

Remote control

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24.10.2014

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General instructions

CAUTION



Read the operating instructions!

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

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

NOTE



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

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

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

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

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

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2 Safety instructions

2.1 Notes on the use of these operating instructions

DANGER

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

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

WARNING

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

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

CAUTION

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

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

CAUTION

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

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

NOTE

Special technical points which users must observe.

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

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

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

2.2 Explanation of icons

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

2.3 General

DANGER



Electric shock!

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

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



Electromagnetic fields!

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

- Observe the maintenance instructions - See 6 Maintenance, care and disposal 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).



Validity of this document!

This document describes an accessory and is only valid in combination with the operating instructions for the power source being used (welding machine)!

- Read the operating instructions, in particular the safety instructions for the power source (welding machine)!

WARNING



Risk of accidents if these safety instructions are not observed!

Non-observance of these safety instructions is potentially fatal!

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



Fire hazard!

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

Stray welding currents can also result in flames forming!

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

WARNING



Risk of injury due to radiation or heat!
Arc radiation results in injury to skin and eyes.
Contact with hot workpieces and sparks results in burns.

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



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

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

CAUTION



Noise exposure!
Noise exceeding 70 dBA can cause permanent hearing damage!

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

CAUTION



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

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



Damage due to the use of non-genuine parts!
The manufacturer's warranty becomes void if non-genuine parts are used!

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



Trained personnel!
Commissioning is reserved for persons who have the relevant expertise of working with arc welding machines.

2.4 Transport

CAUTION



Damage due to supply lines not being disconnected!

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

- Disconnect supply lines!

2.5 Scope of delivery

The delivery is checked and packaged carefully before dispatch, however it is not possible to exclude the possibility of damage during transit.

Receiving inspection

- Check that the delivery is complete using the delivery note!

In the event of damage to the packaging

- Check the delivery for damage (visual inspection)!

In the event of complaints

If the delivery has been damaged during transport:

- Please contact the last haulier immediately!
- Keep the packaging (for possible checking by the haulier or for the return shipment).

Packaging for returns

If possible, please use the original packaging and the original packaging material. If you have any queries on packaging and protection during transport, please contact your supplier.

2.5.1 Ambient conditions

CAUTION



Equipment damage due to dirt accumulation!

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

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

2.5.1.1 In operation

Temperature range of the ambient air:

- -25 °C to +40 °C

Relative air humidity:

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

2.5.1.2 Transport and storage

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

- -30 °C to +70 °C

Relative air humidity

- Up to 90% at 20 °C

3 Intended use

WARNING



Hazards due to improper usage!

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

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


3.1 Use and operation solely with the following machines

- Phoenix 352, 452, 552, 1002
- alpha Q 352, 552
- Phoenix 352, 452, 552, 1002 MM
- alpha Q 352, 552 MM

3.2 Documents which also apply

3.2.1 Warranty

NOTE

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

3.2.2 Declaration of Conformity



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

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

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

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

3.2.3 Service documents (spare parts)



DANGER



Do not carry out any unauthorised repairs or modifications!

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

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

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

Spare parts can be obtained from the relevant authorised dealer.

4 Machine description – quick overview

4.1 Front view

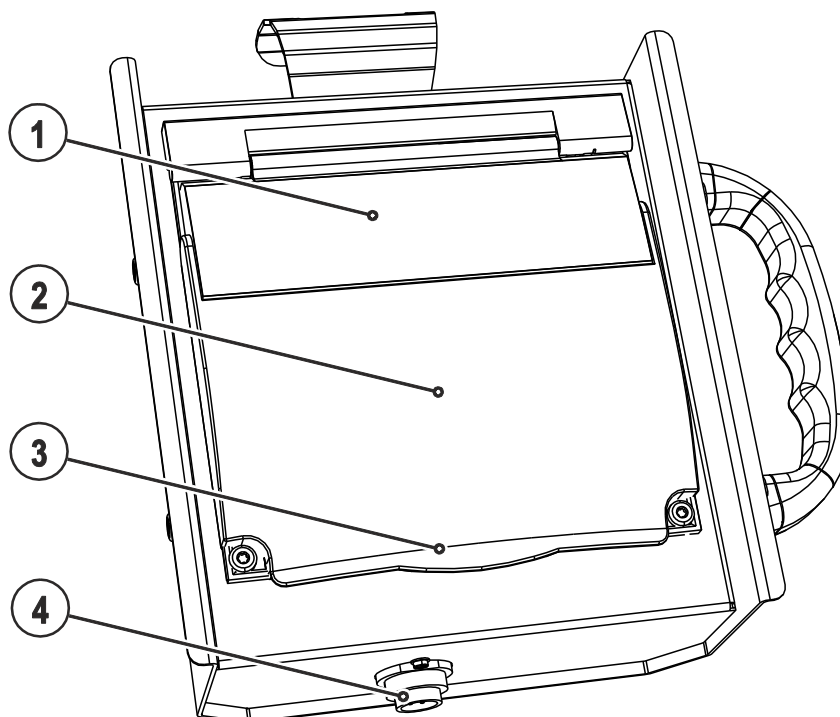


Figure 4-1

Item	Symbol	Description
1		Lid
2		Machine control - See 4.3 Machine control – Operating elements chapter
3		Protective cap
4		Connection socket, 7-pole (digital) Connection to the digital remote control connection on power source or wire feed unit.

