Operating instructions



En En	Welding machine Pico 300 cel pws Pico 300 cel pws vrd 12V Pico 300 cel pws svrd 12V		
099-002044-EW501	Observe additional system documents!	14.10.2022	

General instructions

M WARNING

Read the operating instructions!

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

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

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

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

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

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

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

© 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	Cont	ents		. 3
2	For y	our safet	ν	. 6
	2.1	Notes or	using these operating instructions	. 6
	2.2	Explanat	ion of icons	. 7
	2.3	Safety in	structions	. 8
	2.4	Transpoi	rt and installation	11
3	Inten	ded use.		13
•	3.1	Applicati	ons	13
	3.2	Overviev	v of device types	13
	-	3.2.1	Cellulose electrode types (cel)	13
		3.2.2	Pole reversing switch (pws)	13
		3.2.3	Voltage reducing device	13
	3.3	Docume	nts which also apply	14
		3.3.1	Warranty	14
		3.3.2	Declaration of Conformity	14
		3.3.3	Welding in environments with increased electrical hazards	14
		3.3.4	Service documents (spare parts and circuit diagrams)	14
		3.3.5	Calibration/Validation	14
		3.3.6	Part of the complete documentation	15
4	Mach	nine desc	ription – quick overview	16
	4.1	Front vie	w / rear view	16
	4.2	Machine	control – Operating elements	18
		4.2.1	Welding data display	19
		4.2.2	Welding current actual value display	19
5	Desig	gn and fu	nction	20
	5.1	Transpo	rt and installation	20
		5.1.1	Machine cooling	20
		5.1.2	Workpiece lead, general	20
		5.1.3	Ambient conditions	21
		5.1.4	Transport belt	21
			5.1.4.1 Adjusting the length of the carrying strap	21
		5.1.5	Notes on the installation of welding current leads	22
		5.1.6	Stray welding currents	23
		5.1.7	Mains connection	24
			5.1.7.1 Mains configuration.	24
	5.2	MMA we	lding	25
		5.2.1	Connecting the electrode holder and workpiece lead	25
		5.2.2	Welding task selection.	26
			5.2.2.1 Arcforce (welding characteristics)	26
		F O O	5.2.2.2 Weiding current polarity reversal (polarity reversal)	26
		5.2.3	HOISTAR	27
			5.2.3.1 Hotstaft time	27
		E 0 4	5.2.3.2 Holstan current	27
	52	D.Z.4		21 20
	5.5		Shielding are supply (shielding are cylinderfer welding mechine)	20 20
		5.5.1	5.3.1.1 Prossure regulator connection	20
		532	Connecting a TIG welding torch with rotating das valve	20
		533	Welding task selection	20
		534	Gas test – setting the shielding gas volume	30
		535	Arc ignition	30
		0.0.0	5.3.5.1 Liftarc	30
	54	Remote	control	30
	0.7	541	RT1 19POI	30
		542	RTF1 19POI	31
		543	RT PWS1 19POI	31
		544	RTA PWS2	31
	5.5	Dirt filter		31



5.6	Voltage reducing device	32
5.7	Machine configuration menu	32
	5.7.1 Arcforce correction (welding characteristics)	32
	5.7.2 Arc length restriction (USP)	32
	5.7.3 Welding current actual value display	33
Main	ntenance, care and disposal	34
6.1	General	34
	6.1.1 Cleaning	
	6.1.2 Dirt filter	34
6.2	Maintenance work, intervals	35
	6.2.1 Daily maintenance tasks	35
	6.2.2 Monthly maintenance tasks	35
	6.2.3 Annual test (inspection and testing during operation)	35
6.3	Disposing of equipment	36
Rect	tifying faults	37
7.1	Error messages (power source)	
7.2	Resetting welding parameters to the factory settings	
Tech	nnical data	
8.1	Pico 300 cel pws	
Acce	essories	
9.1	Welding torch, electrode holder and workpiece lead	40
9.2	19-pole remote control	
	9.2.1 Connection cables	40
	9.2.2 Extension cable	40
9.3	Options	40
9.4	General accessories	40
) Appe	endix	41
10.1	Parameter overview – setting ranges	
	5.6 5.7 Main 6.1 6.2 6.3 Recc 7.1 7.2 Tecl 8.1 Acc 9.1 9.2 9.3 9.4 0 App 10.1	 5.6 Voltage reducing device





