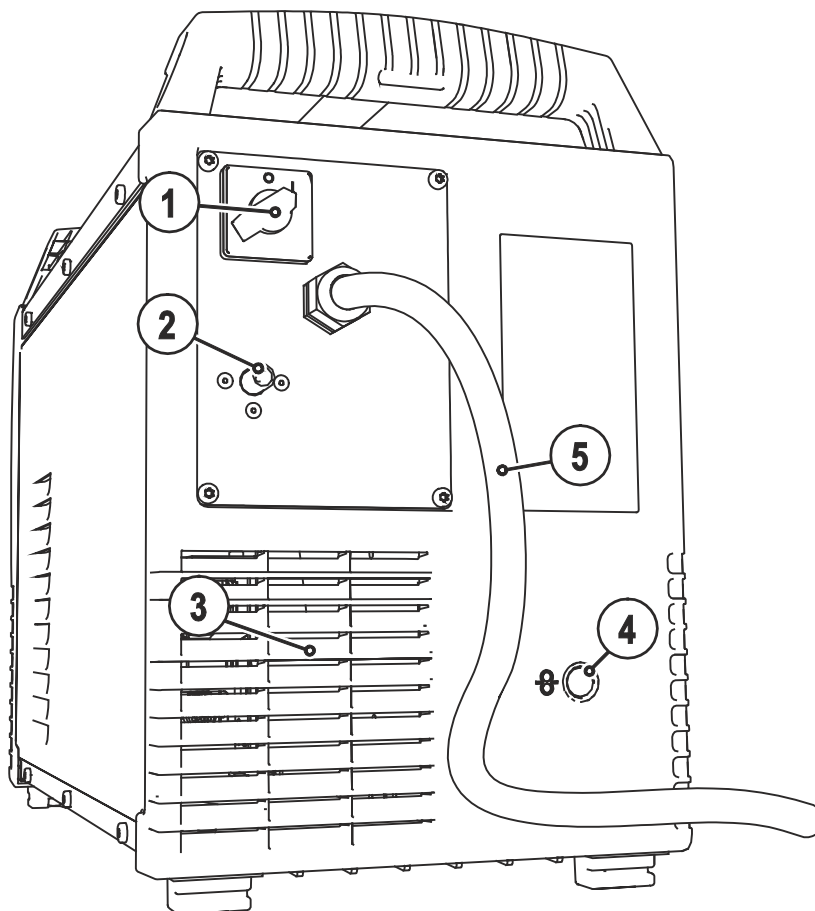


Figure 4-2

Item	Symbol	Description
1		Main switch, machine on/off
2		Connecting nipple G ¹ / ₄ , shielding gas connection
3		Cooling air outlet
4		External wire feed inlet Pre-cut casing inlet for external wire feed.
5		Mains connection cable

4.3 Inside view

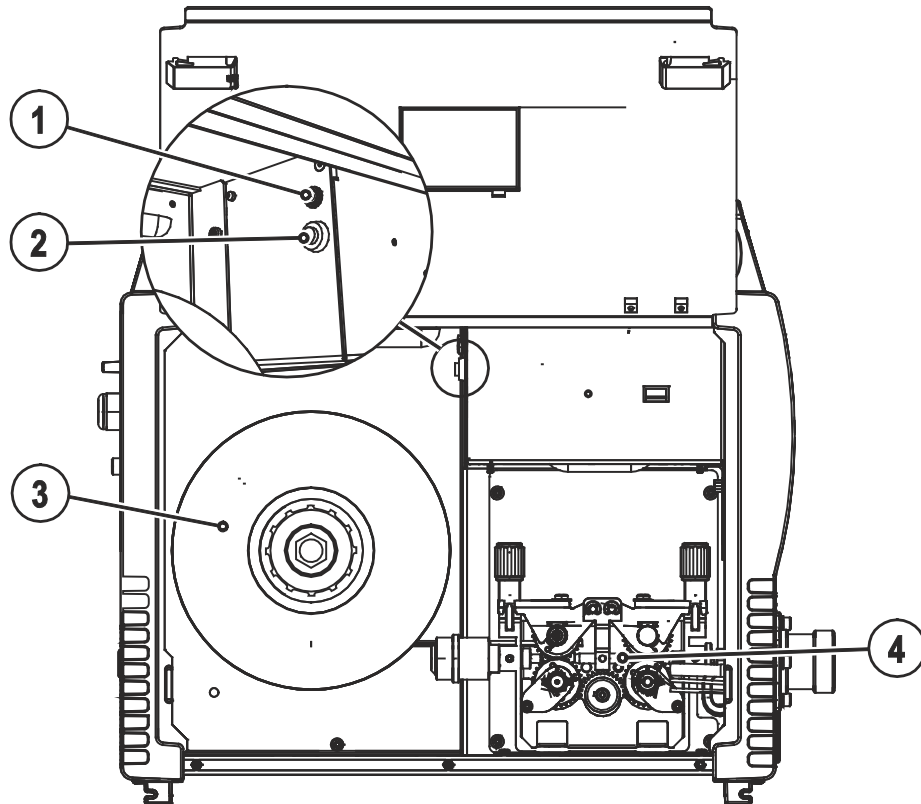


Figure 4-3

Item	Symbol	Description
1		Key button, Automatic cutout Wire feed motor supply voltage fuse (press to reset a triggered fuse)
2		Button, Wire inching For inching the wire electrode when changing the wire spool. The welding wire is inched into the tube package with the current off and without the gas being expelled.
3		Wire spool holder
4		Wire feed unit

4.4 Machine control – Operating elements

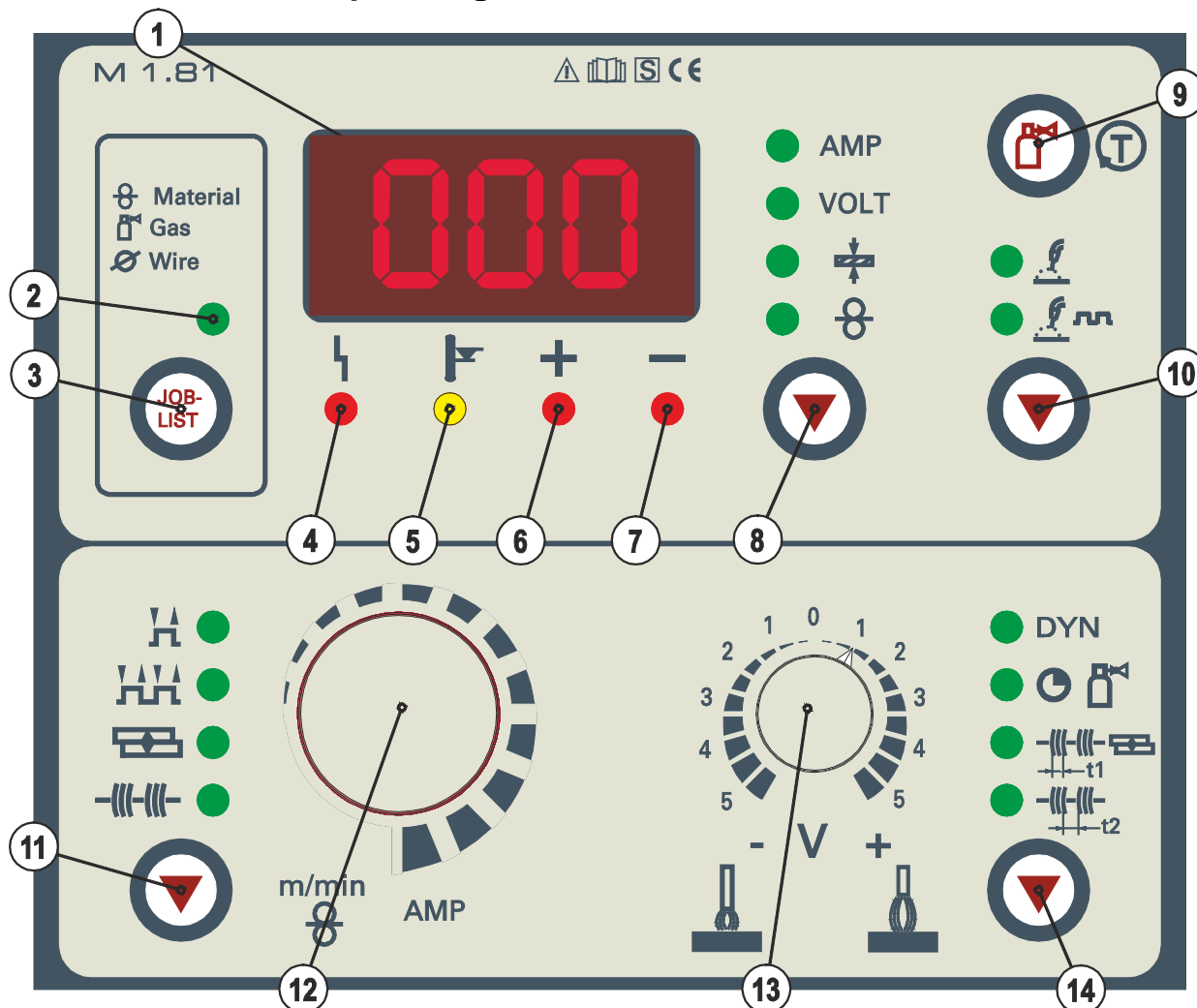

















Figure 4-4

Item	Symbol	Description
1		Three-figure LED display Welding parameter display (see also chap. "Welding data display").
2		Signal light, JOB-List Illuminates upon display or selection of the JOB number
3		Key button, JOB-List Selection of the welding task (JOB) from the JOB list
4		"Collective interference" signal light
5		"Excess temperature" signal light
6		Signal light, polarity setting
7		Signal light, polarity setting
8		Push-button, welding parameter display mode AMP Welding current VOLT Welding voltage ⊕ Material thickness ⊗ Wire feed speed Press for 2 s to put the machine into power-saving mode. To reactivate, activate one of the operating elements.

Item	Symbol	Description
9		Gas test / rinse button <ul style="list-style-type: none"> Gas test: For setting the shielding gas quantity Rinse: For rinsing longer hose packages See also "Shielding Gas Supply" chapter
10		Button, Select welding type <ul style="list-style-type: none">  MIG/MAG standard welding  MIG/MAG pulse arc welding
11		Operating mode button <ul style="list-style-type: none">  Non-latched  Latched  Spots  Interval
12		Welding parameter setting dial For setting the welding performance, for selecting the JOB (welding task) and for setting other welding parameters.
13		Arc length correction rotary dial
14		Runtime parameters button For selecting the parameters to be set. Also for entering and exiting the menus for advanced settings. <ul style="list-style-type: none"> DYN Choke effect/dynamics  Gas post-flow time  Spot time  Pause time

5 Design and function

WARNING



Risk of injury from electric shock!

Contact with live parts, e.g. welding current sockets, is potentially fatal!

- Follow safety instructions on the opening pages of the operating instructions.
- Commissioning may only be carried out by persons who have the relevant expertise of working with arc welding machines!
- Connection and welding leads (e.g. electrode holder, welding torch, workpiece lead, interfaces) may only be connected when the machine is switched off!

CAUTION



Insulate the arc welder from welding voltage!

Not all active parts of the welding current circuit can be shielded from direct contact. To avoid any associated risks it is vital for the welder to adhere to the relevant safety regulations. Even low voltages can cause a shock and lead to accidents.

- Wear dry and undamaged protective clothing (shoes with rubber soles/welder's gloves made from leather without any studs or braces)!
- Avoid direct contact with non-insulated connection sockets or connectors!
- Always place torches and electrode holders on an insulated surface!



Risk of burns on the welding current connection!

If the welding current connections are not locked, connections and leads heat up and can cause burns, if touched!

- Check the welding current connections every day and lock by turning in clockwise direction, if necessary.



Risk of injury due to moving parts!

The wire feeders are equipped with moving parts, which can trap hands, hair, clothing or tools and thus injure persons!

- Do not reach into rotating or moving parts or drive components!
- Keep casing covers or protective caps closed during operation!



Risk of injury due to welding wire escaping in an unpredictable manner!

Welding wire can be conveyed at very high speeds and, if conveyed incorrectly, may escape in an uncontrolled manner and injure persons!

- Before mains connection, set up the complete wire guide system from the wire spool to the welding torch!
- Remove the pressure rollers from the wire feeder if no welding torch is fitted!
- Check wire guide at regular intervals!
- Keep all casing covers or protective caps closed during operation!



Risk from electrical current!

If welding is carried out alternately using different methods and if a welding torch and an electrode holder remain connected to the machine, the open-circuit/welding voltage is applied simultaneously on all cables.

- The torch and the electrode holder should therefore always be placed on an insulated surface before starting work and during breaks.

CAUTION**Damage due to incorrect connection!**

Accessory components and the power source itself can be damaged by incorrect connection!

- Only insert and lock accessory components into the relevant connection socket when the machine is switched off.
- Comprehensive descriptions can be found in the operating instructions for the relevant accessory components.
- Accessory components are detected automatically after the power source is switched on.

**Using protective dust caps!**

Protective dust caps protect the connection sockets and therefore the machine against dirt and damage.

- The protective dust cap must be fitted if there is no accessory component being operated on that connection.
- The cap must be replaced if faulty or if lost!

5.1 Installation

WARNING**Risk of accident due to improper transport of machines that may not be lifted!**

Do not lift or suspend the machine! The machine can fall down and cause injuries! The handles and brackets are suitable for transport by hand only!

- The machine may not be lifted by crane or suspended!

CAUTION**Damage due to supply lines not being disconnected!**

During transport, supply lines which have not been disconnected (mains supply leads, control leads, etc.) may cause hazards such as connected equipment tipping over and injuring persons!

- Disconnect supply lines!

**Installation site!**

The machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!

- The operator must ensure that the ground is non-slip and level, and provide sufficient lighting for the place of work.
- Safe operation of the machine must be guaranteed at all times.

CAUTION**Equipment damage when not operated in an upright position!**

The units are designed for operation in an upright position!

Operation in non-permissible positions can cause equipment damage.

- Only transport and operate in an upright position!

5.2 Machine cooling

To obtain an optimal duty cycle from the power components, the following precautions should be observed:

- Ensure that the working area is adequately ventilated.
- Do not obstruct the air inlets and outlets of the machine.
- Do not allow metal parts, dust or other objects to get into the machine.

5.3 Workpiece lead, general

CAUTION



Risk of burns due to incorrect connection of the workpiece lead!

Paint, rust and dirt on the connection restrict the power flow and may lead to stray welding currents.

Stray welding currents may cause fires and injuries!

- Clean the connections!
- Fix the workpiece lead securely!
- Do not use structural parts of the workpiece as a return lead for the welding current!
- Take care to ensure faultless power connections!

5.4 Welding torch holder

NOTE

The item described in the following is part of the machine's scope of delivery.

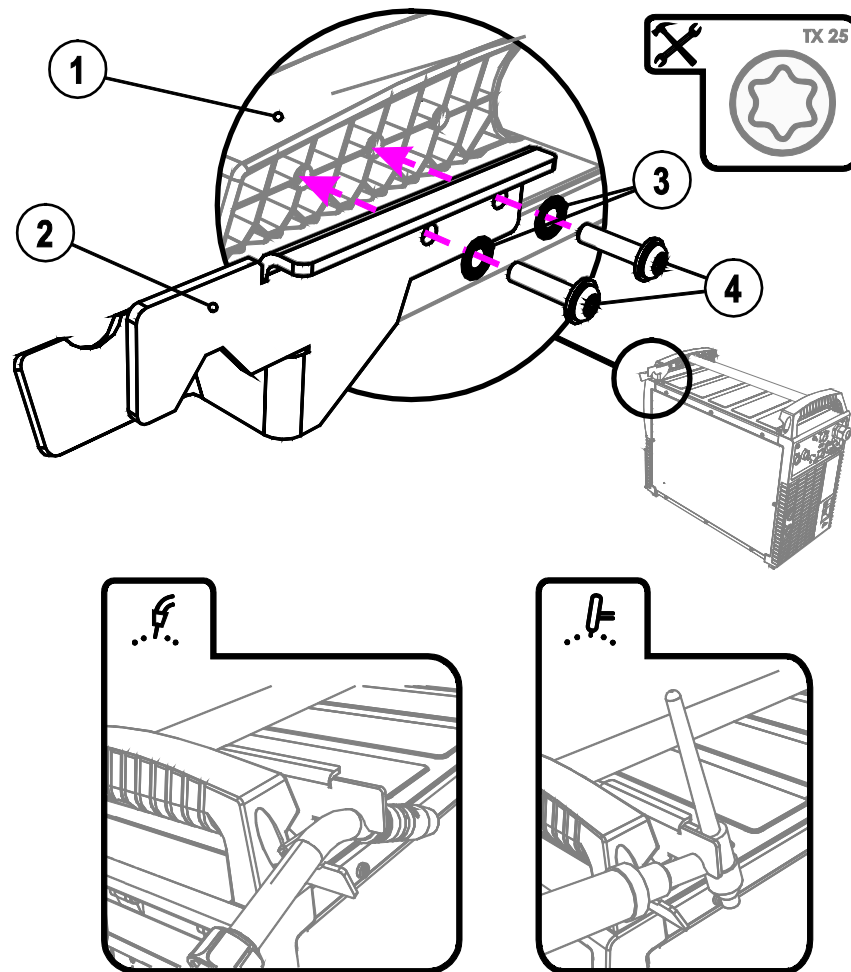


Figure 5-1

Item	Symbol	Description
1		Crossmember of the transport handle
2		Torch holder
3		Fan-type lock washers
4		Fixing screws (x 4)

- Use the mounting screws to screw the torch holder onto the crossmember of the transport handle.
- Insert the welding torch into the welding torch holder as shown.

