Operating instructions





Welding machine

Microplasma 25-2 PG RC Microplasma 55-2 PG RC Microplasma 105-2 PG RC

099-007033-EW501

Observe additional system documents!

4.1.2022

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General instructions

▲ WARNING



Read the operating instructions!

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

- Read and observe the operating instructions for all system components, especially the safety instructions and warning notices!
- Observe the accident prevention regulations and any regional regulations!
- The operating instructions must be kept at the location where the machine is operated.
- Safety and warning labels on the machine indicate any possible risks. Keep these labels clean and legible at all times.
- The machine has been constructed to state-of-the-art standards in line with any applicable regulations and industrial standards. Only trained personnel may operate, service and repair the machine.
- Technical changes due to further development in machine technology may lead to a differing welding behaviour.

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/en/specialist-dealers.

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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The content of this document has been prepared and reviewed with all reasonable care. The information provided is subject to change; errors excepted.

Data security

The user is responsible for backing up data of all changes from the factory setting. The user is liable for erased personal settings. The manufacturer does not assume any liability for this.



1 Contents

1	Cont	ntents		
2	For y	our safet	у	5
	2.1	Notes or	n using these operating instructions	5
	2.2		tion of icons	
	2.3	-	structions	
	2.4	Transpoi	rt and installation	10
3				
	3.1		ons	
	3.2		e version	
	3.3		nts which also apply	
		3.3.1 3.3.2	Warranty Declaration of Conformity	
		3.3.2	Welding in environments with increased electrical hazards	
		3.3.4	Service documents (spare parts and circuit diagrams)	
		3.3.5	Calibration/Validation	
		3.3.6	Part of the complete documentation	
4	Mach	ine desc	ription – quick overview	
-	4.1		wwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwww	
	4.2		w / side view from right	
	4.3	Machine	control – Operating elements	18
		4.3.1	Overview of control sections	
			4.3.1.1 Control section A	
			4.3.1.2 Control section B	
	4.4	Operatin 4.4.1	g the machine control	
		4.4.1	Welding power setting	
		4.4.3	Welding parameter setting in the operation sequence	
		4.4.4	Setting advanced welding parameters (Expert menu)	22
		4.4.5	Changing basic settings (machine configuration menu)	
		4.4.6	Welding data display	
		4.4.7	Setting the welding current (absolute/percentage)	23
5	Desig		nction	
	5.1		rt and installation	
		5.1.1	Ambient conditions	
		5.1.2	Machine cooling	
		5.1.3	Workpiece lead, general	
		5.1.4 5.1.5	Notes on the installation of welding current leads	
		5.1.6	Mains connection	
		0.1.0	5.1.6.1 Mains configuration	
		5.1.7	Shielding and plasma gas supply	
			5.1.7.1 Pressure regulator connection	
			5.1.7.2 Connection of shielding gas and plasma gas hose	
			5.1.7.3 Gas test	
		5.4.0	5.1.7.4 Automatic gas post-flow	
		5.1.8	Welding torch cooling system	
			5.1.8.1 Cooling unit connection	
		5.1.9	Welding torch and workpiece line connection	
		0.1.0	5.1.9.1 Plasma welding	
			5.1.9.2 TIG welding	
	5.2	Plasma v	welding	
		5.2.1	Welding task selection	36
			5.2.1.1 Setting welding procedure	
		5.2.2	Pilot arc	
		F 0 0	5.2.2.1 Adjust pilot arc currents	
	5.3	5.2.3	Expert Menu (Plasma)ling	
	ບ.ບ		/// I/I I/I	ບອ



		5.3.1		task selection	
		5.3.2	Arc ignit	ion	40
			5.3.2.1	HF ignition	40
			5.3.2.2	Liftarc	40
			5.3.2.3		
		5.3.3		stick	
		5.3.4		nenu (TIG)	
		5.3.5	•	the cable resistance	
	E 1				
	5.4			tasks	
		5.4.1		elding	
				Automated pulses	
				Thermal pulsing	
			5.4.1.3	Pulsed welding in the upslope and downslope phases	
			5.4.1.4	Metallurgical pulsing (kHz pulsing)	46
		5.4.2	Average	value pulse welding	47
	5.5	Power-sa	aving mod	de (Standby)	47
	5.6	Access o	ontrol		48
	5.7	Interface	s for auto	mation	48
		5.7.1	Automat	ion interface	49
		5.7.2	RINT X1	2 robot interface	49
		5.7.3		X11 industrial bus interface	
	5.8	PC interf			
		5.8.1		ion	
	5.9			ation menu	
	0.0	5.9.1	_	g, changing and saving parameters	
_	N/ -:4			disposal	
6		•		•	
	6.1				
		6.1.1	•]	
		6.1.2			
	6.2			r, intervals	
		6.2.1	•	aintenance tasks	
		6.2.2		maintenance tasks	
		6.2.3		est (inspection and testing during operation)	
	6.3	•	•	oment	
7	Recti	fying faul	lts		58
	7.1	Warnings	3		58
	7.2	Error me	ssages		59
	7.3	Resettino	g welding	parameters to the factory settings	60
	7.4			control software version	
	7.5			ying faults	
8					
U	8.1	Microplas	25 2	PG RC	62
	8.2			PG RC	
	8.3			2 PG RC	
_		-			
9					
	9.1	_		ling system	
		9.1.1		- type blueCool	
		9.1.2		- type KF	
	9.2	•			
	9.3				
	9.4	•		nication	
	9.5	General	accessor	ies	65
10	Appe	ndix			66
				ew – setting ranges	
	10.2			ealerealer	



2 For your safety

2.1 Notes on using 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.

Technical aspects which the user must observe to avoid material or equipment damage.

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.



Explanation of icons 2.2

Symbol	Description	Symbol	Description
	Indicates technical aspects which the user must observe.		Activate and release / Tap / Tip
	Switch off machine		Release
	Switch on machine		Press and hold
			Switch
	Incorrect / Invalid	97	Turn
	Correct / Valid		Numerical value – adjustable
-	Input		Signal light lights up in green
①	Navigation	•••••	Signal light flashes green
	Output	-)-	Signal light lights up in red
45	Time representation (e.g.: wait 4 s / actuate)	•••••••••••••••••••••••••••••••••••••••	Signal light flashes red
-//-	Interruption in the menu display (other setting options possible)		
*	Tool not required/do not use		
Î	Tool required/use		



2.3 Safety instructions

4

WARNING



Risk of accidents due to non-compliance with the safety instructions! Non-compliance with the safety instructions can be fatal!

- Carefully read the safety instructions in this manual!
- Observe the accident prevention regulations and any regional regulations!
- Inform persons in the working area that they must comply with the regulations!



Risk of injury from electrical voltage!

Voltages can cause potentially fatal electric shocks and burns on contact. Even low voltages can cause a shock and lead to accidents.

- Never touch live components such as welding current sockets or stick, tungsten or wire electrodes!
- · Always place torches and electrode holders on an insulated surface!
- Wear the full personal protective equipment (depending on the application)!
- The machine may only be opened by qualified personnel!
- The device must not be used to defrost pipes!



Hazard when interconnecting multiple power sources!

If a number of power sources are to be connected in parallel or in series, only a technical specialist may interconnect the sources as per standard IEC 60974-9:2010: Installation and use and German Accident Prevention Regulation BVG D1 (formerly VBG 15) or country-specific regulations.

Before commencing arc welding, a test must verify that the equipment cannot exceed the maximum permitted open circuit voltage.

- Only qualified personnel may connect the machine.
- When taking individual power sources out of operation, all mains and welding current leads must be safely disconnected from the welding system as a whole. (Hazard due to reverse polarity voltage!)
- Do not interconnect welding machines with pole reversing switch (PWS series) or machines for AC welding since a minor error in operation can cause the welding voltages to be combined, which is not permitted.



Risk of injury due to radiation or heat!

Arc radiation can lead to skin and eye injuries.

Contact with hot workpieces and sparks can lead to burns.

- Use hand shield or welding helmet with the appropriate safety level (depends on the application).
- Wear dry protective clothing (e.g. hand shield, gloves, etc.) in accordance with the applicable regulations of your country.
- Persons who are not directly involved should be protected with a welding curtain or suitable safety screen against radiation and the risk of blinding!



⚠ WARNING



Risk of injury due to improper clothing!

During arc welding, radiation, heat and voltage are sources of risk that cannot be avoided. The user has to be equipped with the complete personal protective equipment at all times. The protective equipment has to include:

- Respiratory protection against hazardous substances and mixtures (fumes and vapours);
 otherwise implement suitable measures such as extraction facilities.
- Welding helmet with proper protection against ionizing radiation (IR and UV radiation) and heat
- Dry welding clothing (shoes, gloves and body protection) to protect against warm environments with conditions comparable to ambient temperatures of 100 °C or higher and arcing and work on live components.
- Hearing protection against harming noise.



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!



Fire hazard!

Due to the high temperatures, sparks, glowing parts and hot slag that occur during welding, there is a risk of flames.

- · Be watchful of potential sources of fire in the working area!
- Do not carry any easily inflammable objects, e.g. matches or lighters.
- Ensure suitable fire extinguishers are available in the working area!
- Thoroughly remove any residue of flammable materials from the workpiece prior to starting to weld.
- Only further process workpieces after they have cooled down. Do not allow them to contact any flammable materials!

8 099-007033-EW501 4.1.2022



▲ CAUTION



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!



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!







According to IEC 60974-10, welding machines are divided into two classes of electromagnetic compatibility (the EMC class can be found in the Technical data) > see 8 chapter:

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 system
- · 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



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 6.2 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).



▲ CAUTION



Obligations of the operator!

The respective national directives and laws must be complied with when operating the machine!

- Implementation of national legislation relating to framework directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work and associated individual guidelines.
- In particular, directive 89/655/EEC concerning the minimum safety and health requirements for the use of work equipment by workers at work.
- The regulations applicable to occupational safety and accident prevention in the country concerned.
- Setting up and operating the machine as per IEC 60974.-9.
- Brief the user on safety-conscious work practices on a regular basis.
- Regularly inspect the machine as per IEC 60974.-4.



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.

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.

2.4 Transport and installation



⚠ WARNING

Risk of injury due to improper handling of shielding gas cylinders! Improper handling and insufficient securing of shielding gas cylinders can cause serious injuries!

- Observe the instructions from the gas manufacturer and any relevant regulations concerning the use of compressed air!
- Do not attach any element to the shielding gas cylinder valve!
- · Prevent the shielding gas cylinder from heating up.



▲ CAUTION



Risk of accidents due to supply lines!

During transport, attached supply lines (mains leads, control cables, etc.) can cause risks, e.g. by causing connected machines to tip over and injure persons!

Disconnect all supply lines before transport!



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.



Risk of accidents due to incorrectly installed leads!

Incorrectly installed leads (mains, control and welding leads or intermediate hose packages) can present a tripping hazard.

- Lay the supply lines flat on the floor (avoid loops).
- Avoid laying the leads on passage ways.



Risk of injury from heated coolant and its connections!

The coolant used and its connection or connection points can heat up significantly during operation (water-cooled version). When opening the coolant circuit, escaping coolant may cause scalding.

- Open the coolant circuit only when the power source or cooling unit is switched off!
- Wear proper protective equipment (protective gloves)!
- · Seal open connections of the hose leads with suitable plugs.
- Ŕ

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!



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.



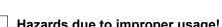
Protective dust caps protect the connection sockets and therefore the machine against dirt and damage.

- 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!

099-007033-EW501 4.1.2022



3 Intended use



Hazards due to improper usage!

The machine has been constructed to the state of the art and any regulations and standards applicable for use in industry and trade. It may only be used for the welding procedures indicated at the rating plate. 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!

⚠ WARNING

- The equipment must only be used in line with its designated purpose and by trained or expert personnel!
- Do not improperly modify or convert the equipment!

3.1 **Applications**

Arc welding machine for microplasma DC welding with HF ignition (contactless). Suitable for operation with automated welding torches.

It may be possible to expand the range of functions by using accessories (see the documentation in the relevant chapter).

3.2 Software version

These instructions apply to the following software version:

07.0410

The software version of the machine control can be displayed in the machine configuration menu (menu Srv) > see 5.9 chapter.

