



	Welding machine Picomig 355 Synergic TKM		
099-005512-EW501	Observe additional system documents!	21.9.2022	

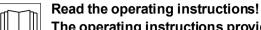


www.ewm-group.com



General instructions

\land WARNING



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.

© EWM AG

Dr. Günter-Henle-Strasse 8 56271 Mündersbach Germany Tel.: +49 2680 181-0, Fax: -244 Email: info@ewm-group.com www.ewm-group.com

The copyright to this document remains the property of the manufacturer.

Copying, including extracts, only permitted with written approval.

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	Contents			3
2	For	your safet	ly	7
	2.1		using these operating instructions	
	2.2		tion of icons	
	2.3	Safety ir	nstructions	9
	2.4	Transpo	rt and installation	.12
3	Inter	Aed use		14
U	3.1		ons	
	3.2		e version	
	3.3		nts which also apply	
	0.0	3.3.1	Warranty	
		3.3.2	Declaration of Conformity	
		3.3.3	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	Mac	hine desc	ription – quick overview	
	4.1		ew / rear view	
	4.2		ew	
	4.3		control – Operating elements	
		4.3.1	Welding data display	
			4.3.1.1 Polarity setting	
5	Desi	an and fu	nction	
Ŭ	5.1	•	rt and installation	
	••••	5.1.1	Ambient conditions	
		5.1.2	Machine cooling	
		5.1.3	Workpiece lead, general	.24
		5.1.4	Welding torch cooling system	
			5.1.4.1 Cooling unit connection	
		5.1.5	Notes on the installation of welding current leads	
		5.1.6	Stray welding currents	
		5.1.7	Mains connection.	
		540	5.1.7.1 Mains configuration.	
		5.1.8 5.1.9	Welding torch holder	
		5.1.9	Shielding gas supply (shielding gas cylinder for welding machine) 5.1.9.1 Pressure regulator connection	
			5.1.9.2 Shielding gas hose connection	
		5.1.10	Shielding gas volume settings.	
		0.1.10	5.1.10.1 Gas test	
			5.1.10.2 Purge hose package	
	5.2	MIG/MA	G welding	
	•	5.2.1	Assemble the wire guide	
		5.2.2	Welding torch and workpiece line connection	
		5.2.3	MIG/MĂG function torch	
		5.2.4	MIG/MAG Push/Pull welding torch	.34
		5.2.5	Wire feed	.34
			5.2.5.1 Inserting the wire spool	.35
			5.2.5.2 Changing the wire feed rollers	.36
			5.2.5.3 Inching the wire electrode	.38
			5.2.5.4 Spool brake setting	.39
		5.2.6	Definition of MIG/MAG welding tasks	
		5.2.7	Welding task selection	
		5.2.8	Welding power (operating point)	
			5.2.8.1 Selecting the welding parameter display mode	
			5.2.8.2 Operating point setting using material thickness	
		E 0 0	5.2.8.3 Arc length	
		5.2.9	forceArc / forceArc puls	
		5.2.10	rootArc/rootArc puls	.42



		5.2.11	Operating modes (functional sequences) 5.2.11.1 Explanation of signs and functions	
			5.2.11.2 Automatic cut-out	
		5.2.12	Conventional MIG/MAG Welding (GMAW non synergic)	
		5.2.13	Expert menu (MIG/MAG)	
	5.3	MMA we	ading	48
		5.3.1	Connecting the electrode holder and workpiece lead	
		5.3.2	Welding task selection	
		5.3.3	Arcforce	
		5.3.4	Hotstart.	-
		5.3.5 5.3.6	Antistick Expert menu (MMA)	
	5.4		Ling	
	5.4	5.4.1	Preparing the TIG welding torch	
		5.4.2	Welding torch and workpiece line connection	
		5.4.3	Welding task selection.	
		5.4.4	Adjusting the gas post-flow time	
		5.4.5	Expert menu (TIG)	
		5.4.6	Arc ignition	
			5.4.6.1 Liftarc	
		5.4.7	Operating modes (functional sequences).	
			5.4.7.1 Legend	
	5.5	Remote	control	
	5.6		parameters (advanced settings)	
	0.0	5.6.1	Selecting, changing and saving parameters	57
		5.6.2	Special parameters in detail	
			5.6.2.1 Ramp time for wire inching (P1)	
			5.6.2.2 Latched/special-latched tap start (P9)	
		5.6.3	Reset to factory settings	
	5.7		configuration menu	
		5.7.1 5.7.2	Selecting, changing and saving parameters	
	5.8	-	aving mode (Standby)	
6			care and disposal	
0	6.1			
	6.2	-	tion of icons	-
	6.3		ance schedule	
	6.4		g of equipment	
7	Recti	fving fau	lts	66
-	7.1		t for rectifying faults	
	7.2		ssages (power source)	
	7.3	Vent coo	lant circuit	68
	7.4		e version of the machine control	
	7.5		g welding parameters to the factory settings	
	7.6		g JOBs (welding tasks) to the factory settings	
		7.6.1 7.6.2	Resetting a single JOB Resetting all JOBs	
	7.7		parameter calibration	
8		-	a	
U	8.1		a 355 Synergic TKM	
9		-		
3	9.1		torch cooling system	
	0.1	9.1.1	Coolant - type blueCool	
		9.1.2	Coolant - type KF	
	9.2		t system	
	9.3		control/connecting and extension cable	73
		9.3.1	19-pole connection	
	9.4	Options		74



9.5	General	al accessories	74
10 Rep	laceable	parts	75
10.1	Wire fee	ed rollers	
	10.1.1	Wire feed rollers for steel wire	75
	10.1.2	Wire feed rollers for aluminium wire	75
	10.1.3	Wire feed rollers for cored wire	
	10.1.4	Wire guide	76
11 App	endix		77
11.1	JOB-Lis	st	77
11.2	Parame	eter overview – setting ranges	
		ing for a dealer	
		-	





2 For your safety

2.1 Notes on using these operating instructions

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.

M 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.

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.

For your safety Explanation of icons



2.2 Explanation of icons

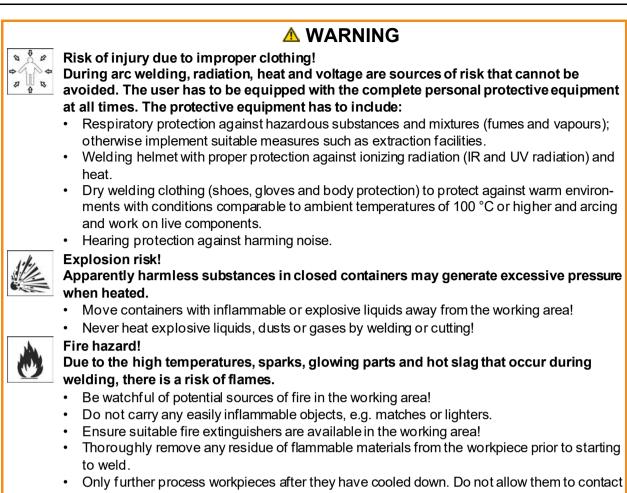
слріан	Explanation of icons			
Symbol	Description	Symbol	Description	
R ³	Indicates technical aspects which the user must observe.		Activate and release / Tap / Tip	
	Switch off machine		Release	
	Switch on machine		Press and hold	
	Incorrect / Invalid	ÛŊ	Switch	
\bigcirc	Correct / Valid	97	Turn	
	Input	\square	Numerical value – adjustable	
\bigcirc	Navigation	-)	Signal light lights up in green	
F	Output	•••••	Signal light flashes green	
45	Time representation (e.g.: wait 4 s / ac- tuate)	-)	Signal light lights up in red	
- <i>11</i>	Interruption in the menu display (other setting options possible)	••••••	Signal light flashes red	
	Tool not required/do not use	-)	Signal light lights up in blue	
Ŷ	Tool required/use	·	Signal light flashes blue	



2.3 **Safety instructions** A 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! 4 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!

Safety instructions





any flammable materials!







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.

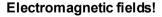
In order to **evaluate** any possible problems with electromagnetic compatibility in the surrounding area, the user must consider the following: (see also EN 60974-10 Appendix A)

- 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





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 6.3 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).



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

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.





R

	▲ 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!
Ĩ	Risk of tipping! There is a risk of the machine tipping over and injuring persons or being damaged itsel during movement and set up. Tilt resistance is guaranteed up to an angle of 10° (ac- cording 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!
X	Incorrectly installed leads (mains, control and welding leads or intermediate hose pack ages) can present a tripping hazard.
	 Lay the supply lines flat on the floor (avoid loops). Avoid laying the leads on passage ways.
111	Risk of injury from heated coolant and its connections!
<u>}}}</u>	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.

- Region 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!

Applications



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!

- 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 GMAW standard welding and in the secondary process TIG welding with Liftarc (contact ignition) or MMA welding. Accessory components may expand the range of functions (see the relevant documentation in the chapter of the same name).

3.2 Software version

The software version of the machine control can be displayed in the machine configuration menu (menu Srv) > see 5.7 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 <u>www.ewm-group.com</u>!

3.3.2 Declaration of Conformity

Finis 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



4

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)

No improper repairs and modifications!

To prevent injuries and damage to the machine, only competent personnel (authorised service personnel) are allowed to repair or modify the machine. Unauthorised manipulations will invalidate the warranty!

• Instruct competent personnel (authorised service personnel) to repair the machine.

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!

The illustration shows a general example of a welding system.

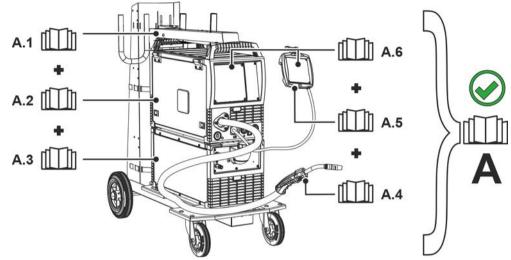


Figure 3-1

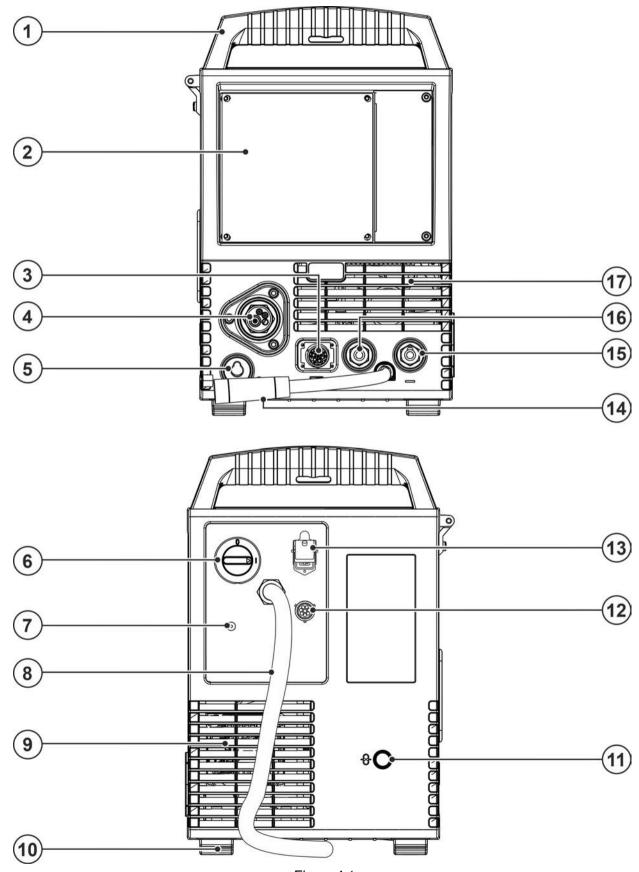
Item	Documentation
A.1	Transport vehicle
A.2	Power source
A.3	Cooling unit
A.4	Welding torch
A.5	Remote control
A.6	Control
Α	Complete documentation