5.5 Notes on the installation of welding current leads

NOTE



Incorrectly installed welding current leads can cause faults in the arc (flickering).

Lay the workpiece lead and hose package of power sources without HF igniter (MIG/MAG) for as long and as close as possible in parallel.

Lay the workpiece lead and hose package of power sources with HF igniter (TIG) for as long as possible in parallel with a distance of 20 cm to avoid HF sparkover.

Always keep a distance of at least 20 cm to leads of other power sources to avoid interferences.

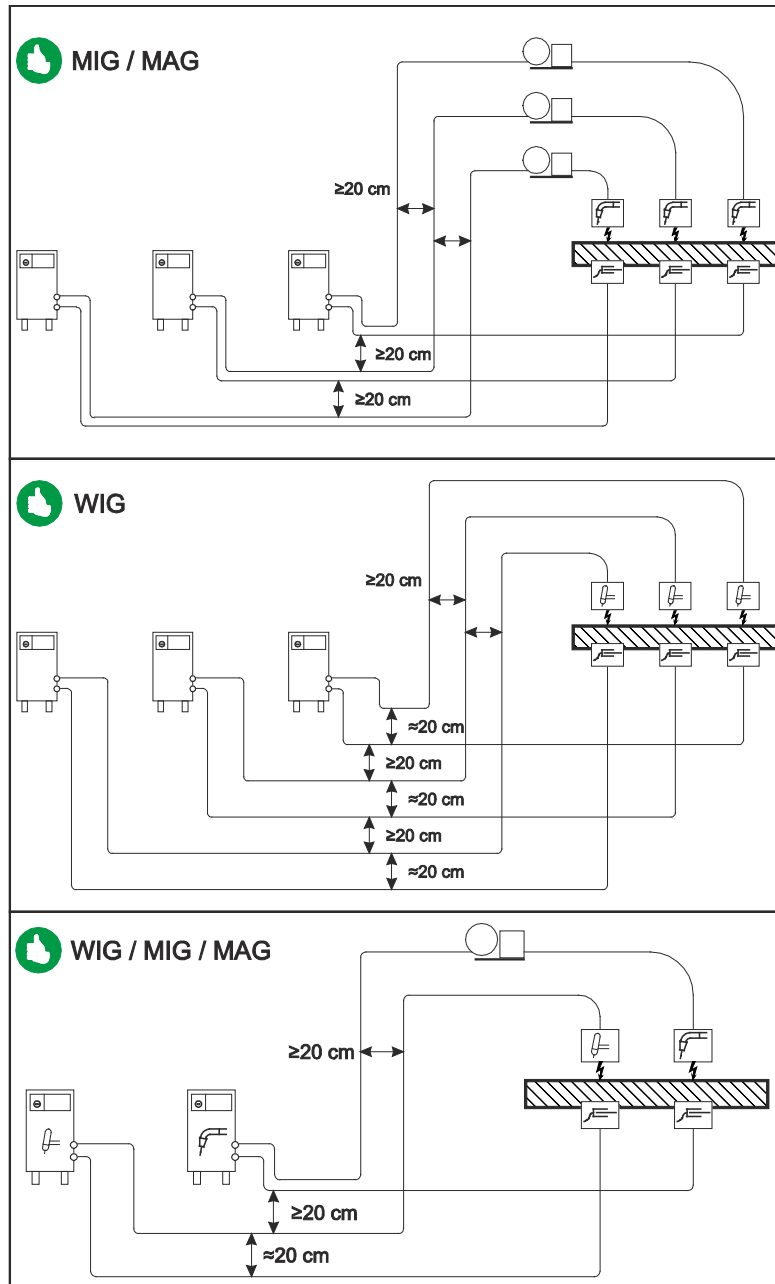


Figure 5-2

NOTE

Use an individual welding lead to the workpiece for each welding machine!

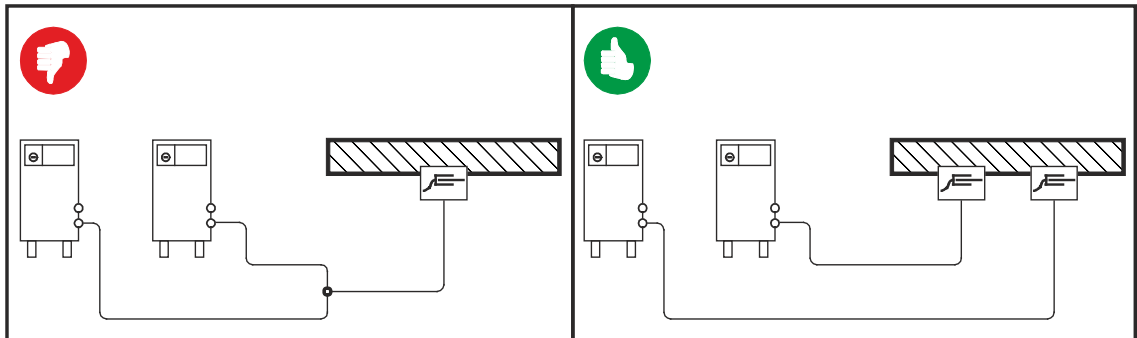


Figure 5-3

NOTE

- Fully unroll welding current leads, torch hose packages and intermediate hose packages. Avoid loops!
- Always keep leads as short as possible!
- Lay any excess cable lengths in meanders.

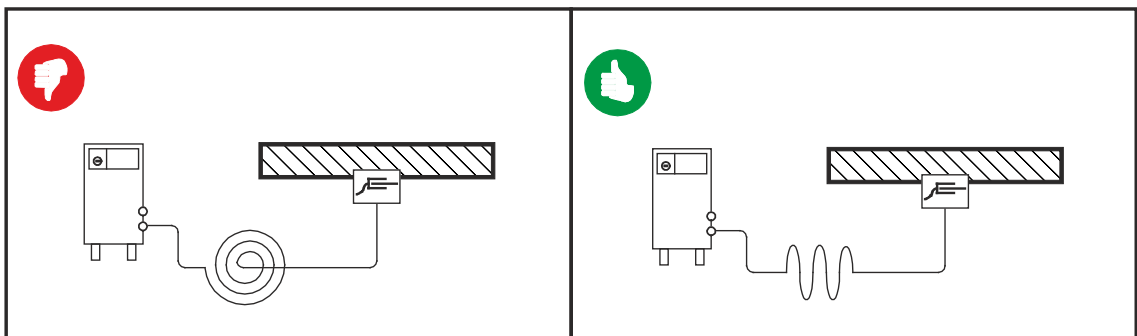


Figure 5-4

5.6 Mains connection

⚠ DANGER



Hazard caused by improper mains connection!

An improper mains connection can cause injuries or damage property!

- Only use machine with a plug socket that has a correctly fitted protective conductor.
- If a mains plug must be fitted, this may only be carried out by an electrician in accordance with the relevant national provisions or regulations!
- Mains plug, socket and lead must be checked regularly by an electrician!
- When operating the generator always ensure it is earthed as stated in the operating instructions. The resulting network has to be suitable for operating devices according to protection class 1.

5.6.1 Mains configuration

NOTE



The machine may be connected to:

- a three-phase system with four conductors and an earthed neutral conductor
- a three-phase system with three conductors of which any one can be earthed, e.g. the outer conductor

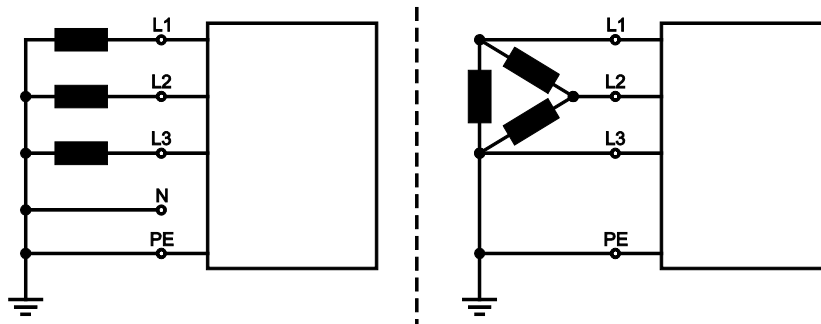


Figure 5-5

Legend

Item	Designation	Colour code
L1	Outer conductor 1	brown
L2	Outer conductor 2	black
L3	Outer conductor 3	grey
N	Neutral conductor	blue
PE	Protective conductor	green-yellow

CAUTION



Operating voltage - mains voltage!

The operating voltage shown on the rating plate must be consistent with the mains voltage, in order to avoid damage to the machine!

- For mains fuse protection, please refer to the “Technical data” chapter!

- Insert mains plug of the switched-off machine into the appropriate socket.

5.7 Shielding gas supply (shielding gas cylinder for welding machine)

5.7.1 Connection

⚠ WARNING



Incorrect handling of shielding gas cylinders!

Incorrect handling of shielding gas cylinders can result in serious and even fatal injury.

- Observe the instructions from the gas manufacturer and in any relevant regulations concerning the use of compressed air!
- Place shielding gas cylinders in the holders provided for them and secure with fixing devices.
- Avoid heating the shielding gas cylinder!

CAUTION



Faults in the shielding gas supply.

An unhindered shielding gas supply from the shielding gas cylinder to the welding torch is a fundamental requirement for optimum welding results. In addition, a blocked shielding gas supply may result in the welding torch being destroyed.

- Always re-fit the yellow protective cap when not using the shielding gas connection.
- All shielding gas connections must be gas tight.

NOTE



Before connecting the pressure regulator to the gas cylinder, open the cylinder valve briefly to expel any dirt.

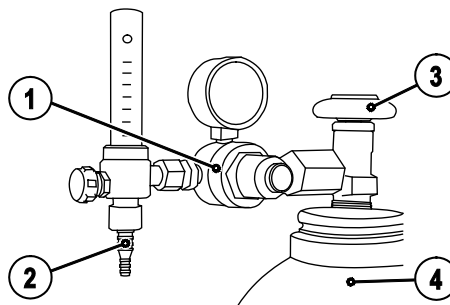


Figure 5-6

Item	Symbol	Description
1		Pressure regulator
2		Shielding gas cylinder
3		Output side of the pressure regulator
4		Cylinder valve

- Place the shielding gas cylinder into the relevant cylinder bracket.
- Secure the shielding gas cylinder using a securing chain.
- Tighten the pressure regulator screw connection on the gas bottle valve to be gas-tight.
- Tighten gas hose on pressure regulator to be gas tight.
- Fasten the gas hose to the shielding gas connecting nipple at the back of the machine using the crown nut.

5.7.2 Gas test, rinse hose package

- Slowly open the gas cylinder valve.
- Open the pressure reducer.
- Switch on the power source at the main switch.
- Trigger gas test function on the machine control by pressing the button briefly.
- Set the relevant gas quantity for the application on the pressure reducer.

Operating element	Action	Result
		<p>Select gas test, rinse hose package.</p> <p>Shielding gas flows for around 25 seconds or until the button is pressed again. Repeat rinsing process several times.</p>

5.7.3 Setting the shielding gas quantity

Welding process	Recommended shielding gas quantity
MAG welding	Wire diameter x 11.5 = l/min
MIG brazing	Wire diameter x 11.5 = l/min
MIG welding (aluminium)	Wire diameter x 13.5 = l/min (100 % argon)
TIG	Gas nozzle diameter in mm corresponds to l/min gas throughput

Helium-rich gas mixtures require a higher gas volume!

The table below can be used to correct the gas volume calculated where necessary:

Shielding gas	Factor
75% Ar/25% He	1.14
50% Ar/50% He	1.35
25% Ar/75% He	1.75
100% He	3.16

NOTE



Incorrect shielding gas setting!

If the shielding gas setting is too low or too high, this can introduce air to the weld pool and may cause pores to form.

- Adjust the shielding gas quantity to suit the welding task!

5.8 MIG/MAG welding

5.8.1 Welding torch and workpiece line connection

NOTE

**Fault with the wire guide!**

On delivery, the central connector is fitted with a capillary tube for welding torches with spiral guides. Conversion is necessary if a welding torch with a plastic core is used!

Welding torch with plastic core:

- use with guide tube!

Welding torch with spiral guide:

- use with capillary tube!



For connection, observe the operating instructions for the welding torch.

Depending on the wire electrode diameter or type, either a steel liner or plastic liner with the correct inner diameter must be inserted in the torch!

Recommendation:

- Use a steel liner when welding hard, unalloyed wire electrodes (steel).
- Use a chrome nickel liner when welding hard, high-alloy wire electrodes (CrNi).
- Use a plastic core to weld or braze soft wire electrodes, high-alloy wire electrodes or aluminium materials.

Preparation for connecting welding torches with a spiral guide:

- Check that the capillary tube is correctly positioned in relation to the central connector!

Preparation for connecting welding torches with a plastic core:

- Push forward the capillary tube on the wire feed side in the direction of the central connector and remove it there.
- Slide plastic core guide tube off the central connector.
- Carefully insert the central plug for the welding torch, with the still oversized plastic liner, into the central connector and screw together with crown nut.
- Use a suitable tool to cut off the plastic liner just before the wire feed roller, making sure not to pinch it.
- Unfasten and remove the central plug on the welding torch.
- Cleanly remove the burr from the separated end of the plastic core!

5.8.1.1 MIG/MAG standard welding

NOTE



Choose welding current connection socket according to the signal light for the polarity setting!

- Select JOB
(see chapter “Function description, selecting MIG/MAG or TIG welding tasks”)
- Polarity selection “+” or polarity selection “-” signal lights show the polarity setting.

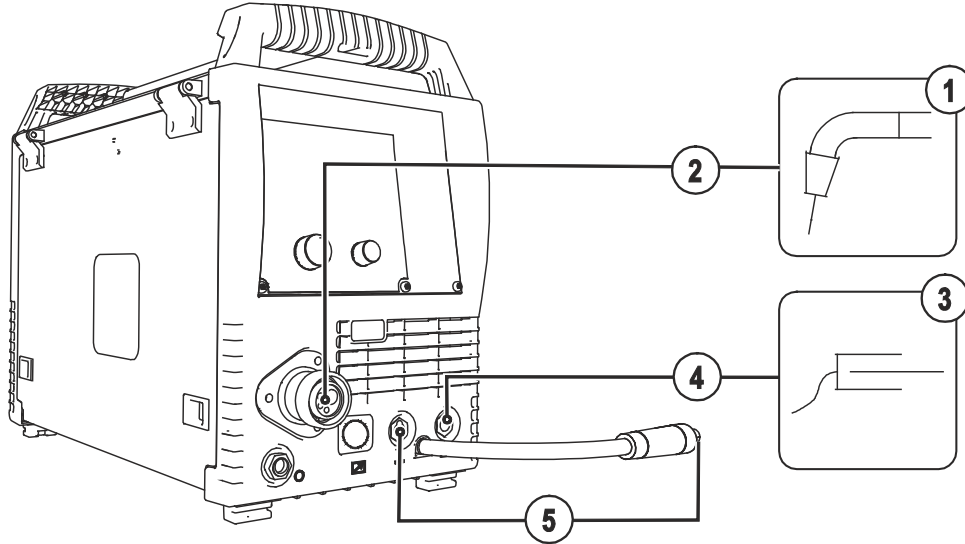


Figure 5-7

Item	Symbol	Description
1		Welding torch
2		Welding torch connection (Euro or Dinse torch connector) Welding current, shielding gas and torch trigger integrated
3		Workpiece
4		"-" welding current connection socket • MIG/MAG welding: Workpiece connection
5		Polarity selector plug, welding current cable Internal welding current cable for central connection/welding torch. • Connection socket for "+" welding current

- Insert the central plug for the welding torch into the central connector and screw together with crown nut.
- Insert the plug of the workpiece lead in the respective welding current connection socket and lock in place by turning to the right.
- Insert the polarity selection plug in the respective welding current connection socket and lock in place by turning to the right.

5.8.1.2 MIG/MAG cored wire welding

NOTE

- Choose welding current connection socket according to the signal light for the polarity setting!**
- Select JOB (see chapter “Function description, selecting MIG/MAG or TIG welding tasks”)
 - Polarity selection “+” or polarity selection “-” signal lights show the polarity setting.