3.3 Documents which also apply

3.3.1 Warranty

For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at www.ewm-group.com!

3.3.2 **Declaration of Conformity**



This product corresponds in its design and construction to the EU directives listed in the declaration. The product comes with a relevant declaration of conformity in the original.

The manufacturer recommends carrying out the safety inspection according to national and international standards and guidelines every 12 months.

3.3.3 Welding in environments with increased electrical hazards



Power sources with this marking can be used for welding in an environment with increased electrical hazard (e.g. boilers). For this purpose, appropriate national or international regulations must be followed. The power source must not be placed in the danger zone!

3.3.4 Service documents (spare parts and circuit diagrams)



▲ WARNING

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.

3.3.5 Calibration/Validation

An original certificate is enclosed with the product. The manufacturer recommends calibration / validation at intervals of 12 months.



3.3.6 Part of the complete documentation

This document is part of the complete documentation and valid only in combination with all other parts of these instructions! Read and observe the operating instructions for all system components, especially the safety instructions!

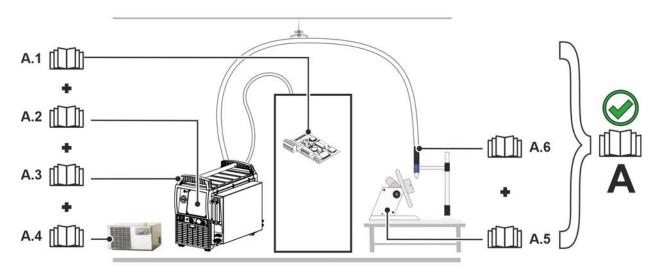


Figure 3-1

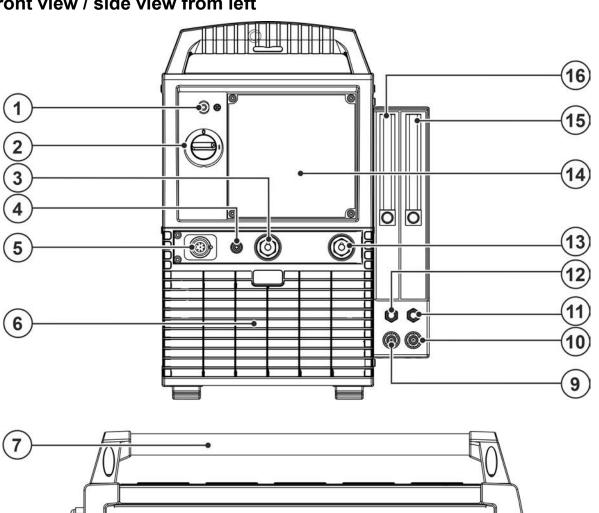
The illustration shows a general example of a welding system.

Item	Documentation
A.1	Robot interface
A.2	Control
A.3	Power source
A.4	Cooling unit
A.5	Mechanisation component
A.6	Welding torch
Α	Complete documentation



Machine description – quick overview 4

Front view / side view from left 4.1



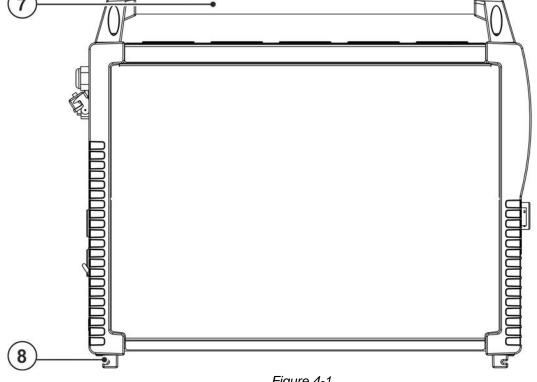


Figure 4-1







Item	Symbol	Description
1	\otimes	Ready for operation signal light Signal light on when the machine is switched on and ready for operation
2		Main Switch Switching the machine on or off.
3	/ = +	Workpiece lead connection socket
4	ŮŮ.	Pilot current connection socket Plasma welding torch nozzle potential
5	♦	7-pole connection socket (digital) For connecting digital accessory components
6		Cooling air inlet Dirt filter optional > see 6.1.2 chapter
7		Carrying handle
8		Machine feet
9	Red	Quick connect coupling (red) coolant return
10	Blue	Quick connect coupling (blue) coolant supply
11		Quick connect coupling plasma gas (plug nipple type 20) Connection to welding torch
12		Quick connect coupling shielding gas (coupling type 20) Connection to welding torch
13	<u>₽</u> —	Welding current connection socket, welding torch
14		Machine control > see 4.3 chapter
15	((\$))	Plasma gas flow regulator Control and display of gas flow volume
16		Shielding gas flow regulator Control and display of gas flow volume

099-007033-EW501 4.1.2022



4.2 Rear view / side view from right

The device configuration shown may differ in case of an additional ex works options or retrofitting options > see 9 chapter.

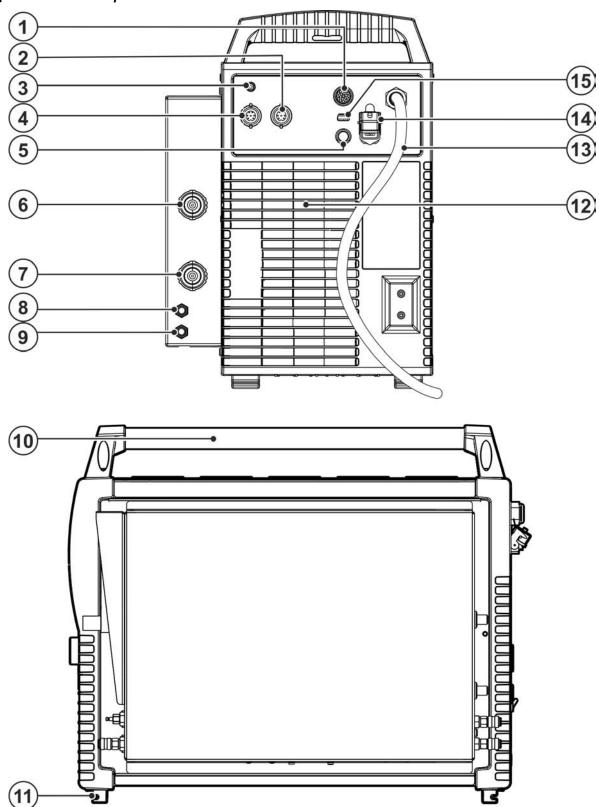


Figure 4-2







Item	Symbol	Description
1	analog	19-pole mechanised welding interface (analogue) > see 5.7.1 chapter
2	♦	7-pole connection socket (digital) For connecting digital accessory components
3	848	Key button, Automatic cutout Wire feed motor supply voltage fuse (press to reset a triggered fuse)
4	8	7-pole connection socket For connecting Wire feed unit
5		8-pole connection socket Cooling unit control lead
6	W W	G1/4" connecting nipple, shielding gas connection Connection to the pressure reducer
7	→	Connecting nipple G1/4" plasma gas, inlet Connection to pressure regulator
8	Red	Quick connect coupling (red) coolant return
9	Blue	Quick connect coupling (blue) coolant supply
10		Carrying handle
11		Machine feet
12		Cooling air outlet
13	D	Mains connection cable > see 5.1.6 chapter
14		5-pole connection socket Cooling unit voltage supply
15	COM	Connection socket (9-pole) - D-Sub PC interface > see 5.8 chapter



4.3 Machine control - Operating elements

4.3.1 Overview of control sections

For description purposes, the machine control has been divided into two sections (A, B) to ensure maximum clarity. The setting ranges for the parameter values are summarised in the parameter overview section > see 10.1 chapter.

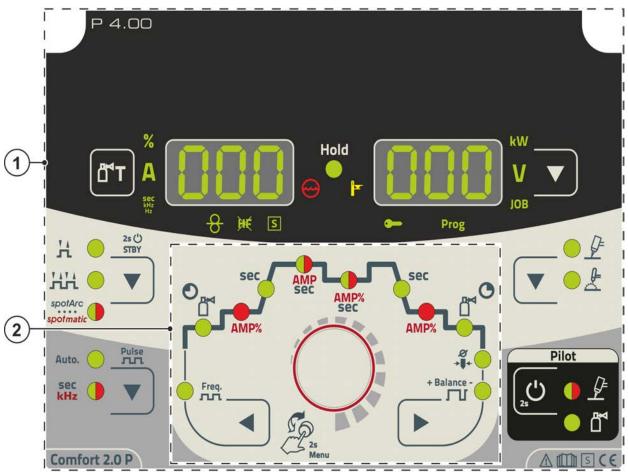


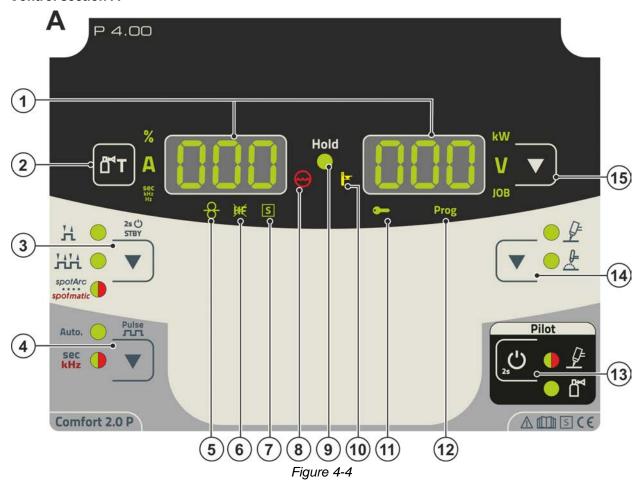
Figure 4-3

	Item Symbol Description		Description
1 Control section A		Control section A	
			> see 4.3.1.1 chapter
-	2		Control section B
			> see 4.3.1.2 chapter

18 099-007033-EW501 4.1.2022



4.3.1.1 **Control section A**



Item	Symbol	Description
1	000	Welding data display (3-digit)
		Displays the welding parameters and the corresponding values > see 4.4.6 chapter
2		Gas test push-button > see 5.1.7.3 chapter
3		Operating mode / power-saving mode push-button HLatched WorkerSpotArc spot welding procedure – signal light turns green SpotArc
4		Pulsed welding push-button AutoTIG automated pulsing (frequency and balance) sec kHzSignal light turns green: Pulsing (thermal pulsing) sec kHzSignal light lights up in red: kHz pulsing (metallurgical pulsing)
5	8	Filler wire welding signal light For machines with filler wire only (AW)
6	無	TIG ignition type signal light Signal light on: Lift arc ignition active/HF start off. You can switch the ignition type in the Expert menu (TIG) > see 5.3.2 chapter.
7	S	Character S function signal light Indicates that it is possible to weld in an environment with major electric hazards, such

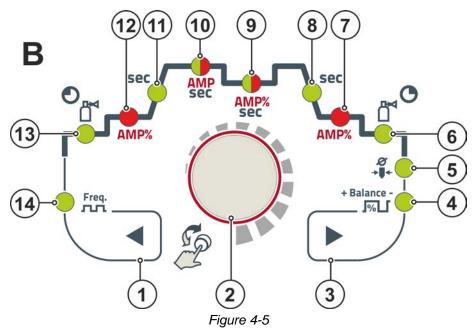
as in boilers. Service must be informed if this signal light is not on.



ltem	Symbol	Description
8	0	Coolant fault signal light Signals pressure loss or low coolant level in the coolant circuit.
9	Hold	Signal light Status display After each completed welding task, the last values used in the welding process for the welding current and welding voltage are shown on the displays, and the signal light will be on
10		Excess temperature signal light In case of excess temperature, temperature monitors de-activate the power unit, and the excess temperature control lamp comes on. Once the machine has cooled down, welding can continue without any further measures.
11	•	Access control active signal light Signal light is on when access control is active on the machine control > see 5.6 chapter.
12	Prog	Programme signal light (only for machine series "RC") Display of the current program number in the welding data display.
13	ڻ	Pilot arc push-button
14		Welding procedure push-button
15		Display switching push-button kW Welding power display V Welding voltage display JOB Display and setting of the JOB number with the control button

4.3.1.2 Control section B

20



Item	Symbol	Description
1		Parameter selection push-button, left
		The welding sequence parameters are selected one after another in an anti-clockwise
		direction. For control systems without this button settings are done exclusively via the
		control button.