4.2 Rear view

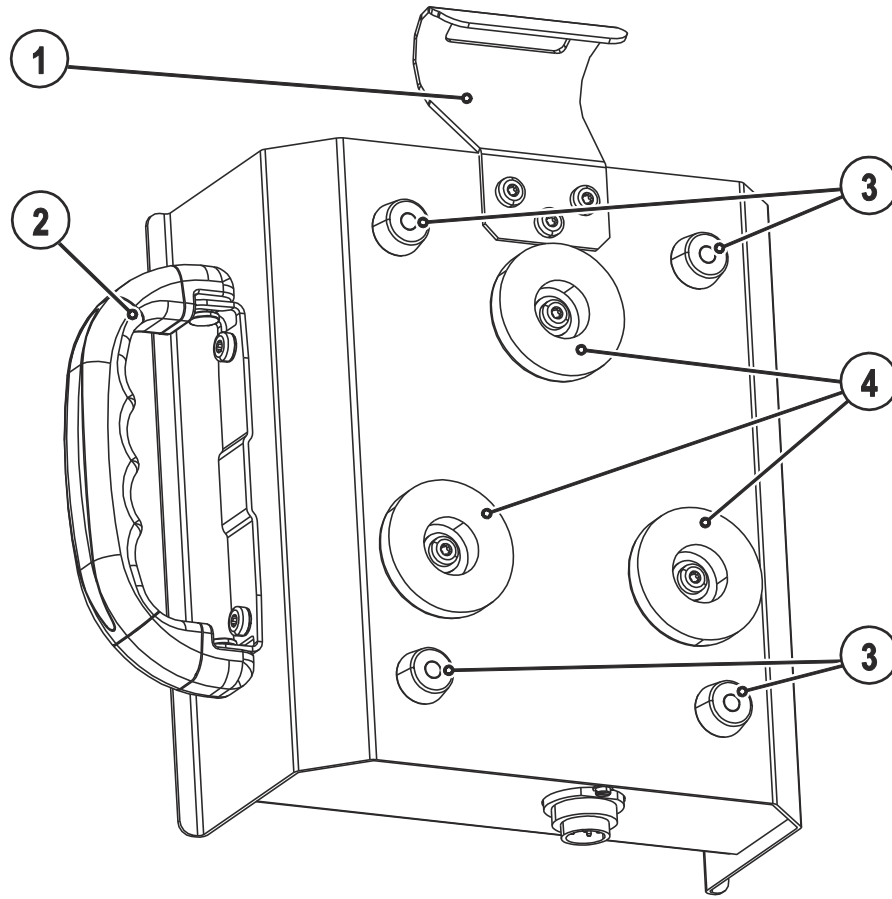


Figure 4-2

Item	Symbol	Description
1		Holder for suspending the remote control
2		Carrying handle
3		Machine feet
4		Fixing magnet To mount remote control on magnetisable surfaces