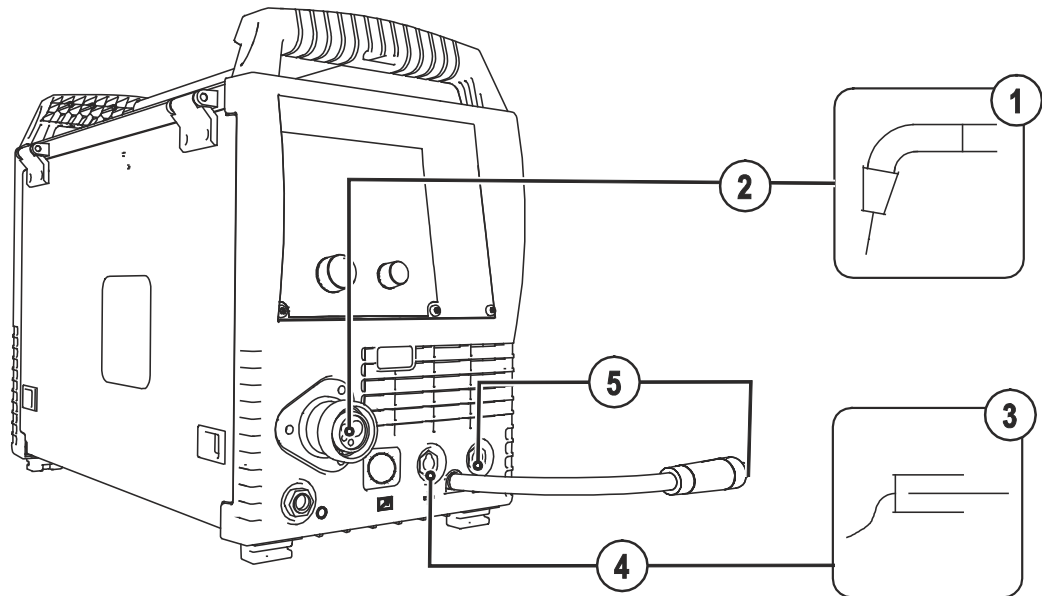


Figure 5-8

Item	Symbol	Description
1		Welding torch
2		Welding torch connection (Euro or Dinse torch connector) Welding current, shielding gas and torch trigger integrated
3		Workpiece
4		Connection socket, "+" welding current • MIG/MAG cored wire welding: Workpiece connection
5		Polarity selector plug, welding current cable Internal welding current cable for central connection/welding torch. • Connection socket for "-" welding current

- Insert the central plug for the welding torch into the central connector and screw together with crown nut.
- Insert the plug of the workpiece lead in the respective welding current connection socket and lock in place by turning to the right.
- Insert the polarity selection plug in the respective welding current connection socket and lock in place by turning to the right.

5.8.2 Wire feed

5.8.2.1 Open the protective flap of the wire feeder

CAUTION



To perform the following steps, the protective flap of the wire feeder needs to be opened. Make sure to close the protective flap again before starting to work.

- Unlock and open protective flap.

5.8.2.2 Inserting the wire spool

CAUTION



Risk of injury due to incorrectly secured wire spool.

If the wire spool is not secured properly, it may come loose from the wire spool holder and fall to the ground, causing damage to the machine and injuries.

- Securely fasten the wire spool to the wire spool holder using the knurled nut.
- Before you start working, always check the wire spool is securely fastened.

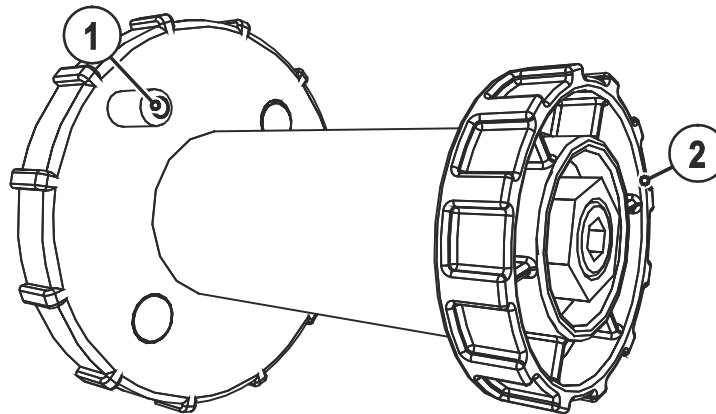


Figure 5-9

Item	Symbol	Description
1		Carrier pin For fixing the wire spool
2		Knurled nut For fixing the wire spool

- Loosen knurled nut from spool holder.
- Fix welding wire reel onto the spool holder so that the carrier pin locks into the spool bore.
- Fasten wire spool using knurled nut.

5.8.2.3 Changing the wire feed rollers

NOTE**Unsatisfactory welding results due to faulty wire feeding!**

Wire feed rollers must be suitable for the diameter of the wire and the material.

- Check the roller label to verify that the rollers are suitable for the wire diameter. Turn or change if necessary!
- use V-groove rollers with for steel wires and other hard wires,
- use U-groove rollers for aluminium wires and other soft, alloyed wires.

- Slide new drive rollers into place so that the diameter of the wire used is visible on the drive roller.
- Screw the drive rollers in place with knurled screws.

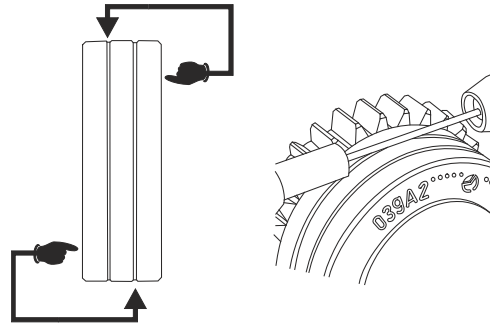


Figure 5-10

5.8.2.4 Inching the wire electrode

CAUTION



Risk of injury due to moving parts!

The wire feeders are equipped with moving parts, which can trap hands, hair, clothing or tools and thus injure persons!

- Do not reach into rotating or moving parts or drive components!
- Keep casing covers or protective caps closed during operation!



Risk of injury due to welding wire escaping in an unpredictable manner!

Welding wire can be conveyed at very high speeds and, if conveyed incorrectly, may escape in an uncontrolled manner and injure persons!

- Before mains connection, set up the complete wire guide system from the wire spool to the welding torch!
- Remove the pressure rollers from the wire feeder if no welding torch is fitted!
- Check wire guide at regular intervals!
- Keep all casing covers or protective caps closed during operation!



Risk of injury due to welding wire escaping from the welding torch!

The welding wire can escape from the welding torch at high speed and cause bodily injury including injuries to the face and eyes!

- Never direct the welding torch towards your own body or towards other persons!

CAUTION



Extensive wear due to incorrect contact pressure!

Incorrect contact pressure will cause extensive wear of the wire feed rollers!

- With the adjusting nuts of the pressure units set the contact pressure so that the wire electrode is conveyed but will still slip through if the wire spool jams.
- Set the contact pressure of the front rollers (in wire feed direction) to a higher value!

NOTE



The inching speed is infinitely adjustable by simultaneously pressing the wire inching push-button and turning the wire speed rotary knob. The left display shows the wire feed speed selected, the right display shows the current motor current of the wire feed mechanism.

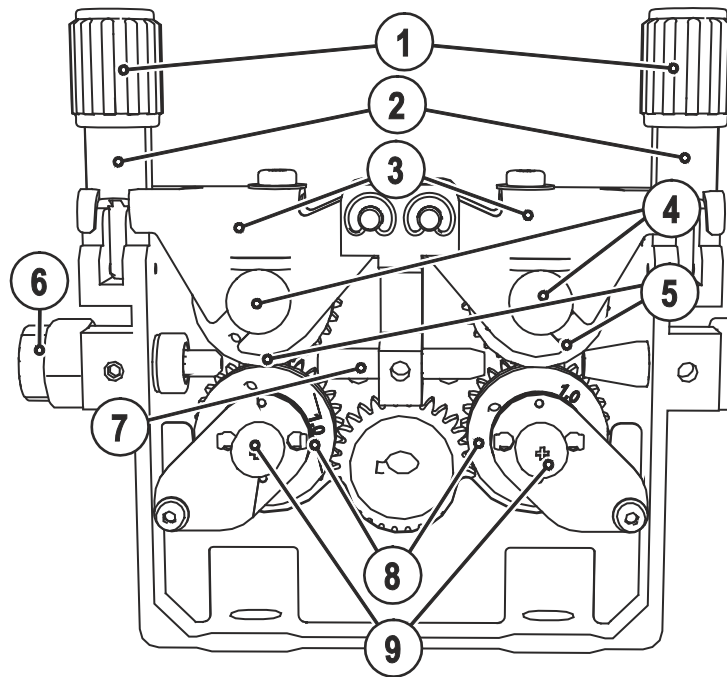


Figure 5-11

Item	Symbol	Description
1		Adjusting nut
2		Feed roll tensioner Fixing the clamping unit and setting the pressure.
3		Clamping unit
4		Knurled screw
5		Pressure roller
6		Wire feed nipple
7		Guide tube
8		Drive roller
9		Axle

- Extend and lay out the torch hose package.
- Unfasten pressure units and fold out (clamping units and pressure rollers will automatically flip upwards).
- Unwind welding wire carefully from the wire spool and insert through the wire inlet nipple over the drive roller grooves and the guide pipe into the capillary tube and Teflon core using guide pipe.
- Press the clamping element with the pressure roller back downwards and fold the wire units back up again (wire electrode should be in the groove on the drive roller).
- Set the contact pressure with the adjusting nuts of the pressure unit.
- Press the wire inching button until the wire electrode projects out of the welding torch.

Automatic inching stop

Touch the welding torch against the workpiece during inching. Inching of the welding wire will stop as soon it touches the workpiece.

5.8.2.5 Spool brake setting

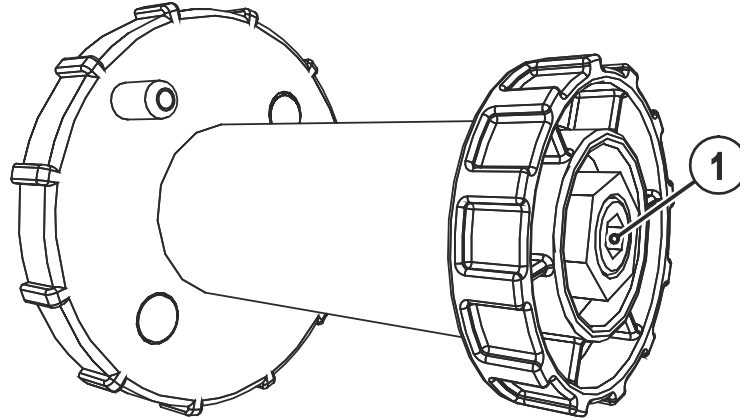


Figure 5-12

Item	Symbol	Description
1		Allen screw Securing the wire spool retainer and adjustment of the spool brake

- Tighten the Allen screw (8 mm) in the clockwise direction to increase the braking effect.

NOTE



Tighten the spool brake until the wire spool no longer turns when the wire feed motor stops but without it jamming during operation!

5.8.3 Definition of MIG/MAG welding tasks

This machine range features simple operation with a very wide range of functions.

- JOBS (welding tasks consisting of welding process, type of material, wire diameter and type of shielding gas) are pre-defined for all common welding tasks.
- Simple JOB selection from a list of pre-defined JOBS (sticker on the machine).
- The required process parameters are calculated by the system depending on the operating point specified (single-dial operation via wire speed rotary dial).
- Conventional welding task definition using wire speed and welding voltage is also possible.

NOTE



The welding task definition described below applies when defining MIG/MAG and cored wire welding tasks.



Pay attention to the signal light for the polarity setting!

It may be necessary to change the welding current polarity depending on the JOB selected or the welding process.

- Reconnect the polarity selection plug if necessary.

5.8.4 Welding task selection

The settings for the respective welding parameters are specified by the different JOBS. The right JOB can be determined quickly with the JOB list.

In the example, the following details are known:

- Welding process: MIG/MAG
- Type of material (filler wire): G3Si1
- Wire diameter: 0.8 mm
- Shielding gas type: 80-90% Ar
- Panel thickness: 2 mm

5.8.4.1 JOB selection

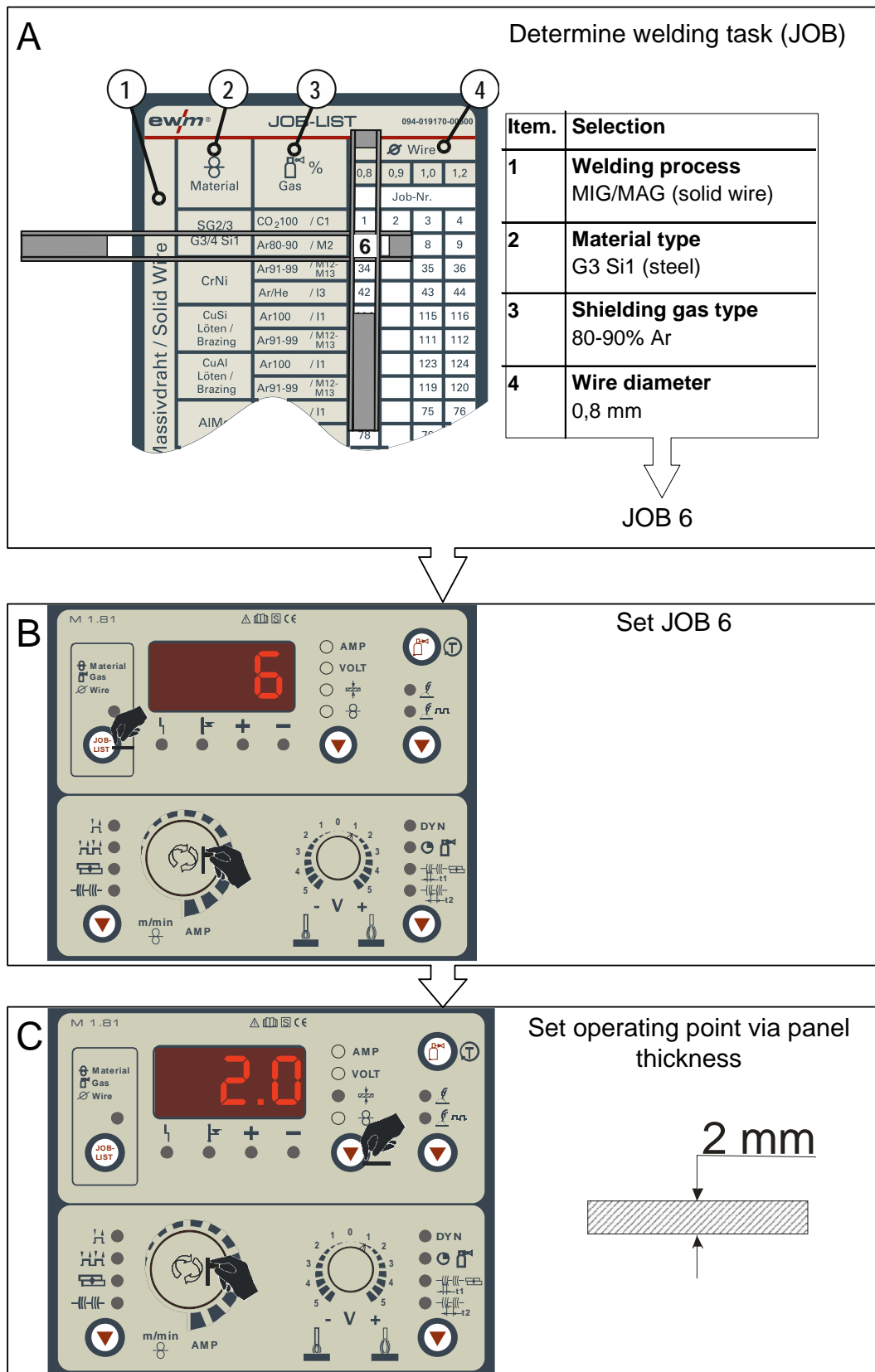


Figure 5-13

- Select JOB (welding task) by means of the JOB list.
The "JOB list" sticker is on the inside of the cover of the wire feed unit.
- Set the operating point by means of the panel thickness (see chapter "Setting the MIG/MAG operating point").

It is only possible to change the JOB number when no welding current is flowing.

Operating element	Action	Result	Display
	1 x	Select JOB list (LED Material Gas Wire is on)	
		Set JOB number. Wait 3 s until the setting has been applied.	

5.8.4.2 Operating mode

Operating element	Action	Result
	n x	Selecting the operating mode The LED indicates the selected operating mode. Non-latched operation Latched operation Spots Interval operation

5.8.4.3 Welding type (MIG/MAG standard/pulse arc welding)

Operating element	Action	Result	Display
	n x	Select welding type The signal light indicates the selection. Standard MIG/MAG welding Pulse arc MIG/MAG welding	No change

5.8.5 Welding data display

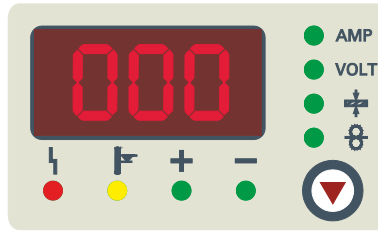


Diagram 5-14

The button for the welding parameter display mode is next to the display.

Each time the button is pressed the display changes to the next parameter. After the last parameter is reached the display continues with the first parameter.

The display shows:

- Nominal values (before welding)
- Actual values (during welding)
- Hold values (after welding)

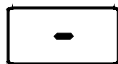
Parameter	Nominal values	Actual values	Hold values
Welding current	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Material thickness	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wire speed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Welding voltage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

After welding you can change back to the nominal values

- by pressing the buttons or using the dials on the controls
- or by briefly pressing the torch trigger.

5.8.5.1 Power-saving mode

The power-saving function can be activated either by pressing the button for a longer time (see chapter "Machine description – Short overview") or by setting a parameter in the configuration menu (time-based power-saving mode).



When power-saving mode is activated, both machine displays show the horizontal digit in the centre of the display only.

Pressing any operating element (e.g. tapping the torch trigger) deactivates power-saving mode and the machine is ready for welding again.