2 For your safety

2.1 Notes on using these operating instructions

A DANGER

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

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

MARNING

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

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

▲ CAUTION

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

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

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

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

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



2.2 Explanation of icons

Symbol	Description	Symbol	Description
R ^a	Indicates technical aspects which the user must observe.	$\Leftrightarrow $	Activate and release / Tap / Tip
	Switch off machine		Release
	Switch on machine	(I) (I) (I) (I) (I) (I) (I) (I) (I) (I)	Press and hold
	Incorrect / Invalid	ÛŊ	Switch
	Correct / Valid	ÐŢ	Turn
	Input	\square	Numerical value – adjustable
\bigcirc	Navigation	-``	Signal light lights up in green
F	Output	•••••	Signal light flashes green
4s	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
Ĵ	Tool required/use	•••••	Signal light flashes blue



2.3	Safety instructions
-----	---------------------

	🛆 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!
L	Risk of injury from electrical voltage!
7	Voltages can cause potentially fatal electric shocks and burns on contact. Even low vol-
	tages can cause a shock and lead to accidents.
	 Never touch live components such as weiding 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!
W _n	If a number of power sources are to be connected in parallel or in series, only a techni-
	cal specialist may interconnect the sources as per standard IEC 60974-9:2010: Installa-
	tion 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 com-
	bined, which is not permitted.
	Risk of injury due to radiation or heat!
3	Arc radiation can lead to skin and eye injuries.
-	Contact with hot workpieces and sparks can lead to burns.
	• Use hand shield or welding heimet with the appropriate safety level (depends on the appli-
	Cation). Wear dry protective elething (e.g. hand shield, glayee, etc.) in appardance with
	• wear any protective clothing (e.g. nand 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!





 Only further process workpieces after they have cooled down. Do not allow them to contact any flammable materials! Safety instructions







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.

For your safety

Transport and installation





- Only transport and operate in an upright position!
- Accessory components and the power source itself can be damaged by incorrect connection!
 - Only insert and lock accessory components into the relevant connection socket when the machine is switched off.
 - Comprehensive descriptions can be found in the operating instructions for the relevant accessory components.
 - Accessory components are detected automatically after the power source is switched on.
- Protective dust caps protect the connection sockets and therefore the machine against dirt and damage.
 - The protective dust cap must be fitted if there is no accessory component being operated on that connection.
 - The cap must be replaced if faulty or if lost!

E P



3 Intended use

§

MARNING

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 system for MMA DC welding with pole reversing switch for quick polarity switching and, as secondary process, TIG DC welding with lift arc (contact ignition).

3.2 Overview of device types

3.2.1 Cellulose electrode types (cel)

CEL device types are equipped with special Arcforce characteristics. These device types facilitate welding with cellulose electrode types which is safe for vertical-down welding, especially in the lower output range.

3.2.2 Pole reversing switch (pws)

With PWS device types, the polarity of the welding current connections (pole reversal) can be changed using a changeover switch on the machine or on the remote control.

Useful function with frequently changing electrode types without time-consuming reconnection of the welding current connections (also directly at the operating point, in combination with a PWS remote control).

3.2.3 Voltage reducing device

Only machine variants with the (VRD/SVRD/AUS/RU) code are equipped with a voltage reduction device (VRD). The VRD is used for increased safety, especially in hazardous environments such as shipbuilding, pipe construction or mining.

A VRD is mandatory in some countries and required by many on-site safety instructions for power sources.

The VRD > see 4.2 chapter signal light is illuminated when the voltage reduction device is operating without fault and the output voltage is reduced to a value specified in the relevant standard (see technical data > see 8 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

This product corresponds in its design and construction to the EU directives listed in the decla-

ration. The product comes with a relevant declaration of conformity in the original.
 The manufacturer recommends carrying out the safety inspection according to national and international standards and guidelines every 12 months.

3.3.3 Welding in environments with increased electrical hazards



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

3.3.4 Service documents (spare parts and circuit diagrams)



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!

MWARNING

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.