4.3 Machine control – Operating elements

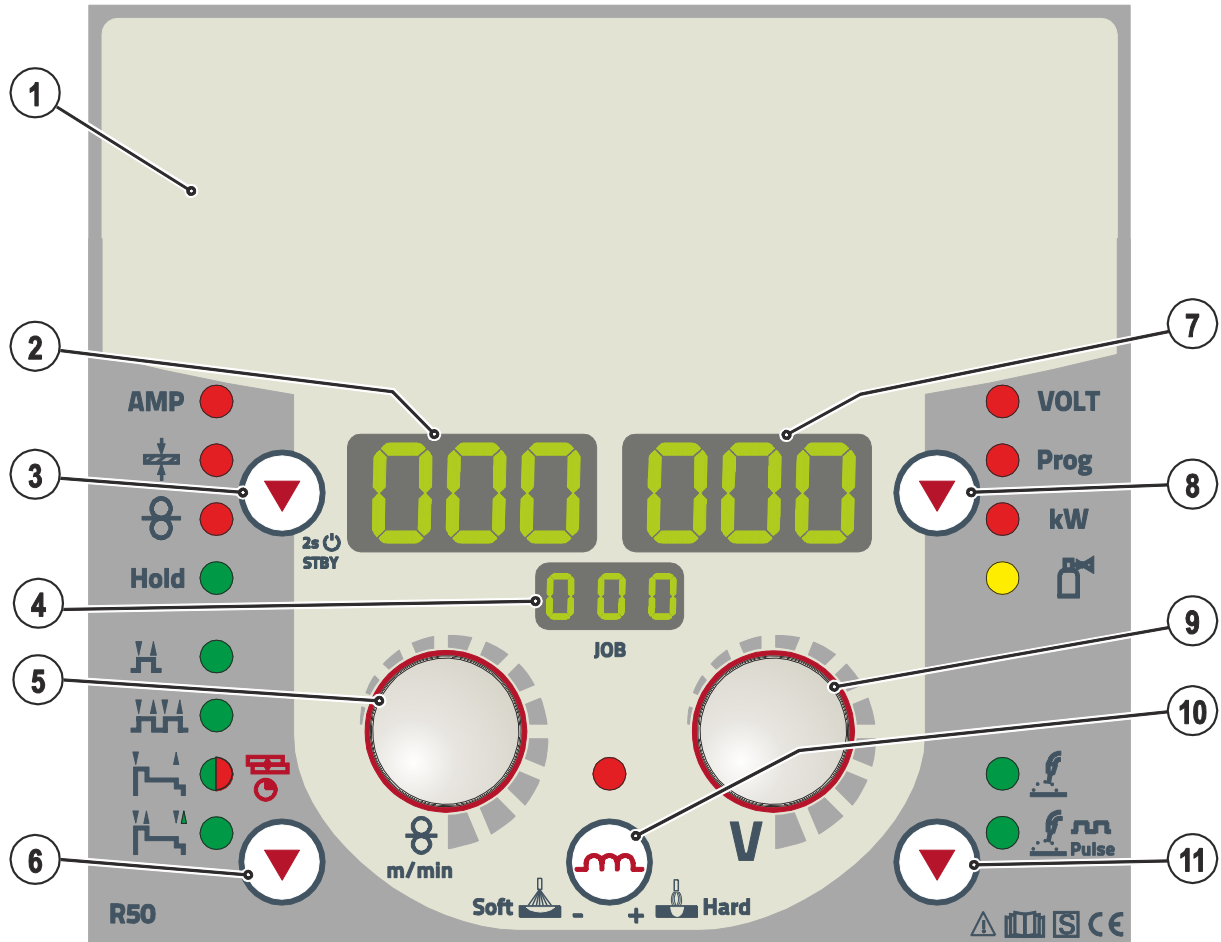


Figure 4-3

Item	Symbol	Description
1		Lid - See 4.3.1 Machine control – Concealed operating elements chapter
2		Display, left Welding current, material thickness, wire speed, hold values
3		Push-button, parameter selection left/power-saving mode AMP Welding current Material thickness Wire feed speed Hold After welding, the values used last are shown from the main program. The signal light is illuminated. STBY Press for 2 s to put machine into power-saving mode. To reactivate, activate one of the operating elements.
4		Display, JOB Shows the currently selected welding task (JOB number).
5		Welding parameter setting, rotary dial For setting the welding performance, for selecting the JOB (welding task) and for setting other welding parameters.
6		Select operating mode button Non-latched Signal light lights up in green: Special non-latched Signal light lights up in red: MIG spot welding
7		Display, right Welding voltage, program number, motor current (wire feed mechanism)
8		Button, Parameter selection (right) VOLT Welding voltage Prog Program number kW Welding performance display Gas flow quantity (optional)
9		Arc length correction/selection of welding program, rotary dial <ul style="list-style-type: none"> • Correction of the arc length from -9.9 V to +9.9 V. • Selection of welding programs 0 to 15 (not possible if accessory components, such as program torches, are connected).
10		Push-button, throttling effect (arc dynamics) + Hard Arc is harder and more narrow Soft - Arc is softer and wider
11		Push-button, welding type standard MIG/MAG welding pulsed MIG/MAG welding (not for Taurus S)

4.3.1 Machine control – Concealed operating elements

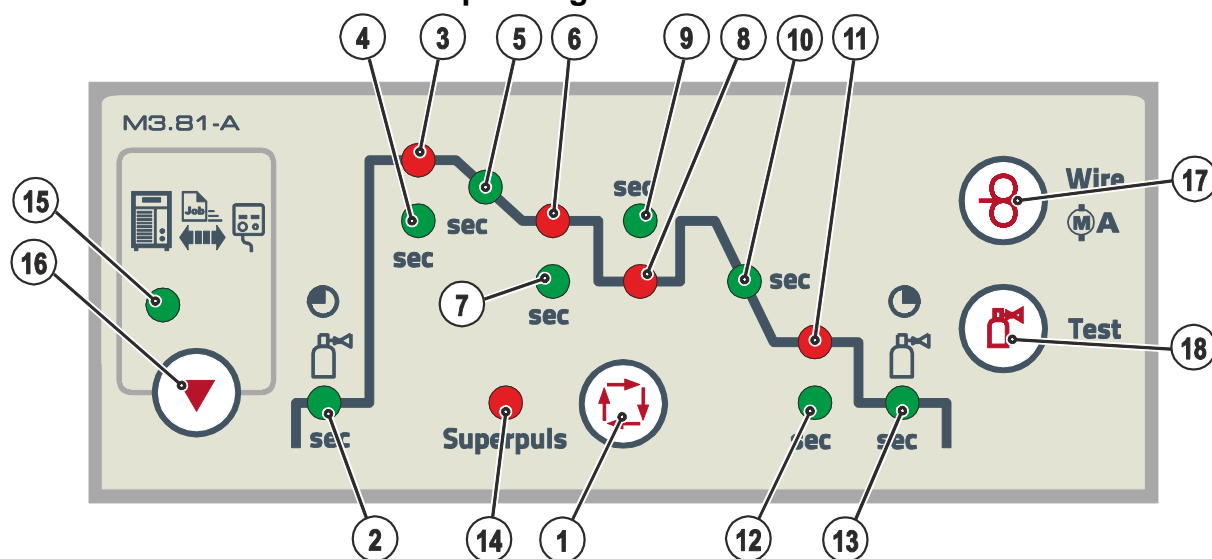






Figure 4-4

Item	Symbol	Description
1		Select welding parameters button This button is used to select the welding parameters depending on the welding process and operating mode used.
2		Signal light, gas pre-flow time Setting range 0.0 s to 20.0 s
3		Signal light, start program (P_{START}) <ul style="list-style-type: none"> Wire speed: 1% to 200% of the main program P_A Correction of the arc length -9.9 V to +9.9 V
4	sec	Signal light, start time Setting range, absolute 0.0 s to 20.0 s (0.1 s increments)
5	sec	Signal light, slope time program P_{START} to main program P_A Setting range 0.0 s to 20.0 s (0.1 s increments)
6		Signal light, main program (P_A) <ul style="list-style-type: none"> Wire speed WF-min. to WF-max. Correction of the arc length -9.9 V to +9.9 V
7	sec	Signal light, duration of main program P_A Setting range 0.1 s to 20.0 s (0.1 s increments). Used e.g. in connection with the super pulse function
8		Signal light, reduced main program (P_B) <ul style="list-style-type: none"> Wire speed: 1% to 200% of the main program P_A Correction of the arc length -9.9 V to +9.9 V
9	sec	Signal light, duration reduced main program P_B Setting range 0.0 s to 20.0 s (0.1 s increments). Used e.g. in connection with the super pulse function.
10	sec	Signal light, slope time program P_A (or P_B) to end program P_{END} Setting range 0.0 s to 20.0 s (0.1 s increments)
11		Signal light, end program (P_{END}) <ul style="list-style-type: none"> Wire speed: 1% to 200% of the main program P_A Correction of the arc length -9.9 V to +9.9 V
12	sec	Signal light, duration of end program P_{END} Setting range 0.0 s to 20.0 s (0.1 s increments)
13		Signal light, gas post-flow time Setting range 0.0 s to 20.0 s