5.8.6 MIG/MAG operating point

5.8.6.1 Selecting the welding parameter display mode

The operating point (welding performance) can be displayed or set as the welding current, material thickness or wire speed.

Operating element	Action	Result
	$n \times$	Switching the display between: AMP Welding current VOLT Welding voltage (correction) Material thickness Wire speed

5.8.6.2 Operating point setting using material thickness

The process of setting the operating point by means of the panel thickness parameter is described as an example below.

Operating element	Action	Result	Display
		Increase or reduce welding performance via the panel thickness parameter. Display example: 2.0 mm	

5.8.6.3 Arc length correction setting

Operating element	Action	Result
		"Arc length correction" setting Setting range: -5 V to +5 V

NOTE



The basic settings are now completed.

Other welding parameters have already been set optimally in the factory; they can, however, be modified to suit individual requirements.

5.8.7 Further welding parameters

NOTE



Validity of the settings.

Settings for

- Spot time,
 - Pause time and
 - Wire feed speed
- apply for all JOBs.

- Choke effect/dynamics,
 - Gas post-flow time,
 - Gas pre-flow time and
 - Wire burn-back correction
- are saved separately for each JOB.

Changes are stored permanently in the JOB that is currently selected.

Resetting to factory configuration, see chapter “Resetting the controls (Reset all)”

5.8.7.1 Choke effect / dynamics

Operating element	Action	Result	Display
	n x	Selecting the parameter to be set The LED indicates the parameter selected. DYN Choke effect/dynamics Gas post-flow time Spot time Pause time (interval operation)	Parameter value set
		Set choke effect/dynamics. Setting range: 40: Arc hard and narrow, deeper fusion penetration. -40: Arc soft and wide.	

5.8.7.2 Gas post-flow time

Operating element	Action	Result	Display
	n x	Selecting the parameter to be set The LED indicates the parameter selected. DYN Choke effect/dynamics Gas post-flow time Spot time Pause time (interval operation)	Parameter value set
		Adjusting the gas post-flow time. Setting range: 0.0 s to 20.0 s in increments of 0.1 s	

5.8.7.3 Spot time

NOTE

Select the respective operating mode before setting the spot or pause time.

Operating element	Action	Result	Display
	n x	Selecting the parameter to be set The LED indicates the parameter selected. DYN Choke effect/dynamics Gas post-flow time Spot time Pause time (interval operation)	Parameter value set
		Setting the stop time. Setting range: 0.1 s to 20.0 s in increments of 0.1 s	

5.8.7.4 Pause time (interval operation)

Operating element	Action	Result	Display
	n x	Selecting the parameter to be set The LED indicates the parameter selected. DYN Choke effect/dynamics Gas post-flow time Spot time Pause time (interval operation)	Parameter value set
		Setting the pause time. Setting range: 0.1 s to 20.0 s in increments of 0.1 s	

5.8.7.5 Burn-back

- Preselection: Select a MIG/MAG JOB (see chapter “Selecting MIG/MAG welding tasks”).

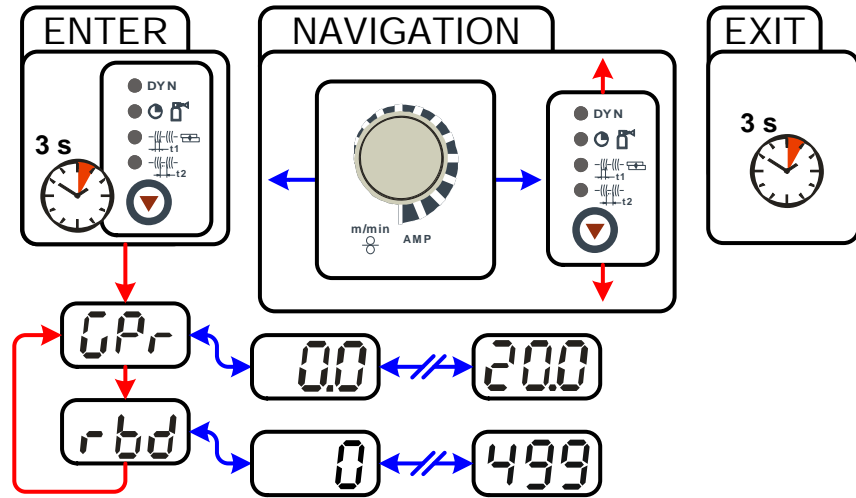


Figure 5-15

Display	Setting/selection
	Burn-back correction 0 to 499 of the burn back time specified in the JOB

5.8.7.6 gas pre-flow time

- Preselection: Select a MIG/MAG JOB (see chapter “Selecting MIG/MAG welding tasks”).

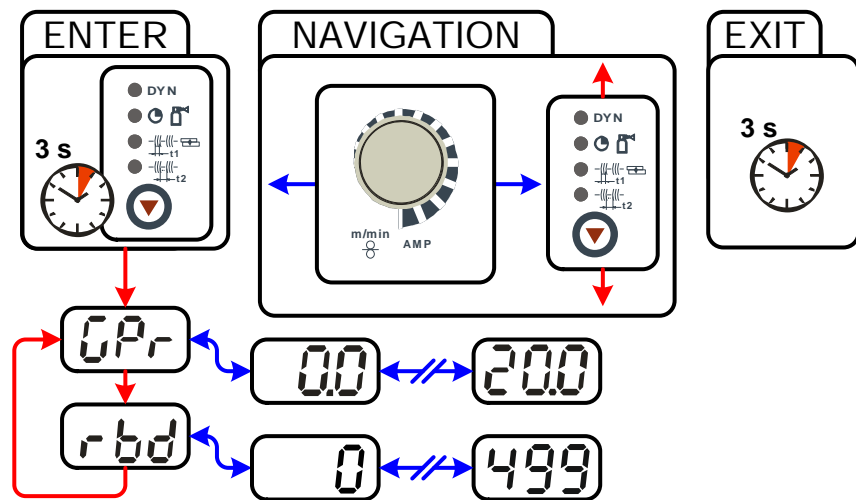












Figure 5-16

Display	Setting/selection
	Gas pre-flow time 0.0 s to 20.0 s (0.1 s increments)

5.8.8 MIG/MAG functional sequences / operating modes

5.8.9 Explanation of signs and functions

Symbol	Meaning
	Press torch trigger
	Release torch trigger
	Shielding gas flowing
	Welding output
	Wire electrode is being conveyed
	Wire creep
	Wire burn-back
	Gas pre-flows
	Gas post-flows
	Non-latched
	Latched
t	Time
t₁	Spot time
t₂	Pause time

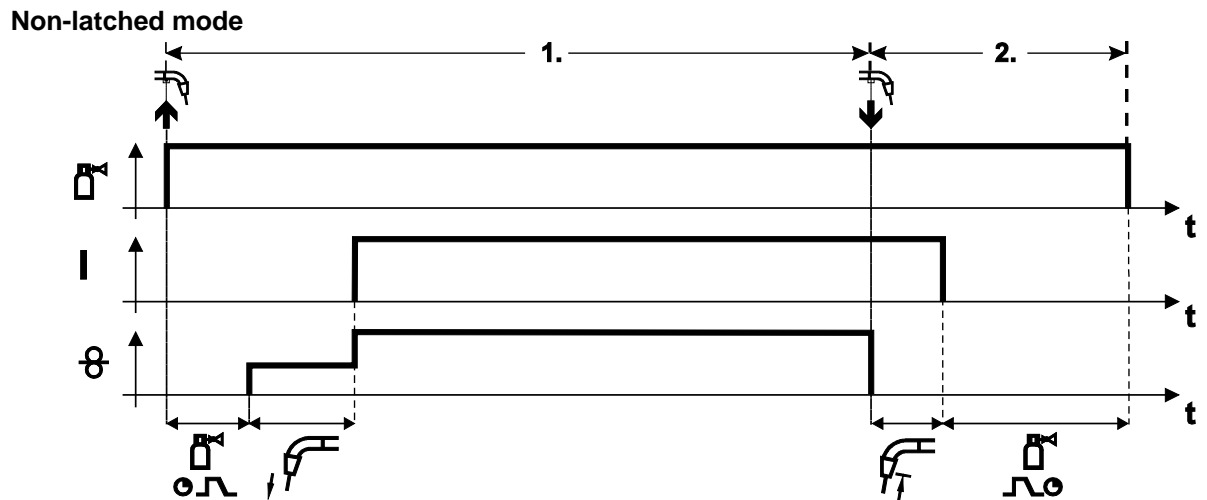


Figure 5-17

Step 1

- Press and hold torch trigger.
- Shielding gas is expelled (gas pre-flows).
- Wire feed motor runs at "creep speed".
- Arc ignites after the wire electrode makes contact with the workpiece; welding current flows.
- Change over to pre-selected wire speed.

Step 2

- Release torch trigger.
- WF motor stops.
- Arc is extinguished after the preselected wire burn-back time expires.
- Gas post-flow time elapses.

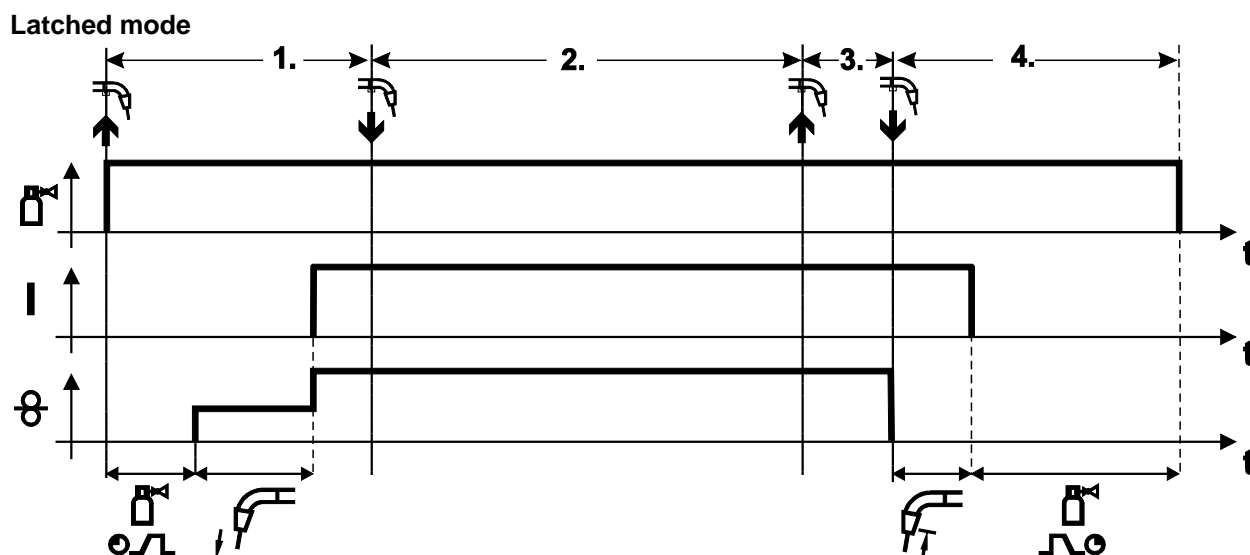


Figure 5-18

1. cycle

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at “creep speed”
- Arc ignites when the wire electrode makes contact with the workpiece
Welding current flows
- Wire feed speed increases to the set nominal value

2. cycle

- Release torch trigger (no effect)

3. cycle

- Press torch trigger (no effect)

4. cycle

- Release torch trigger
- Wire feed motor stops
- Arc is extinguished after the pre-selected wire burn-back time elapses
- Gas post-flow time elapses

Spot welding

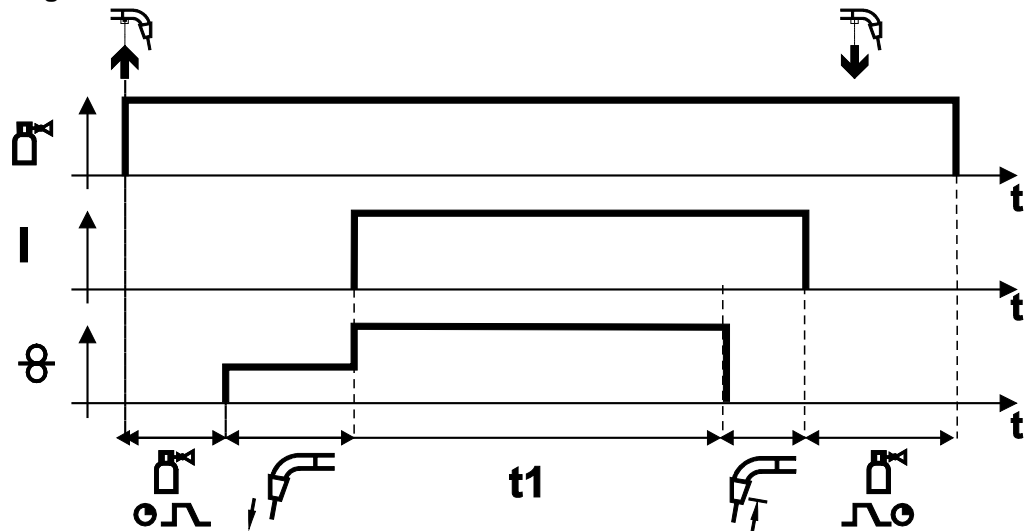


Figure 5-19

Start

- Press and hold torch trigger.
- Shielding gas is expelled (gas pre-flows).
- Arc ignites after the wire electrode makes contact with the workpiece at creep speed.
- Welding current flows.
- Wire feed speed increases to the set nominal value.
- The wire feed stop welding after the spot time elapses.
- Arc is extinguished after the wire burn-back time elapses.
- Gas post-flow time elapses.

Premature termination

- Release torch trigger.

Interval

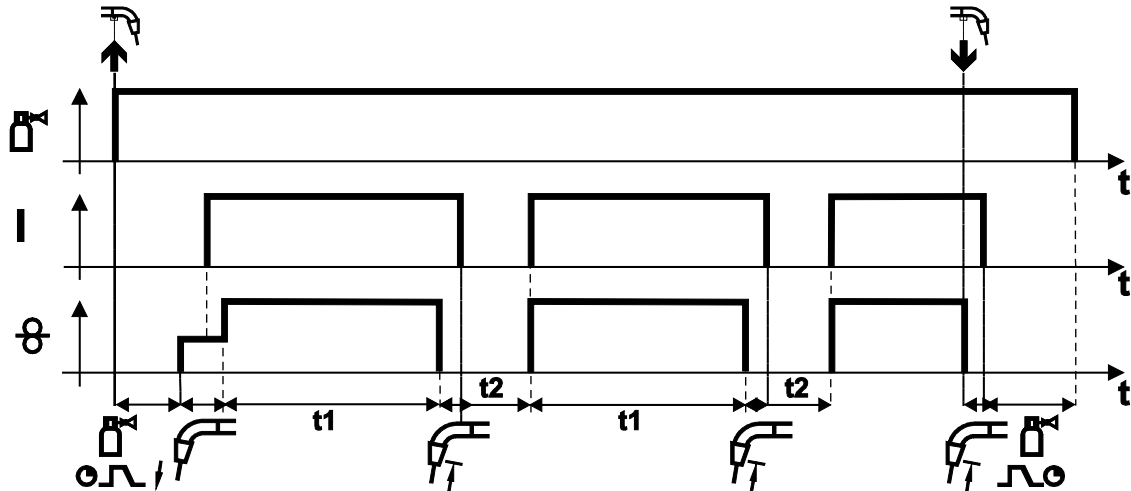


Figure 5-20

Start

- Press and hold torch trigger.
- Shielding gas is expelled (gas pre-flows).

Sequence

- Arc ignites after the wire electrode makes contact with the workpiece at creep speed.
- Welding current flows.
- Wire feed speed increases to the set nominal value.
- The wire feed stops after the spot time elapses.
- Arc is extinguished after the wire burn-back time elapses.
- The process is repeated when the pause time is over.

End

- Release torch trigger, wire feed stops, arc is extinguished, gas post-flow time elapses.

If the pause time is less than 3 s, wire creep only takes place in the first spot phase.

When the torch trigger is released, the welding process is also ended even before the spot time elapses.

5.8.10 Conventional MIG/MAG Welding (GMAW non synergic)

- Select JOB 188

It is only possible to change the JOB number when no welding current is flowing.

Operating element	Action	Result	Display
	1 x	Select JOB list (LED is on)	
		Set JOB number. Wait 3 s until the setting has been applied.	

5.8.10.1 Operating mode

Operating element	Action	Result
	n x	Selecting the operating mode The LED indicates the selected operating mode. Non-latched operation Latched operation Spots Interval operation

5.8.11 Welding data display

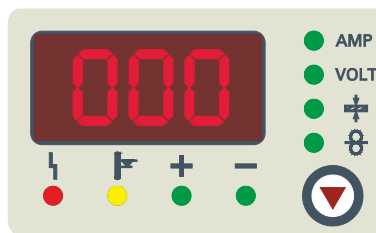


Diagram 5-21

The button for the welding parameter display mode is next to the display.

Each time the button is pressed the display changes to the next parameter. After the last parameter is reached the display continues with the first parameter.

The display shows:

- Nominal values (before welding)
- Actual values (during welding)
- Hold values (after welding)

Parameter	Nominal values	Actual values	Hold values
Welding current	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wire speed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Welding voltage	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

After welding you can change back to the nominal values

- by pressing the buttons or using the dials on the controls
- or by briefly pressing the torch trigger.