Front view / rear view

4 Machine description – quick overview

4.1 Front view / rear view



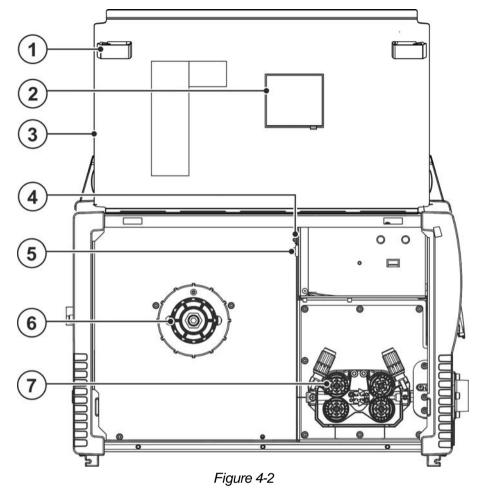




Item	Symbol	Description
1		Carrying handle
2		Machine control > see 4.3 chapter
3		19-pole connection socket (analogue) For connecting analogue accessory components (remote control, welding torch control lead, etc.)
4		Welding torch connection (Euro or Dinse torch connector)
		Welding current, shielding gas and torch trigger integrated
5	Ο	Park socket, polarity selection plug Retainer for the polarity selection plug in MMA mode or for transport.
6		Main Switch Switching the machine on or off.
7		Connection thread - G¼" Shielding gas connection (inlet)
8	5	Mains connection cable > see 5.1.7 chapter
9		Cooling air outlet
10		Machine feet
11	8	External wire feed inlet Pre-cut casing inlet for external wire feed.
12	\bigcirc	8-pole connection socket Cooling unit control lead
13		4-pole connection socket Cooling unit voltage supply
14		Welding current cable, polarity selection Welding current to Euro torch connector/torch, for polarity selection
		MIG/MAG: Connection socket for "+" welding current Self-shielding flux cored wire/TIG: Connection socket, "-" welding current MMA: Park socket
15		Connection socket, "-" welding current How to connect the accessories depends on the welding procedure. Please observe the connection description for the corresponding welding procedure > see 5 chapter.
16	╋	Connection socket, "+" welding current How to connect the accessories depends on the welding procedure. Please observe the connection description for the corresponding welding procedure > see 5 chapter.
17		Cooling air inlet

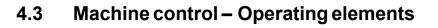


4.2 **Inside view**





Item	Symbol	Description	
1		Slide latch, lock for the protective cap	
2		Wire spool inspection window	
		Check wire supply	
3		Protective cap	
		Cover for the wire feed mechanism and other operating elements.	
		Depending on the machine series, additional stickers with information on the replace-	
		ment parts and JOB lists will be located on the inside.	
4	0 1	Key button, Automatic cutout	
	83	Wire feed motor supply voltage fuse	
	1	(press to reset a triggered fuse)	
5	C	Push-button, wire inching	
	\mathbf{H}	Potential- and gas-free inching of the wire electrode through the hose package to the	
		welding torch > see 5.2.5.3 chapter.	
6		Wire spool holder	
7		Wire feed unit > see 5.2.5 chapter	



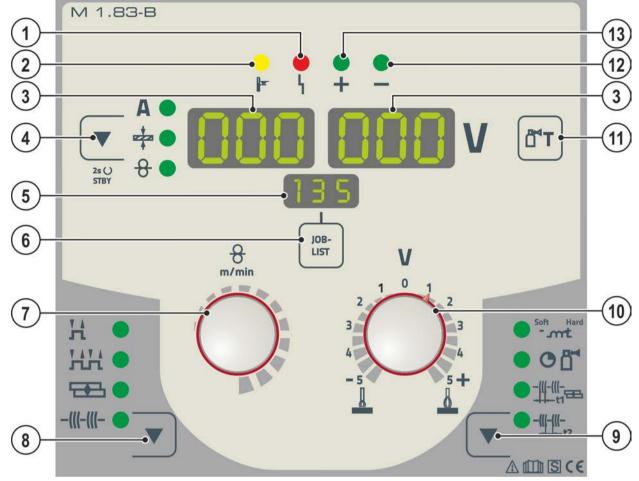


Figure 4-3

Item	Symbol	Description	
1	ſ	"Collective interference" signal light	
2		"Excess temperature" signal light	
3	000	Welding data display (3-digit)	
		Displays the welding parameters and the corresponding values > see 4.3.1 chapter	
4		Welding parameter display mode/power-saving mode push-button	
	V	AWelding current	
		₩ Material thickness	
		heta Wire feed speed	
		Press for 2 s to put the machine into power-saving mode.	
		Activate one of the operating elements to reactivate > see 5.8 chapter.	
5	000	Display, JOB	
		Shows the currently selected welding task (JOB number).	
6	JOB-	Welding task push-button (JOB)	
	LIST	Select the welding task from the welding task list (JOB-LIST). The list can be found in-	
		side the protective cap on the wire feeder and in the appendix to these operating in-	
		structions.	
7	(A	Welding parameter setting dial	
		For setting the welding performance, for selecting the JOB (welding task) and for set-	
		ting other welding parameters.	





ltem	Symbol	Description
8		Operating mode button
	·	HNon-latched
		HH Latched
		Spors
9		Runtime parameters button
		For selecting the parameters to be set. Also for entering and exiting the menus for ad-
		vanced settings.
		- Choke effect/dynamics
		Gas post-flow time
		THE TRANSPORT TIME
		-///-///-
10	V	Arc length correction rotary dial
		Duch hutten and test / since here neckane > and 5 40 sherter
11		Push-button gas test / rinse hose package > see 5.1.9 chapter
12		Signal light polarity setting
13	+	Signal light polarity setting

Machine description – quick overview

Machine control - Operating elements



4.3.1 Welding data display

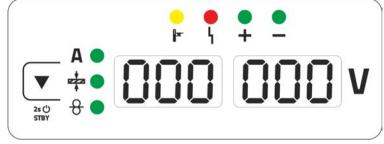


Figure 4-4

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

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

The display shows:

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

MIG/MAG

Parameter	Nominal values	Actual values	Hold values
Welding current		M	N
Material thickness	R		
Wire feed speed	R		
Welding voltage	M	M	Ŋ

[1] traditional MIG/MAG

TIG/MMA				
Parameter	Nominal values	Actual values	Hold values	
Welding current	N			
Welding voltage		M	Ŋ	

After the welding, the display switches form hold values to nominal values by

- pressing the push-buttons or turning the rotary knobs of the control
- waiting for about 5 seconds

4.3.1.1 Polarity setting

The polarity setting displays the polarity required for the selected JOB on the machine control > see 4.3 chapter. The required polarity can then be set with the polarity selection plug.



5 Design and function



\land 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



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!

\land WARNING

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

Damage to the machine due to improper transport! The machine can be damaged by tensile or lateral forces if it is set down or picked up in a nonvertical position!

- Do not drag the machine horizontally on the machine feet!
- Always pick up the machine vertically and set it down carefully.

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 6.3 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)
- ^[1] Ambient temperature dependent on coolant! Observe the coolant temperature range of the torch cooling

Transport and installation



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!

5.1.3 Workpiece lead, general

A 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 Welding torch cooling system

5.1.4.1 Cooling unit connection

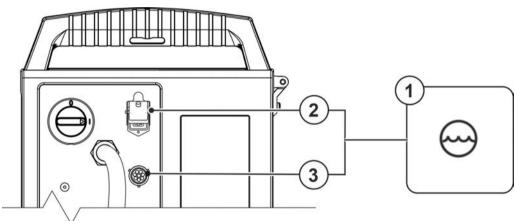


Figure 5-1

Item Symbol Description

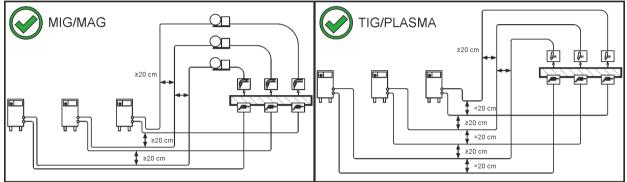
Item	Symbol	Description
1	\odot	Cooling module
2	(3)	4-pole connection socket Cooling unit voltage supply
3	\odot	8-pole connection socket Cooling unit control lead

- Insert and lock the 4-pole supply plug on the cooling unit into the 4-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.



5.1.5 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).



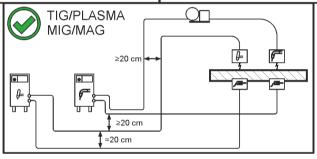


Figure 5-2

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

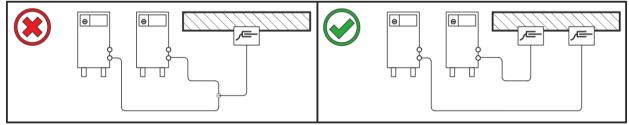


Figure 5-3

- Fully unroll welding current leads, torch hose packages and intermediate hose packages. Avoid loops!
- Always keep leads as short as possible!

Lay any excess cable lengths in meanders.

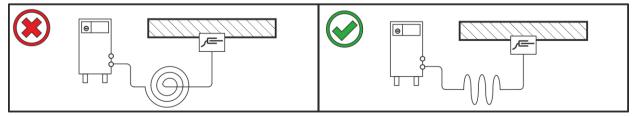


Figure 5-4

Transport and installation



5.1.6 Stray welding currents

Π

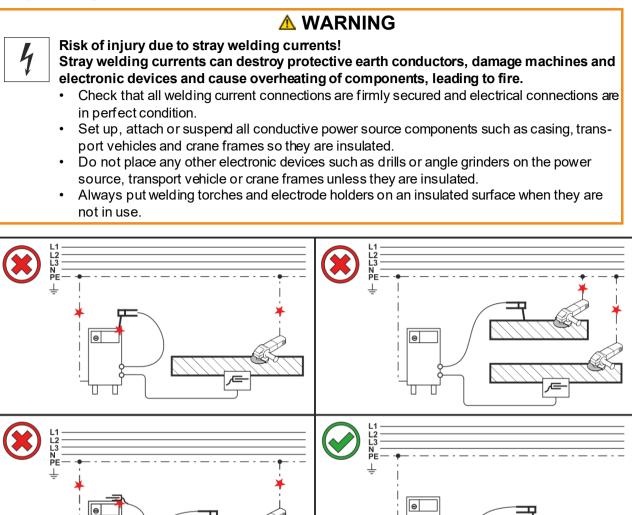


Figure 5-5



5.1.7 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.

5.1.7.1 Mains configuration

The machine may be connected to:

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

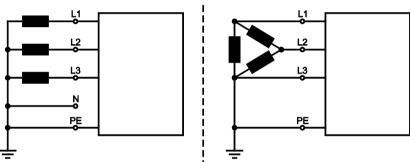


Figure 5-6

Legend

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

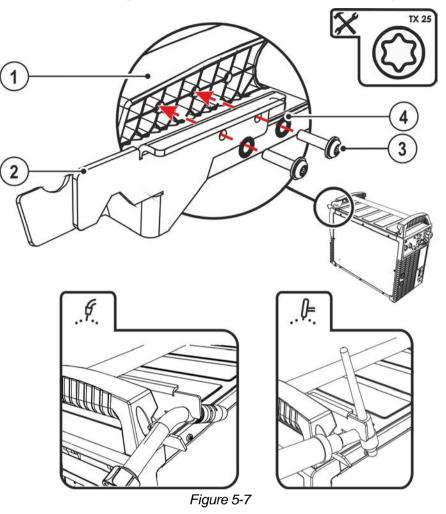
• Insert mains plug of the switched-off machine into the appropriate socket.