Item	Symbol	Description
14	Super-puls	Signal lamp, super pulse function Lights up when the super pulse function is active.
15		Signal light: organising welding tasks (JOB) Flashes when JOB number is displayed or selected
16		Press organise welding tasks (JOB) push-button Briefly pressing the button = display of welding task selected in welding system Holding the button down for long (> 3 s) = "Organise welding tasks (JOB)" mode: <ul style="list-style-type: none"> • Load welding task (JOB) from welding machine to remote control • Copy welding task (JOB) from remote control to welding machine
17		Push-button, wire inching/motor current (wire feed mechanism) Drahtelektrode einfädeln
18		Gas test / rinse button <ul style="list-style-type: none"> • Gas test: For setting the shielding gas quantity • Rinse: For rinsing longer hose packages Schutzgasversorgung

5 Design and function

5.1 General

NOTE



Basically, all descriptions on the process settings in the standard operating instructions shall apply. This operating manual exclusively describes deviating control functions.

5.2 Establishing the connections

CAUTION



Damage to the machine due to improper connection!

The remote controls have been developed to be connected to welding machines or wire feed units only. Connecting them to other machines may cause damage to the machines!

- Observe the operating instructions for the welding machine or wire feed unit!
- Switch off the welding machine before connecting!


NOTE



Observe documentation of other system components when connecting!



- Switch off the welding machine
- Insert the male connector plug (socket) into the remote control connection socket and lock by turning to the right.
- Insert the male connector plug (pin) into the remote control connection socket of the welding machine and lock by turning to the right.

5.3 Gas test

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

Shielding gas flows for around 25 seconds or until the button is pressed again.

5.4 Rinse hose package function

Operating Element	Action	Result
	 5 s	Select rinse hose package. Shielding gas flows continuously until the Gas Test button is pressed again.

5.4.1 Setting the shielding gas quantity

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

Helium-rich gas mixtures require a higher gas volume!

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

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

NOTE



Incorrect shielding gas setting!

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

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

5.5 Definition of MIG/MAG welding tasks




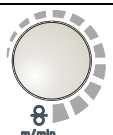


NOTE

Please note the relevant documentation of the accessory components.








This range of machines feature simple operation with a very wide range of functions.

- Various JOBS (i.e. welding tasks consisting of welding process, material type, wire diameter and shielding gas type) have been pre-defined JOB-List.
- 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).
- Additional parameters can be modified as required in the configuration menu on the control or using the PC300.NET welding parameter software.

5.5.1 Welding task selection

Operating element	Action	Result	Display
	1 x 	JOB list selection (signal light flashes)	
		Set JOB number. Wait 3 s until the setting has been applied.	

5.5.1.1 Operating mode

Operating element	Action	Result	Display
	n x 	Select operating mode The LED displays the selected operating mode.  Non-latched operation  Latched operation  Green Special non-latched mode  Red Spot operating mode  Special latched mode	No change

5.5.1.2 Choke effect / dynamics

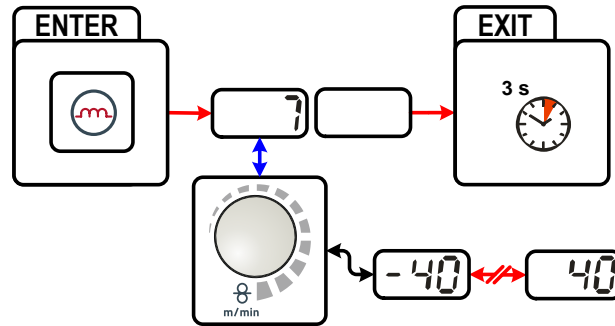


Figure 5-1

Display	Setting/selection
	Dynamics setting 40: Arc harder and narrower -40: Arc softer and wider

5.5.1.3 superPuls

In superPuls mode, the program toggles from main program (PA) to reduced main program (PB). This function is used e.g. in thin sheet welding to accurately reduce the heat input or weld vertical-up welds without weaving. superPuls in combination with EWM welding processes offers many possibilities.

Welding performance can be represented as average value (ex works) or solely as program A value. If the average value display is activated the signal lights of the main (PA) and reduced main program (PB) are illuminated simultaneously. The display variants can be changed using special parameter P19, see chapter "Special parameters (Advanced settings)".

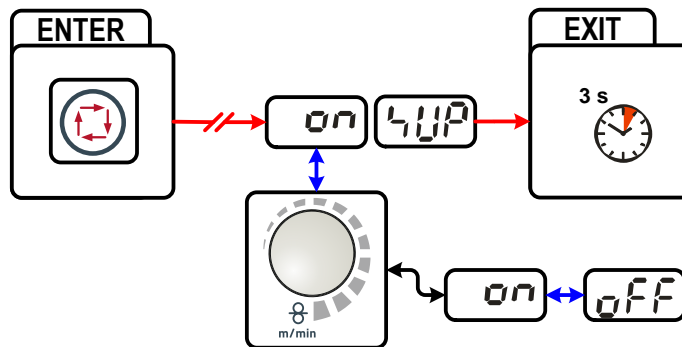


Figure 5-2

Display	Setting/selection
	Selects super pulses Switches function on or off.
	Switch on Switching on machine function
	Switch off Switching off machine function

5.5.1.4 Burn-back

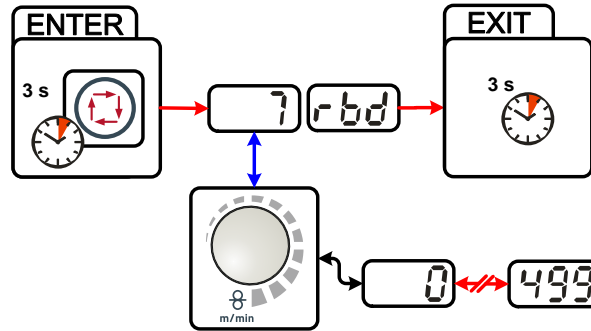


Figure 5-3

Display	Setting/selection
	menu burn back Set burn back
	Parameter setting (setting range 0 to 499) Back-burn set too high: large drops developing on the wire electrode result in poor ignition properties or the wire electrode sticking to the welding nozzle. Back-burn set too low: Wire electrode sticks in the molten pool

5.6 MIG/MAG operating point

The operating point (welding output) is specified using the principle of MIG/MAG one-dial operation, i.e. the user need only specify the operating point by setting the required wire speed, for example, and the digital system will calculate the optimum values for welding current and voltage (operating point).