Item	Documentation
A.1	Power source
A.2	Electrode holder/welding torch
A.3	Remote control
Α	Complete documentation

Machine description – quick overview Front view / rear view



- Machine description quick overview 4
- Front view / rear view 4.1





Item	Symbol	Description
1		Carrying strap > see 5.1.4.1 chapter
2		Carrying handle
3		Machine control > see 4.2 chapter
4		Cooling air inlet
5	\checkmark	Connection socket, 19-pole Remote control connection
6	S	Welding current polarity switch > see 5.2.2.2 chapterSwitch for quick switching of welding current polarity.**
7	٣	Connection socket, electrode holder The welding current polarity ("+" or "-") are based on the setting of the "Welding current polarity changeover switch".
8		Connection socket, workpiece lead The welding current polarity ("+" or "-") are based on the setting of the "Welding current polarity changeover switch".
9		Main Switch Switching the machine on or off.
10	5	Mains connection cable > see 5.1.7 chapter
11		Cooling air outlet
12	F4	Fuse Solenoid switch pole reversal fuse
13	F5	Fuse Solenoid switch pole reversal fuse
14		Machine feet



4.2 Machine control – Operating elements

The parameters and their setting ranges are described in chapter Parameters Overview - Setting Ranges > see 10.1 chapter.



Figure 4-2

Item	Symbol	Description
1	000	Welding data display (3-digit)
		Displays the welding parameters and the corresponding values > see 4.2.1 chapter
2		Collective interference signal light
	ר	For error messages, > see 7 chapter
3		Excess temperature signal light
		In case of excess temperature, temperature monitors de-activate the power unit, and
		the excess temperature control lamp comes on. Once the machine has cooled down,
		welding can continue without any further measures.
4	sec	Hotstart time signal light
5	AMP%	Hotstart current signal light
6	AMP	Main current signal light
		Imin to Imax (1 A increments)
7		Welding parameter setting rotary transducer
		Setting of welding current and other welding parameter and their values
8	VRD	Voltage reduction device (VRD) signal light > see 5.6 chapter
9		Select welding parameters button
	T_+	This button is used to select the welding parameters depending on the welding process
		and operating mode used.
10	А	"Arcforce" button (welding characteristics) according to electrode type
11		Welding procedure push-button
	▼	[⊥] / _± TIG welding
		左 MMA welding



Item Symbol Description



AMP ----- Welding current display

VOLT ---- Welding voltage display

4.2.1 Welding data display

All relevant welding parameters with their values are shown depending on the welding procedure selected and the associated functions. Machine parameters and error codes are shown as well in a unique manner. The meaning of the parameters and values shown is explained in the relevant chapter for the function.

4.2.2 Welding current actual value display

The welding current in the welding data display is displayed as nominal value at the factory. The welding current display can be determined by switching the parameter red to actual values in the respective expert menu:

MMA welding

TIG welding

- In idle mode (when no welding current is flowing) the nominal value is displayed
- If welding current is flowing, the welding data display is switched to the actual value •
- After welding, the nominal value is displayed again

Transport and installation



5 **Design and function**

Transport and installation 5.1



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

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

The units are designed for operation in an upright position! R Operation in non-permissible positions can cause equipment damage.

- Only transport and operate in an upright position!
- Accessory components and the power source itself can be damaged by incorrect connection! R.
 - 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.

5.1.1 Machine cooling

- Insufficient ventilation results in a reduction in performance and equipment damage. R
 - Observe the ambient conditions!
 - Keep the cooling air inlet and outlet clear!
 - Observe the minimum distance of 0.5 m from obstacles!
- 5.1.2 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!



5.1.3 Ambient conditions

- The machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!
 - The operator must ensure that the ground is non-slip and level, and provide sufficient lighting for the place of work.
 - Safe operation of the machine must be guaranteed at all times.

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

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

In operation

Temperature range of the ambient air:

• -25 °C to +40 °C (-13 °F to 104 °F)

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)

Relative humidity

• up to 90 % at 20 °C (68 °F)

5.1.4 Transport belt

5.1.4.1 Adjusting the length of the carrying strap

To demonstrate adjustment, lengthening the strap is shown in the figure. To shorten, the strap's loops must be inched in the opposite direction.





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).





20 cm ≈20 cm

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

Π



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.







5.1.6 Stray welding currents

4



Risk of injury due to stray welding currents!

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

- Check that all welding current connections are firmly secured and electrical connections are in perfect condition.
- Set up, attach or suspend all conductive power source components such as casing, transport vehicles and crane frames so they are insulated.
- Do not place any other electronic devices such as drills or angle grinders on the power source, transport vehicle or crane frames unless they are insulated.
- Always put welding torches and electrode holders on an insulated surface when they are not in use.



Figure 5-5

Design and function Transport and installation



5.1.7 Mains connection

	▲ DANGER
4	 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 nati-
	 onal 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, ٠

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.



5.2 MMA welding

5.2.1 Connecting the electrode holder and workpiece lead





Risk of crushing and burns!