Design and function Transport and installation



5.1.8 Welding torch holder

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



Item Symbol Description

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

Use the mounting screws to screw the torch holder onto the crossmember of the transport handle. ٠

Insert the welding torch into the welding torch holder as shown. ٠



ĺ

Transport and installation

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



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

- Place shielding gas cylinder into the designated holder and secure with fastening elements (chain/belt)!
- Attach the fastening elements within the upper half of the shielding gas cylinder!
- · The fastening elements must tightly enclose the shielding gas cylinder!
- 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.

5.1.9.1 Pressure regulator connection

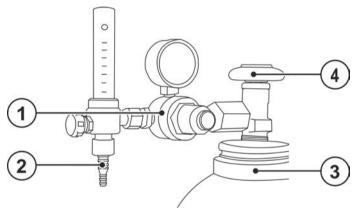


Figure 5-8

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.

Design and function

Transport and installation



5.1.9.2 Shielding gas hose connection

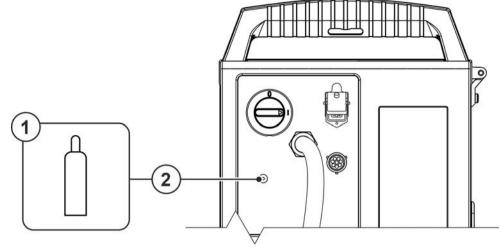


Figure 5-9

Item Symbol Description



Shielding gas cylinder / pressure regulator Connection thread - G¹/4" Shielding gas connection (inlet)

• Screw the gas hose connection to the shielding gas connection (inlet) on the machine gas-tight.

5.1.10 Shielding gas volume settings

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

- Slowly open the gas cylinder valve.
- Open the pressure regulator.
- Switch on the power source at the main switch.
- Trigger gas test > see 5.1.10.1 chapter function (welding voltage and wire feed motor remain switched off no accidental arc ignition).
- Set the relevant gas quantity for the application on the pressure regulator.

Setting instructions

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

Helium-rich gas mixtures require a higher gas volume!

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

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



5.1.10.1 Gas test

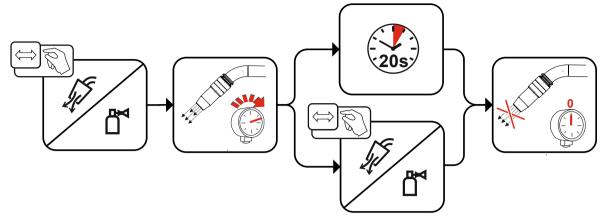
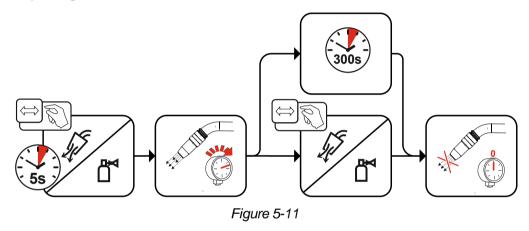


Figure 5-10

5.1.10.2 Purge hose package





5.2 MIG/MAG welding

5.2.1 Assemble the wire guide

The Euro torch connector is factory-fitted with a guide tube for welding torches with steel liner. Conversion is necessary if a welding torch with a steel liner is used!

- Operate welding torches with a liner > with a guide tube!
- Operate welding torches with a steel liner > with a capillary tube!

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

Recommendation:

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

Preparation for connecting welding torches with a spiral guide:

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

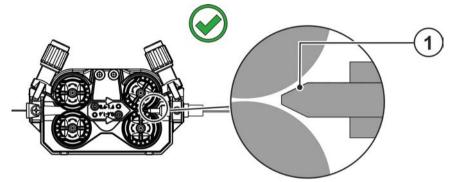


Figure 5-12

Preparation for connecting welding torches with a liner:

- Push forward the capillary tube on the wire feed side in the direction of the Euro torch connector and remove it there.
- Insert the liner guide tube from the Euro torch connector side.
- Carefully insert the welding torch connector with as yet too long a liner into the Euro torch connector and secure with a crown nut.
- Cut off the liner with a liner cutter > see 9 chapter just before the wire feed roller.
- Loosen the welding torch connector and remove.
- Carefully chamfer the cut off end of the liner with a liner sharpener > see 9 chapter and sharpen.

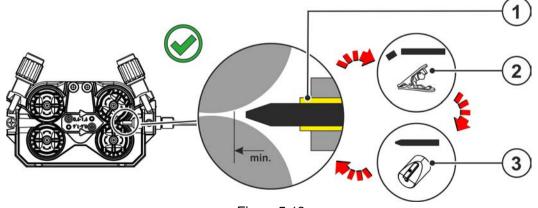


Figure 5-13



5.2.2 Welding torch and workpiece line connection

On delivery, the Euro torch connector is fitted with a capillary tube for welding torches with a steel liner. Conversion is necessary if a welding torch with a liner is used!

- Operate welding torches with a liner > with a guide tube.
- Operate welding torches with a steel liner > with a capillary tube.

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

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

Recommendation:

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

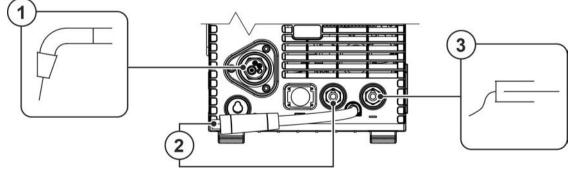
Preparation for connecting welding torches with a spiral guide:

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

Preparation for connecting welding torches with a liner:

- Push forward the capillary tube on the wire feed side in the direction of the Euro torch connector and remove it there.
- Insert the liner guide tube from the Euro torch connector side.
- Carefully insert the welding torch connector with as yet too long a liner into the Euro torch connector and secure with a crown nut.
- Cut off the liner with a liner cutter > see 9 chapter just before the wire feed roller.
- Loosen the welding torch connector and remove.
- Carefully chamfer the cut off end of the liner with a liner sharpener > see 9 chapter and sharpen.

Some wire electrodes (e.g. self-shielding cored wire) are welded using negative polarity. In this case, the welding current lead should be connected to the "-" welding current socket, and the workpiece lead should be connected to the "+" welding current socket. Observe the information from the electrode manufacturer!





Item	Symbol	Description
1	Į	Welding torch
	Y	
2		Polarity selector plug, welding current cable
		Internal welding current cable for central connection/welding torch.
		Connection socket for "+" welding current
3	Ļ	Workpiece



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

Where applicable:

- Insert the welding torch control cable into the 19-pole connection socket and lock (MIG/MAG torches with additional control cables only).
- 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).

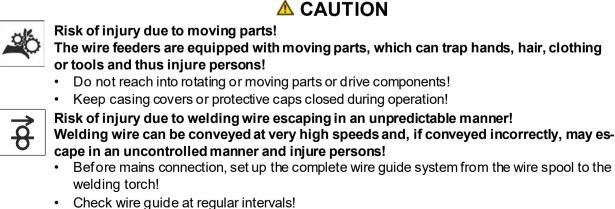
5.2.3 **MIG/MAG** function torch

The torch trigger on the MIG welding torch is generally used to start and finish the welding process. Function torches feature additional operating elements to set the wire feed speed and voltage correction. Welding torches with one rotary knob, one rocker or one pair of buttons only must be configured on the machine control appropriately. For this purpose, set the FRC special parameter to the corresponding accessory component > see 5.6 chapter.

MIG/MAG Push/Pull welding torch 5.2.4

Pin assignment +10V 10V DV (Up DV (Up) ∍∿ <u>_</u>ر= <u>_</u>ر <u>م</u>ر 泛≞ 스 ך גר גר 5<u>R</u>)<u>s</u> <u>څ</u>د ت ۶⊥ U М Μ =)́⊻ Μ 19pol. Buchse (19pole socket 19pol. Buchse (19pole socket) 19pol. Buchse (19pole socket) without potentiometers with potentiometer for wire feed speed Figure 5-15

5.2.5 Wire feed



Keep all casing covers or protective caps closed during operation!

<u>_</u> DA / 1 14 5_ _ر ⊬ر <u>~</u> ĩ٩ ode DV (o ≡)<u>R</u> <u>_</u> =)<u>∨</u>

with potentiometers for wire feed speed and arc length correction



5.2.5.1 Inserting the wire spool



Risk of injury due to incorrectly secured wire spool.

- If the wire spool is not secured properly, it may come loose from the wire spool support and fall to the ground, causing damage to the machine and injuries.
- Make sure to correctly fasten the wire spool to the wire spool support.
- Before you start working, always check the wire spool is securely fastened.

Standard D300 wire spool holder can be used. Adapters are required when using standardised basket coils (DIN 8559) > see 9 chapter.

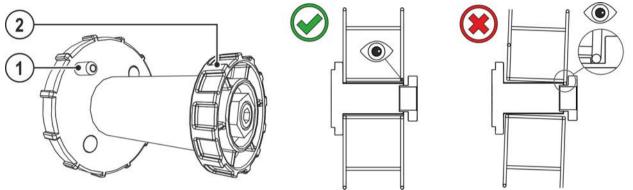


Figure 5-16

Item Symbol Description

ntonn	Cymsol	Description
1		Carrier pin
		For fixing the wire spool
2		Knurled nut For fixing the wire spool

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

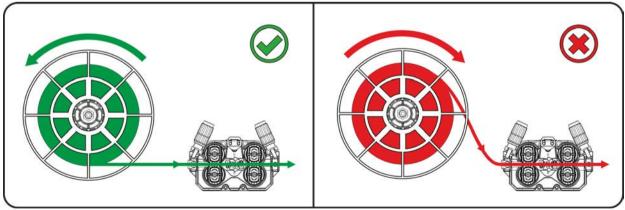


Figure 5-17

Observe the unwinding direction of the wire spool.



5.2.5.2 Changing the wire feed rollers

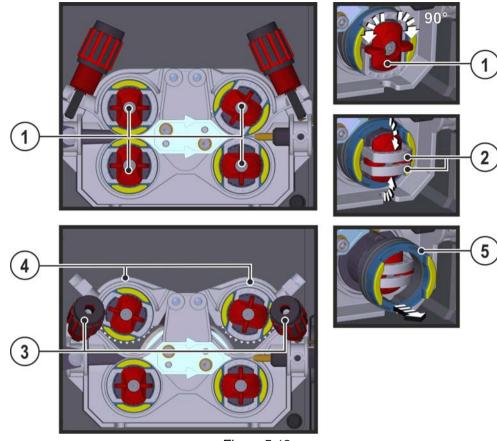


Figure 5-18

Item	Symbol	Description
1		Tommy
		The tommy is used to secure the closure brackets of the wire feed rollers.
2		Closure bracket
		The closure brackets are used to secure the wire feed rollers.
3		Feed roll tensioner
		Fixing the clamping unit and setting the pressure.
4		Clamping unit
5		Wire feed roller
		see the Wire feed roller overview table

- Rotate the tommy by 90° clockwise or anti-clockwise (tommy locks into place).
- Fold the closure brackets outwards by 90°.
- Unfasten pressure units and fold out (clamping units and pressure rollers will automatically flip upwards).
- Remove the wire feed rollers from the roller support.
- Select new wire feed rollers accoriding to the Wire feed roller overview table and reassemble the wire feed mechanism in reverse order.