099-007033-EW501 4.1.2022



Machine description – quick overview Machine control – Operating elements

Item	Symbol	Description
2		Control button
		Central control button to be pressed or turned > see 4.4 chapter.
3		Parameter selection push-button, right
		The welding sequence parameters are selected one after another in a clockwise direction. For control systems without this button settings are done exclusively via the con-
		trol button.
4	ПП	Balance signal light bal
		Pulse balance
5	Ø	Electrode diameter signal light [nd8]
	→ •	Ignition optimisation (TIG)/tungsten balling basic setting
6	, O	Gas post-flow time [F]
7	AMP%	End current signal light [Ed]
8	sec	Down-slope time 🖽 signal light
9	AMP%	Signal light, two colour
	sec	Red: Secondary or pulse pause current 📿 (% of AMP)
		Green: Pulse pause time 🖃
10	AMP	Signal light, two colour
	sec	Red: Main current // pulse current // PL
		Green: Pulse time
11	sec	Signal light Up-slope time EUP
12	AMP%	Signal light start current [5]
13	O _n	Gas pre-flow time signal light [Pr]
14	Freq.	FrE signal light
	7.7.	

099-007033-EW501 4.1.2022

Machine description – quick overview

Operating the machine control



Operating the machine control 4.4

4.4.1 Main screen

The machine control switches to the main screen after it has been turned on or a setting has been completed. This means that the previously selected settings (indicated by signal lights where applicable) and the nominal value for the current (A) are displayed in the left-hand welding data display. Depending on the selection, the right-hand display shows the welding voltage (V) nominal value or the welding power (kW) actual value. The control always switches back to the main screen after 4 sec..

4.4.2 Welding power setting

The welding power is set using the control button. You can also adjust the parameters in the operation sequence or settings in the different machine menus.

4.4.3 Welding parameter setting in the operation sequence

Set a welding parameter in the functional sequence by clicking (select) and turning the click wheel (navigate to the desired parameter). Press again to apply the selected parameter as the setting (corresponding parameter value and signal light flash). Then turn to set the parameter value.

During welding parameter setting, the parameter value to be set flashes in the left hand display. A parameter abbreviation or a deviation in the specified parameter value upwards or downwards is shown on the right-hand display:

Display	Meaning
ררט סו	Increase the parameter value To return to the factory settings.
<u> </u>	Factory setting (example value = 20) Parameter is set to optimum value
30 [-0	Decrease the parameter value To return to the factory settings.

4.4.4 Setting advanced welding parameters (Expert menu)

The Expert menu contains functions and parameters which cannot be set directly in the machine control or which do not need to be et on a regular basis. The number and display of these parameters depends on the previously selected welding procedure or the functions.

To select them hold the control button for more than 2 sec. Select the required parameter/menu item by turning (navigate) and pressing (confirm) the control button.

You can also or alternatively use the push-buttons to the left and right of the control button to navigate.

4.4.5 Changing basic settings (machine configuration menu)

The basic welding system functions can be adjusted in the machine configuration menu. Only experienced users should change the settings > see 5.9 chapter.

099-007033-EW501 22 4.1.2022







4.4.6 Welding data display

The following welding parameters can be displayed before (nominal values), during (actual values) or after welding (hold values):

Parameter	Before welding (nominal values)	During welding (actual values)	After welding (hold values)
Welding current	⊘	⊘	⊘
Parameter times	⊘	(X)	(X)
Parameter currents	⊘	(X)	(X)
Frequency, balance	⊘	③	(X)
JOB number	⊘	(X)	(X)
Welding power	(X)	⊘	⊘
Welding voltage	⊘	⊘	⊘

When the hold values are displayed after welding and the settings are then changed (e.g. welding current), the display will switch to the relevant nominal values.

The parameters that can be set in the machine control function sequence are dependent on the welding task selected. This means that if no pulse variant was selected, for example, no pulse parameters will be available to set in the function sequence.

4.4.7 Setting the welding current (absolute/percentage)

The welding current for the ignition, secondary, end and hot start current can be set as a percentage of the main current AMP or as an absolute value. To select the display use the parameter \(\frac{\text{Rb5}}{\text{Bb5}}\) in the configuration menu > see 5.9 chapter.

23



5 Design and function



⚠ WARNING

Risk of injury from electrical voltage!

Contact with live parts, e.g. power connections, can be fatal!

- Observe the safety information on the first pages of the operating instructions!
- Commissioning must be carried out by persons who are specifically trained in handling power sources!
- · Connect connection or power cables while the machine is switched off!

Read and observe the documentation to all system and accessory components!

5.1 Transport and installation



▲ WARNING

Risk of accident due to improper transport of machines that must not be lifted! Do not lift or suspend the machine! The machine can drop and cause injuries! The handles, straps or brackets are suitable for transport by hand only!

· The machine must not be suspended or lifted using a crane.

A connected and ready-to-use welding torch cooling unit is required for the operation of this plasma welding machine!

5.1.1 Ambient conditions



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.



Equipment damage due to contamination!

Unusually high amounts of dust, acids, corrosive gases or substances can damage the machine (observe maintenance intervals > see 6.2 chapter).

Avoid large amounts of smoke, steam, oily fumes, grinding dust and corrosive ambient air!

In operation

Temperature range of the ambient air:

-25 °C to +40 °C (-13 °F to 104 °F) [1]

Relative humidity:

- up to 50 % at 40 °C (104 °F)
- up to 90 % at 20 °C (68 °F)

Transport and storage

Storage in a closed room, temperature range of the ambient air:

-30 °C to +70 °C (-22 °F to 158 °F) [1]

Relative humidity

up to 90 % at 20 °C (68 °F)

Ambient temperature dependent on coolant! Observe the coolant temperature range of the torch cooling

5.1.2 Machine cooling



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!

099-007033-EW501



5.1.3 Workpiece lead, general

▲ CAUTION



Risk of burning due to incorrect welding current connection! If the welding current plugs (machine connections) are not locked or if the workpiece connection is contaminated (paint, corrosion), these connections and leads can heat up and cause burns when touched!

- Check welding current connections on a daily basis and lock by turning to the right when necessary.
- Clean workpiece connection thoroughly and secure properly. Do not use structural parts of the workpiece as welding current return lead!

5.1.4 Notes on the installation of welding current leads

- · 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
- Always keep leads as short as possible! For optimum welding results max. 30 m (welding lead + intermediate hose package + torch lead).

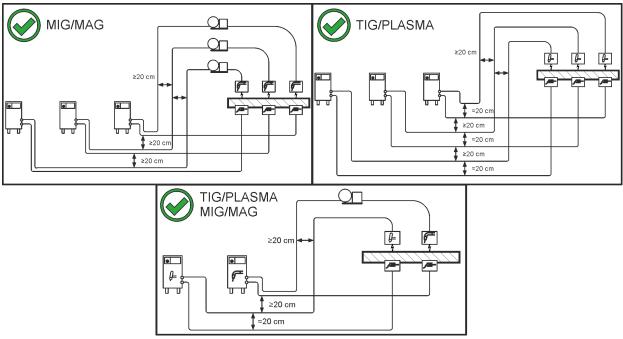


Figure 5-1



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

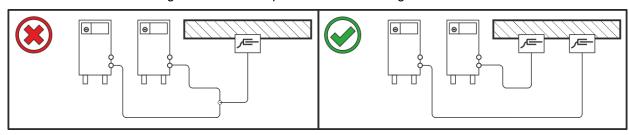


Figure 5-2

- 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.

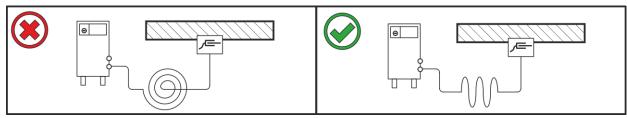


Figure 5-3



5.1.5 Stray welding currents

MARNING



Risk of injury due to stray welding currents!

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

- Check that all welding current connections are firmly secured and electrical connections are in perfect condition.
- Set up, attach or suspend all conductive power source components such as casing, transport vehicles and crane frames so they are insulated.
- Do not place any other electronic devices such as drills or angle grinders 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.

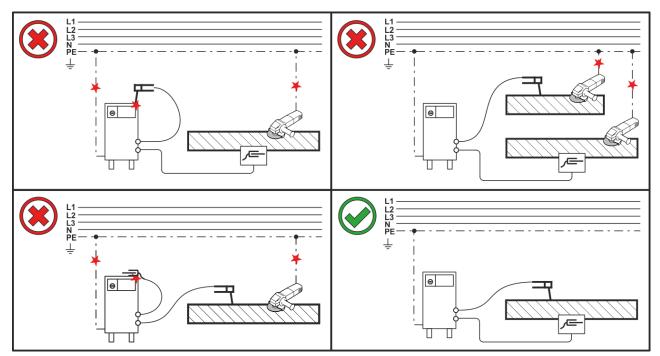


Figure 5-4



5.1.6 Mains connection



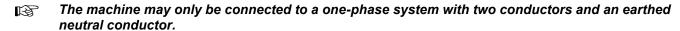
▲ DANGER

Hazards caused by improper mains connection!

An improper mains connection can cause injuries or damage property!

- The connection (mains plug or cable), the repair or voltage adjustment of the device must be carried out by a qualified electrician in accordance with the respective local laws or national regulations!
- The mains voltage indicated on the rating plate must match the supply voltage.
- Only operate machine using a socket that has correctly fitted protective earth.
- Mains plug, socket and lead must be checked by a qualified electrician on a regular basis!
- When operating the generator, always ensure it is earthed as stipulated in the operating instructions. The network created must be suitable for operating machines according to protection class I.

5.1.6.1 Mains configuration



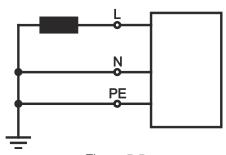


Figure 5-5

Legend

9		
Item	Designation	Colour code
L	Outer conductor	brown
N	Neutral conductor	blue
PE	Protective conductor	green-yellow

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

5.1.7 Shielding and plasma gas supply



B

▲ WARNING

Risk of injury due to improper handling of shielding gas cylinders! Improper handling and insufficient securing of shielding gas cylinders can cause serious injuries!

- Observe the instructions from the gas manufacturer and any relevant regulations concerning the use of compressed air!
- Do not attach any element to the shielding gas cylinder valve!
- · Prevent the shielding gas cylinder from heating up.

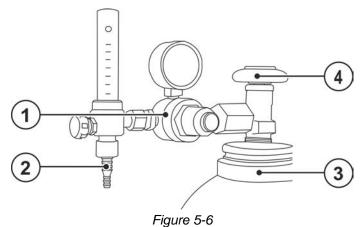
An unhindered shielding gas supply from the shielding gas cylinder to the welding torch is a fundamental requirement for optimum welding results. In addition, a blocked shielding gas supply may result in the welding torch being destroyed.

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

28 099-007033-EW501
4.1.2022



5.1.7.1 Pressure regulator connection



 Item
 Symbol
 Description

 1
 Pressure regulator

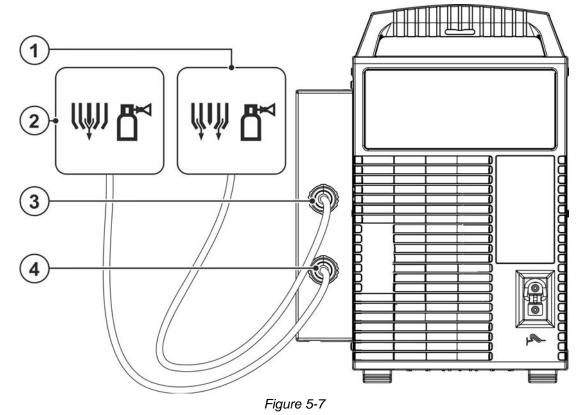
 2
 Output side of the pressure regulator

 3
 Shielding gas cylinder

 4
 Cylinder valve

- Before connecting the pressure regulator to the gas cylinder, open the cylinder valve briefly to blow out any dirt.
- Tighten the pressure regulator screw connection on the gas bottle valve to be gas-tight.
- Screw the gas hose connection to the outlet side of the pressure regulator gas-tight.