The operating point setting can also be specified using the accessory components such as the remote control, welding torch, etc.

5.6.1 Selecting the display unit



Figure 5-4

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

Operating element	Action	Result
	n x	Switching the display between: AMP Welding current Material thickness Wire speed

Application example

Aluminium is to be welded.

- Material = AlMg,
- Gas = Ar 100%,
- Wire diameter = 1.2 mm

The correct wire speed is not known and is to be determined.

- Select the appropriate JOB (see "JOB list" sticker)
- Switch to the material thickness display
- Set the material thickness as appropriate (e.g. 5 mm)
- Switch to the wire speed display

The resulting wire speed will be shown (e.g. 8.4 m/min).

5.6.2 Operating point setting using material thickness

Given below is a description of the setting work via the wire speed parameters as an example of operating point setting.

Operating element	Action	Result	Display
		Increase or reduce welding performance via the wire speed parameter. Display example: 10.5 m/min	

5.6.2.1 Arc length correction setting

The arc length can be corrected as follows.

Operating element	Action	Result	Display
		"Arc length correction" setting (Display example: -0.9V, setting range -9.9 V to +9.9 V)	

5.6.2.2 Accessory components for operating point setting

The operating point can also be set with various accessory components such as

- remote controls
- special torches
- PC software
- robot and industrial bus interfaces (optional mechanised welding interface required – not possible for all machines in this series!)

You will find an overview of accessory components in the "Accessories" chapter. See the operating instructions for the machine in question for a more detailed description of the individual machines and their functions.

5.7 MIG/MAG welding data display

To the left and right of the control displays are the "Parameter selection" buttons (▼). They are used to select welding parameters to be displayed.

Each press of the button advances the display to the next parameter (LEDs next to the button indicate the selection). After the last parameter is reached, the system starts again from the beginning.



Figure 5-5

The display shows:

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

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

When settings are changed (e.g. wire feed speed) the display immediately switches to nominal value setting.

5.8 coldArc / coldArc puls

Heat-reduced, low-spatter short arc for welding and brazing of thin metal sheets with low distortion and for root welding with excellent gap bridging properties.



Figure 5-6

After selecting the coldArc process - See 5.5.1 Welding task selection chapter the following properties are available:

- Less distortion and reduced discolouration thanks to minimised heat input
- Considerably reduced spatter thanks to virtually power-free material transfer
- Easy welding of root passes in all panel thicknesses and in all positions
- Perfect gap bridging even with inconsistent gap widths
- Unalloyed, low-alloy and high-alloy steels and also dissimilar joints of even the thinnest metal sheets
- Brazing of CrNi sheets with CuAl8/AlBz8
- Brazing and welding of coated metal sheets, e.g. with CuSi, AlSi and Zn
- Manual and automated applications

coldArc welding to:		Wire Ø (mm)									
		0.8		0.9		1		1.2		1.6	
Material	Gas	JOB		JOB		JOB		JOB		JOB	
CrNi	Ar 91–99%	-	-	-	-	51	7.0	52	6.0	-	-
AlMg	Ar 100%	-	-	-	-	55	8.0	56	8.0	-	-
AlSi	Ar 100%	-	-	-	-	59	8.0	60	6.0	-	-
AL99	Ar 100%	-	-	-	-	63	8.0	64	6.0	-	-
Steel	Ar 91–99%	-	-	-	-	-	-	-	-	-	-
	Ar 80–90%	191	7.0	192	6.0	193	6.0	194	5.0	195	5.0
	CO2	182	7.0	183	6.0	184	6.0	185	5.0	186	5.0

coldArc brazing to:		Wire Ø (mm)											
		0.6		0.8		0.9		1		1.2		1.6	
Material	Gas	JOB		JOB		JOB		JOB		JOB		JOB	
CuSi	Ar 100%	-	-	66	10.0	-	-	67	8.0	68	6.0	69	6.0
CuAl	Ar 100%	-	-	70	7.0	-	-	71	6.0	72	6.0	73	7.0
AlSi	Ar 100%	-	-	196	8.0	-	-	197	8.0	198	8.0	199	8.0
Zn	Ar 100%	-	-	200	6.0	-	-	201	6.0	202	6.0	203	6.0

You can make use of these properties after selecting the coldArc process (see the "Selecting a MIG/MAG welding task" chapter).

With coldArc welding, it is important to ensure good quality wire feeding because of the welding filler materials being used!

- Equip the welding torch and torch hose package to suit the task! (siehe Kapitel Anschluss Schweißbrenner and the operating instructions for the welding torch.)