Unsatisfactory welding results due to faulty wire feeding!

The wire feed rolls must be suitable for the diameter of the wire and the material. The wire feed rolls are colour-coded to facilitate distinction (see the Wire feed roll overview table). When working with a wire diameter of > 1.6 mm the drive has to be converted for the wire feed kit ON WF 2,0-3,2MM EFEED > see 10 chapter.

					-
\Aliro	food	roll	overview	tables	
vvire	ieeu	1011	overview	lable.	

Material	Diameter	r	Colour code			Groove form
	Ø mm	Ø inch		V TR		
Steel	0.6	.024	monochrome	light pink	-	
Stainless steel	0.8	.031		white		
Brazing	0.8 0.9 1.0	.031 .035 .039	bicolour	white	blue	V-groove
	1.0 1.2	.039 .047		blue	red	
	1.4	.055	monochrome	green	-	
	1.6	.063		black		
	2.0	.079		grey		
	2.4	.094		brown	-	
	2.8	.110		light green		
	3.2	.126		purple		
Aluminium	0.8	.031	bicolour	white	yellow	
	0.9 1.0	.035 .039		blue		
	1.2	.047		red		U-groove
	1.6	.063		black		
	2.0	.079		grey		
	2.4	.094		brown		
	2.8	.110		light green		
	3.2	.126		purple		
Flux cored wire	0.8	.031	bicolour	white	orange	
	0.9 1.0	.035 .039		blue		
	1.2	.047		red		V-groove, knurled
	1.4	.055		green		
	1.6	.063		black]	
	2.0	.079		grey]	
	2.4	.094		brown	1	



5.2.5.3 Inching the wire electrode



A CAUTION

- Risk of injury due to welding wire escaping from the welding torch!
 The welding wire can escape from the welding torch at high speed and cause bodily injury including injuries to the face and eyes!
 Never direct the welding torch towards your own body or towards other persons!
- Improper contact pressure increases wear on the wire feed rolls.

Adjust the contact pressure on the adjusting nuts of the feed roll tensioners so that the wire electrode is fed but slips when the wire spool is blocked.

The inching speed is infinitely adjustable by simultaneously pressing the wire inching pushbutton and turning the wire speed rotary knob. The left display shows the wire feed speed selected, the right display shows the current motor current of the wire feed mechanism. Depending on the design of the device, the wire feed mechanism may be reversed!

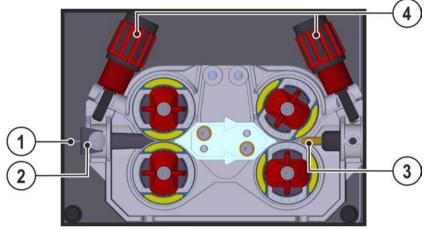


Figure 5-19

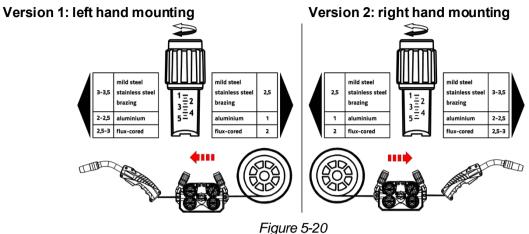
Item	Symbol	Description
1		Welding wire
2		Wire feed nipple
3		Guide tube
4		Adjusting nut

- Extend and lay out the torch hose package.
- Carefully unwind the welding wire from the wire spool and insert through the wire feed nipples up to the wire feed rollers.
- Press the inching push-button (the drive catches the welding wire and automatically guides it to the welding torch outlet) > see 4.2 chapter.

A prerequisite for the automatic inching process is the correct preparation of the wire guide, especially in the capillary and wire guide tube area > see 5.2.1 chapter.



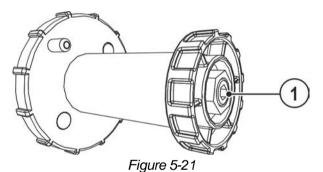
• The contact pressure has to be adjusted separately for each side (wire inlet/outlet) at the feed roll tensioner setting nuts depending on the welding consumable used. A table with the setting values can be found on a sticker near the wire drive.



Automatic inching stop

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

5.2.5.4 Spool brake setting



tem Symbol Description

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

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

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

5.2.6 Definition of MIG/MAG welding tasks

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

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

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

Pay attention to the signal light for the polarity setting!

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

• Reconnect the polarity selction plug if necessary.

MIG/MAG welding



5.2.7 Welding task selection

The settings for the respective welding parameters are defined by the different JOBs. The right JOB can be determined quickly with the JOB list > see 11.1 chapter.

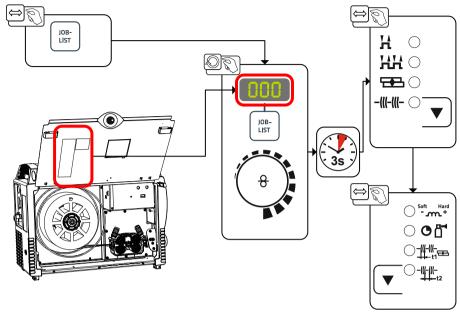


Figure 5-22

The settings for spot time, pause time and wire feed speed apply to all JOBs. All other parameter values are stored separately in each JOB. Changes are permanently saved in the currently selected JOB.

If required, these parameter values can be reset to the factory settings > see 5.6.3 chapter.

5.2.8 Welding power (operating point)

5.2.8.1 Selecting the welding parameter display mode

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

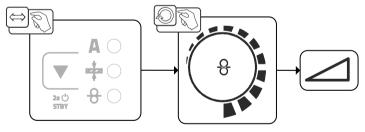


Figure 5-23

5.2.8.2 Operating point setting using material thickness

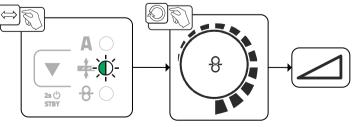


Figure 5-24



5.2.8.3 Arc length

If required, the arc length (welding voltage) can be corrected from -5 V to +5 V for the individual welding task.

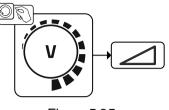
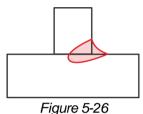


Figure 5-25

The basic settings are now completed. Other welding parameters have already been set optimally in the factory; they can, however, be modified to suit individual requirements.

5.2.9 forceArc / forceArc puls

Heat-reduced, directionally-stable and powerful arc with deep fusion penetration for the upper power range.



- · Smaller included angle due to deep penetration and directionally stable arc
- Excellent root and sidewall fusion
- Secure welding also with very long stick-outs
- Reduced undercuts
- Manual and automated applications

You can make use of these properties after selecting the forceArc process > see 5.2.7 chapter.

As with pulse arc welding, it is important to make sure of a good welding current connection.

- Keep welding current cables as short as possible and ensure that cable cross-sections are adequate!
- Fully unroll welding current cables, torche hose packages and, if applicable, intermediate hose packages. Avoid loops!
- · Use welding torches, preferably water-cooled, that are suitable for the higher power range.
- Use welding wire with adequate copper coating when welding steel. The wire spool should have layer spooling.

Unstable arc!

Welding current cables that are not fully unrolled can cause faults in the arc (flickering).

• Fully unroll welding current cables, torch hose packages and, if applicable, intermediate hose packages. Avoid loops!

MIG/MAG welding



5.2.10 rootArc/rootArc puls

Short arc with perfect weld modelling capabilities for effortless gap bridging, especially for root welding



- · Reduced spatter compared to standard short arc
- Good root formation and secure sidewall fusion
- Manual and automated applications

Unstable arc!

Welding current cables that are not fully unrolled can cause faults in the arc (flickering).

• Fully unroll welding current cables, torch hose packages and, if applicable, intermediate hose packages. Avoid loops!

5.2.11 Operating modes (functional sequences)

5.2.11.1 Explanation of signs and functions

Symbol	Meaning
₽ ₹	Press torch trigger
₽	Release torch trigger
Ľ	Shielding gas flowing
I	Welding output
\$	Wire electrode is being conveyed
,F	Wire creep
F _T	Wire burn-back
 ©	Gas pre-flows
۲۵ مر	Gas post-flows
Н	Non-latched
<u>777</u>	Latched
t	Time
t ₁	Spot time
t ₂	Pause time

5.2.11.2 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:

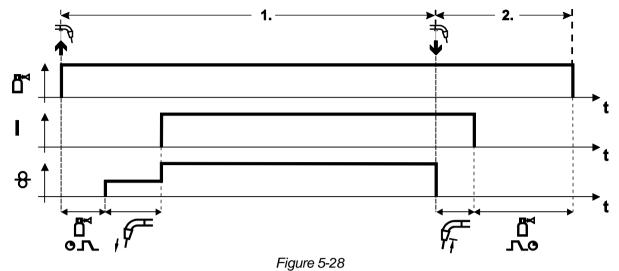
• During ignition

5 s after the start of the welding process, no welding current flows (ignition error).

• During welding The arc is interrupted for more than 5 s (arc interruption).



Non-latched mode



Step 1

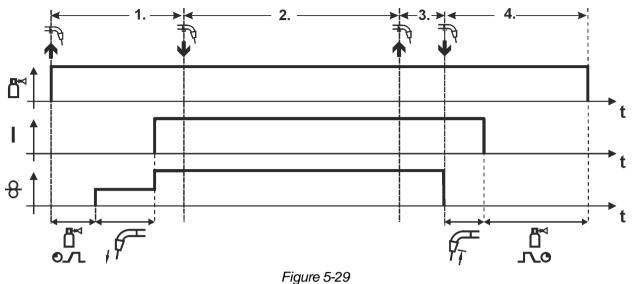
- Press and hold torch trigger.
- Shielding gas is expelled (gas pre-flows).
- Wire feed motor runs at "creep speed".
- Arc ignites after the wire electrode makes contact with the workpiece; welding current flows.
- Change over to pre-selected wire speed.

Step 2

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



Latched mode



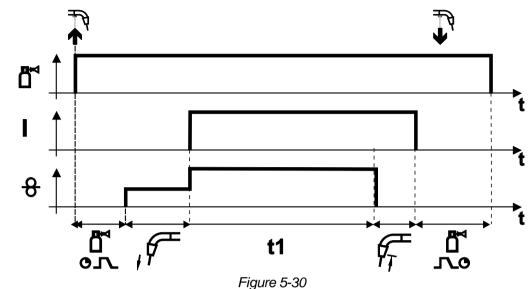
1. cycle

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at "creep speed"
- Arc ignites when the wire electrode makes contact with the workpiece Welding current flows
- · Wire feed speed increases to the set nominal value
- 2. cycle
- Release torch trigger (no effect)
- 3. cycle
- Press torch trigger (no effect)
- 4. cycle
- Release torch trigger
- Wire feed motor stops
- · Arc is extinguished after the pre-selected wire burn-back time elapses
- Gas post-flow time elapses





Spot welding



Start

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

Premature termination

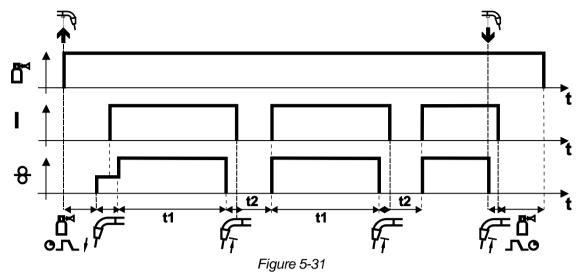
• Release torch trigger.