5.1.7.2 Connection of shielding gas and plasma gas hose



ItemSymbolDescription1Shielding gas



Item	Symbol	Description
2	((🎳)	Plasma gas
3	W W	G1/4" connecting nipple, shielding gas connection Connection to the pressure reducer
4	-€\₩	Connecting nipple G1/4" plasma gas, inlet Connection to pressure regulator

- Check correct condition and sealing of tubes. Blow through gas hoses.
- Screw the connection coupling of the plasma gas line onto the G1/4" connecting nipple, plasma gas connection.
- Screw the connection coupling of the shielding gas line onto the G1/4" connecting nipple, shielding gas connection.

5.1.7.3 Gas test



The connected gas lines should each have a pre-pressure of 4.5 bar (tolerance limits: plasma gas 4 bar to 5 bar, shielding gas 4 bar to 5 bar).

The functional sequence for the gas test is carried out in the same way for shielding gas and plasma gas. The gas test is only possible if:

- · the pilot arc is not ignited and
- · no welding process is being carried out.

Shielding and plasma gas setting can be checked without welding current flowing (currentless) and set if required. Activation of the gas test button releases both gas valves simultaneously and the gas setting can be made at the corresponding flow regulator.

- Press and hold the shielding or plasma gas test pushbutton.
- Release the pushbutton (test procedure complete).
- Press the torch trigger and set the shielding gas quantity with the flow gauge of the pressure regulator.

The flow quantity cannot be set higher on the gas flow regulator for fine adjustment of the gas flow than specified on the shielding gas cylinder pressure reducer.

5.1.7.4 Automatic gas post-flow

If the function is active, the gas post-flow time is defined by the machine control unit in dependence on power output. The defined gas post-flow time can also be adjusted if required. This value is then saved for the current welding task. The automatic gas post-flow function \overline{LPR} can be activated or deactivated in the machine configuration menu > see 5.9 chapter.

30 099-007033-EW501



5.1.8 Welding torch cooling system

5.1.8.1 **Cooling unit connection**

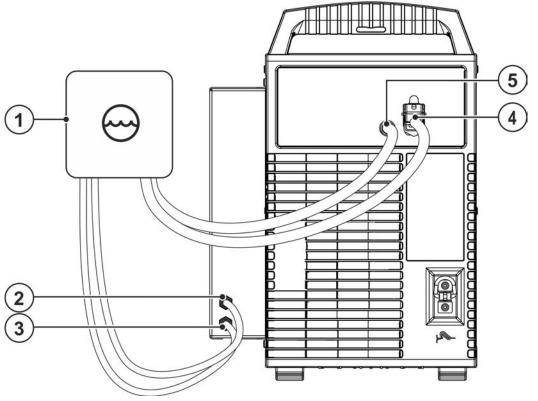


Figure 5-8

Item	Symbol	Description
1		Welding torch cooling unit
2	Red	Quick connect coupling (red) coolant return
3	Blue	Quick connect coupling (blue) coolant supply
4	(3)	5-pole connection socket Cooling unit voltage supply
5	(1)	8-pole connection socket Cooling unit control lead

- Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings: Return line red to quick connect coupling, red (coolant return) and supply line blue to quick connect coupling, blue (coolant supply).
- Insert and lock the 5-pole supply plug on the cooling unit into the 5-pole connection socket on the welding machine.
- Insert and lock the 8-pole control lead plug on the cooling unit into the 8-pole connection socket on the welding machine.



5.1.8.2 Connection of external recooling unit

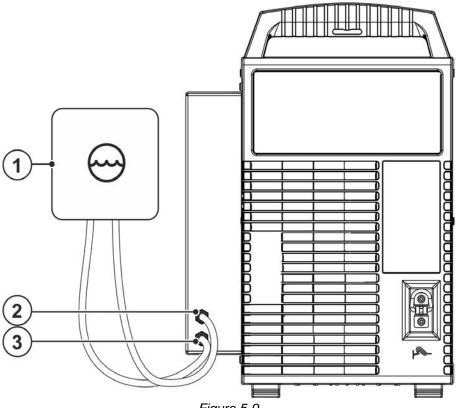


Figure 5-9

Item	Symbol	Description
1		Welding torch cooling unit
2	Red	Quick connect coupling (red) coolant return
3	Blue	Quick connect coupling (blue) coolant supply

Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings: Return line red to quick connect coupling, red (coolant return) and supply line blue to quick connect coupling, blue (coolant supply).



5.1.9 Welding torch and workpiece line connection

5.1.9.1 Plasma welding

Before commissioning, the plasma welding torch must be equipped for the welding JOB and B correspondingly set/adjusted!

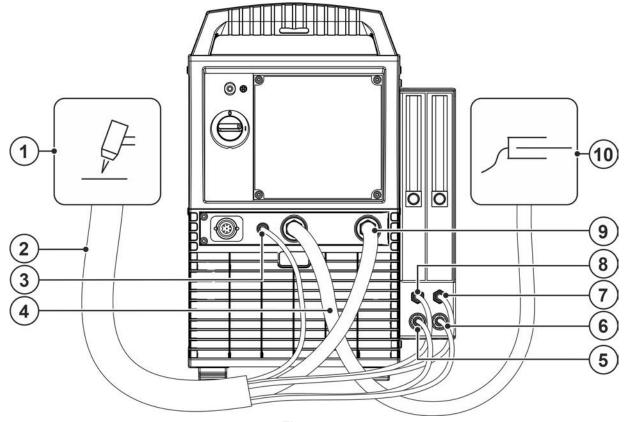


Figure 5-10

Item	Symbol	Description
1		Welding torch
2		Torch hose package
3	ŮŮ.	Pilot current connection socket Plasma welding torch nozzle potential
4		Workpiece lead
5	Red	Quick connect coupling (red) coolant return
6	Blue	Quick connect coupling (blue) coolant supply
7	((🎳)	Quick connect coupling plasma gas (plug nipple type 20) Connection to welding torch
8		Quick connect coupling shielding gas (coupling type 20) Connection to welding torch
9		Welding current connection socket, welding torch
10	/ ■	Workpiece



- Insert the plug on the welding current lead into the "-" welding current connection socket and lock.
- Insert the plug of the pilot power line into the "+" pilot current connection socket.
- Insert the quick connect coupling of the plasma gas line onto the quick-release nipple type 20.
- Insert the quick-release nipple of the protective gas line onto the quick connect coupling type 20.
- Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings: Return line red to quick connect coupling, red (coolant return) and supply line blue to quick connect coupling, blue (coolant supply).
- Insert the cable plug on the work piece lead into the "+" welding current connection socket and lock by turning to the right.

TIG welding 5.1.9.2

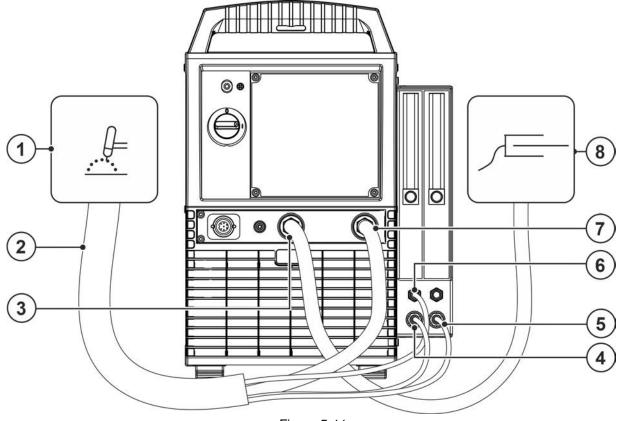
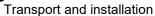


Figure 5-11

Item	Symbol	Description
1	<u> </u>	Welding torch
2		Torch hose package
3		Workpiece lead
4	Red	Quick connect coupling (red) coolant return
5	Blue	Quick connect coupling (blue) coolant supply
6		Quick connect coupling shielding gas (coupling type 20) Connection to welding torch
7		Welding current connection socket, welding torch
8	/ ■	Workpiece

099-007033-EW501 34 4.1.2022







- Insert the plug on the welding current lead into the "-" welding current connection socket and lock.
- Insert the quick-release nipple of the protective gas line onto the quick connect coupling type 20.
- Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings: Return line red to quick connect coupling, red (coolant return) and supply line blue to quick connect coupling, blue (coolant supply).
- Insert the cable plug on the work piece lead into the "+" welding current connection socket and lock by turning to the right.



5.2 Plasma welding

5.2.1 Welding task selection

The basic prerequisite for starting the plasma process is a connected and functioning cooling circuit for cooling of the welding torch.

5.2.1.1 Setting welding procedure

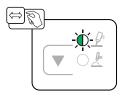


Figure 5-12

5.2.2 Pilot arc

Ignite pilot arc

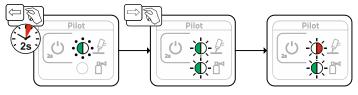


Figure 5-13

Switching off the pilot arc

B

36

The pilot arc must be switched off and the gas post flow time (plasma gas) waited for before switching off the welding machine. If the welding machine is switched off prematurely the tungsten electrode loses its jacket of shielding gas and will consequently oxidise.

- · Switch off the pilot arc before switching off the welding machine!
- · Wait until the welding torch has cooled down.

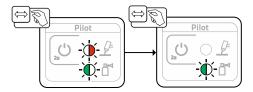


Figure 5-14

099-007033-EW501 4.1.2022

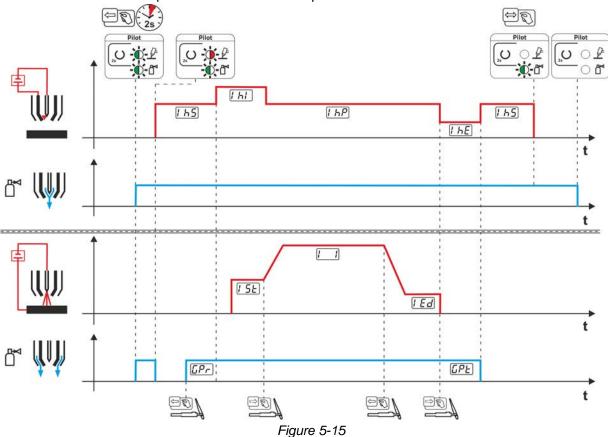


5.2.2.1 Adjust pilot arc currents

The pilot arc current can be adapted to the welding process at four operating points:

- 1. Pilot arc standby current [h5] (during the welding pause)
- 2. Pilot arc ignition current [ref] (before welding)
- 3. Pilot arc process current [hp] (during welding)
- 4. Pilot arc end current [] (at the welding end during gas post-flow time [])

The current is set in the expert menu > see 5.2.3 chapter.





5.2.3 **Expert Menu (Plasma)**

The Expert menu has adjustable parameters stored that don't require regular setting. The number of parameters shown may be limited, e.g. if a function is deactivated.

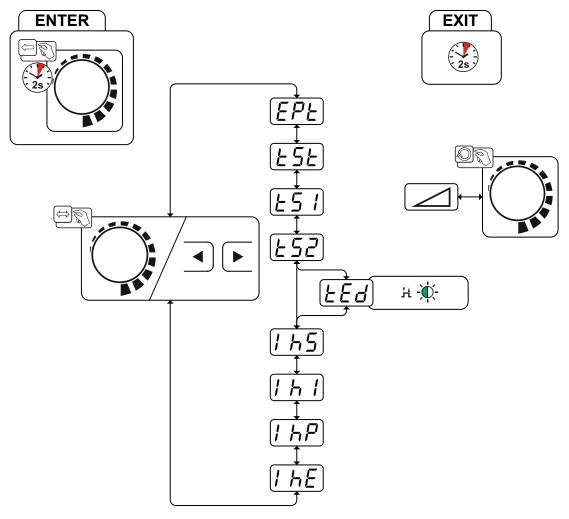


Figure 5-16

Display	Setting/selection
EPŁ	Expert menu
£5£	Start time (duration of start current)
<u> </u>	Slope time (main current to secondary current)
£52	Slope time (secondary current to main current)
E E d	End current time (duration of end current)
[h5	Pilot arc standby current No welding process active
· · · · · · · · · · · · · · · · · · ·	Pilot arc ignition current Start phase welding process (gas pre-flow time, start current)
(hP	Pilot arc process current Main current phase welding process
IHE	Pilot arc end current End current phase welding process (end current, gas post-flow time)



5.3 TIG welding

5.3.1 Welding task selection

The setting of the tungsten electrode diameter has a direct influence on the machine functionality, TIG ignition behaviour and minimum current limits. The ignition energy is controlled by the set electrode diameter. Smaller electrode diameters requires less start current and less start current time than greater electrode diameters. The set value should correspond to the tungsten electrode diameter. The value can also be set to meet individual requirements, e.g. for thin panels a smaller diameter is recommended to reduce the ignition energy.