- 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 5-7

Item	Symbol	Description
1	٣	Connection socket, electrode holder The welding current polarity ("+" or "-") are based on the setting of the "Welding current polarity changeover switch".
2	ļ	Connection socket, workpiece lead The welding current polarity ("+" or "-") are based on the setting of the "Welding current polarity changeover switch".

• 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.

Design and function

MMA welding



5.2.2 Welding task selection



Figure 5-8

5.2.2.1 Arcforce (welding characteristics)

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.

Electrode type allocation



The electrode characteristics you can select at the machine control are guiding values. Each characteristic can be optimised according to electrode type and the related welding properties > see 5.7 chapter.

5.2.2.2 Welding current polarity reversal (polarity reversal)

The user can use the welding current polarity changeover switch > see 4 chapter to electronically reverse the welding current polarity of the welding current sockets. If different electrode types are used, for which different polarities are prescribed by the manufacturer, the welding cables do not need to be replugged. The selected switch position indicates the selected polarity (+/-).

If switching is to be effected by a remote control (PWS), the switch at the power source must be switched to position +T.



5.2.3 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).



5.2.3.1 Hotstart time



Figure 5-11

5.2.3.2 Hotstart current



Figure 5-12

5.2.4 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.



TIG welding



5.3 TIG welding

•

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

	▲ WARNING
А	Risk of injury due to improper handling of shielding gas cylinders!
	Improper handling and insufficient securing of shielding gas cylinders can cause seri-
	ous injuries!
	• Observe the instructions from the gas manufacturer and any relevant regulations concern-
	ing the use of compressed air!
	Do not attach any element to the shielding gas cylinder valve!

- Prevent the shielding gas cylinder from heating up.
- An unhindered shielding gas supply from the shielding gas cylinder to the welding torch is a fundamental requirement for optimum welding results. In addition, a blocked shielding gas supply may result in the welding torch being destroyed.
 - Always re-fit the yellow protective cap when not using the shielding gas connection.
 - All shielding gas connections must be gas tight.

5.3.1.1 Pressure regulator connection



Figure 5-14

Item Symbol Description

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

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



5.3.2 Connecting a TIG welding torch with rotating gas valve

Prepare welding torch according to the welding task in hand (see operating instructions for the torch).



Figure 5-15

Item	Symbol	Description
1		Output side of the pressure regulator
2	ŀ	Welding torch
3	Ţ	Workpiece

- Insert the welding current plug of the welding torch into the connection socket and lock by turning to the right.
- Insert cable plug on the workpiece lead into the welding current socket "/="" and lock by turning to the right.
- Screw the shielding gas hose of the welding torch to the pressure regulator outlet.

If the rotary gas valve is open, the shielding gas flows permanently from the welding torch (no adjustment with a separate gas valve). The rotary valve must be opened before each welding procedure and closed after each welding procedure.

Design and function

Remote control



5.3.3 Welding task selection



Figure 5-16

With the selection the TIG welding process, the function of the welding current polarity changeover switch is deactivated. The welding current polarity is permanently set to "-" on the electrode holder connection socket.

5.3.4 Gas test – setting the shielding gas volume

A CAUTION



Electric shocks!

When setting the shielding gas quantity, high voltage ignition pulses or open circuit voltage are applied at the welding torch; these can lead to electric shocks and burning on contact.

 Keep the welding torch electrically insulated from persons, animals or equipment during the setting procedure.

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!

Rule of thumb for the gas flow rate:

Diameter of gas nozzle in mm corresponds to gas flow in l/min.

Example: 7mm gas nozzle corresponds to 7l/min gas flow.

• Press the torch trigger and set the shielding gas quantity with the flow gauge of the pressure regulator.

5.3.5 Arc ignition

5.3.5.1 Liftarc



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 Remote control

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

5.4.1 RT1 19POL

Functions

• Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.



5.4.2 RTF1 19POL



Features

Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.

5.4.3 RT PWS1 19POL

When a remote control is connected, the polarity is changed at the changeover switch of the remote control (ex works). If you wish to change the polarity at the welding machine control (with a remote control connected) you can set this option in the machine configuration menu (parameter rCP) > see 5.7 chapter.



- Functions
- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current at the welding machine
- Pole reversing switch, suitable for machines with PWS function

5.4.4 RTA PWS2

When a remote control is connected, the polarity is changed at the changeover switch of the remote control (ex works). If you wish to change the polarity at the welding machine control (with a remote control connected) you can set this option in the machine configuration menu (parameter rCP) > see 5.7 chapter.