Design and function

MIG/MAG welding



Interval



Start

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

Sequence

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

End

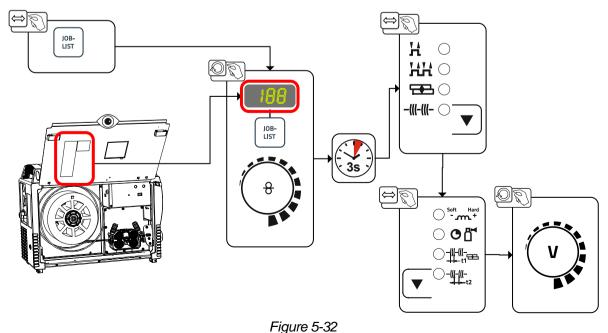
• Release torch trigger, wire feed stops, arc is extinguished, gas post-flow time elapses.

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

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

5.2.12 Conventional MIG/MAG Welding (GMAW non synergic)

You can only change the JOB number when no welding current is flowing.





5.2.13 Expert menu (MIG/MAG)

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.

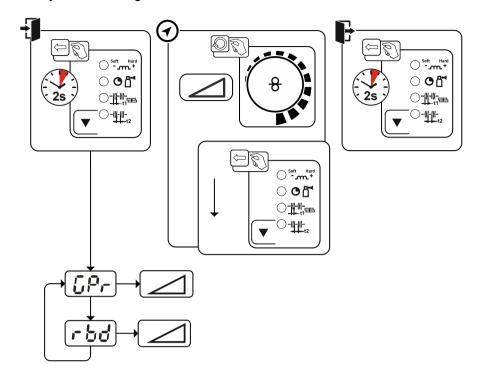


Figure 5-33

Display	Setting/selection
[Pr	Gas pre-flow time
rbd	Burn-back correction

MMA welding



5.3 MMA welding

5.3.1 Connecting the electrode holder and workpiece lead

Risk of crushing and burns!

A CAUTION



When changing stick electrodes there is a risk of crushing and burns!

- Wear appropriate and dry protective gloves.
- Use an insulated pair of tongs to remove the used stick electrode or to move welded workpieces.

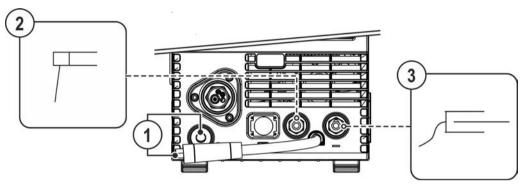


Figure 5-34

Item Symbol Description

1		 Polarity selector plug, welding current cable Connect to the park socket.
2	7	Electrode holder
3	ľ	Workpiece

- Insert the polarity selection plug in the park socket and lock in place by turning to the right.
- Insert the electrode holder plug and workpiece lead into the welding current socket depending on application and lock in place by turning to the right. The corresponding polarity will be based on the information of the electrode manufacturer on the electrode packaging.



5.3.2 Welding task selection

Select MMA JOB 128 > see 11.1 chapter.

You can only change the JOB number when no welding current is flowing.

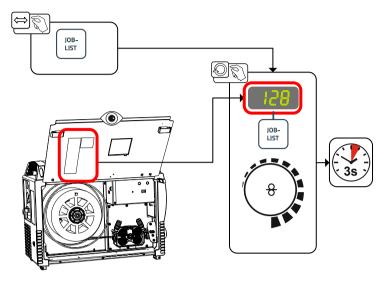


Figure 5-35

5.3.3 Arcforce

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

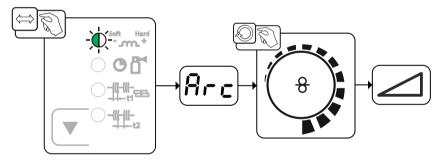


Figure 5-36

Display

Setting/selection



Arcforce correction

Increase value > harder arc

Decrease value > softer arc

5.3.4 Hotstart

The function hot start ensures a secure igniting of the arc and a sufficient heating to the still cold parent metal at the beginning of the welding process. The ignition takes place here with increased current (hot start current) over a certain time (hot start time).

For parameter setting, > see 5.3.6 chapter.

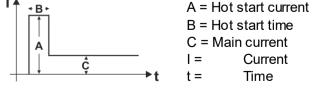
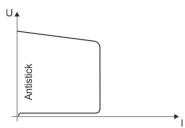


Figure 5-37

MMA welding



5.3.5 Antistick



The Antistick feature prevents the electrode from annealing.

Should the electrode stick despite the Arcforce feature, the machine automatically switches to the minimum current within approx. one second. This prevents the electrode from annealing. Check the welding current setting and correct for the welding task in hand.

Figure 5-38

5.3.6 Expert menu (MMA)

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.

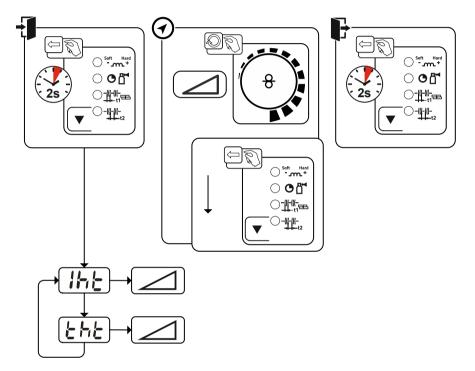


Figure 5-39

Display	Setting/selection
I h E	Hotstart current
EhE	Hotstart time



5.4 TIG welding

5.4.1 Preparing the TIG welding torch

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

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

5.4.2 Welding torch and workpiece line connection

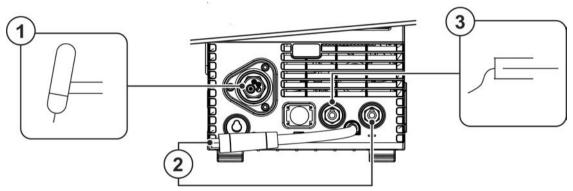


Figure 5-40

Item Symbol Description

1	ŀ	Welding torch
2		 Polarity selector plug, welding current cable Internal welding current cable for central connection/welding torch. Connection socket for "-" welding current
3		Workpiece

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

ewm

5.4.3 Welding task selection

• Select TIG JOB 127.

You can only change the JOB number when no welding current is flowing.

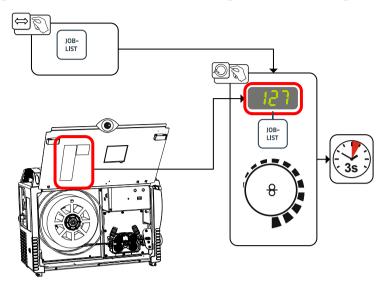


Figure 5-41

5.4.4 Adjusting the gas post-flow time

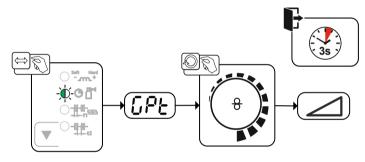
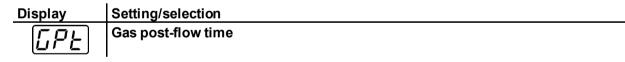


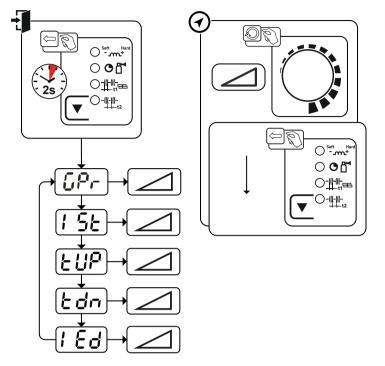
Figure 5-42





5.4.5 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.



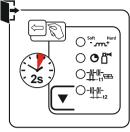


Figure 5-43

Display	Setting/selection
[Pr	Gas pre-flow time
1 <u>5</u> E	Start current (as percentage, dependent on main current)
ĿIJ₽	Upslope time to main current
Edn	Downslope time
l Ed	End current (as a percentage, dependent on main current)

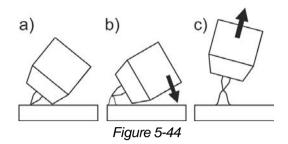
Design and function

TIG welding



5.4.6 Arc ignition





The arc ignites through contact with the workpiece:

- a) Carefully place the torch gas nozzle and tungsten electrode tip against the workpiece (lift arc current flows independent of the set main current)
- b) Angle the torch above the torch gas nozzle until the distance between electrode tip and workpiece is approx. 2–3 mm (arc ignites, current increases to the set main current).
- c) Lift the torch off and bring into normal position.

Complete the welding task: Remove the torch from the workpiece so that the arc extinguishes.

5.4.7 Operating modes (functional sequences)

5.4.7.1 Legend

Symbol	Meaning
	Press torch trigger
	Release torch trigger
I	Welding current
Ð	Gas pre-flows
•	Gas post-flows
Ľ	
Ж	Non-latched
Ж	Latched
t	Time
t _{Up}	Upslopetime
t _{Down}	Downslope time
Istart	Start current
	End-crater current

Iend End-crater current

5.4.7.2 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

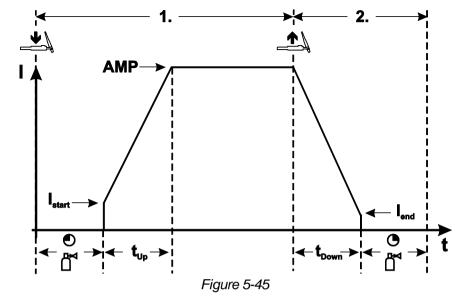
5 s after the start of the welding process, no welding current flows (ignition error).

During welding

The arc is interrupted for more than 5 s (arc interruption).



Non-latched mode



1st cycle

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

The arc is ignited using liftarc.

- The welding current flows with the value set for the starting current Istart.
- Welding current increases to the main current in the set upslope time.

2nd cycle

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

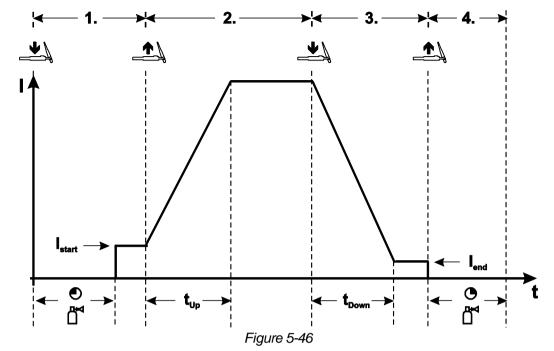
If the torch trigger is pressed again during the downslope time, the welding current returns to the set main current!

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

Remote control



Latched mode



1st cycle

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

The arc is ignited using liftarc.

• The welding current flows with the value set for the starting current Istart.

2nd cycle

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

3rd cycle

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

4th cycle

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

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

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

5.5 Remote control

The remote controls are operated on the 19-pole remote control connection socket (analogue).

5.6 Special parameters (advanced settings)

Special parameters (P1 to Pn) are applied for customer-specific configuration of machine functions. This allows the user maximum flexibility in optimising their requirements.