The electrode diameter setting determines the minimum current limit, which in turn affects the ignition, main and secondary current. The minimum current limits have a positive effect on the ignition behaviour and ensure a very high arc stability for each electrode diameter selected. The minimum current limit function is enabled ex works, but can be disabled with parameter [L] in the machine configuration menu > see 5.9 chapter.

For foot-operated remote control mode, minimum current limits are disabled by default.

The following welding task is an example of use:

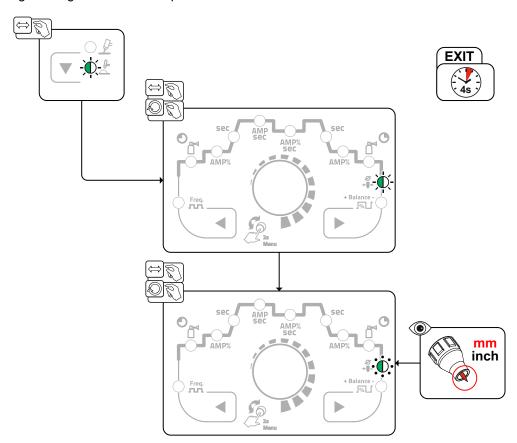


Figure 5-17



5.3.2 Arc ignition

5.3.2.1 **HF** ignition

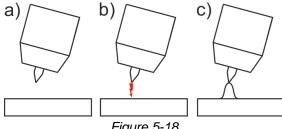


Figure 5-18

The arc is started without contact using high-voltage ignition pulses:

- a) Position the welding torch in the welding position above the workpiece (distance between the electrode tip and the workpiece approx. 2-3 mm).
- b) Press the torch trigger (high-voltage ignition pulses start the arc).
- c) Depending on the selected operating mode, the welding current flows with the set start or main cur-

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

5.3.2.2 Liftarc

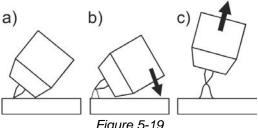


Figure 5-19

The arc is ignited on contact with the workpiece:

- a) 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).
- b) 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.
- c) 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.

5.3.2.3 **Automatic cut-out**

Once the fault periods have elapsed, the automatic cut-out stops the welding process when it has been triggered by one of two states:

- **During ignition** 3 s after the start of the welding process, no welding current flows (ignition error).
- **During welding** The arc is interrupted for more than 3 s (arc interruption). You can disable or set the time for re-ignition after an arc interruption in the machine configuration menu > see 5.9 chapter (parameter (LEA)).

5.3.3 TIG antistick

The function prevents uncontrolled re-ignition following the sticking of the tungsten electrode in the weld pool by switching off the welding current. In addition, wear at the tungsten electrode is reduced.

After triggering the function the machine immediately switches to the gas post-flow process phase. The welder starts the new process again at the first cycle. The user can switch the function on or off (parameter ERS) > see 5.9 chapter.

099-007033-EW501 40 4 1 2022



5.3.4 Expert menu (TIG)

The Expert menu has adjustable parameters stored that don't require regular setting. The number of parameters shown may be limited, e.g. if a function is deactivated.

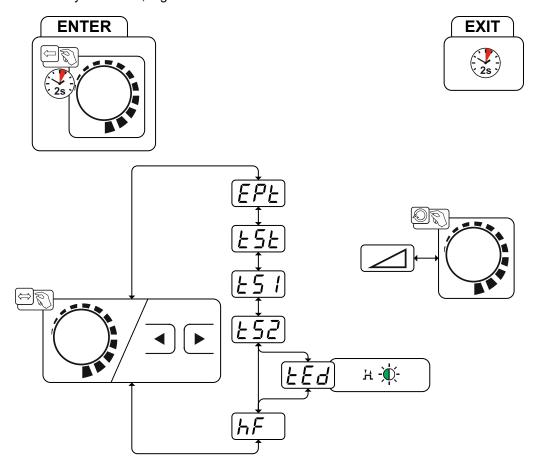


Figure 5-20

Display	Setting/selection
EPŁ	Expert menu
<u> </u>	Start time (duration of start current)
E5 1	Slope time (main current to secondary current)
£52	Slope time (secondary current to main current)
EEd	End current time (duration of end current)
<u>LE</u>	Ignition type (TIG)
(111	HF start active (ex works)
	oFFLift arc ignition active



5.3.5 Aligning the cable resistance

To ensure optimum welding properties, the electric cable resistance should be aligned again whenever an accessory component such as the welding torch or the intermediate hose package (AW) has been changed. The resistance value of the cables can be set directly or can be aligned by the power source. In the delivery state the cable resistance is set to the optimum values. To optimise the welding properties for other cable lengths, an alignment process (voltage correction) is necessary.

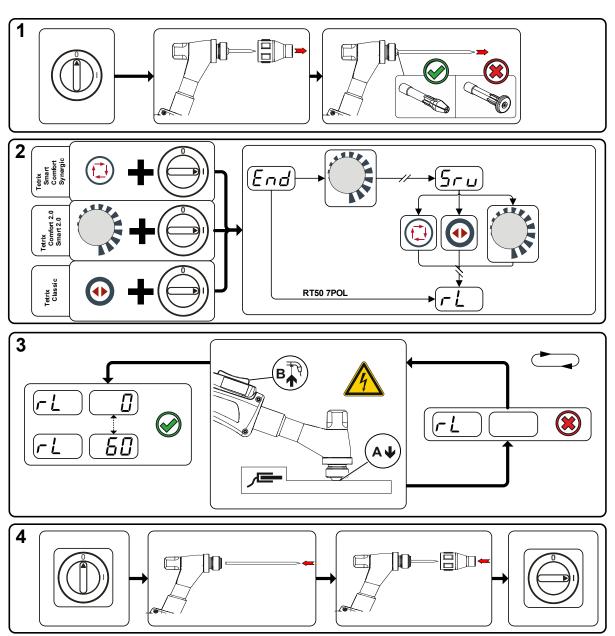


Figure 5-21



1 Preparation

- Switch off the welding machine.
- · Unscrew the gas nozzle from the welding torch.
- · Unfasten the tungsten electrode and extract.

2 Configuration

- Activate the rotary knob while switching on the welding machine at the same time.
- · Release rotary knob.
- You can now use the rotary knob (rotate and press) to select the parameter -> see 5.9 chapter.

3 Alignment/measurement

• Applying slight pressure, press the welding torch with the collet against a clean, purged location on the workpiece and then press the torch trigger for approx. 2 seconds. A short-circuit current will flow briefly, which is used to determine and display the cable resistance. The value can be between 0 m Ω and 60 m Ω . The new value is immediately saved without requiring further confirmation. If no value is shown on the right-hand display, then measurement failed. The measurement must be repeated.

4 Restoring welding standby mode

- · Switch off the welding machine.
- · Lock the tungsten electrode in the collet again.
- · Screw the gas nozzle onto the welding torch.
- · Switch on the welding machine.

5.4 Recurring welding tasks

The user has additional memory locations at their disposal to save recurring or different welding tasks on a permanent basis (101 plasma JOBs / 8 WIG JOBs). To do so, simply select the required memory location and set the welding task as described previously.

Switching a JOB is only possible if no welding current flows. Up-slope and down-slope times can be set individually for latched and non-latched operation.

Selection

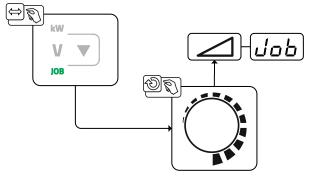


Figure 5-22

When one or more of the recurring welding tasks has been selected, the JOB signal light comes on.



5.4.1 Pulse welding

The following pulse types can be selected:

- Automated pulsing
- Thermal pulsing
- Metallurgical pulsing
- Average value pulsing

5.4.1.1 **Automated pulses**

The automated pulsing pulse variant is only activated for DC welding in combination with the spotArc operating mode. The current-dependent pulse frequency and balance create vibrations in the weld pool that have a positive effect on the gap bridging. The required pulse parameters are automatically defined by the machine control. If required, the function can be disabled by pressing the pulsed welding push-button.

Selection

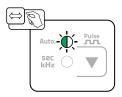
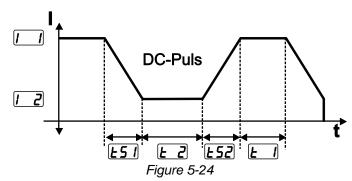


Figure 5-23

5.4.1.2 Thermal pulsing

The operation sequences basically match the standard welding sequences, but there is an additional switching back and forth between the main current AMP (pulse current) and the secondary current AMP% (pulse pause current) at the set times. Pulse and pause times and the pulse edges (£51 and £52) are entered in seconds on the control.



Selection

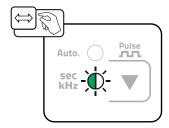


Figure 5-25



Pulse time setting

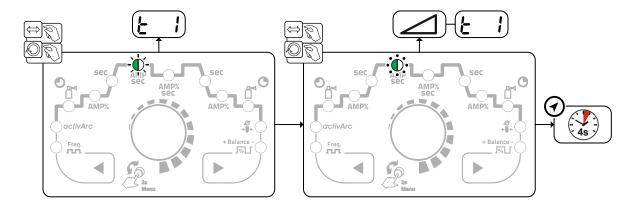


Figure 5-26

Pulse pause setting

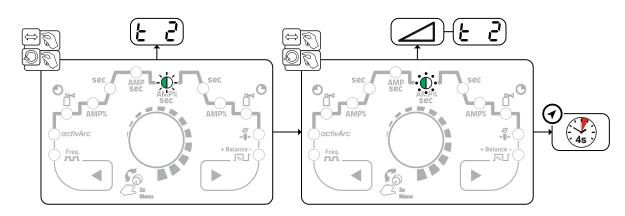


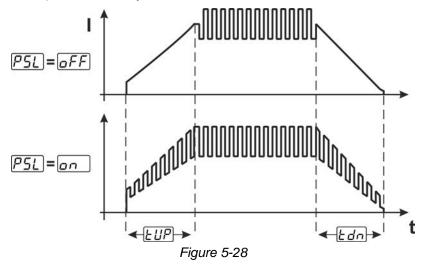
Figure 5-27

Pulse edge setting

The [5] and [5] pulse edges can be set in the Expert menu (TIG) > see 5.3.4 chapter.

5.4.1.3 Pulsed welding in the upslope and downslope phases

The pulse function can also be deactivated if necessary during the up-slope and down-slope phases (parameter PSL) > see 5.9 chapter.





5.4.1.4 Metallurgical pulsing (kHz pulsing)

Metallurgical pulsing (kHz pulsing) uses the plasma force (arc force) occurring at high currents which allows you to achieve a constricted arc with concentrated heat input. Unlike thermal pulsing, no times are set; a frequency FrE and the balance FrE are set instead. The pulsing process also occurs during the upslope and down-slope phase.

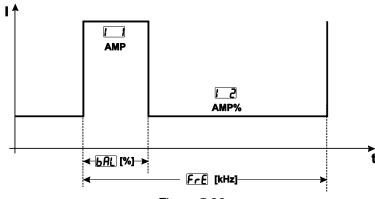


Figure 5-29

Selection

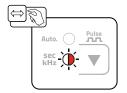


Figure 5-30

Balance setting

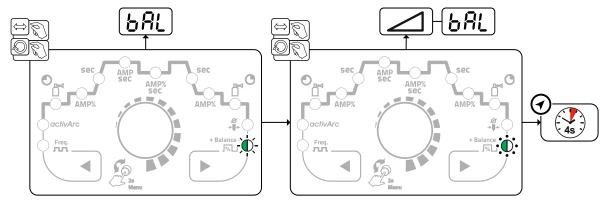


Figure 5-31

46 099-007033-EW501



Frequency setting

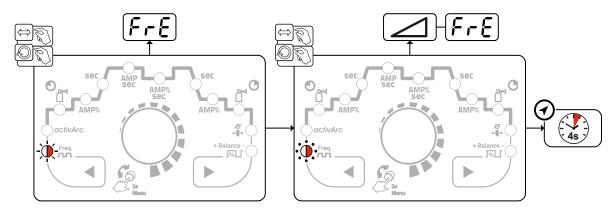


Figure 5-32

5.4.2 Average value pulse welding

A special feature with average value pulses is that the power source will always maintain the preset average value. This makes this method especially suitable for welding according to welding procedure specifications.