Functions

- Welding current setting (0 % to 100 %)
- Pole reversing switch
- Setting Arcforce

5.5 Dirt filter

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

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



Item	Symbol	Description
1		Cooling air inlet
2		Dirt filter with fixing plate
3		4 fixing screws for dirt filter

• Fix dirt filter with 4 fixing screws on the front of the casing (cooling air inlet) of the welding machine.



5.6 Voltage reducing device

Only machine variants with the (VRD/SVRD/AUS/RU) code are equipped with a voltage reduction device (VRD). The VRD is used for increased safety, especially in hazardous environments such as shipbuilding, pipe construction or mining.

A VRD is mandatory in some countries and required by many on-site safety instructions for power sources.

The VRD > see 4.2 chapter signal light is illuminated when the voltage reduction device is operating without fault and the output voltage is reduced to a value specified in the relevant standard (see technical data > see 8 chapter).

5.7 Machine configuration menu





5.7.1 Arcforce correction (welding characteristics)

Example:

You are using a rutile/basic electrode type and set "Rutilbas" accordingly on the machine control. When welding the electrode type, you specify a hard or aggressive arc. You should now change the arcforce setting in the direction of "less arcforce – softer arc" until the required result is achieved.

Display	Setting/selection
cor	 Arcforce correction > see 5.2.2.1 chapter Increase value > harder arc Decrease value > softer arc

5.7.2 Arc length restriction (USP)

The arc length restriction $[\underline{USP}]$ function stops the welding process when an excessive arc voltage is detected (unusually high gap between electrode and workpiece). The setting is saved separately for each welding process.

The arc length restriction cannot be used for cel characteristics (if available).

Display Setting/selection

ווכס	Arc length restriction > see 5.7.2 chapter
	Image: Second
	<u>GFF</u> Function switched off



5.7.3 Welding current actual value display

The welding current in the welding data display is displayed as nominal value at the factory. The welding current display can be determined by switching the parameter red to actual values in the respective expert menu:

MMA welding

TIG welding

- In idle mode (when no welding current is flowing) the nominal value is displayed
- If welding current is flowing, the welding data display is switched to the actual value
- · After welding, the nominal value is displayed again

Display	Setting/selection
rcď	Welding current actual value display > see 4.2.1 chapter



6 Maintenance, care and disposal

6.1 General

Risk of injury due to electrical voltage after switching off! Working on an open machine can lead to fatal injuries! Capacitors are loaded with electrical voltage during operation. Voltage remains present for up to four minutes after the mains plug is removed. 1. Switch off machine. 2. Remove the mains plug. Wait for at last 4 minutes until the capacitors have discharged! **M** WARNING Improper maintenance, testing and repairs! 4 Maintenance, testing and repair of the machine may only be carried out by skilled and gualified personnel (authorised service personnel). A competent person is someone who, based on training, knowledge and experience, can recognize the hazards and possible consequential damage that may occur when testing power sources and can take the necessary safety precautions. Follow the maintenance instructions > see 6.2 chapter. If any of the test requirements below are not met, the unit must not be put back into operation until 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.

6.1.1 Cleaning

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

6.1.2 Dirt filter

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





6.2 Maintenance work, intervals

6.2.1 Daily maintenance tasks

Visual inspection

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

Functional test

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

6.2.2 Monthly maintenance tasks

Visual inspection

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

Functional test

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

6.2.3 Annual test (inspection and testing during operation)

A periodic test according to IEC 60974-4 "Periodic inspection and test" has to be carried out. In addition to the regulations on testing given here, the relevant local laws and regulations must also be observed. For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at <u>www.ewm-group.com</u>!

Disposing of equipment



6.3 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 Error messages (power source)

A welding machine error is indicated by the collective fault signal lamp (A1) lighting up and an error code (see table) being displayed in the machine control display. In the event of a machine error, the power unit shuts down.

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

Error message	Possible cause	Remedy
"E 1"	Electronics error	Switch the machine off and back on again. If the
		error persists, inform the service dept.
"E 2"	Temperature error	Allow machine to cool down.
"E 3"	Electronics error	See "E 1".
"E 4"	Electronics error	See "E 1".
"E 5"	Electronics error	See "E 1".
"E 6"	Balancing error in voltage re- cording	Switch off the machine, place the electrode holder in an insulated position and switch the machine
"E 7"	Balancing error in current re- cording	back on. If the error persists, inform the service dept.
"E 8"	Error in one of the electronics supply voltages	Switch the machine off and back on again. If the error persists, inform the service dept.
"E 9"	Mains undervoltage	Switch off the machine and check the mains volt- age.
"E10"	Secondary excess voltage	Switch the machine off and back on again. If the error persists, inform the service dept.
"E11"	Mains excess voltage	Switch off the machine and check the mains volt- age.
"E12"	Voltage reduction error (VRD)	Switch the machine off and back on again. If the error persists, inform the service dept.