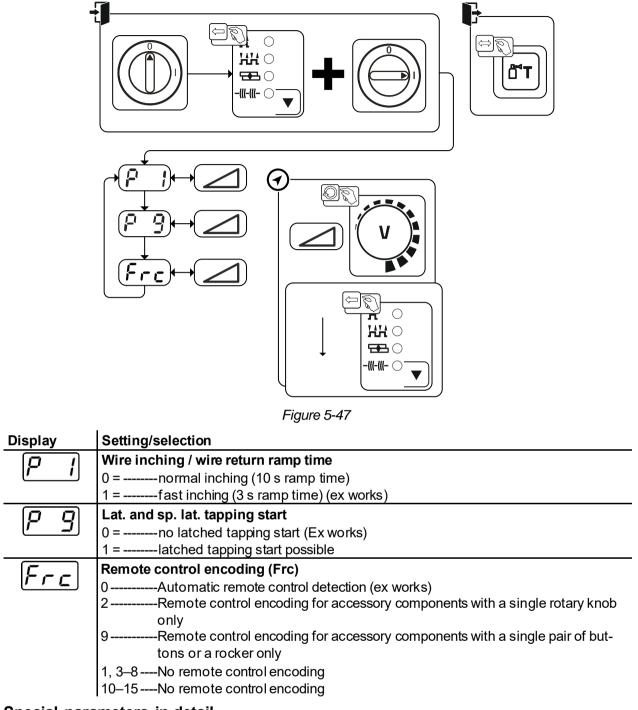
These settings are not configured directly on the machine control since a regular setting of the parameters is generally not required. The number of selectable special parameters can deviate between the machine controls used in the welding system (also see the relevant standard operating instructions).

If required, the special parameters can be reset to the factory settings > see 5.6.3 chapter.





5.6.1 Selecting, changing and saving parameters



5.6.2 Special parameters in detail

5.6.2.1 Ramp time for wire inching (P1)

The wire inching starts with a speed 1.0 m/min for 2 secs. It is subsequently increased to a ramp function to 6.0 m/min. The ramp time can be set between two ranges.

During wire inching, the speed can be changed by means of the welding power rotary knob. Changing the speed has no effect on the ramp time.

5.6.2.2 Latched/special-latched tap start (P9)

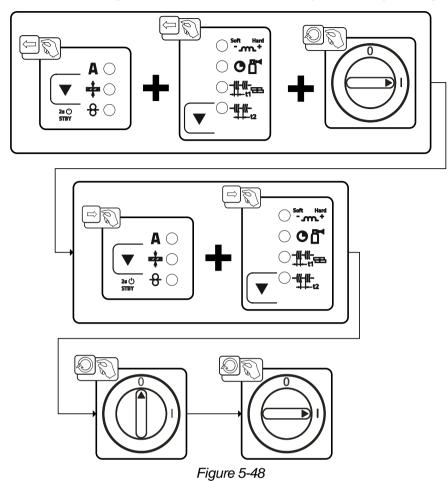
In latched – tap start – operating mode it is possible to switch straight to the second step by tapping the torch trigger; it is not necessary for current to be flowing.

The welding can be halted by pressing the torch trigger for a second time.



5.6.3 Reset to factory settings

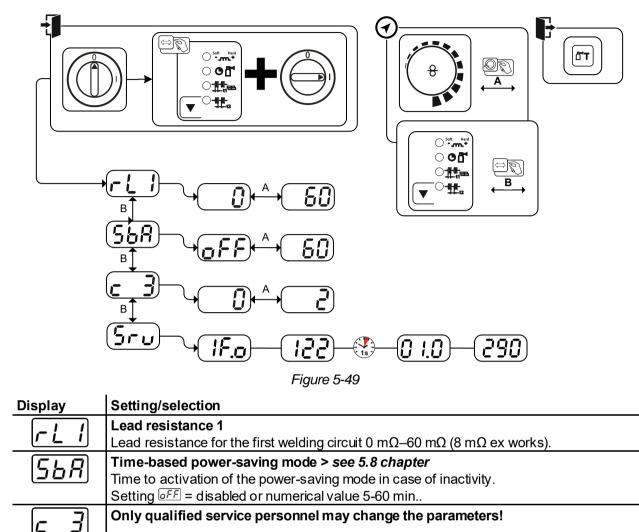
All special parameters saved by the user will be overwritten by the factory settings!





5.7 Machine configuration menu

5.7.1 Selecting, changing and saving parameters



Service menu Any changes to the service menu should be agreed with the authorised service personnel.

Sru



5.7.2 Aligning the cable resistance

The resistance value of cables can either be set directly or it can be aligned using the power source. The factory setting of the power sources is 8 m Ω . This value corresponds to a 5 m earth cable, a 1.5 m intermediate hose package and a 3 m water-cooled welding torch. With other hose package lengths, it is necessary to carry out a +/- voltage correction to optimise welding properties. The voltage correction value can be set close to zero by means of realigning the cable resistance. It is recommended to align the electric cable resistance after replacing accessories such as torches or intermediate hose packages.

In case a second wire feeder is used the (rL2) parameter has to be aligned. For all other configurations it is sufficient to align the (rL1) parameter.

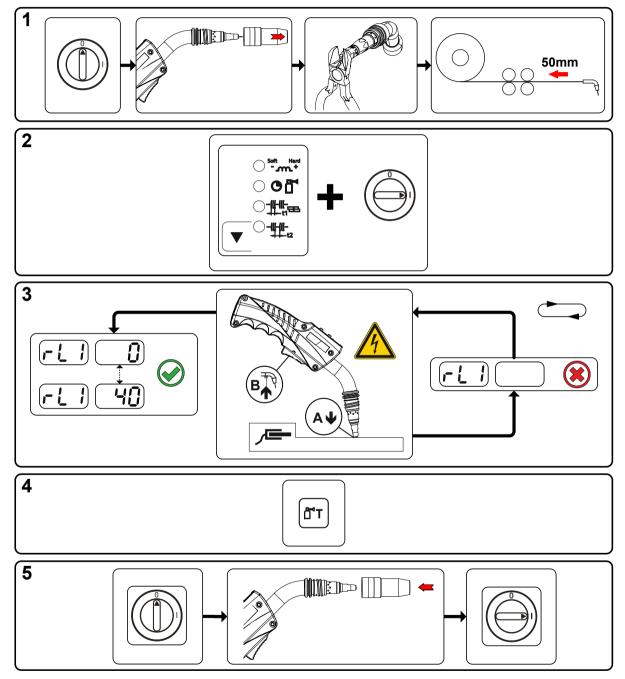


Figure 5-50



1 Preparation

- Switch off the welding machine.
- Unscrew the gas nozzle from the welding torch.
- Trim the welding wire so that it is flush with the contact tip.
- Retract the welding wire a little (approx. 50 mm) on the wire feeder. There should now be no more welding wire in the contact tip.

2 Configuration

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

3 Alignment/Measurement

Applying slight pressure, put the welding torch in place with the contact tip on a clean, purged location
on the workpiece and then press the torch trigger for approx. 2 seconds. A short-circuit current will
flow briefly, which is used to determine and display the new cable resistance. The value can be
between 0 mΩ and 40 mΩ. 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 Saving

• Press the "gas test" push-button.

5 Restoring welding standby mode

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

5.8 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 5bR) > see 5.7 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.



6 Maintenance, care and disposal

6.1 General

Working of Capacitors for up to for 1. Switch 2. Remove	DANGER ury due to electrical voltage after switching off! n an open machine can lead to fatal injuries! s are loaded with electrical voltage during operation. Voltage remains present our minutes after the mains plug is removed. off machine. e the mains plug. at last 4 minutes until the capacitors have discharged!
Maintenand qualified p who, based sible conse the necess • Follow the • If any of	A competent person is someone and repair of the machine may only be carried out by skilled and ersonnel (authorised service personnel). A competent person is someone d on training, knowledge and experience, can recognize the hazards and pos- equential damage that may occur when testing power sources and can take ary safety precautions. The maintenance instructions > see 6.3 chapter. The test requirements below are not met, the unit must not be put back into opera- it has been repaired and tested again.

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.



6.2 Explanation of icons

Personnel	
	Welder / operator
G i	Qualified person (authorised service personnel)
Tests	·
	Visual inspection
	Functional test
Period, inte	erval
8h	One-shift operation
24h	Multi-shift operation
0-0 8h	Every 8 hours
	Daily
W	Weekly
	Monthly
	Every 6 months
Y	Annually

6.3 Maintenance schedule

Inspector	Type of inspec- tion	(ŝ		 Maintenance step Only personnel designated as inspectors or repairers due to their training are allowed to carry out the relevant work step! Non-applicable inspection points are omitted. 	Repairer
	۲	Î	8	 Check and clean the welding torch. Deposits in the welding torch may cause short circuits, impair the welding result and lead to welding torch damage! Check wire drive, welding torches, and liner elements for application-related equipment and setting. Clean the wire feed rolls on a regular basis (depending on the degree of soiling). Replace worn wire feed rolls. Connections of the welding current leads (check for tight and locked seating). Is shielding gas cylinder with gas cylinder securing elements (chain/belt) secured? Strain relief: Are hose packages secured with strain relief? 	
	۲	D	0-0 8h	 Checking all supply lines and their connections (pipes, hoses, hose packages) for damage or leaks. Checking the welding system for damage to the housing. 	G i

Maintenance, care and disposal Maintenance schedule



	-c-			Maintenance step	
Inspector	Type of inspec- tion		24h	Only personnel designated as inspectors or repairers due to their trai- ning are allowed to carry out the relevant work step! Non-applicable in- spection points are omitted.	Repairer
				 Transport elements (strap, lifting eyes, handle, wheels, parking brake) corresponding safety elements (if necessary fuse caps) are present and flawless? 	
	Je and the second secon	9 D	0 8h	 Cleaning connections of coolant pipes (quick connect coupling, connections) from impurities and install protective caps when not in use. Gas test that the solenoid valve opens and closes properly. Checking operating, signalling and indicator lights, protective devices and actuators. 	
	A.	Å M	₿ ₩	 Check wire feed roll holder (wire feed rolls must be firmly seated on their holders and must not have any play) Cleaning dirt filter (if applicable) 	
	A.	С Р	0-0 8h	Checking correct mounting of the wire spool.	
	July Contraction of the second	С-О Y	H/Y	 Clean external surfaces with a damp cloth (do not use aggressive cleaning agents). 	
G	F			Cleaning the power source (inverter)	Ģi
G	Y			Cleaning heat exchanger (torch cooling)	G
	J.			Coolant change (torch cooling)	
G	R			Periodic inspection and testing	G
	July Contraction	С Н		 The coolant must be checked using the appropriate frost protection tes- ter TYP 1 (KF) or FSP (blueCool) for sufficient frost protection and re- placed if necessary (accessories). 	



6.4 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:

Welding helmets

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.



7 Rectifying faults

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

7.1 Checklist for rectifying faults

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

Legend	Symbol	Description
	×	Fault/Cause
	%	Remedy

Functional errors

- ✗ Mains fuse triggers unsuitable mains fuse
 - ★ Set up recommended mains fuse > see 8 chapter.
- ✔ Machine does not start up after switching on (device fan and possibly coolant pump have no function).
 - Connect the control cable of the wire feeder.
- ✓ All machine control signal lights are illuminated after switching on
- ✓ No machine control signal light is illuminated after switching on
- ✓ No welding power
 - ℜ Phase failure > check mains connection (fuses)
- ✓ Machine restarts continuously
- ✗ Wire feeder without function
- ✗ System does not start up
 - x 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
 - ***** Properly fasten the contact tip and contact tip holder.

Coolant error/no coolant flowing

- ✗ Insufficient coolant flow
 - ☆ Check coolant level and refill if necessary
- ✓ Air in the coolant circuit
 - ℜ Vent coolant circuit > see 7.3 chapter

Wire feed problems

- Contact tip blocked
 - 🛠 Clean and, if necessary, replace.
- ✓ Setting the spool brake > see 5.2.5.4 chapter
 - ☆ Check settings and correct if necessary
- ✓ Setting pressure units > see 5.2.5.3 chapter
- ☆ Check settings and correct if necessary
- 💉 Worn wire rolls
 - ℜ Check and replace if necessary
- ✓ Wire feed motor without supply voltage (automatic cutout triggered by overloading)
 - * Reset triggered fuse (rear of the power source) by pressing the key button
- Kinked hose packages
 - ✤ Extend and lay out the torch hose package
- ✗ Wire guide core or spiral is dirty or worn
 - 🛠 Clean core or spiral; replace kinked or worn cores



7.2 Error messages (power source)

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

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	Ε

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.