NOTE

- This function can only be enabled with the PC300.NET software.**
 - (See operating instructions for the software)

5.9 forceArc / forceArc puls

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

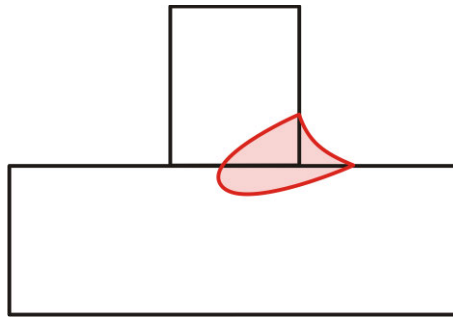


Figure 5-7

- 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
- Un-, low- and high-alloyed steels as well as high-tensile fine-grained building steels
- Manual and automated applications

forceArc welding from:		Wire Ø (mm)							
		0.8		1		1.2		1.6	
Material	Gas	JOB	Ø	JOB	Ø	JOB	Ø	JOB	Ø
Steel	Ar 91–99%	190	17.0	254	12.0	255	9.5	256	7.0
	Ar 80–90%	189	17.0	179	12.0	180	9.5	181	6.0
CrNi	Ar 91–99%	-	-	251	12.0	252	12.0	253	6.0

You can make use of these properties after selecting the forceArc process "- See 5.5.1 Welding task selection 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.

NOTE



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!

5.10 rootArc/rootArc puls

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

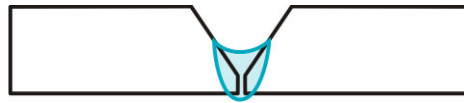


Figure 5-8

- Reduced spatter compared to standard short arc
- Good root formation and secure sidewall fusion
- Un-alloyed and low-alloy steels
- Manual and automated applications

rootArc welding up to:		Wire Ø (mm)											
		0.6		0.8		0.9		1		1.2		1.6	
Material	Gas	JOB	⊗	JOB	⊗	JOB	⊗	JOB	⊗	JOB	⊗	JOB	⊗
Steel	CO ₂	-	-	-	-	-	-	204	7.0	205	5.0	-	-
	Ar 80–90%	-	-	-	-	-	-	206	8.0	207	6.0	-	-

NOTE



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!

5.11 pipeSolution

Powerful arc for rapid, secure welding with and without gap in all positions.

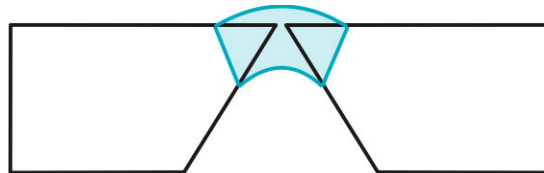


Figure 5-9

- Root welding for metal sheets and pipes in all positions
- Unalloyed and low-alloy steels as well as high-tensile fine-grained steels
- Manual and automated applications











pipeSolution welding to:		Wire Ø (mm)											
		0.6		0.8		0.9		1		1.2		1.6	
Material	Gas	JOB	⊗	JOB	⊗	JOB	⊗	JOB	⊗	JOB	⊗	JOB	⊗
Steel	CO ₂	x	x	x	x	x	x	171	6.0	172	5.0	x	x
	Ar 80–90%	x	x	x	x	x	x	173	6.0	174	5.0	x	x

5.12 MIG/MAG functional sequences / operating modes

NOTE

 There are optimum pre-sets for welding parameters such as gas pre-flow and burn back, etc. for numerous applications (although these can also be changed if required).

5.12.1 Explanation of signs and functions

Symbol	Meaning
	Start of welding
	End of welding
	Shielding gas flowing
I	Welding output
	Wire electrode is being conveyed
	Wire creep
	Wire burn-back
	Gas pre-flows
	Gas post-flows
	Non-latched
	Non-latched special
t	Time
PSTART	Start program
Flat	Main program
PEND	End program

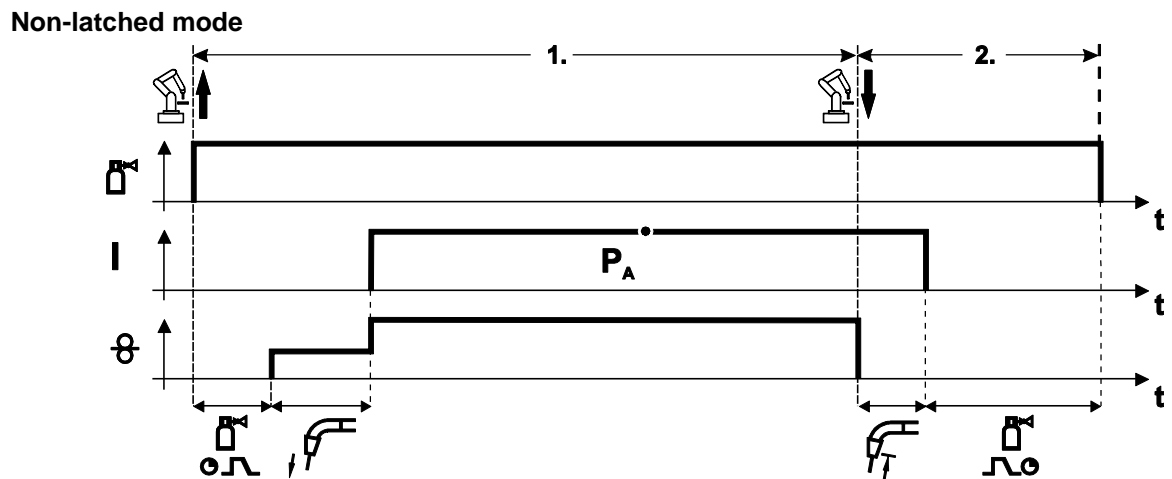


Figure 5-10

Step 1

- Robot issues the start signal to the power source.
- 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.
- Changeover to pre-selected wire speed (main program P_A).

Step 2

- Robot issues the stop signal to the power source.
- WF motor stops.
- Arc is extinguished after the pre-selected wire burn-back time elapses.
- Gas post-flow time elapses.