7.2 Resetting welding parameters to the factory settings

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



Figure 7-1

Display	Setting/selection
c RL	Calibration The machine will be calibrated for approx 2 seconds each time it is switched on.
l nl	Initialising Keep the push-button pressed until [n] is shown on the display.



8 Technical data

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

8.1 Pico 300 cel pws

	MMA	TIG
Welding current (I ₂)	10 A to 300 A	
Welding voltage according to standard (U ₂)	20,4 V to 32,0 V	10,4 V to 22,0 V
Duty cycle DC at 40° C ^[1]		
25 %	300 A	-
30 %	-	300 A
60 %	220 A	240 A
100 %	170 A	190 A
Open circuit voltage (U ₀ /U _r)	107 V / 99 V	107 V / 12 V
Open circuit voltage (U ₀ /U _r) - VRD	107 V	/ 12 V
Open circuit voltage (U ₀ /U _r) - SVRD	107 V	/ 12 V
Mains voltage (Tolerance) / Frequency	3 x 400 V (-25 % to	o +20 %) / 50/60 Hz
mains fuse ^[2]	3 x	10 A
Mains connection cable	H07RN	-F4G2,5
max. Connected load (S1)	12,1 kVA	8,3 kVA
Generator rating (Rec.)	161	κVA
Cos φ / efficiency	0,99	/ 88 %
Protection class / Overvoltage category	Ι	/ III
Contamination level		3
Insulation class / protection classification	H/I	P 23
Residual current circuit breaker	Type B (rec	ommended)
Noise level ^[3]	<70 (dB(A)
Ambient temperature	-25 °C to	o +40 °C
Machine cooling	Fan	(AF)
Torch cooling	gas o	r water
Workpiece lead (min.)	50 ו	mm²
EMC class		4
Test mark	s / C E	/ EAC / 25
Standards used	See declaration of conform	nity (appliance documents)
Dimensions (l x b x h) L / B / H	490 x 186 x 445 mm /	19.3 x 7.3 x 17.5 inch
Weight	23,5 kg	/ 51.8 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.



9 Accessories

9.1 Welding torch, electrode holder and workpiece lead

Туре	Designation	Item no.
EH50 4M	Electrode holder	092-000004-00000
WK50QMM 4M KL	Workpiece cable, clamp	092-000003-00000
TIG 26V 4M	ABITIG 26 V 4 m BCC-1 BHC-01	094-010979-00000

9.2 19-pole remote control

Туре	Designation	Item no.
RT1 19POL	Remote control current	090-008097-00000
RT PWS1 19POL	Remote control, vertical-down weld current, pole re- versal	090-008199-00000
RTA PWS2	Remote control, welding current setting (0 % to 100 %), pole reversing switch, setting Arcforce	090-008856-00000
RTF1 19POL 5 M	Foot-operated remote control current with connec- tion cable	094-006680-00000

9.2.1 Connection cables

Туре	Designation	Item no.		
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		

9.2.2 Extension cable

Туре	Designation	Item no.		
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		

9.3 Options

Туре	Designation	Item no.	
ON Filter TG.0005	Retrofit option, contamination filter for air inlet	092-001856-00000	

9.4 General accessories

Туре	Designation	Item no.
16A 5POLE/CEE	Mains plug	094-000712-00000
KLF-L1-L2-L3-PE	Label of mains cable	094-023697-00000
ON AL D13/27	Cap for load sockets	092-003282-00000





10 Appendix

10.1 Parameter overview – setting ranges

>	Parameters/function	Setting range				
Welding data displa (3-digit)		Standard (ex works)	min.		max.	Unit
MMA (MMA)						
	Main current (AMP)		10	-	300	А
	Hot start current (AMP%)	120	50	-	200	%
	Hot start time (sec)	0,5	0,1	-	20,0	s
cor	Arcforce correction	0	-8	-	10	
USP	Arc length restriction	off	off	-	on	
red	Welding current actual value display	off	off	-	on	
TIG (TIG)						
	Main current AMP		10	-	300	А
USP	Arc length restriction	on	off	-	on	
rcd	Welding current actual value display	off	off	-	on	



10.2 Searching for a dealer

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



"More than 400 EWM sales partners worldwide"