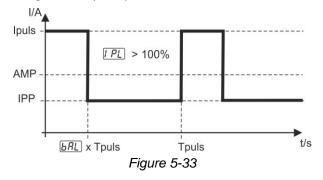
To activate average value pulses in conjunction with the metallurgical pulsing variant, the Pul parameter in the machine configuration menu must be switched to ...

To activate average value pulses in conjunction with the thermal pulsing variant, the PRU parameter in the machine configuration menu must be switched to ...

Once the function is activated, the red signal lights for the main current AMP and secondary current AMP% light up at the same time.

Average value pulse welding means that the system switches between two currents periodically, with an average current value (AMP), a pulse current (Ipuls), a balance (ERL) and a frequency (FrE) having been defined first. The predefined ampere current average value is decisive, and the pulse current (Ipuls) is defined by the PL parameter as a percentage of the average current value (AMP). The PL parameter is set in the Expert menu > see 5.3.4 chapter.

The pulse pause current (IPP) is not set; the machine control calculates the value instead to ensure that the average value of the welding current (AMP) is maintained.



AMP = main current (average value), e.g. 100 A

Ipuls = pulse current = IPL x AMP, e.g. 140% x 100 A = 140 A

IPP = pulse pause current

Tpuls = duration of one pulse cycle = $1/\frac{F_r E}{}$, e.g. 1/100 Hz = 10 ms

BRL = balance

5.5 Power-saving mode (Standby)

You can activate the power-saving mode by either pressing the push-button > see 4.3 chapter for a prolonged time or by setting a parameter in the machine configuration menu (time-controlled power-saving mode 568) > see 5.9 chapter.

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

Pressing any operating element (e.g. turning a rotary knob) deactivates power-saving mode and the machine is ready for welding again.



5.6 Access control

The machine control can be locked to secure it against unauthorised or unintentional adjustment. The access block has the following effect:

- The parameters and their settings in the machine configuration menu, Expert menu and operation sequence can only be viewed but not changed.
- Welding procedure and welding current polarity cannot be changed.

The parameters for setting the access block are configured in the machine configuration menu > see 5.9 chapter.

Enabling access block

- Assign the access code for the access block: Select parameter [cod] and select a number code (0-
- Enable access block: Set parameter Loc to access block enabled on.

The access block activation is indicated by the "Access block active" signal light > see 4.3 chapter.

Disabling access block

- Enter the access code for the access block: Select parameter [and and enter the previously selected number code (0-999).
- Disable access block: Set parameter Loc to access block disabled off. The only way to disable the access block is to enter the selected number code.

5.7 Interfaces for automation



WARNING



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)!

B.

Damage to the machine due to improper connection!

Unsuitable control leads or incorrect connection of input and output signals can cause damage to the machine.

- Only use shielded control leads!
- If the machine is to be operated with control voltages connection via suitable isolation amplifiers is required!
- To control the main or secondary current via control voltages, the relevant inputs must be enabled (see specification for activation of control voltage).



5.7.1 Automation interface

These accessory components can be retrofitted as an option > see 9 chapter.

MARNING



No function of the external interrupt equipment (emergency stop switch)! If the emergency stop circuit has been set up using an external interrupt equipment connected to the interface for automated welding, the machine must be configured for this setup. If this is not observed, the power source will ignore the external interrupt equipment and will not shut down!

• Remove jumper 1 on the corresponding control board (to be done only by qualified service personnel)!

Pin	Signal shape	Designation	Diagram	
Α	Output	PE Connection for cable screen		X6
В	Output	REGaus For servicing purposes only	PE	Α .
С	Input	SYN_E Synchronisation for master/slave operation	REGaus	B (
D	Input	IGRO Current flows signal I>0 (maximum load 20mA	SYN E	C
	(no c.)	/ 15V) 0V = welding current flowing		(
E	Input	Not/Aus Emergency stop for higher level shut-down of	IGR0	D
+	Input	the power source.	Not/Aus	E
R	Output	To use this function, jumper 1 must be unplugged on	0V	F
		PCB T320/1 in the welding machine. Contact open =	NC	G
	Output	welding current off 0V Reference potential	Uist	Н
F G	Output	0V Reference potential NC Not assigned	VSchweiss	J
U	Output	Uist Actual welding voltage, measured on pin F, 0-	SYN_A	K
•••	Output	10V (0V = 0V, 10V = 100V)	Str./Stp.	<u></u>
J		Vschweiss Reserved for special purposes		
K	Input	SYN_A Synchronisation for master/slave operation	+15V	<u>M</u>
L	Input	Str/Stp Start / stop welding current, same as torch	-15V	N C
		trigger.	NC	P >
		Only available in non-latched operating mode. +15V = start, 0V = stop	Not/Aus	R >
M	Output	+15V Voltage supply	0V	s
141	Output	+15V, max. 75mA	list	T
N	Output	-15V Voltage supply	NC	U
		-15V, max. 25mA	SYN_A 0V	<u>^^</u> (
Р	-	NC Not assigned	3111_400	 (
S	Output	0V Reference potential		
T	Output	list Actual welding current, measured on pin F; 0-10V (0V = 0A, 10V = 1000A)		
U		NC		
V	Output	SYN_A 0V Synchronisation for master/slave operation		

5.7.2 RINT X12 robot interface

The standard digital interface for mechanised applications (optional, retrofitting on the machine or external fitting by the customer)

Functions and signals:

- · Digital inputs: start/stop, operating modes, JOB and program selection, inching, gas test
- · Analogue inputs: control voltages, e.g. for welding performance, welding current, etc.
- · Relay outputs: process signal, ready for welding, system composite fault, etc.



5.7.3 **BUSINT X11** industrial bus interface

The solution for easy integration with automated production with e.g.

- Profinet/Profibus
- EnthernetIP/DeviceNet
- **EtherCAT**

etc.

PC interface 5.8

Welding parameter software

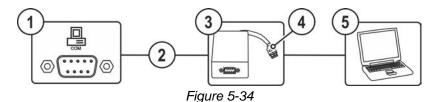
Set all welding parameters on the PC and simply transfer to one or more welding machines (accessory, set consisting of software, interface, connection leads)

- Data exchange between power source and PC
- Welding task administration (JOBs)
- Online-data exchange
- Default settings for welding data monitoring
- Update function for new welding parameters

5.8.1 Connection

Equipment damage or faults may occur if the PC is connected incorrectly! 3 Not using the SECINT X10USB interface results in equipment damage or faults in signal transmission. The PC may be destroyed due to high frequency ignition pulses.

- Interface SECINT X10USB must be connected between the PC and the welding machine!
- The connection must only be made using the cables supplied (do not use any additional extension cables)!



ltem	Symbol	Description
1		Connection socket (9-pole) - D-Sub
	СОМ	PC interface
2		Connection cable, 9-pole, serial
3		SECINT X10 USB
4		USB connection
		Connecting a Windows PC to SECINT X10 USB
5		Windows PC



5.9 Machine configuration menu

Basic machine settings are defined in the machine configuration menu.

5.9.1 Selecting, changing and saving parameters

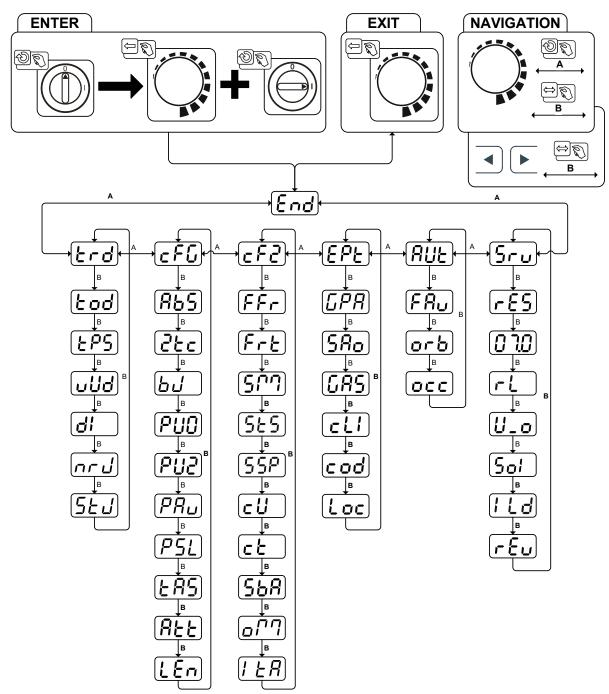


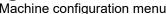
Figure 5-35

Display	Setting/selection
	Exit the menu
	Exit
	Torch configuration menu
<u> Erd</u>	Set welding torch functions
Lod	Torch mode (ex works 1)



Display	Setting/selection
LPS	Alternative welding start – tapping start
	Available from torch mode 11 (welding stop by tapping remains active).
	Function enabled (ex works) Function disabled
	Up/down speed
பப்ப	Increase value > rapid current change
	Decrease value > slow current change
⊿ ¦	Current jump Current jump setting in ampere
	Get JOB number
חרט	Set maximum selectable jobs (setting: 1 to 128, factory setting 10).
	Additional parameter after activating the BLOCK JOB function.
[5 <i>LJ</i>]	Start JOB Set first JOP to get (petting: 130 to 356, feetery petting 130)
	Set first JOB to get (setting: 129 to 256, factory setting 129).
cF5	Machine configuration Settings for machine functions and parameter display
	Absolute value setting (ignition, secondary, end and hot start cur-
<i>Rb5</i>	rent) > see 4.4.7 chapter
	Welding current setting, absolute
	<u>off</u> Welding current setting, as a percentage of the main current (ex works)
[2	Non-latched operation (version C)
	©FF Function disabled (ex works)
	RINT X12, JOB control for automation solutions
Ь <i>Ц</i>	<u></u>
	off (factory setting)
PUD	Pulsed TIG welding (thermal)
	For an arial amplications and the state of t
	TIG average value pulsing
PUZ	Producting value pulsing enabled
	aff Average value pulsing disabled (ex works)
PRu	TIG average value pulsing
(Average value pulsing enabled
	Pulsed TIG welding (thermic) in the upslope and downslope
<u> </u>	phases > see 5.4.1.3 chapter
	Function enabled (ex works)
	<i>aFF</i> Function disabled
(£85)	TIG antistick > see 5.3.3 chapter
	<u>or</u> function active (factory setting). <u>off</u> function inactive.
	Show warnings > see 7.1 chapter
REE	<u>off</u> Function disabled (ex works)
	Function enabled
LEn	Setting the system of units
<u> </u>	Units of length in mm, m/min. (metric system) [[77] Unit of length in inches, ipm (imperial system)
<u>c</u> F 2	Machine configuration (second part) Settings for machine functions and parameter display
	Settings for machine functions and parameter display







Display	Setting/selection
FFr	RTF start ramp Welding current rises to the specified main current level in a ramp function (ex works)
	<u>off</u> Welding current immediately jumps to the specified main current level
FrE	RTF response
· , =	LinLinear response LoūLogarithmic responsive (ex works)
	spotmatic operating mode
	Ignition by contact with the workpiece
	Function enabled (ex works)
	Spot time setting
<u>[5<i>E</i> 5</u>]	Short spot time, setting range 5 ms to 999 ms, increments of 1 ms (ex works) FFLong spot time, setting range 0.01 s to 20.0 s, increments of 10 ms (ex works)
55 <i>P</i>	Process activation setting
	Separate process activation (ex works)
	Torch cooling mode
ر لا	RUEAutomatic operation (ex works)
	Permanently enabled
	Welding torch cooling, post-flow time
c Ł	Setting 1–60 min. (ex works 5 min.)
SBR	Time-based power-saving mode > see 5.5 chapter
	Time to activation of the power-saving mode in case of inactivity. Setting FF = disabled or numerical value 5-60 min
[a77]	Operating mode switching via interface for automated welding
	2E5Special non-latched
[L D	Re-ignition after arc interruption > see 5.3.2.3 chapter
1 11	UabJOB-dependent time (ex works 5 s).
	<u>off</u> Function disabled or numerical value 0.1–5.0 s.
EPE	Expert menu
<u>EPB</u>	Automatic gas post-flow function > see 5.1.7.4 chapter
	Function on <u>FF</u> Function off (factory setting)
	Error output to interface for automated welding, contact SYN_A
פמכ	GFFAC synchronisation or hot wire (ex works)
	F5nError signal, negative logic
	F5PError signal, positive logic RucAVC (Arc voltage control) connection
	Gas monitoring
נבחט	Depending on where the gas sensor is situated, the use of a pilot static tube and the
	welding process monitoring phase.
	Monitoring during the welding process. Gas sensor between gas valve and
	welding torch (with pilot static tube).
	Monitoring prior to the welding process. Gas sensor between gas valve and welding torch (without pilot static tube).
	Permanent monitoring Gas sensor between gas cylinder and gas valve (with
	pilot static tube).