Non-latched operation with superpulse

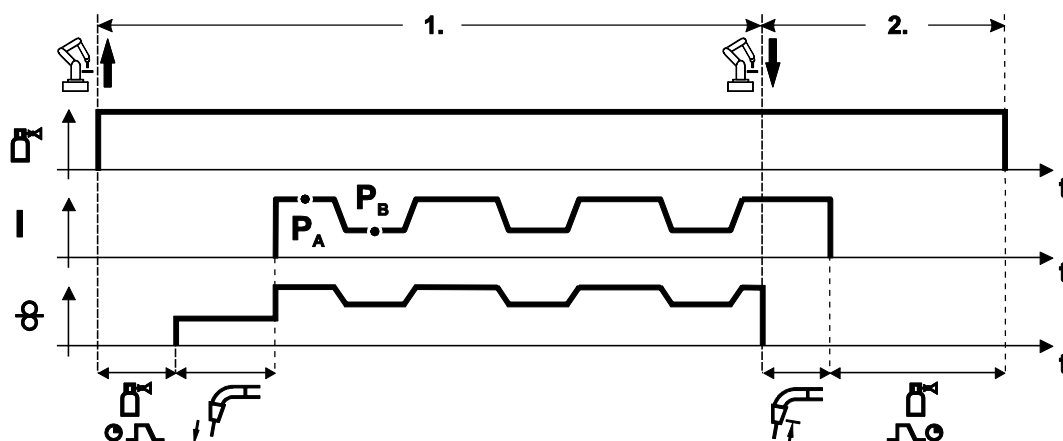


Figure 5-11

Step 1

- Robot issues the start signal to the power source.
- 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.
- Start the super pulse function beginning with main program P_A :
The welding parameters switch between main program P_A and the reduced main program P_B at the specified times.

Step 2

- Robot issues the stop signal to the power source.
- Super pulse function is ended.
- Wire feed motor stops.
- Arc is extinguished after the pre-selected wire burn-back time elapses.
- Gas post-flow time elapses.

Special, non-latched

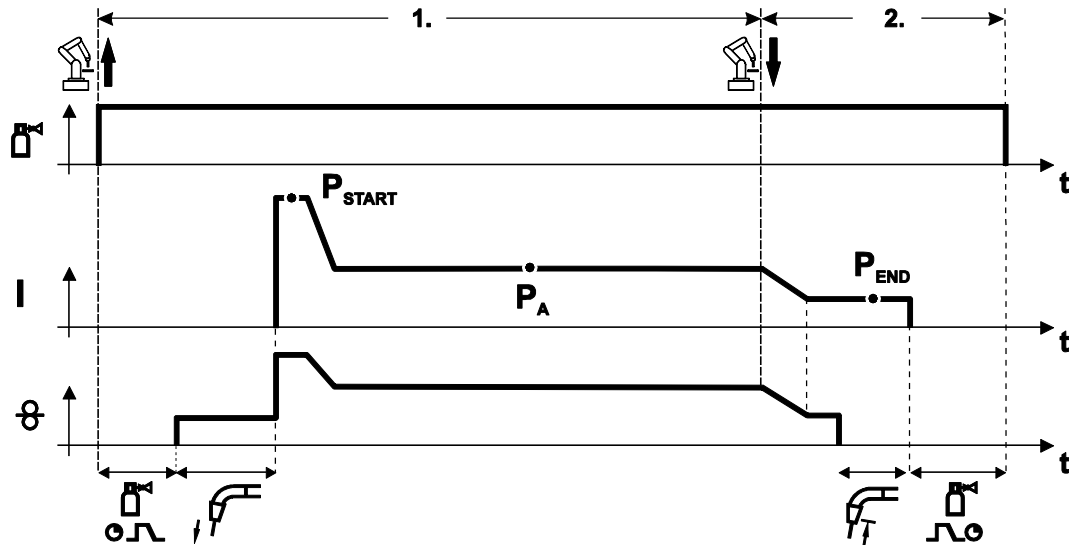


Figure 5-12

Step 1

- Robot issues the start signal to the power source.
- 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 is flowing (start program P_{START} for the time t_{start}).
- Slope to main program P_A .

Step 2

- Robot issues the stop signal to the power source.
- Slope to end program P_{END} for the time t_{end} .
- WF motor stops.
- Arc is extinguished after the pre-selected wire burn-back time elapses.
- Gas post-flow time elapses.

Special, non-latched with superpulse

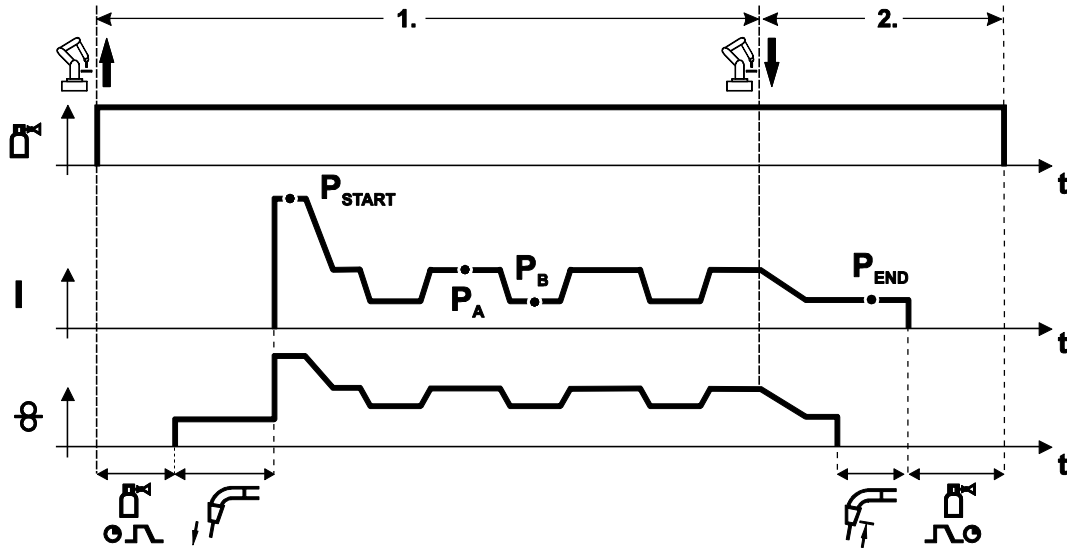


Figure 5-13

Step 1

- Robot issues the start signal to the power source.
- 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 is flowing (start program P_{START} for the time t_{start}).
- Slope on main program P_A .
- Start the super pulse function beginning with main program P_A :
The welding parameters switch between main program P_A and the reduced main program P_B at the specified times.