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

Err	Category		у	Possible cause	Remedy	
	a)	b)	c)			
1	۲	۲	(Mains overvoltage	Check the mains voltages and compare with	
2	۲	۲	\bigcirc	Mains undervoltage	the connection voltages of the welding ma- chine	
3	(۲	Excess temperature of welding machine	Allow the machine to cool down (mains switch to "1")	
4	\odot	(8	Coolant error	Fill coolant Turn on pump shaft (coolant pump) Check overcurrent trip of air cooling unit	
5		8	8	Wire feeder, tachometer error	Check the wire feeder tachometer generator sends no signal, motor control defective > inform Service.	
6	\odot	\bigotimes		Shielding gas error	Check shielding gas supply (for machines with shielding gas monitoring)	
7	۲	۲	\bigcirc	Overvoltage on secondary	Inverter error > inform Service	
8	۲	۲	\bigotimes	Wire error	Separate the electrical connection between welding wire and housing or an earthed object	
9	\odot	۲	۲	Fast shutdown	Rectify error on robot (Interface for automated welding)	
10	۲	\odot	۲	Arc interruption	Check wire feeding (interface for automated welding)	
11	۲		۲	Ignition error (after 5 s)	Check wire feeding (interface for automated welding)	
13	\bigcirc	8	۲	Emergency stop deactivation	Check the emergency stop switch of the in- terface for automated welding	
14	۲	\odot	۲	Wire feeder detection	Check cable connections	
				ID number allocation error (2DV)	Correct ID numbers	
15	۲	\odot	۲	Detection of wire feeder 2	Check cable connections	
16	۲	۲	\bigcirc	Error in open circuit voltage reduction (VRD)	Inform Service.	

Rectifying faults

Vent coolant circuit



Err	Category		y	Possible cause	Remedy
	a)	b)	c)		
17	۲	\bigcirc		Overcurrent detection on wire feeder	Check ease of wire feeding
18	۲	\bigcirc		Error in tachometer generator signal	Check the connection and particularly the ta- chometer generator of the second wire fee- der (slave drive).
56	56 😣 😣 🧭 Mains phase failure		Mains phase failure	Check mains voltages	
58	۲	\oslash	۲	Short circuit	Check welding circuit for short circuit; put down welding torch isolated
59	۲	۲	\bigcirc	Machine incompatible	Check machine usage
60	۲	۲	\bigcirc	Software update required	Inform Service.

Category legend (resetting the error)

- a) The error message disappears when the error is eliminated.
- b) The error message can be reset by pressing a pushbutton. Resetting the machine errors is only possible with the listed machine controls:

Machine control	Pushbutton
RC1 / RC2	Enter
Expert	S
Expert 2.0 / Expert XQ 2.0	<u></u>
CarExpert / Progress (M3.11)	

c) Error messages can only be reset by switching the machine off and on again.

The shielding gas error (Err 6) can be reset by pressing the "Welding parameters" key button.

7.3 Vent coolant circuit

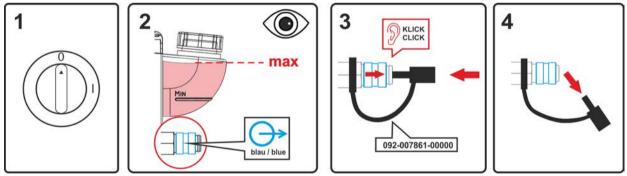


Figure 7-1

• Switch off the machine and fill the coolant tank to the maximum level.

• Unlock the quick-connect coupling with a suitable tool (connection open).

To vent the cooling system always use the blue coolant connection, which is located as deep as possible inside the system (close to the coolant tank)!



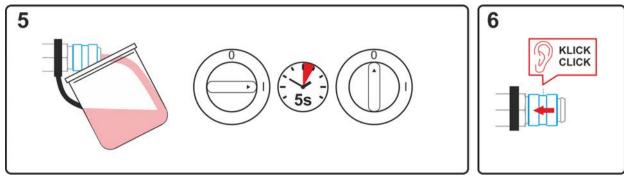


Figure 7-2

- Position a suitable collection container for collecting the escaping coolant at the quick-connect coupling and switch on the machine for approx. 5s.
- Lock the quick-connect coupling by pushing back the locking ring.

7.4 Software version of the machine control

The query of the software versions only serves to inform the authorised service staff. It is available in the machine configuration menu > see 5.7 chapter.

7.5 Resetting welding parameters to the factory settings

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

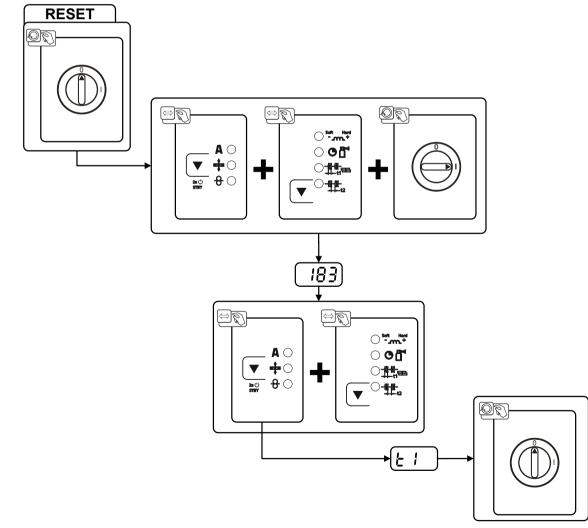


Figure 7-3

 Display
 Setting/selection

 Code of machine control

Rectifying faults Resetting JOBs (welding tasks) to the factory settings



Display

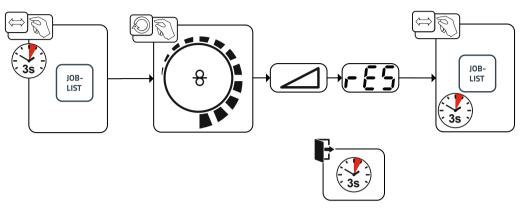
L

Setting/selection Initialisation complete

1 All customised welding parameters haven been overwritten by the factory settings.

7.6 Resetting JOBs (welding tasks) to the factory settings

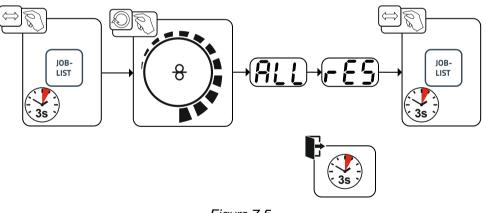
7.6.1 Resetting a single JOB





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

7.6.2 **Resetting all JOBs**



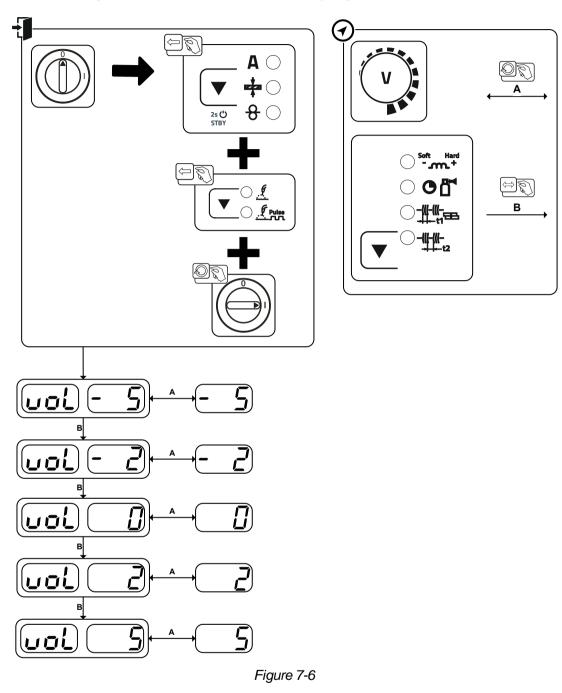


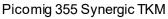
Display	Setting/selection
	RESET to factory settings
	The RESET will be done after pressing the button.
	The menu will be ended when no changes are done after 3 sec.



7.7 Welding parameter calibration

In case of deviations between the welding parameters set on the front panel/remote control and those shown on the welding machine, this function allows for easy alignment.







8 Technical data

8.1 Picomig 355 Synergic TKM

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

	MIG/MAG	TIG	MMA	
Welding current (I ₂)		5 A to 350 A	-	
Welding voltage according to stan-	14,3 V to 31,5 V	10,2 V to 24,0 V	20,2 V to 34,0 V	
dard (U ₂)				
Duty cycle DC at 40° C ^[1]				
40 %		350 A		
60 %		300 A		
100 %		270 A		
Open circuit voltage (U ₀)		79 V		
Mains voltage (Tolerance)	3:	x 400 V (-25 % to +20	%)	
Frequency		50/60 Hz		
mains fuse ^[2]		3 x 16 A		
Mains connection cable		H07RN-F4G2,5		
max. Connected load (S1)	13,9 kVA	10,6 kVA	15,0 kVA	
Generator rating (Rec.)		20,3 kVA		
Cos φ / efficiency		0,99 / 88 %		
Protection class / Overvoltage	I / III			
category				
Contamination level	3			
Insulation class / protection		H / IP 23		
classification				
Residual current circuit breaker		Type B (recommended	(b	
Noise level ^[3]		<70 dB(A)		
Ambient temperature ^[4]		-25 °C to +40 °C		
Machine cooling / Torch cooling		Fan (AF) / gas		
Wire feed speed		0,5 m/min to 25m/min		
Factory-installed roll equipment	1	,0/1,2 mm for steel wi	re	
Drive		4 rollers (37 mm)		
Wire spool diameter	Standar	dised wire spools up to	o 300 mm	
Welding torch connection	Euro torch connector			
Workpiece lead (min.)		50 mm ²		
EMC class		Α		
Test mark		S/C€/EAE/KA		
Standards used	See declaratio	n of conformity (applia	nce documents)	
Dimensions ($I x b x h$)		636 x 298 x 482 mm		
		25.0 x 11.7 x 19.0 incl	h	
Weight		34,4 kg		
	75.8 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.
- ^[3] 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!