Display	Setting/selection
c L I	Minimum current limit (TIG) > see 5.3.1 chapter
	Depending on the set tungsten electrode diameter oFFFunction disabled
	Function enabled (ex works)
cod	Access control – access code
	Setting: 000 to 999 (000 ex works)
Loc	Access control > see 5.6 chapter Function enabled
	□FFFunction disabled (ex works)
	Automation menu ³
RUE	
FAL	Fast take-over of control voltage (automation) ³
	Function enabled FF Function disabled (ex works)
	Orbital welding ³
orb	<u>off</u> Function disabled (ex works)
	Function enabled
[0 C C]	Orbital welding ³ Correction value for orbital current
5ru	Service menu Any changes to the service menu should be agreed with the authorised service person-
	nel.
rE5	Reset (to factory setting)
	Describe values in the machine configuration many
	Reset the values in the machine configuration menu PL Complete reset of all values and settings
	Resetting is performed when exiting the menu (End).
	Software version query
	System bus ID and version number are separated by a dot.
	Example: 07.0040 = 07 (system bus ID) 0.0.4.0 (version number) Cable resistance alignment
<u> </u>	Cable resistance anginnent
<u> </u>	Only qualified service personnel may change the parameters!
501	TIG HF start (soft/hard) switching
	soft ignition (factory setting).
	GFF hard ignition.
i Ld	Ignition pulse limit Setting 0 ms–15 ms (increments of 1 ms)
rEu	PCB state – qualified service personnel only!
(L L L	

¹ for AC welding machines only.

² For machines with filler wire (AW) only.

³ for components for automated welding (RC) only.



6 Maintenance, care and disposal

6.1 General

▲ DANGER



Risk of injury due to electrical voltage after switching off!

Working on an open machine can lead to fatal injuries!

Capacitors are loaded with electrical voltage during operation. Voltage remains present for up to four minutes after the mains plug is removed.

- 1. Switch off machine.
- 2. Remove the mains plug.
- 3. Wait for at last 4 minutes until the capacitors have discharged!

MARNING



Incorrect maintenance, testing and repair!

Maintenance, testing and repair of the machine may only be carried out by skilled and qualified personnel. A qualified person is one who, because of his or her 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.

Observe the maintenance instructions > see 6.2 chapter.

• In the event that the provisions of one of the below-stated tests are not met, the machine must not be operated again until it has been repaired and a new test has been carried out!

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.

Under the specified ambient conditions and normal working conditions this machine is essentially maintenance-free and requires just a minimum of care.

Contamination of the machine may impair service life and duty cycle. The cleaning intervals depend on the ambient conditions and the resulting contamination of the machine. The minimum interval is every six months.

6.1.1 Cleaning

- Clean the outer surfaces with a moist cloth (no aggressive cleaning agents).
- Purge the machine venting channel and cooling fins (if present) with oil- and water-free compressed air. Compressed air may overspeed and destroy the machine fans. Never direct the compressed air directly at the machine fans. Mechanically block the fans, if required.
- · Check the coolant for contaminants and replace, if necessary.

6.1.2 Dirt filter

When using a dirt filter, the cooling air throughput is reduced and the duty cycle of the machine is reduced as a result. The duty cycle decreases with the increasing contamination of the filter. The dirt filter must be remove at regular intervals and cleaned by blowing out with compressed air (depending on the level of soiling).



6.2 Maintenance work, intervals

6.2.1 Daily maintenance tasks

Visual inspection

- Mains supply lead and its strain relief
- Gas cylinder securing elements
- Check hose package and power connections for exterior damage and replace or have repaired by specialist staff as necessary!
- Gas tubes and their switching equipment (solenoid valve)
- Check that all connections and wearing parts are hand-tight and tighten if necessary.
- Check correct mounting of the wire spool.
- Wheels and their securing elements
- Transport elements (strap, lifting lugs, handle)
- Other, general condition

Functional test

- Operating, message, safety and adjustment devices (Functional test)
- Welding current cables (check that they are fitted correctly and secured)
- Gas tubes and their switching equipment (solenoid valve)
- Gas cylinder securing elements
- Check correct mounting of the wire spool.
- Check that all screw and plug connections and replaceable parts are secured correctly, tighten if necessary.
- Remove any spatter.
- Clean the wire feed rollers on a regular basis (depending on the degree of soiling).

6.2.2 Monthly maintenance tasks

Visual inspection

- Casing damage (front, rear and side walls)
- Wheels and their securing elements
- Transport elements (strap, lifting lugs, handle)
- Check coolant tubes and their connections for impurities

Functional test

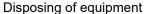
- Selector switches, command devices, emergency stop devices, voltage reducing devices, message and control lamps
- Check wire guide elements (wire feed roll holder, wire feed nipple, wire guide tube) for tight fit. Recommendation for replacing the wire feed roll holder (eFeed) after 2000 hours of operation, see replacement parts).
- Check coolant tubes and their connections for impurities
- Check and clean the welding torch. Deposits in the torch can cause short circuits and have a negative impact on the welding result, ultimately causing damage to the torch.

6.2.3 Annual test (inspection and testing during operation)

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. For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at www.ewm-group.com!

099-007033-EW501 56







Disposing of equipment



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!
- According to European provisions (Directive 2012/19/EU on Waste of Electrical and Electronic Equipment), 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 has to be disposed of, or recycled, in accordance with the waste separation systems in use.

According to German law (law governing the distribution, taking back and environmentally correct disposal of electrical and electronic equipment (ElektroG)), 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.

The deletion of personal data is the responsibility of the end user.

Lamps, batteries or accumulators must be removed and disposed of separately before disposing of the device. The type of battery or accumulator and its composition is marked on the top (type CR2032 or SR44). The following EWM products may contain batteries or accumulators:

- Batteries or accumulators are easy to remove from the LED cassette.
- Device controls Batteries or accumulators are located on the back of these in corresponding sockets on the circuit board and are easy to remove. The controls can be removed using standard tools.

Information on returning used equipment or collections can be obtained from the respective municipal administration office. Devices can also be returned to EWM sales partners across Europe.

Further information on the topic of the disposal of electrical and electronic equipment can be found on our website at: https://www.ewm-group.com/de/nachhaltigkeit.html.

099-007033-EW501 57



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 Warnings

Depending on the display options of the machine display, a warning message is displayed as follows:

Display type - machine control	Display
Graphic display	\triangle
two 7-segment displays	ALL
one 7-segment display	R

The cause of the warning is indicated by a corresponding warning number (see table).

The display of possible warning numbers depends on the machine version (interfaces/functions).

- In case of multiple warnings, these are displayed in sequence.
- · Document machine warning and inform service personnel, if required.

Warning code	Possible cause	Remedy
1	Machine excess temperature	Allow the machine to cool down
2	Half-wave failures	Check process parameters
3	Welding torch cooling warning	Check coolant level and refill if necessary
4	Gas warning	Check gas supply
5	See warning number 3	-
6	Welding consumable (wire electrode) fault	Check wire feeding (with machines with filler wire)
7	CAN bus failure	Inform service.
16	Protective gas warning	Check gas supply
17	Plasma gas warning	Check gas supply
18	Forming gas warning	Check gas supply
20	Coolant temperature warning	Check coolant level and refill if necessary
24	Coolant flow warning	Check coolant supply; check coolant level and, if necessary, fill up
28	Wire stock warning	Check wire feeding (with machines with filler wire)
32	Encoder malfunction, drive	Inform service.
33	Drive is operating under overload conditions	Adjust mechanical load
34	JOB unknown	Select alternatives JOB

The warnings can be reset by pressing a push-button (see table):

Machine control	Smart	Classic	Comfort	Smart 2 Comfort 2	Synergic
Pushbutton	©	•	• AMP • VOLT • JOB	kW V	VOLT JOB PROG

58 099-007033-EW501



7.2 Error messages

Depending on the options of the machine display, a fault is shown as follows:

Display type - machine control	Display
Graphic display	4
two 7-segment displays	Err
one 7-segment display	E

The possible cause of the fault is signalled by a corresponding fault number (see table). In the case of an error, the power unit shuts down.

The possible error numbers displayed depend on the machine series and version!

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

Error	Possible cause	Remedy
3	Tacho error	Check wire guide / hose package.
	Wire feeder is not connected	Switch off cold wire mode in the machine configuration menu (off status). Connect the wire feeder.
4	Temperature error	Allow the machine to cool.
	Error in the emergency stop circuit (interface for automated welding)	Check the external shutdown devices. Check the jumper JP 1 on PCB T320/1.
5	Overvoltage	Switch off the machine and shock the mains valtage
6	Undervoltage	Switch off the machine and check the mains voltage.
7	Coolant error (with connected cooling unit only).	Check coolant level and top up if necessary.
8	Gas error	Check the gas supply.
9	Secondary overvoltage	Switch the machine off and on. If the error persists, no-
10	PE error	tify Service.
11	FastStop position	Slope "Acknowledge error" signal (0 to 1) using the robot interface (if present).
12	VRD error	Switch the machine off and on. If the error persists, notify Service.
16	Pilot arc fault	Check welding torch.
17	Filler wire error Excess current or deviation of the actual value from the wire target value.	Check the wire feed system (drives, hose packages, welding torches, process wire feed speed and robot travel speed) and correct if necessary.
18	Plasma gas error Target value specification deviates significantly from the actual value.	Check plasma gas supply (leak tightness, kinks, guide, connections, closure).
19	Shielding gas error Target value specification deviates significantly from the actual value	Check plasma gas supply (leak tightness, kinks, guide, connections, closure).
20	Coolant flow Coolant flow rate too low	Check cooling circuit (coolant level, leak tightness, kinks, guide, connections, closure).
22	Excess temperature in cooling circuit	Check cooling circuit (coolant level, temperature target value).
23	Excess temperature of the HF choke	Allow the machine to cool. Adjust processing cycle times if necessary.
24	Pilot arc ignition error	Check the wear parts of the plasma torch.



Error	Possible cause	Remedy	
32	Electronics error (I>0 error)		
33	Electronics error (Uact error)		
34	Electronics error (A/D channel error)	Switch the machine off and on. If the error persists, notify Service.	
35	Electronics error (slope error)		
36	Electronics error (S sign)		
37	Electronics error (temperature error)	Allow the machine to cool.	
38		Switch the machine off and on.	
39	Electronics error (secondary overvoltage)	If the error persists, notify Service.	
40	Electronics error (I>0 error)	Inform service.	
48	Ignition error	Check the welding process.	
49	Arc interruption	Inform service.	
51	Error in the emergency stop circuit (interface for automated welding)	Check the external shutdown devices. Check jumper JP 1 on PCB T320/1.	
57	Auxiliary drive error, tacho error	Check the auxiliary drive (tacho – no signal, M3.51 defective > notify Service).	
59	Incompatible component	Replace component.	

7.3 Resetting welding parameters to the factory settings

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

To reset the welding parameters or machine settings to the factory settings, select parameter [E5] in the service menu [5-u] > see 5.9 chapter.

7.4 Display machine control software version

The query of the software versions only serves to inform the authorised service staff. It is available in the machine configuration menu > see 5.9 chapter.