5.8.11.1 Setting the operating point (welding output)

The operating point (welding performance) is set with the wire speed and the welding voltage.

Operating element	Action	Result
		Switch the display between: AMP Welding current (only actual and hold values are displayed) VOLT Welding voltage Material thickness (will be skipped) Wire speed

Settings are made using the "welding parameter setting" and "arc length correction" rotary dials, which are used here to set the wire speed and the welding voltage.

Operating element	Action	Result
		Increase or reduce welding performance via the wire speed parameter.

Operating element	Action	Result
		Set the welding voltage Setting range: 5 V to 35 V

NOTE



Automatic display mode switching:

If the wire speed or the voltage is changed, the display will switch briefly to show the respective parameter. This means that you don't have to change the display mode before setting the parameter.

If the display mode is set to display the welding current, it will always show "0" before welding begins. Actual values are shown during welding; these can be changed as necessary using the "welding parameter setting" rotary dial.

5.8.12 MIG/MAG automatic cut-out

NOTE



The welding machine ends the ignition process or the welding process with an

- ignition fault (no welding current flows within 5 s after the start signal)
- arc interruption (arc is interrupted for longer than 5 s)

5.9 MMA welding

CAUTION



Risk of being crushed or burnt.

When replacing spent or new stick electrodes

- Switch off machine at the main switch
- Wear appropriate safety gloves
- Use insulated tongs to remove spent stick electrodes or to move welded workpieces and
- Always put the electrode holder down on an insulated surface.

5.9.1 Connecting the electrode holder and workpiece lead

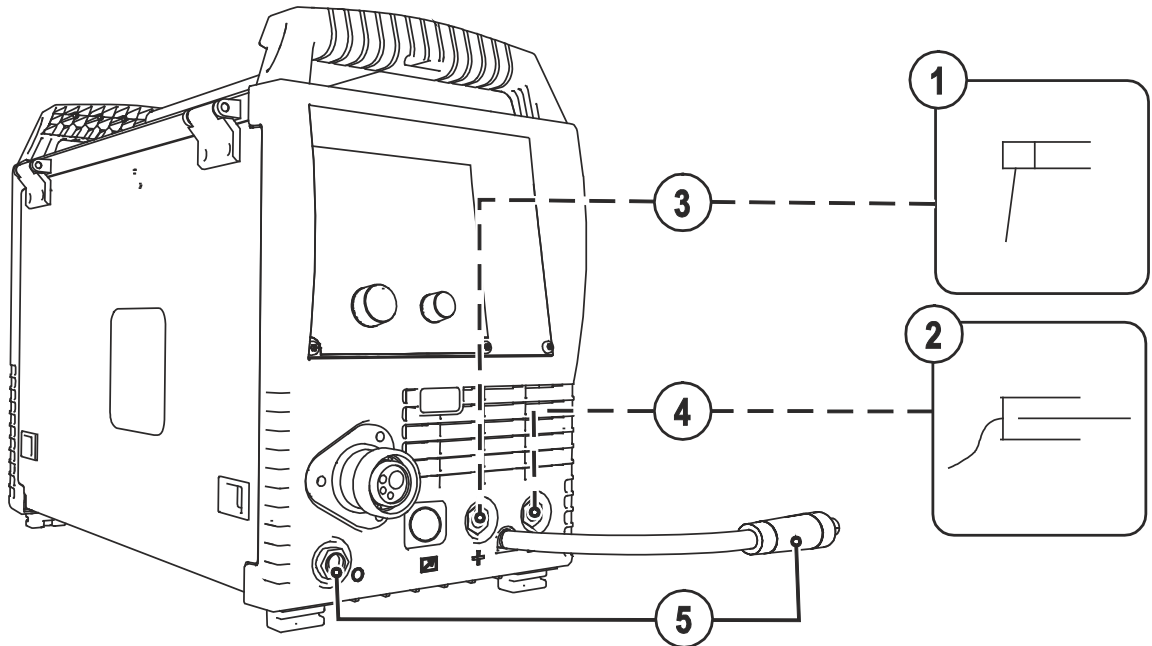


Figure 5-22

Item	Symbol	Description
1		Electrode holder
2		Workpiece
3		Connection socket for "+" welding current Electrode holder or workpiece lead connection
4		Connection socket, "-" welding current Electrode holder or workpiece lead connection
5		Polarity selector plug, welding current cable • Connect to the park socket.

- Insert the polarity selection plug in the park socket and lock in place by turning to the right.
- Insert cable plug of the electrode holder into either the "+" or "-" welding current connection socket and lock by turning to the right.
- Insert cable plug of the workpiece lead into either the "+" or "-" welding current connection socket and lock by turning to the right.

NOTE



Polarity depends on the instructions from the electrode manufacturer given on the electrode packaging.

5.9.2 Welding task selection

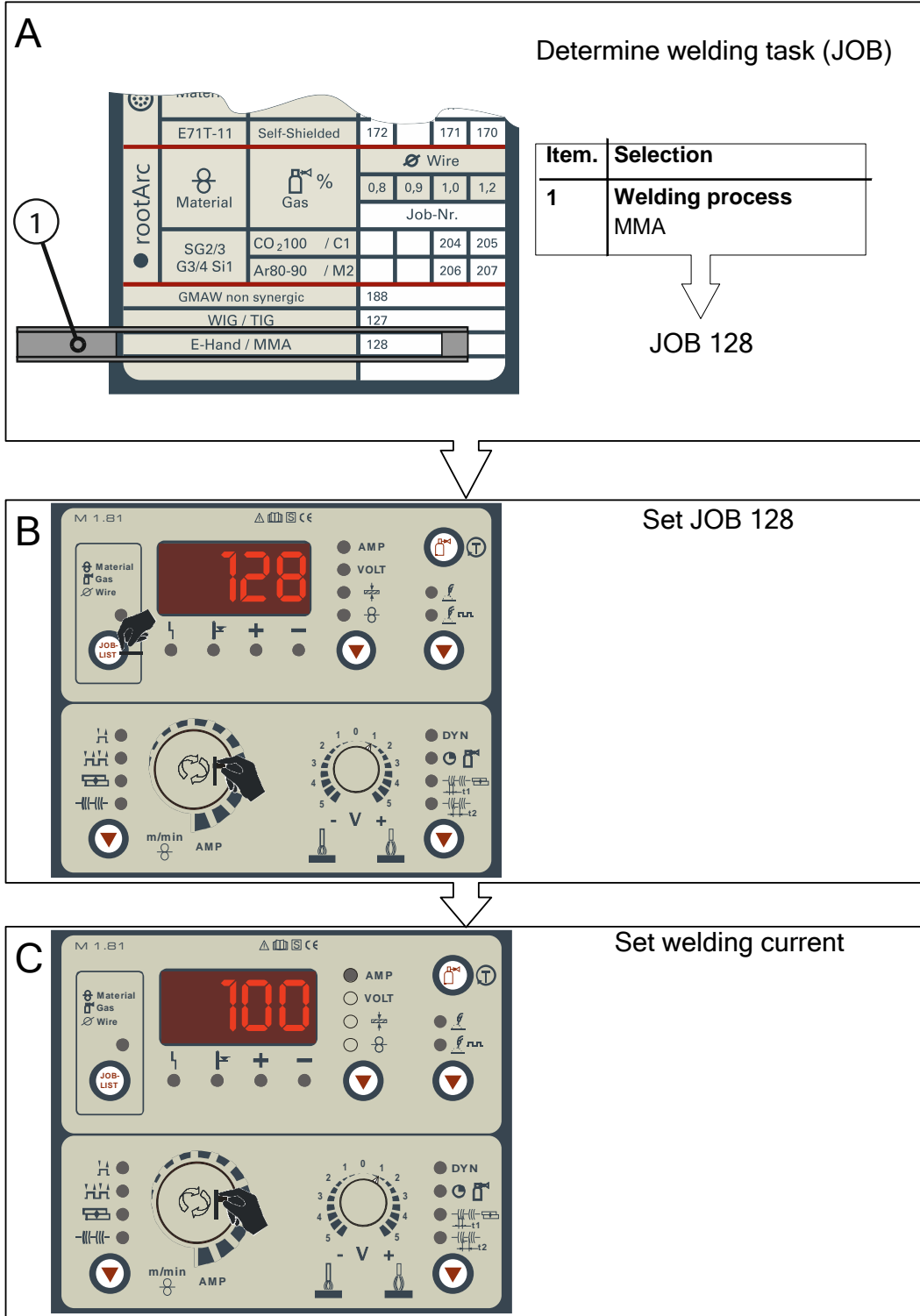


Figure 5-23

- Select MMA JOB 128.

It is only possible to change the JOB number when no welding current is flowing.

Operating element	Action	Result	Display
	1 x	Select JOB list Material Gas Wire (LED is on)	
		Set JOB number. Wait 3 s until the setting has been applied.	

5.9.3 Welding current setting

Set the welding current with the rotary dial for the welding parameter settings.

Operating element	Action	Result	Display
		Set welding current.	current nominal value

5.9.4 MMA welding data display

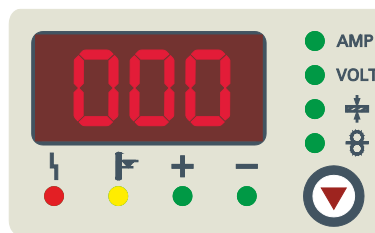


Diagram 5-24

The button for the welding parameter display mode is next to the display.

Each time the button is pressed it switches between welding current and welding voltage.

The display shows:

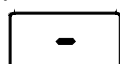
- Nominal values (before welding)
- Actual values (during welding)
- Hold values (after welding)

Parameter	Nominal values	Actual values	Hold values
Welding current	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Welding voltage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

The display switches back from hold values to actual values for approximately 5 s after welding is finished.

5.9.4.1 Power-saving mode

The power-saving function can be activated either by pressing the button for a longer time (see chapter "Machine description – Short overview") or by setting a parameter in the configuration menu (time-based power-saving mode).



When power-saving mode is activated, both machine displays show the horizontal digit in the centre of the display only.

Pressing any operating element (e.g. tapping the torch trigger) deactivates power-saving mode and the machine is ready for welding again.

5.9.5 Arcforce

During the welding process, arcforce prevents the electrode sticking in the weld pool with increases in current. This makes it easier to weld large-drop melting electrode types at low current strengths with a short arc in particular.

Operating element	Action	Result	Display
	1 x	Select DYN setting (LED DYN is on)	Parameter value setting
		Arc forcing setting for electrode types: Setting range -40 to 40 Negative values: Rutile Values around zero: Basic Positive values: Rutilecellulose	

5.9.6 Hotstart

The hotstart device improves the ignition of the stick electrodes using an increased ignition current.

- a) = Hotstart time
- b) = Hotstart current
- I = Welding current
- t = Time

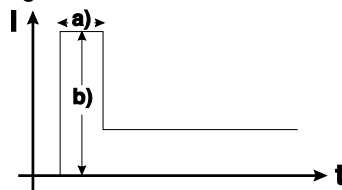


Figure 5-25

5.9.6.1 Hotstart settings

- Select MMA JOB 128. (see chapter "Selecting MMA welding tasks")

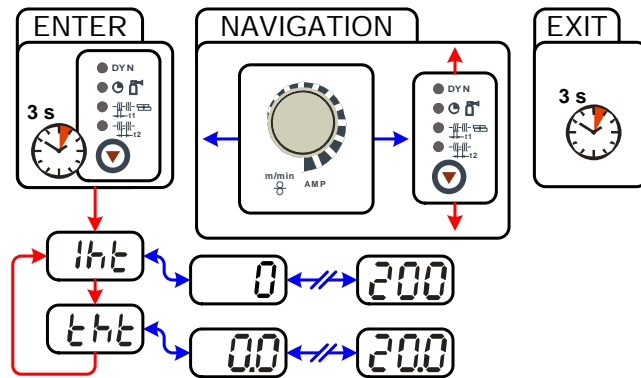
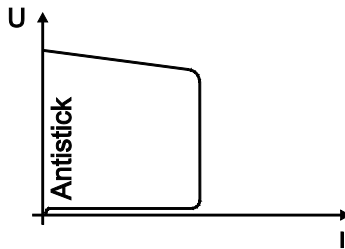


Figure 5-26

Display	Setting/selection
	Hotstart current 0% to 200% of the welding current (1% increments)
	Hotstart time 0.0 s to 20.0 s (0.1 s increments)

5.9.7 Antistick



Anti-stick prevents the electrode from annealing.

If the electrode sticks in spite of the Arcforce device, the machine automatically switches over to the minimum current within about 1 second to prevent the electrode from overheating. Check the welding current setting and correct according to the welding task!

Figure 5-27

5.10 TIG welding

5.10.1 Preparing the TIG welding torch

The TIG welding torch is to be equipped to suit the relevant welding task!

- Fit suitable tungsten electrodes and
- an appropriate shielding gas nozzle.
- Observe the operating instructions for the TIG welding torch!

5.10.2 Welding torch and workpiece line connection

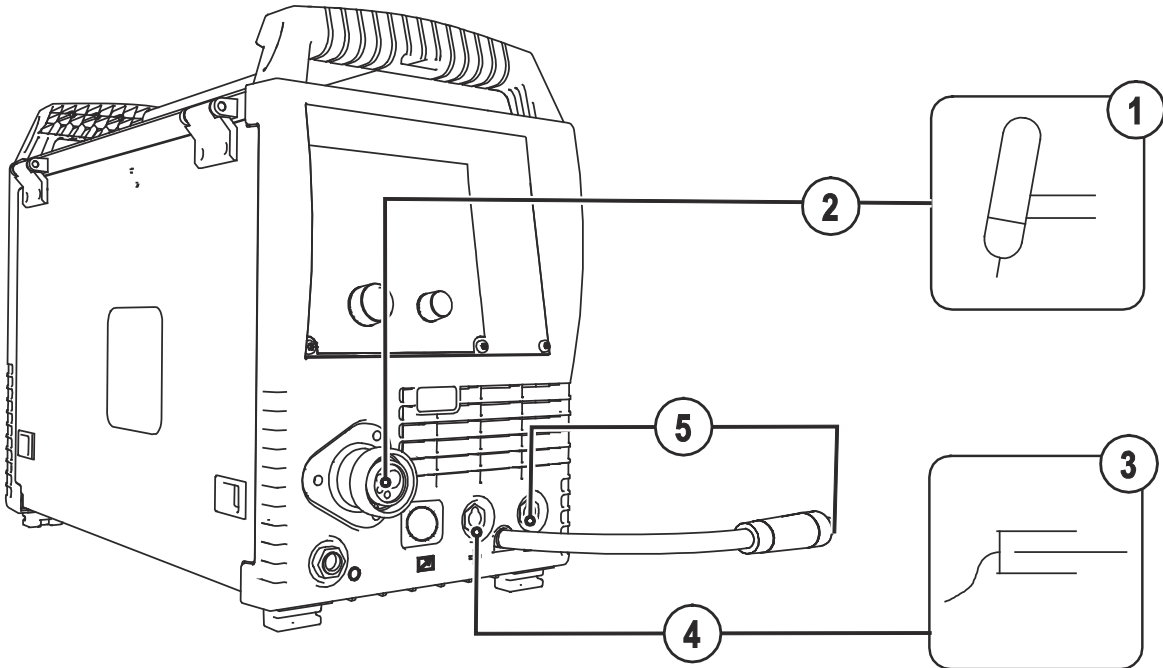


Figure 5-28

Item	Symbol	Description
1		Welding torch
2		Welding torch connection (Euro or Dinse torch connector) Welding current, shielding gas and torch trigger integrated
3		Workpiece
4		Connection socket, "+" welding current • TIG welding: Workpiece connection
5		Polarity selector plug, welding current cable Internal welding current cable for central connection/welding torch. • Connection socket for "-" welding current

- Insert the central plug for the welding torch into the central connector and screw together with crown nut.
- Insert the polarity selection plug into the "-" welding current connection socket and lock in place by turning to the right.
- Insert the plug of the workpiece lead into the "+" welding current connection socket and lock in place by turning to the right.