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.
cool50 U40	Cooling module	090-008598-00502
cool50-2 U42	Cooling unit with reinforced pump	090-008797-00502
HOSE BRIDGE UNI	Tube bridge	092-007843-00000

9.1.1 Coolant - type blueCool

Туре	Designation	Item no.			
blueCool-1051	Coolant up to -10 °C (14 °F), 5 l	094-024141-00005			
blueCool -10 25 l	Coolant up to -10 °C (14 °F), 25 I	094-024141-00025			
blueCool-3051	Coolant up to -30 °C (22 °F), 5 l	094-024142-00005			
blueCool -30 25 l	Coolant up to -30 °C (22 °F), 25 l	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 l	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 l	094-006256-00001
TYP1	Frost protection tester	094-014499-00000

9.2 Transport system

Туре	Designation	Item no.
Trolly 35.2-2	Transport vehicle	090-008296-00000
Trolly 55-5	Transport cart, assembled	090-008632-00000
Trolly 55-6	Transport cart, assembled	090-008825-00000
ON TR Trolly 55-5 / 55-6	Cross arm and holder for wire feeder	092-002700-00000

9.3 Remote control/connecting and extension cable

9.3.1 19-pole connection

Туре	Designation	Item no.				
R10 19POL	Remote control	090-008087-00000				
RG10 19POL 5M	Remote control to set the wire speed and welding voltage correction	090-008108-00000				
RA5 19POL 5M	Remote control e.g. connection cable	092-001470-00005				
RA10 19POL 10m	Remote control e.g. connection cable	092-001470-00010				
RA20 19POL 20m	Remote control e.g. connection cable	092-001470-00020				
RV5M19 19POLE 5M	Extension cable	092-000857-00000				
RV5M19 19POL 10M	Extension cable	092-000857-00010				
RV5M19 19POL 15M	Extension cable	092-000857-00015				
RV5M19 19POL 20M	Extension cable	092-000857-00020				

Options



9.4 Options

Туре	Designation	Item no.		
ON D Barrel TG.0003	Wire guide Rolliner for drum feed	092-007929-00000		
ON Case	Tool box for mounting to trolly Trolly 55-5 / Trolly 55-6	092-002899-00000		
ONCS	Crane suspension for Picomig 180 / 185 D3 / 305	092-002549-00000		
T.005/TG.0003/D.0002	D3, Phoenix and Taurus 355 compact, drive 4			
ON TH TG.03/TG.04/TG.11 R	Torch holder, right	092-002699-00000		
ON WAK	Wheel assembly kit	092-001356-00000		
TG.03/TG.04/TG.09/K.02				
ON Filter TG.0003	Dirt filter	092-002662-00000		

9.5 General accessories

Туре	Designation	Item no.
AK300	Wire spool adapter K300	094-001803-00001
CA D200	Centering adapter for 5-kg spools	094-011803-00000
16A 5POLE/CEE	Mains plug	094-000712-00000
DM 842 Ar/CO2 230bar 30l D	Pressure regulator with manometer	394-002910-00030
G1 G1/4 R 3M	Gas hose	094-000010-00003
DSP	Sharpener for liner	094-010427-00000
Cutter	Hose cutter	094-016585-00000
voltConverter 230/400	Voltage converter	090-008800-00502
ON AL D13/27	Cap for load sockets	092-003282-00000
ADAPTER EZA> DINSE-ZA	Adapter for welding torches with Dinse connector to Euro central connector, on the machine	094-016765-00000



10 Replaceable parts

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

10.1 Wire feed rollers

10.1.1 Wire feed rollers for steel wire

Туре	Designation	Item no.
FE 4R 0.6 MM/0.023 INCH	Drive roll set, 37 mm, 4 rolls, V-groove for steel,	092-002770-00006
LIGHT PINK	stainless steel and brazing	
FE 4R 0.8-1.0MM / 0.03-0.04	Drive roll set, 37 mm, 4 rolls, V-groove for steel,	092-002770-00009
INCH BLUE/WHITE	stainless steel and brazing	
FE 4R 1.0-1.2MM / 0.04-0.045	Drive roll set, 37 mm, 4 rolls, V-groove for steel,	092-002770-00011
INCH BLUE/RED	stainless steel and brazing	
FE 4R 1.4 MM/0.052 INCH	Drive roll set, 37 mm, 4 rolls, V-groove for steel,	092-002770-00014
GREEN	stainless steel and brazing	
FE 4R 1.6 MM/0.06 INCH	Drive roll set, 37 mm, 4 rolls, V-groove for steel,	092-002770-00016
BLACK	stainless steel and brazing	
FE 4R 2.0 MM/0.08 INCH	Drive roll set, 37 mm, 4 rolls, V-groove for steel,	092-002770-00020
GREY	stainless steel and brazing	
FE 4R 2.4 MM/0.095 INCH	Drive roll set, 37 mm, 4 rolls, V-groove for steel,	092-002770-00024
BROWN	stainless steel and brazing	
FE 4R 2.8 MM/0.11 INCH	Drive roll set, 37 mm, 4 rolls, V-groove for steel,	092-002770-00028
LIGHT GREEN	stainless steel and brazing	
FE 4R 3.2 MM/0.12 INCH	Drive roll set, 37 mm, 4 rolls, V-groove for steel,	092-002770-00032
VIOLET	stainless steel and brazing	

10.1.2 Wire feed rollers for aluminium wire

Туре	Designation	Item no.
AL 4R 0.8 MM/0.03 INCH WHITE/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00008
AL 4R 1.0 MM/0.04 INCH BLUE/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00010
AL 4R 1.2 MM/0.045 INCH RED/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00012
AL 4R 1.6 MM/0.06 INCH BLACK/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00016
AL 4R 2.0 MM/0.08 INCH GREY/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00020
AL 4R 2.4 MM/0.095 INCH BROWN/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00024
AL 4R 2.8 MM/0.110 INCH LIGHT GREEN/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00028
AL 4R 3.2 MM/0.125 INCH VIOLET/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00032



10.1.3 Wire feed rollers for cored wire

Туре	Designation	Item no.
FUEL 4R 0.8 MM/0.03 INCH	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for	092-002848-00008
WHITE/ORANGE	flux cored wire	
FUEL 4R 1.0 MM/0.04 INCH	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for	092-002848-00010
BLUE/ORANGE	flux cored wire	
FUEL 4R 1.2 MM/0.045 INCH	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for	092-002848-00012
RED/ORANGE	flux cored wire	
FUEL 4R 1.4 MM/0.052 INCH	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for	092-002848-00014
GREEN/ORANGE	flux cored wire	
FUEL 4R 1.6 MM/0.06 INCH	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for	092-002848-00016
BLACK/ORANGE	flux cored wire	
FUEL 4R 2.0 MM/0.08 INCH	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for	092-002848-00020
GREY/ORANGE	flux cored wire	
FUEL 4R 2.4 MM/0.095 INCH	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for	092-002848-00024
BROWN/ORANGE	flux cored wire	

10.1.4 Wire guide

Туре	Designation	Item no.
DV X	Wire feed roll mount set	092-002960-E0000
SETDRAHTFUERUNG	Wire guide set	092-002774-00000
ON WF 2,0-3,2mm eFeed	Retrofitting option, wire guide for 2.0–3.2 mm wires, eFeed drive	092-019404-00000
SET IG 4x4 1.6mm BL	Inlet guide set	092-002780-00000
GUIDE TUBE L105	Guide tube	094-006051-00000
CAPTUB L=107 mm; Ø ≤ 1,6	Capillary tube	094-006634-00000
mm		
CAPTUB L=105 mm; $\emptyset \le 2,4$	Capillary tube	094-021470-00000
mm		



11 Appendix

11.1 JOB-List

ev	(m°	JOB-LIS ⁻	г	09	4-01917	0-00500	ev	vm•	JOB-LIS	т	09	4-021250-0050
			Ø Wire						Ø Wire			
	8	674%	0,8 0,9		1,0	1,2		8	ద ™%	0,8	0,9	1,0 1,2
	Material	Gas		Job	-Nr.			Material	Gas		Job	-Nr.
	SG2/3	CO ₂ 100 / C1	1	2	3	4	ð		Ar-82/CO ₂ -18	189		179
a a	G3/4 Si1	- Ar80-90 / M2	6	7	8	9	forceArc	SG2/3	M21			
∕ir€		Ar91-99 / M12- M13	34		35	36	5	G3/4 Si1	A = 00/00 10	190		254
	CrNi	Ar/He / 13	42		43	44	•		Ar-90/CO ₂ -10 M20			
olio	CuSi	Ar100 / I1	114		115	116						
Ň	Löten / Brazing	Ar91-99 / M12- M13	110		111	112						
ht	CuAl	Ar100 / I1	122		123	124						
ra	Löten / Brazing	A-01.00 /M12-	118		119	120						
i <o< td=""><td>j</td><td>Ar100 / I1</td><td>74</td><td></td><td>75</td><td>76</td><td></td><td></td><td></td><td></td><td></td><td></td></o<>	j	Ar100 / I1	74		75	76						
Massivdraht / Solid Wire	AIMg	Ar/He / I3	78		79	80						
Ma		Ar100 / I1	82		83	84						
	AlSi	Ar/He / I3	86		87	88						
		Ar100 / I1	90		91	92						
	AI99	Ar/He / I3	94		95	96						
		Aline 15	54	Ø		50						
	8	ద ో%	0,8	0,9	1,0	1,2						
0	Material	Gas	0,0	Job		1,2						
Vir	SG2/3	Ar80-90 / M2	235		237	238						
م	G3/4 Si1 Metal	A100-30 7 WZ	200		207	200						
Le	SG2/3	Ar80-90 / M2	240		242	243						
Ŭ V	G3/4 Si1 Rutil / Basic		240		272	240						
- ×n		Ar91-99 / M12- M13	227		228	229						
Ē	CrNi Metal	M13 M13	227		220	220						
t/		Ar98/2 / M13	231		232	233						
rat	CrNi Rutil / Basic	Ar92/8 / M22	210		211	212						
Fülldraht / Flux-Cored Wire			210	Ø		212						
Fü	8	ద ో%	0,9	1,0	1,1	1,2						
	Material	Gas	0,5		-Nr.	1,2						
	E74T 44	Calf Chielded	172		171	170						
	E71T-11	Self-Shielded	172	Ø	1. Sec.	170						
LC LC	8	₫*%	0,8	0,9	1,0	1,2						
rootArc	Material	Gas	0,0		-Nr.	1,2						
ĕ		<u> </u>		300	204	205						
	SG2/3 G3/4 Si1	CO ₂ 100 / C1 Ar80-90 / M2										
	GMAW non synergic		188		206	207						
-	WIG /		127									
	E-Hand / MMA		128									
							ro 11					

Figure 11-1

MIG/MAG pulse arc welding can be selected with JOBs 6–9, 34–36, 42–44, 74–76, 78–80, 82–84, 86–88, 90–92, 94–96, 110–112, 114–116, 118–120, 122–124, 179, 206, 207, 235–238 and 254. If an attempt is made to set another JOB to pulse, "noP" = "no Pulse" appears briefly on the display and the machine is reset to default.



11.2 Parameter overview – setting ranges

ay	Parameters/function	Setting range						
Welding data display (3-digit)		Standard (ex works)	Min.		Max.	Unit		
	MIG/MAG		T					
SEc	Gas pre-flow time	0,5	0,0	-	20,0	s		
dYn	Dynamic correction		-40	-	40			
GPE	Gas post-flow time	0,5	0,0	-	20,0	s		
E I	Spot time	2	0,1	-	20,0	s		
E 2	Pause time (interval)	2	0,1	-	20,0	s		
rbd	Wire burn-back		0	-	499			
	TIG							
[Pr	Gas pre-flow time	0,5	0,0	-	20,0	s		
I SE	Start current		0,0	-	20,0	s		
EUP	Up-slope time	1	0,0	-	20,0	S		
Edn	Down-slope time		0,0	-	20,0	S		
I Ed	End current	20	1	-	200	%		
GPE	Gas post-flow time	0,5	0,0	-	20,0	s		
	MMA	-	-					
1 hE	Hot start current		0,0	-	20,0	%		
EhE	Hot start time	0,5	0,1	-	20,0	s		
	Basic parameters (independent of pro	cedure)	-					
<u>c</u> RL	Calibration							
End	Exit menu							
<u>c</u> FG	Machine configuration							
Fre	Remote control encoding	0	0	-	15			
P I	Wire inching ramp time	1	0	-	1			
P 9	Tapping start for latched and special latched operation	0	0	-	1			
rL I	Cable resistance 1	8	0	-	60	mΩ		
<u>568</u>	Time-based power-saving mode	off	5	-	60	min.		
5ru	Service menu							
ωEr	Software version of the machine control							
-	Power-saving mode active							



11.3 Searching for a dealer

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



"More than 400 EWM sales partners worldwide"