7.5 Checklist for rectifying faults

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

Legend	Symbol	Description
	<i>N</i>	Fault/Cause
	*	Remedy

Functional errors

Mains fuse triggers

- Mains fuse triggers unsuitable mains fuse
 - Set up recommended mains fuse > see 8 chapter.
- ✓ No machine control signal light is illuminated after switching on
- No welding power
 - ★ Phase failure > check mains connection (fuses)
- ✓ 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

Coolant error/no coolant flowing

- ✓ Insufficient coolant flow
 - Check coolant level and refill if necessary
- ✓ Air in the coolant circuit
 - ★ Vent coolant circuit



Pore formation

- ✓ Inadequate or missing gas shielding
 - * Check shielding gas setting and replace shielding gas cylinder if necessary
 - Shield welding site with protective screens (draughts affect the welding result)
 - ★ Use gas lens for aluminium applications and high-alloy steels
- ✓ Unsuitable or worn welding torch equipment
 - ★ Check size of gas nozzle and replace if necessary
- ✓ Condensation in the gas tube
 - Ye Purge hose package with gas or replace

Welding torch overheated

- ✓ Loose welding current connections
 - ★ Tighten power connections on the torch and/or on the workpiece
 - ★ Tighten contact tip correctly
- ✓ Overload
 - ★ Check and correct welding current setting
 - ★ Use a more powerful welding torch

Pilot arc ignites but no main arc forms

- ✓ Distance between workpiece and torch too high
 - ★ Decrease distance to workpiece
- ✓ Contaminated workpiece surface
- ✓ Bad current transfer on ignition
 - * Check the setting on the "Tungsten electrode diameter/Ignition optimisation" rotary dial and increase if necessary (higher ignition energy).
 - ★ Setting the tungsten electrode
- ✓ Incompatible parameter settings
 - ★ Check settings and correct if necessary



8 Technical data

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

8.1 Microplasma 25-2 PG RC

	Plasma	TIG
Welding current (I ₂)	0,3 A to 20 A	2 A to 20 A
Welding voltage according to standard (U ₂)	25,0 V to 25,8 V	10,1 V to 10,8 V
Plasma current (pilot arc)	2-6	6 A
Duty cycle DC at 40° C [1]		
100 %	20	Α
Open circuit voltage (U ₀)	95	S V
Ignition voltage (U _P)	12	kV
Mains voltage (Tolerance)	1 x 230 V (-40) % to +15 %)
Frequency	50/6	0 Hz
mains fuse [2]	1 x	10 A
Mains connection cable	H07RN-	-F3G2,5
max. Connected load (S ₁)	1,5 kVA	0,8 kVA
Generator rating (Rec.)	2 kVA	
Cos φ	0,99	
Protection class / Overvoltage category	I / III	
Contamination level	3	
Insulation class / protection classification	H / IP 23	
Residual current circuit breaker	Type B (recommended)	
Noise level [3]	Noise level [3] <70 dB(A)	
Ambient temperature [4]	-25 °C to	o +40 °C
Machine cooling / Torch cooling	Fan (AF) / Cooling unit, ext.	
Workpiece lead (min.)	25 r	nm²
EMC class	Į ,	4
Safety marking	S/C€/EM	
Standards used	See declaration of conform	nity (appliance documents)
Dimensions (I x b x h)	625 x 377	
	24.6 x 14.8	x 20.9 inch
Weight	36,6	· ·
	79.8	3 lb.

^[1] Load cycle: 10 min. (60 % DC \triangleq 6 min. welding, 4 min. pause)

^[2] Safety fuses are recommended DIAZED xxA gG. When using automatic cutouts, the "C" trigger characteristic must be used.

Noise level during idle mode and operation under standard load according to IEC 60974-1 at the maximum operating point.

^[4] Ambient temperature dependent on coolant! Observe coolant temperature range!



8.2 Microplasma 55-2 PG RC

	Plasma	TIG
Welding current (I ₂)	0,3 A to 50 A	2 A to 50 A
Welding voltage according to standard (U ₂)	25,0 V to 27,0 V	10,1 V to 12,0 V
Plasma current (pilot arc)	2-6	5 A
Duty cycle DC at 40° C [1]		
100 %	50	A
Open circuit voltage (U ₀)	95	V
Ignition voltage (U _P)	12	kV
Mains voltage (Tolerance)	1 x 230 V (-40	% to +15 %)
Frequency	50/60) Hz
mains fuse [2]	1 x 16 A	1 x 10 A
Mains connection cable	H07RN-	F3G2,5
max. Connected load (S ₁)	3,1 kVA	1,6 kVA
Generator rating (Rec.)	4,2 kVA	
Cos φ	0,99	
Protection class / Overvoltage category	I / III	
Contamination level	3	
Insulation class / protection classification	H / IP 23	
Residual current circuit breaker	Type B (recommended)	
Noise level [3]	<70 dB(A)	
Ambient temperature [4]	-25 °C to	+40 °C
Machine cooling / Torch cooling	Fan (AF) / Coo	oling unit, ext.
Workpiece lead (min.)	25 n	nm²
EMC class	A	<u>- </u>
Safety marking	S/C€/ENI	
Standards used	See declaration of conform	ity (appliance documents)
Dimensions (I x b x h)	625 x 377	
	24.6 x 14.8	x 20.9 inch
Weight	36,6	•
	79.8	B lb.

^[1] Load cycle: 10 min. (60 % DC ≜ 6 min. welding, 4 min. pause)

^[2] Safety fuses are recommended DIAZED xxA gG. When using automatic cutouts, the "C" trigger characteristic must be used.

Noise level during idle mode and operation under standard load according to IEC 60974-1 at the maximum operating point.

^[4] Ambient temperature dependent on coolant! Observe coolant temperature range!



8.3 Microplasma 105-2 PG RC

	Plasma	TIG
Welding current (I ₂)	0,3 A to 100 A	2 A to 100 A
Welding voltage according to standard (U ₂)	25,0 V to 29,0 V	10,1 V to 14,0 V
Plasma current (pilot arc)	2-6	A
Duty cycle DC at 40° C [1]		
100 %	70 A	100 A
60 %	100 A	-
Open circuit voltage (U ₀)	95	V
Ignition voltage (U _P)	12	kV
Mains voltage (Tolerance)	1 x 230 V (-40	% to +15 %)
Frequency	50/60) Hz
mains fuse [2]	1 x 20 A	1 x 16 A
Mains connection cable	H07RN-F3G2,5	
max. Connected load (S ₁)	5,8 kVA	3 kVA
Generator rating (Rec.)	7,8 kVA	
Cos φ	0,99	
Protection class / Overvoltage category	I / III	
Contamination level	3	
Insulation class / protection classification	H / IP 23	
Residual current circuit breaker	Type B (recommended)	
Noise level [3]	<70 d	B(A)
Ambient temperature [4]	-25 °C to	+40 °C
Machine cooling / Torch cooling	Fan (AF) / Coo	oling unit, ext.
Workpiece lead (min.)	25 m	nm²
EMC class	A	
Safety marking	S/C€/ENI	
Standards used	See declaration of conform	ity (appliance documents)
Dimensions (I x b x h)	625 x 377	
	24.6 x 14.8	x 20.9 inch
Weight	36,6	•
	79.8	lb.

^[1] Load cycle: 10 min. (60 % DC ≙ 6 min. welding, 4 min. pause)

[4] Ambient temperature dependent on coolant! Observe coolant temperature range!

^[2] Safety fuses are recommended DIAZED xxA gG. When using automatic cutouts, the "C" trigger characteristic must be used.

Noise level during idle mode and operation under standard load according to IEC 60974-1 at the maximum operating point.



9 Accessories

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

9.1 Welding torch cooling system

Туре	Designation	Item no.
Cool 50 MPW50	Cooling module with centrifugal pump	090-008818-00502
HOSE BRIDGE UNI	Tube bridge	092-007843-00000
RK1	Reverse cooling unit	094-002283-00000
UKV4SET 4M	Hose connection set	092-000587-00000

9.1.1 Coolant - type blueCool

Туре	Designation	Item no.
blueCool -10 5 I	Coolant up to -10 °C (14 °F), 5 I	094-024141-00005
blueCool -10 25 I	Coolant up to -10 °C (14 °F), 25 I	094-024141-00025
blueCool -30 5 I	Coolant up to -30 °C (22 °F), 5 I	094-024142-00005
blueCool -30 25 I	Coolant up to -30 °C (22 °F), 25 I	094-024142-00025
FSP blueCool	Frost protection tester	094-026477-00000

9.1.2 Coolant - type KF

Туре	Designation	Item no.
KF 23E-5	Coolant up to -10 °C (14 °F), 5 I	094-000530-00005
KF 23E-200	Coolant (-10 °C), 200 litres	094-000530-00001
KF 37E-5	Coolant up to -20 °C (4 °F), 5 I	094-006256-00005
KF 37E-200	Coolant (-20 °C), 200 I	094-006256-00001
TYP1	Frost protection tester	094-014499-00000

9.2 Options

Type	Designation	Item no.
ON Filter TG.04/K.02	Contamination filter for air inlet	092-002698-00000
ON WAK	Wheel assembly kit	092-001356-00000
TG.03/TG.04/TG.09/K.02		

9.3 Interface

Туре	Designation	Item no.
RINT X12 STANDARD	Robot interface	090-008291-00000
ON PLUG SET RINT X12	Optional EWM plug set, retrofit kit for RINT X12	092-001822-00000
RA5 19POL 1x 5M	Connection cable, 19-pole, 5 m	092-001569-00005
FRV 7POL 10 m	Extension/connecting cable	092-000201-00000

9.4 Computer communication

Туре	Designation	Item no.
PC300 XQ Set	PC300.Net welding parameter software kit incl. ca-	090-008777-00000
	ble and SECINT X10 USB interface	

9.5 General accessories

Туре	Designation	Item no.
Maxex AR/MIX 200bar 30m³ G1/4"	Pressure regulator	096-000000-00000
Maxex Hydrogen 200bar 30m³ G3/8"L	Pressure regulator	096-000001-00000
2M-G1/4"+G3/8"/DIN EN 559	Gas tube, 2 m	092-000525-00001
GH 2X1/4" 2M	Gas hose	094-000010-00001



10 **Appendix**

10.1 Parameter overview – setting ranges

Name	Display			Setting range		
	Code	Standard	Unit	min.		тах.
Main current AMP, depending on power source	[-	Α	-	-	-
Gas pre-flow time	[SPr	0,5	s	0	-	20
Start current, percentage of AMP	1 5E	20	%	1	-	200
Start current, absolute, depending on power source	I SE	-	Α	-	-	-
Start time	E5E	0,01	s	0,01	-	20,0
Up-slope time	EUP	1,0	S	0,0	-	20,0
Pulse current	I PL	140	%	1		200
Pulse time	E 1	0,01	s	0,00	-	20,0
Slope time (time from main current AMP to secondary current AMP%)	E5 1	0,00	s	0,00	-	20,0
Secondary current, percentage of AMP	[2	50	%	1		200
Secondary current, absolute, depending on power source	1 2	-	Α	-		-
Pulse pause time	E 2	0,01	S	0,00	-	20,0
Slope time (time from main current AMP to secondary current AMP%)	£52	0,00	s	0,00	-	20,0
Down-slope time	Edn	1,0	s	0,0	-	20,0
End current, percentage of AMP	l Ed	20	%	1	-	200
End current, absolute, depending on power source	l Ed	-	Α	-	-	-
End current time	EEd)	0,01	s	0,01	-	20,0
Gas post-flow time	GPE	8	s	0,0	-	40,0
Electrode diameter, metric	ndA	2,4	mm	1,0	-	4,0
Electrode diameter, imperial	ndA	92	mil	40	-	160
spotArc time	E P	2	s	0,01	-	20,0
spotmatic time (55500)	E P	200	ms	5	-	999
spotmatic time (5£56FF>)	Ł P	2	s	0,01	-	20,0
Pulse balance	ЬЯL	50	%	1	-	99
Pulse frequency	FrE	50	Hz	5	-	15000



10.2 Searching for a dealer

Sales & service partners www.ewm-group.com/en/specialist-dealers



"More than 400 EWM sales partners worldwide"