5.10.3 Welding task selection

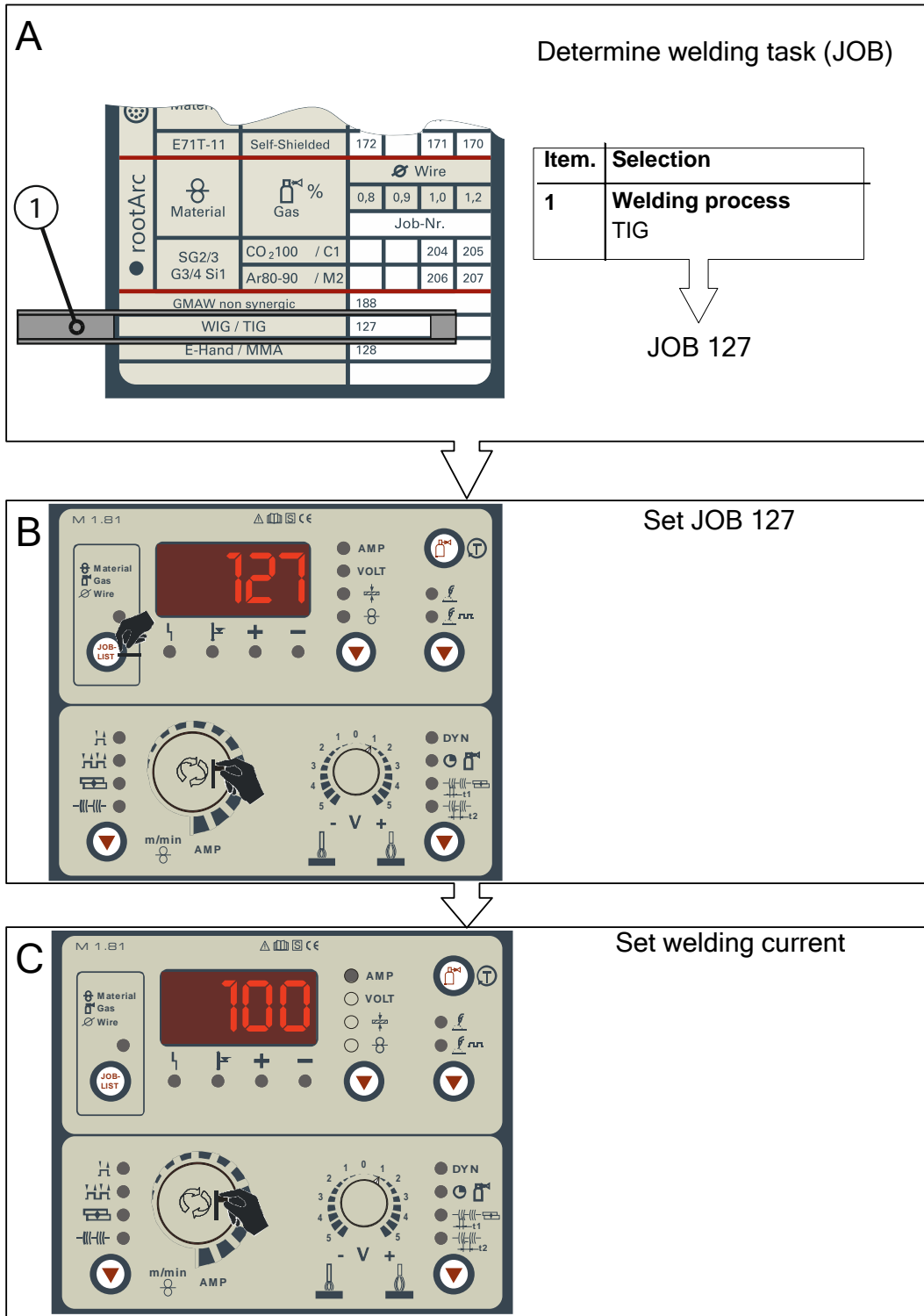


Figure 5-29

- Select TIG JOB 127.

It is only possible to change the JOB number when no welding current is flowing.

Operating element	Action	Result	Display
	1 x	Select JOB list (LED Material Gas is on) Wire	
		Set JOB number. Wait 3 s until the setting has been applied.	

5.10.4 Welding current setting

Set the welding current with the rotary dial for the welding parameter settings.

Operating element	Action	Result	Display
		Set welding current.	current nominal value

5.10.5 Adjusting the gas post-flow time

Operating element	Action	Result	Display
	1 x	Select setting for gas post-flow time (LED is on)	parameter value setting
		Setting the gas post-flow time Setting range: 0.0 s to 20.0 s	

5.10.6 Further welding parameters

- Preselection: Select TIG JOB 127. (see chapter "Selecting TIG welding tasks")

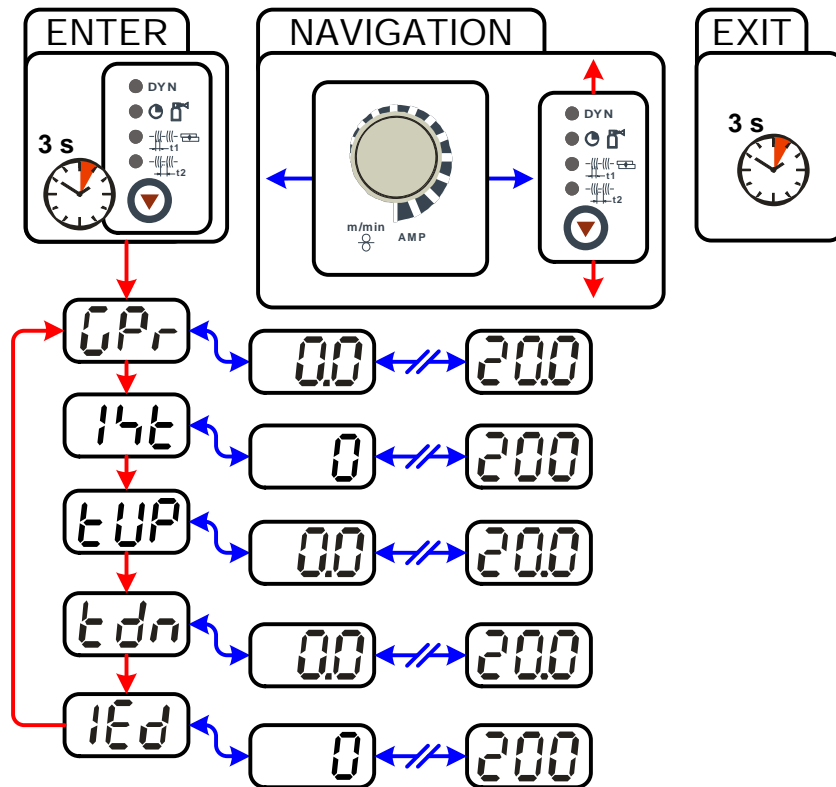


Figure 5-30

Display	Setting/selection
	Gas pre-flow time 0.0 s to 20.0 s (0.1 s increments)
	Ignition current 0% to 200% of the welding current (1% increments)
	Upslope time 0.0 s to 20.0 s (0.1 s increments)
	Downslope time 0.0 s to 20.0 s (0.1 s increments)
	End current 0% to 200% of the welding current (1% increments)

5.10.7 TIG welding data display

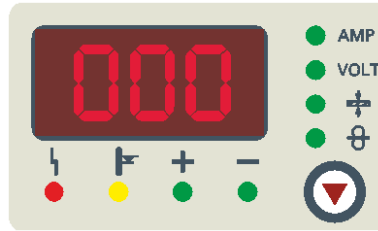


Diagram 5-31

The button for the welding parameter display mode is next to the display. Each time the button is pressed it switches between welding current and welding voltage.

The display shows:

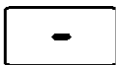
- Nominal values (before welding)
- Actual values (during welding)
- Hold values (after welding)

Parameter	Nominal values	Actual values	Hold values
Welding current	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Welding voltage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

The display switches back from hold values to actual values for approximately 5 s after welding is finished.

5.10.7.1 Power-saving mode

The power-saving function can be activated either by pressing the button for a longer time (see chapter "Machine description – Short overview") or by setting a parameter in the configuration menu (time-based power-saving mode).



When power-saving mode is activated, both machine displays show the horizontal digit in the centre of the display only.

Pressing any operating element (e.g. tapping the torch trigger) deactivates power-saving mode and the machine is ready for welding again.

5.10.8 TIG arc ignition

5.10.8.1 Liftarc ignition

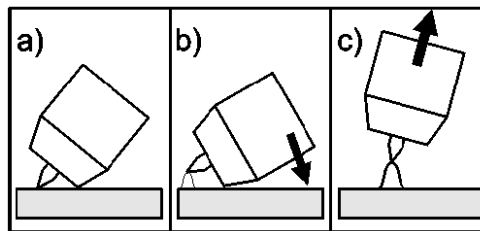








Figure 5-32

The arc is ignited on contact with the workpiece:

- Carefully place the torch gas nozzle and tungsten electrode tip onto the workpiece and press the torch trigger (liftarc current flowing, regardless of the main current set).
- Incline the torch over the torch gas nozzle to produce a gap of approx. 2-3 mm between the electrode tip and the workpiece. The arc ignites and the welding current is increased, depending on the operating mode set, to the ignition or main current set.
- Lift off the torch and swivel to the normal position.

Ending the welding process: Release or press the torch trigger depending on the operating mode selected.

5.10.9 Function sequences/operating modes
5.10.9.1 Legend

Symbol	Meaning
	Press torch trigger
	Release torch trigger
I	Welding current
	Gas pre-flows
	Gas post-flows
	Non-latched
	Latched
t	Time
t_{Up}	Upslope time
t_{Down}	Downslope time
I_{start}	Ignition current
I_{end}	End-crater current

Non-latched mode

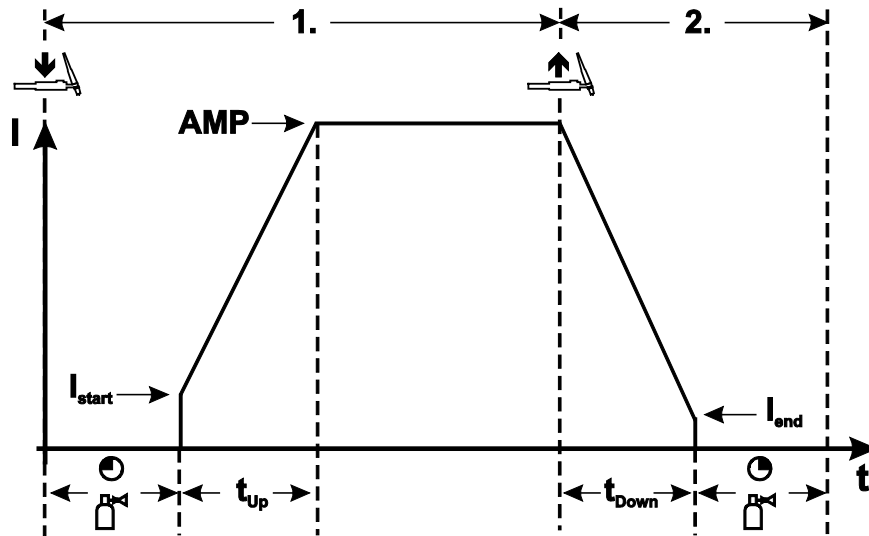


Figure 5-33

1st cycle

- Press and hold torch trigger.
- Shielding gas is expelled (gas pre-flows).

The arc is ignited using liftarc.

- The welding current flows with the value set for the starting current I_{start} .
- Welding current increases to the main current in the set upslope time.

2nd cycle

- Release torch trigger.
- The main current falls in the set downslope time to the end-crater current I_{end} .

If the torch trigger is pressed again during the downslope time, the welding current returns to the set main current!

- The main current reaches the end-crater current I_{end} , the arc extinguishes.
- Gas post-flow time elapses.

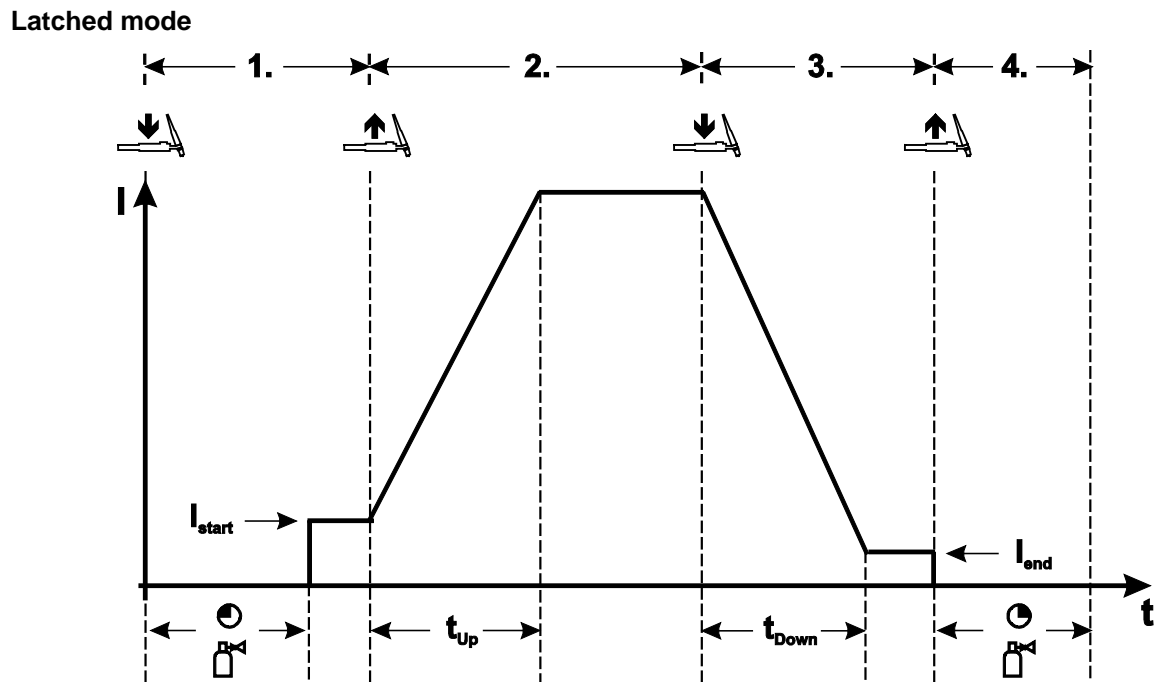


Figure 5-34

1st cycle

- Press and hold torch trigger.
- Shielding gas is expelled (gas pre-flows).

The arc is ignited using liftarc.

- The welding current flows with the value set for the starting current I_{start} .

2nd cycle

- Release torch trigger.
- Welding current increases to the main current in the set upslope time.

3rd cycle

- Press and hold torch trigger.
- The main current falls in the set downslope time to the end-crater current I_{end} .

4th cycle

- Release torch trigger, arc is extinguished.
- Gas post-flow time elapses.

The welding process is terminated immediately if the torch trigger is released during the downslope time.

The welding current drops to zero and the gas post-flow time begins.

5.10.10 TIG automatic cut-out**NOTE**

The welding machine ends the ignition process or the welding process with an

- Ignition fault (no welding current flows within 3 s after the start signal).
- Arc interruption (arc is interrupted for longer than 3 s).

5.11 Machine configuration menu

5.11.1 Selecting, changing and saving parameters

NOTE

ENTER (Enter the menu)

- Switch off the machine at the main switch.
- Press and hold the "sequence parameter" push-button and switch the machine on again at the same time.

NAVIGATION (Navigate the menu)

- Select parameters by pressing the "sequence parameter" push-button.
- Set or change the parameters by turning the "welding parameter setting" rotary knob.

EXIT (Exit the menu)

- Press the "gas test/flushing" push-button (switch machine off and on again).

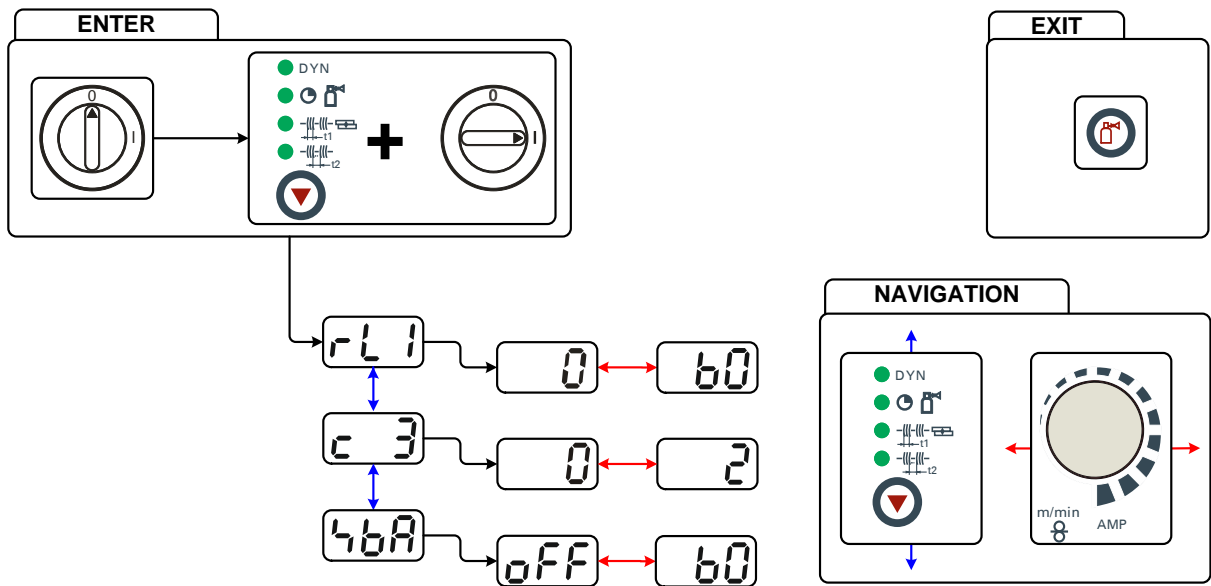


Figure 5-35

Display	Setting/selection
rL1	Lead resistance 1 Lead resistance for the first welding circuit 0 mΩ–60 mΩ (8 mΩ ex works).
c 3	Only qualified service personnel may change the parameters!
4bA	Time-based power-saving mode <ul style="list-style-type: none"> • 5 min.–60 min. = Time to activation of power-saving mode in case of inactivity. • off = inactivated

5.11.2 Matching the cable resistance

The resistance value of cables can either be set directly or it can be matched using the power source. The factory setting of the power sources is 8 m-ohm. This value corresponds to a 5 m earth cable, a 1.5 m intermediate hose package and a 3 m water-cooled welding torch. With other hose package lengths, it is necessary to carry out a +/- voltage correction to optimise welding properties. The voltage correction value can be set close to zero by means of re-matching the cable resistance. It is recommended to match the electric cable resistance after replacing accessories such as torches or intermediate hose packages. In case a second wire feeder is used the (rL2) parameter has to be adjusted. For all other configurations it is sufficient to match the (rL1) parameter.

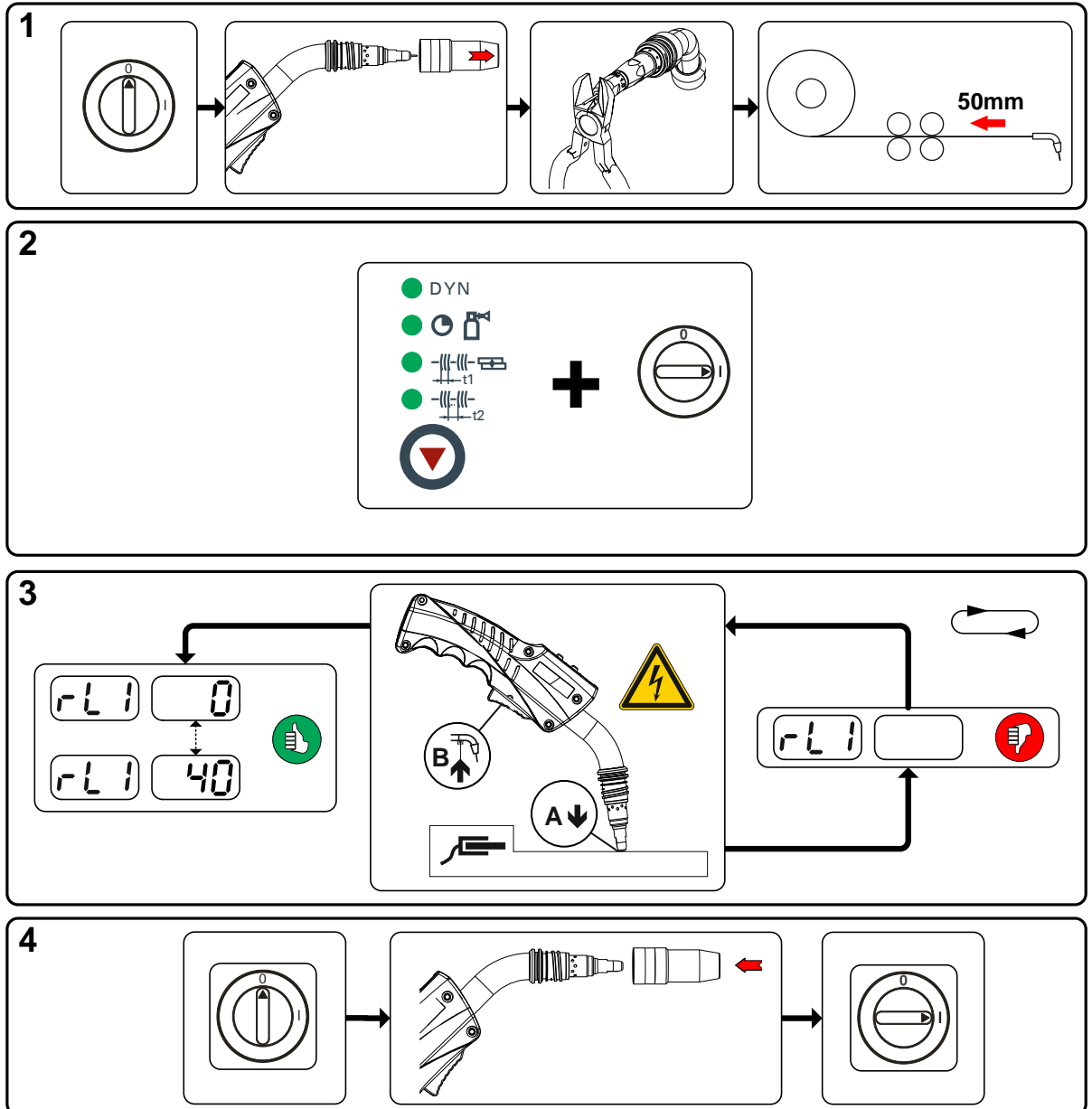


Figure 5-36

1 Preparation

- Switch off the welding machine.
- Unscrew the gas nozzle of the welding torch.
- Cut off the welding wire to be flush with the contact tip.
- Retract the welding wire a bit (approx. 50 mm) on the wire feeder. Now there should be no more welding wire in the contact tip.

2 Configuration

- Press the "sequence parameter" push-button while simultaneously switching on the welding machine. Release the "sequence parameter" push-button.
- The desired parameter can now be selected using the "sequence parameter" push-button. Parameter rL1 must be balanced for all machine combinations. In case of welding systems with a second power circuit – if two wire feeders are to be operated from a single power source, for example – a second balancing with parameter rL2 must be performed.

3 Balancing/measurement

- Applying slight pressure, put the welding torch in place with the contact tip on a clean, purged location on the workpiece and then press the torch trigger for approx. 2 seconds. Short-circuit current flows briefly, which is used to determine and display the cable resistance. The value can be between 0 mΩ and 40 mΩ. The new value is immediately saved without requiring any further confirmation. If no value is shown in the right display, then the measurement failed. The measurement must be repeated.

4 Restoring welding standby mode

- Switch off the welding machine.
- Screw the gas nozzle onto the welding torch.
- Switch on the welding machine
- Insert the welding wire.

6 Maintenance, care and disposal

DANGER



Do not carry out any unauthorised repairs or modifications!

To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!

The warranty becomes null and void in the event of unauthorised interference.

- Appoint only skilled persons for repair work (trained service personnel)!



Risk of injury from electric shock!

Cleaning machines that are not disconnected from the mains can lead to serious injuries!

- Disconnect the machine completely from the mains.
- Remove the mains plug!
- Wait for 4 minutes until the capacitors have discharged!

6.1 General

When used in the specified environmental conditions and under normal operating conditions, this machine is largely maintenance-free and requires a minimum of care.

There are some points, which should be observed, to guarantee fault-free operation of your welding machine. Among these are regular cleaning and checking as described below, depending on the pollution level of the environment and the length of time the unit is in use.

6.2 Maintenance work, intervals

6.2.1 Daily maintenance tasks

- Clean the wire feed rollers on a regular basis (depending on the degree of soiling).

6.2.1.1 Visual inspection

- Mains supply lead and its strain relief
- Gas tubes and their switching equipment (solenoid valve)
- Other, general condition

6.2.1.2 Functional test

- Check correct mounting of the wire spool.
- Welding current cables (check that they are fitted correctly and secured)
- Gas cylinder securing elements
- Operating, message, safety and adjustment devices (Functional test)

6.2.2 Monthly maintenance tasks

6.2.2.1 Visual inspection



- Casing damage (front, rear and side walls)
- Wheels and their securing elements
- Transport elements (strap, lifting lugs, handle)

6.2.2.2 Functional test

- Selector switches, command devices, emergency stop devices, voltage reducing devices, message and control lamps
- Check that the wire guide elements (inlet nipple, wire guide tube) are fitted securely.

6.2.3 Annual test (inspection and testing during operation)

NOTE

-  The welding machine may only be tested by competent, capable persons!
A capable person is one who, because of his training, knowledge and experience, is able to recognise the dangers that can occur while testing welding power sources as well as possible subsequent damage and who is able to implement the required safety procedures.
-  For further information, please see the accompanying supplementary sheets "Machine and Company Data, Maintenance and Testing, Warranty"!

A periodic test according to IEC 60974-4 "Periodic inspection and test" has to be carried out. In addition to the regulations on testing given here, the relevant local laws and regulations must also be observed.

6.3 Maintenance work

Repair and maintenance work may only be performed by qualified authorised personnel; otherwise the right to claim under warranty is void. In all service matters, always consult the dealer who supplied the machine. Return deliveries of defective equipment subject to warranty may only be made through your dealer. When replacing parts, use only original spare parts. When ordering spare parts, please quote the machine type, serial number and item number of the machine, as well as the type designation and item number of the spare part.

6.4 Disposing of equipment

NOTE



Proper disposal!

The machine contains valuable raw materials, which should be recycled, and electronic components, which must be disposed of.

- Do not dispose of in household waste!
- Observe the local regulations regarding disposal!



6.4.1 Manufacturer's declaration to the end user

- According to European provisions (guideline 2002/96/EG of the European Parliament and the Council of January, 27th 2003), used electric and electronic equipment may no longer be placed in unsorted municipal waste. It must be collected separately. The symbol depicting a waste container on wheels indicates that the equipment must be collected separately. This machine is to be placed for disposal or recycling in the waste separation systems provided for this purpose.
- According to German law (law governing the distribution, taking back and environmentally correct disposal of electric and electronic equipment (ElektroG) from 16.03.2005), used machines are to be placed in a collection system separate from unsorted municipal waste. The public waste management utilities (communities) have created collection points at which used equipment from private households can be disposed of free of charge.
- Information about giving back used equipment or about collections can be obtained from the respective municipal administration office.
- EWM participates in an approved waste disposal and recycling system and is registered in the Used Electrical Equipment Register (EAR) under number WEEE DE 57686922.
- In addition to this, returns are also possible throughout Europe via EWM sales partners.

6.5 Meeting the requirements of RoHS

We, EWM AG Mündersbach, hereby confirm that all products supplied by us which are affected by the RoHS Directive, meet the requirements of the RoHS (Directive 2002/95/EC).

7 Rectifying faults

All products are subject to rigorous production checks and final checks. If, despite this, something fails to work at any time, please check the product using the following flowchart. If none of the fault rectification procedures described leads to the correct functioning of the product, please inform your authorised dealer.

7.1 Checklist for rectifying faults

NOTE

 **The correct machine equipment for the material and process gas in use is a fundamental requirement for perfect operation!**

Legend	Symbol	Description
	↘	Fault/Cause
	✘	Remedy

Wire feed problems

- ↘ Contact tip blocked
 - ✘ Clean, spray with anti-spatter spray and replace if necessary
- ↘ Setting the spool brake (see "Setting the spool brake" chapter)
 - ✘ Check settings and correct if necessary
- ↘ Setting pressure units (see "Inching wire electrodes" chapter)
 - ✘ Check settings and correct if necessary
- ↘ Worn wire rolls
 - ✘ Check and replace if necessary
- ↘ Wire feed motor without supply voltage (automatic cutout triggered by overloading)
 - ✘ Reset triggered fuse (rear of the power source) by pressing the key button
- ↘ Kinked hose packages
 - ✘ Extend and lay out the torch hose package
- ↘ Wire guide core or spiral is dirty or worn
 - ✘ Clean core or spiral; replace kinked or worn cores

Functional errors



- ↘ Machine control without displaying the signal lights after switching on
 - ✘ Phase failure > check mains connection (fuses)
- ↘ No welding performance
 - ✘ Phase failure > check mains connection (fuses)
- ↘ Various parameters cannot be set
 - ✘ Entry level is blocked, disable access lock (see chapter entitled "Lock welding parameters against unauthorised access")
- ↘ Connection problems
 - ✘ Make control lead connections and check that they are fitted correctly.
- ↘ Loose welding current connections
 - ✘ Tighten power connections on the torch and/or on the workpiece
 - ✘ Tighten contact tip correctly

Mains fuse triggers

- ↘ Unsuitable mains fuse
 - ✘ Set up the mains fuse according to the "Technical data" chapter.

7.2 Error messages (power source)

NOTE

-  **A welding machine error is indicated by an error code being displayed (see table) on the display on the machine control.**
In the event of a machine error, the power unit is shut down.
-  **The display of possible error numbers depends on the machine version (interfaces/functions).**




- Document machine errors and inform service staff as necessary.
- If multiple errors occur, these are displayed in succession.

Error	Category			Possible cause	Remedy
	a)	b)	c)		
Error 1 (Ov.Vol)	-	-	x	Mains overvoltage	Check the mains voltages and compare with the connection voltages of the welding machine
Error 2 (Un.Vol)	-	-	x	Mains undervoltage	
Error 3 (Temp)	x	-	-	Welding machine excess temperature	Allow the machine to cool down (mains switch to "1")
Error 4 (Water)	xx	x	-	Low coolant level	Top off the coolant Leak in the coolant circuit > rectify the leak and top off the coolant Coolant pump is not working > check excess current trigger on air cooling unit
Error 5 (Wi.Spe)	x	-	-	Wire feeder, speedometer error	Check the wire feeder speedometer is not issuing a signal, M3.00 defective > inform Service
Error 6 (gas)	x	-	-	Shielding gas error	Check shielding gas supply (for machines with shielding gas monitoring)
Error 7 (Se.Vol)	-	-	x	Secondary excess voltage	Inverter error > inform Service
Error 8 (no PE)	-	-	x	Earth fault between welding wire and earth line (Phoenix 330 only)	Separate the connection between the welding wire and casing or an earthed object
Error 9 (fast stop)	x	-	-	Fast cut-out triggered by BUSINT X11 or RINT X12	Rectify error on robot
Error 10 (no arc)	-	x	-	Arc break triggered by BUSINT X11 or RINT X12	Check wire feeding
Error 11 (no ign)	-	x	-	Ignition fault after 5 s triggered by BUSINT X11 or RINT X12	Check wire feeding
Error 14 (no DV)	-	x	-	Wire feeder not detected. Control cable not connected.	Check cable connections
				Incorrect ID numbers assigned during operation with multiple wire feeders.	Check assignment of ID numbers (see the "Changing ID number of wire feeder" chapter)
Error 15 (DV2?)	-	x	-	Wire feeder 2 not detected. Control cable not connected.	Check cable connections
Error 16 (VRD)	-	-	x	VRD (open circuit voltage reduction error)	Inform Service
Error 17 (WF. Ov.)	-	x	x	Wire feed mechanism overcurrent detection	Check the wire feeding

Error	Category			Possible cause	Remedy
	a)	b)	c)		
Error 18 (WF. Sl.)	-	x	x	No speedometer signal from second wire feeder (slave drive)	Check the connection and particularly the speedometer of the second wire feeder (slave drive).

Legend for categories (error reset)

- a) The error message will disappear once the error has been rectified.
- b) The error message can be reset by pressing a key button:

Welding machine control	Key button
RC1 / RC2	
Expert	
CarExpert / Progress (M3.11)	
alpha Q / Concept / Basic / Basic S / Synergic / Synergic S / Progress (M3.71) Picomig 305	not possible

- c) The error message can only be reset by switching the machine off and on again.
The shielding gas error (Err 6) can be reset by pressing the "Welding parameters" key button.

7.3 Resetting welding parameters to the factory settings

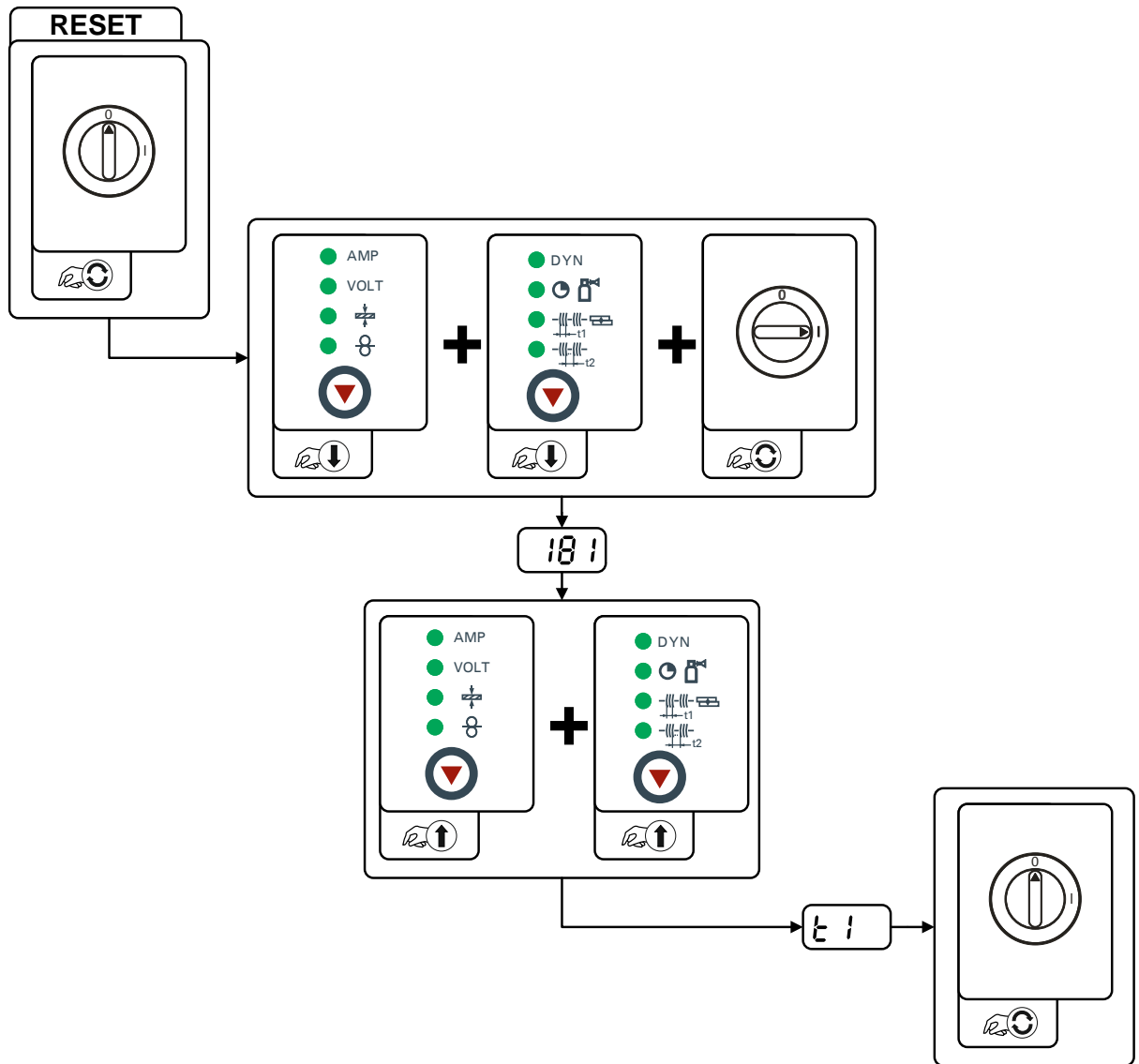


Figure 7-1

Display	Setting/selection
	Code of machine control
	Initialisation complete All customised welding parameters have been overwritten by the factory settings.

7.4 Resetting JOBS (welding tasks) to the factory settings

7.4.1 Resetting a single JOB

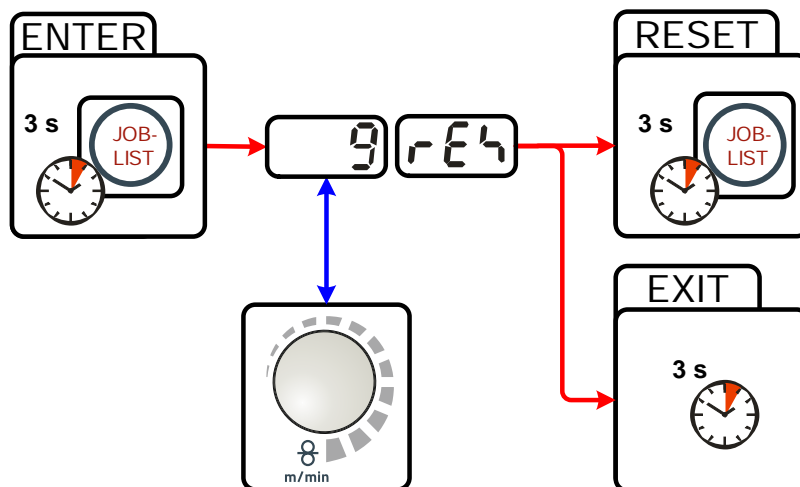


Figure 7-2

Display	Setting/selection
	Reset to factory settings The RESET will be done after pressing the button. The menu will be ended when no changes are done after 3 sec.
	JOB-number (example) The shown JOB will be set to ex works.

7.4.2 Resetting all JOBs

NOTE

All customised welding parameters that are stored will be replaced by the factory settings.

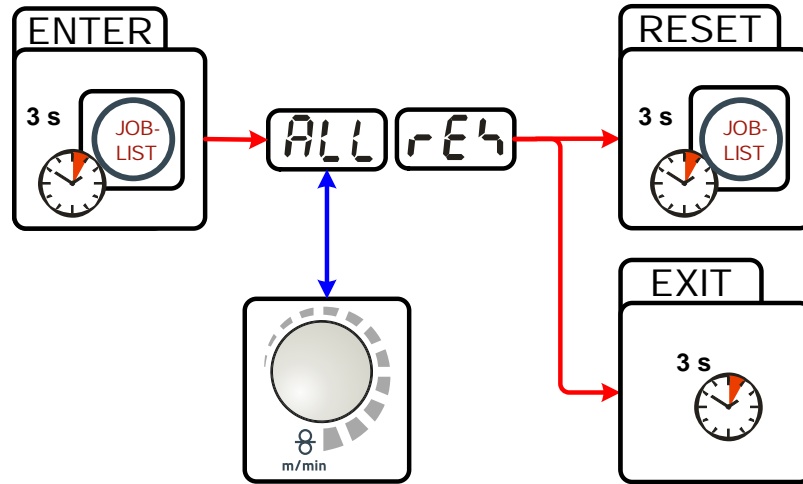


Figure 7-3


Display	Setting/selection
	Reset to factory settings The RESET will be done after pressing the button. The menu will be ended when no changes are done after 3 sec.

8 Technical data

NOTE

 Performance specifications and guarantee only in connection with original spare and replacement parts!

8.1 Picomig 305 puls D2

Setting range	MIG/MAG	TIG	MMA
Welding current	5 A to 300 A		
Welding voltage	14.3 V to 29 V	10.2 V to 22 V	20.2 V to 32 V
Duty cycle (DC) at 40 °C			
40%	300 A		
60%	260 A		
100%	200 A		
Duty cycle (DC) at 25 °C			
50%	300 A		
60%	280 A		
100%	240 A		
Load alternation	10 min. (60% DC \triangle 6 min. welding, 4 min. pause)		
Open circuit voltage	93 V		
Mains voltage (tolerances)	3 x 400 V (-25% to +20%)		
Frequency	50/60 Hz		
Mains fuse (safety fuse, slow-blow)	3 x 16 A		
Mains connection lead	H07RN-F4G2,5		
Max. connected load	11.0 kVA	8.3 kVA	12.1 kVA
Recommended generator rating	16.4 kVA		
cos ϕ	0.99		
Insulation class/protection classification	F/IP 23		
Ambient temperature	-25 °C to +40 °C		
Machine/torch cooling	Fan/gas		
Welding torch connection	Euro torch connector		
Wire feed speed	1 m/min. to 20 m/min.		
Standard roller installation	1.0/1.2 mm for steel wire		
Drive	4 rolls (37 mm)		
Wire spool diameter	200 mm		
Workpiece lead	50 mm ²		
Dimensions L x W x H in mm	535 x 300 x 480		
Weight	27 kg		
EMC class	A		
Constructed to standard	IEC 60974-1, -5, -10  /C €		

8.2 Picomig 305 puls D3

Setting range	MIG/MAG	TIG	MMA
Welding current	5 A to 300 A		
Welding voltage	14.3 V to 29 V	10.2 V to 22 V	20.2 V to 32 V
Duty cycle (DC) at 40 °C			
40%	300 A		
60%	260 A		
100%	200 A		
Duty cycle (DC) at 25 °C			
50%	300 A		
60%	280 A		
100%	240 A		
Load alternation	10 min. (60% DC Δ 6 min. welding, 4 min. pause)		
Open circuit voltage	93 V		
Mains voltage (tolerances)	3 x 400 V (-25% to +20%)		
Frequency	50/60 Hz		
Mains fuse (safety fuse, slow-blow)	3 x 16 A		
Mains connection lead	H07RN-F4G2,5		
Max. connected load	11.0 kVA	8.3 kVA	12.1 kVA
Recommended generator rating	16.3 kVA		
cos ϕ	0.99		
Insulation class/protection classification	F/IP 23		
Ambient temperature	-25 °C to +40 °C		
Machine/torch cooling	Fan/gas		
Welding torch connection	Euro torch connector		
Wire feed speed	1 m/min. to 20 m/min.		
Standard roller installation	1.0/1.2 mm for steel wire		
Drive	4 rolls (37 mm)		
Wire spool diameter	300 mm		
Workpiece lead	50 mm ²		
Dimensions L x W x H in mm	625 x 300 x 480		
Weight	29 kg		
EMC class	A		
Constructed to standard	IEC 60974-1, -5, -10 S/C €		

9 Accessories

NOTE



Performance-dependent accessories like torches, workpiece leads, electrode holders or intermediate hose packages are available from your authorised dealer.

9.1 General accessories

Type	Designation	Item no.
5POLE/CEE/16A/M	Machine plug	094-000712-00000
DM AR/MIX 35L/MIN	Manometer pressure regulator	094-000009-00000
G1 G1/4 R 3M	Gas hose	094-000010-00003
SPL	Sharpener for plastic liners	094-010427-00000
HC PL	Hose cutter	094-016585-00000

9.2 Options

Type	Designation	Item no.
ON MF XX5	Dirt filter	092-002662-00000

9.3 Transport systems

Type	Designation	Item no.
Trolly 35.2-2	Transport vehicle	090-008296-00000

10 Replaceable parts

CAUTION



Damage due to the use of non-genuine parts!

The manufacturer's warranty becomes void if non-genuine parts are used!

- Only use system components and options (power sources, welding torches, electrode holders, remote controls, spare parts and replacement parts, etc.) from our range of products!
- Only insert and lock accessory components into the relevant connection socket when the machine is switched off.

10.1 Wire feed rollers

10.1.1 Wire feed rollers for steel wire

Type	Designation	Item no.
FE 2DR4R 0,6+0,8	Drive rollers, 37 mm, steel	092-000839-00000
FE 2DR4R 0,8+1,0	Drive rollers, 37 mm, steel	092-000840-00000
FE 2DR4R 0,9+1,2	Drive rollers, 37 mm, steel	092-000841-00000
FE 2DR4R 1,0+1,2	Drive rollers, 37 mm, steel	092-000842-00000
FE 2DR4R 1,2+1,6	Drive rollers, 37 mm, steel	092-000843-00000
FE/AL 2GR4R	Pressure rollers, smooth, 37mm	092-000844-00000

10.1.2 Wire feed rollers for aluminium wire

Type	Designation	Item no.
AL 4ZR4R 0,8+1,0	Twin rollers, 37 mm, for aluminium	092-000869-00000
AL 4ZR4R 1,0+1,2	Twin rollers, 37 mm, for aluminium	092-000848-00000
AL 4ZR4R 1,2+1,6	Twin rollers, 37 mm, for aluminium	092-000849-00000
AL 4ZR4R 2,4+3,2	Twin rollers, 37 mm, for aluminium	092-000870-00000

10.1.3 Wire feed rollers for cored wire

Type	Designation	Item no.
ROE 2DR4R 0,8/0,9+0,8/0,9	Drive rollers, 37 mm, cored wire	092-000834-00000
ROE 2DR4R 1,0/1,2+1,4/1,6	Drive rollers, 37 mm, cored wire	092-000835-00000
ROE 2DR4R 1,4/1,6+2,0/2,4	Drive rollers, 37 mm, cored wire	092-000836-00000
ROE 2DR4R 2,8+3,2	Drive rollers, 37 mm, cored wire	092-000837-00000
ROE 2GR4R	Pressure rollers, knurled, 37mm	092-000838-00000

10.1.4 Conversion sets

Type	Designation	Item no.
URUE VERZ>UNVERZ FE/AL 4R	Conversion kit, 37mm, 4-roller drive on non-toothed rollers (steel/aluminium)	092-000845-00000
URUE AL 4ZR4R 0,8+1,0	Conversion kit, 37mm, 4-roller drive for aluminium	092-000867-00000
URUE AL 4ZR4R 1,0+1,2	Conversion kit, 37mm, 4-roller drive for aluminium	092-000846-00000
URUE AL 4ZR4R 1,2+1,6	Conversion kit, 37mm, 4-roller drive for aluminium	092-000847-00000
URUE AL 4ZR4R 2,4+3,2	Conversion kit, 37mm, 4-roller drive for aluminium	092-000868-00000
URUE ROE 2DR4R 0,8/0,9+0,8/0,9	Conversion kit, 37mm, 4-roller drive for cored wire	092-000830-00000
URUE ROE 2DR4R 1,0/1,2+1,4/1,6	Conversion kit, 37mm, 4-roller drive for cored wire	092-000831-00000
URUE ROE 2DR4R 1,4/1,6+2,0/2,4	Conversion kit, 37mm, 4-roller drive for cored wire	092-000832-00000
URUE ROE 2DR4R 2,8+3,2	Conversion kit, 37mm, 4-roller drive for cored wire	092-000833-00000

Verschleißteile 4 Rollen-Antrieb Ø = 37mm		St= Stahl Al= Aluminium CrNi= Edelstahl Cu= Kupfer		St= Steel Al= Aluminium CrNi= Stainless steel Cu= Copper	Wear parts 4-Roller drive system Ø = 37mm	
V-Nut: St-, CrNi-, Cu-Draht „Standard V-Nut“, oben unverzahnt und glatt, Rollenbezeichnung: „1,0“		V-groove: St-, CrNi-, Cu wire "Standard V-groove", on the top ungeared and plane, rolls description: "1,0"				
Antriebsrollen- Ø (b): Drive rolls- Ø (b): 0,6 + 0,8 0,8 + 1,0 0,9 + 1,2 1,0 + 1,2 1,2 + 1,6	Ersatzset: Spare set: 092-000839-00000 092-000840-00000 092-000841-00000 092-000842-00000 092-000843-00000					
Gegendruckrollenset (a) Set of counter pressure rolls (a)		092-000844-00000		092-000845-00000		
Umrüstung verzahnt → unverzahnt: <i>conversion geared → ungeared:</i>						
U-Nut: Al-, Cu-Draht „Option U-Nut“, oben verzahnt, Rollenbezeichnung: „1,0 A2“		U-groove: Al-, Cu wire "Option U-groove", on the top geared-twin rolls, rolls description: "1,0 A2"				
Antriebsrollen- Ø (a+b): Drive rolls- Ø (a+b): 0,8 + 1,0 1,0 + 1,2 1,2 + 1,6 2,4 + 3,2	Ersatzset: Spare set: 092-000869-00000 092-000848-00000 092-000849-00000 092-000870-00000	Umrüstset: Conversion set: 092-000867-00000 092-000846-00000 092-000847-00000 092-000868-00000				
U-Nut gerändelt: Füll-/Röhrchendraht „Option U-Nut gerändelt“, oben verzahnt, ohne Nut gerändelt, Rollenbezeichnung: „1,0-1,2 R“		knurled U-groove: Cored wire "Option knurled U-groove", on the top geared, without knurled groove, rolls description: "1,0-1,2 R"				
Antriebsrollen- Ø (b): Drive rolls- Ø (b): 0,8 / 0,9 + 0,8 / 0,9 1,0 / 1,2 + 1,4 / 1,6 1,4 / 1,6 + 2,0 / 2,4 2,8 + 3,2	Ersatzset: Spare set: 092-000834-00000 092-000835-00000 092-000836-00000 092-000837-00000	Umrüstset: Conversion set: 092-000830-00000 092-000831-00000 092-000832-00000 092-000833-00000				
Gegendruckrollenset (a): Set of counterpressure rolls (a):		092-000838-00000		094-006025-00503		

Figure 10-1

11 Appendix A

11.1 JOB-List

ewm®		JOB-LIST		094-019170-00500				
● Massivdraht / Solid Wire	⊗ Material	🔥 Gas	%	⊘ Wire				
				0,8	0,9	1,0	1,2	
	Job-Nr.							
	SG2/3 G3/4 Si1	CO ₂ 100 / C1	/	C1	1	2	3	4
					Ar80-90 / M2	6	7	8
	CrNi	Ar91-99 / M12-M13	/	M12-M13	34		35	36
					Ar/He / I3	42		43
	CuSi Löten / Brazing	Ar100 / I1	/	I1	114		115	116
					Ar91-99 / M12-M13	110		111
	CuAl Löten / Brazing	Ar100 / I1	/	I1	122		123	124
					Ar91-99 / M12-M13	118		119
	AlMg	Ar100 / I1	/	I1	74		75	76
					Ar/He / I3	78		79
	AlSi	Ar100 / I1	/	I1	82		83	84
					Ar/He / I3	86		87
Al99	Ar100 / I1	/	I1	90		91	92	
				Ar/He / I3	94		95	96
● Fülldraht / Flux-Cored Wire	⊗ Material	🔥 Gas	%	⊘ Wire				
				0,8	0,9	1,0	1,2	
	Job-Nr.							
	SG2/3 G3/4 Si1 Metal	Ar80-90 / M2	/	M2	235		237	238
	SG2/3 G3/4 Si1 Rutil / Basic	Ar80-90 / M2	/	M2	240		242	243
	CrNi Metal	Ar91-99 / M12-M13	/	M12-M13	227		228	229
	CrNi Rutil / Basic	Ar98/2 / M13	/	M13	231		232	233
Ar92/8 / M22					210		211	212
● rootArc	⊗ Material	🔥 Gas	%	⊘ Wire				
				0,9	1,0	1,1	1,2	
	Job-Nr.							
	E71T-11	Self-Shielded	/		172		171	170
SG2/3 G3/4 Si1	CO ₂ 100 / C1	/	C1			204	205	
				Ar80-90 / M2			206	207
GMAW non synergic				188				
WIG / TIG				127				
E-Hand / MMA				128				

NOTE

- 👉 **MIG/MAG pulse arc welding can be selected with JOBs 6-9, 34-36, 42-44, 74-76, 78-80, 82-84, 86-88, 90-92, 94-96, 110, 111, 114, 115, 118, 119, 122, 123, 206 and 207.**
- If an attempt is made to set another JOB to pulse, "noP" = "no Pulse" appears briefly on the display and the machine is reset to standard.

12 Appendix B

12.1 Overview of EWM branches

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