Step 2

- Robot issues the stop signal to the power source.
- Super pulse function is ended.
- Slope to end program P_{END} for the time t_{end} .
- WF motor stops.
- Arc is extinguished after the pre-selected wire burn-back time elapses.
- Gas post-flow time elapses.

5.12.2 MIG/MAG program sequence ("Program steps" mode)

Certain materials, such as aluminium, require special functions in order to be able to weld them safely and at high quality. The latched special operating mode is used here with the following programs:

- Start program P_{START} (reduction of cool points at the start of the seam)
- Main program P_A (continuous welding)
- Reduced main program P_B (targeted heat reduction)
- End program P_{END} (minimisation of end craters via targeted heat reduction)

The programs include the parameters wire speed (operating point), arc length correction, slope times, program duration, etc.

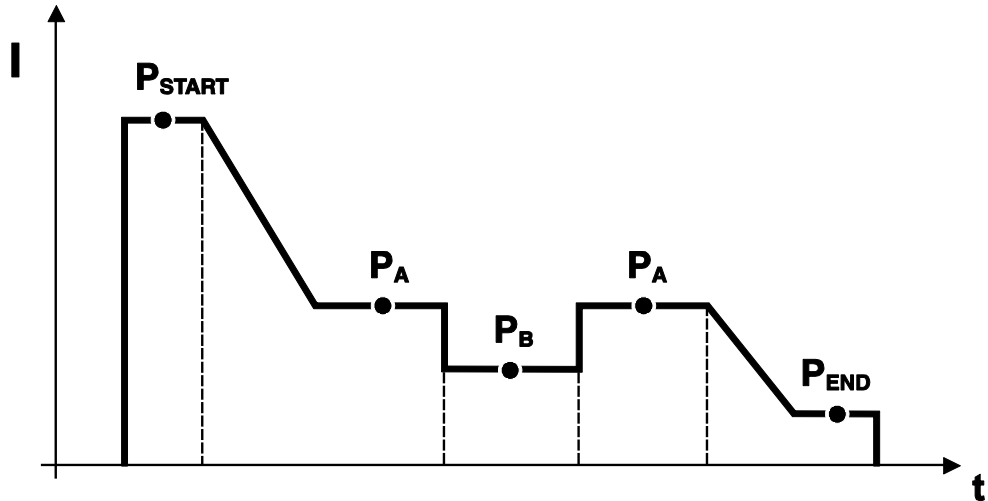


Figure 5-14

In every JOB, separate settings can be made for the ignition program, reduced main program and end program as to whether or not to alternate with the pulse process.

These properties are stored on the welding machine with the JOB. This means that in the factory settings, the pulse process is active during the end program in all forceArc JOBS.

NOTE

- This function can only be enabled with the PC300.NET software.**
- (See operating instructions for the software)

5.12.2.1 Selection of the program sequence parameter

Operating Element	Action	Result	Display
	n x	Select parameter in the program sequence	
		Setting welding parameters	

5.12.2.2 MIG/MAG overview of parameters

NOTE

P_{START} , P_B , and P_{END} are set as relative programs ex factory. They relate to percentages of the wire feed value of the main program P_A . These programs can also be set in an absolute manner, if desired (see Setting of special parameter P21).

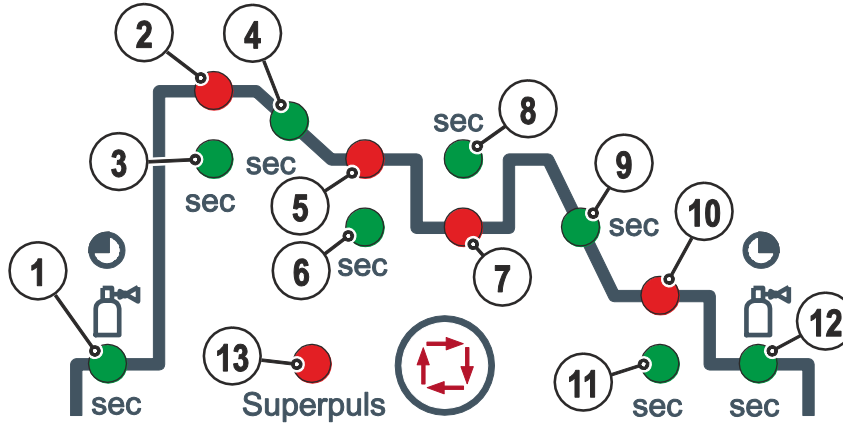


Figure 5-15

Basic Parameters

Item	Meaning / Explanation	Setting Range
1	Gas pre-flow time	0.0s to 20.0s
2	P_{START} Wire speed, relative Arc length correction	1% to 200% -9.9V to +9.9V
3	Duration	0.0s to 20.0s
4	Slope duration from P_{START} to P_A	0.0s to 20.0s
5	P_A Wire speed, absolute	0.1 m/min to 40 m/min
6	Duration (spot time and superpulse)	0.01s to 20.0s
7	P_B Wire speed, relative Arc length correction, relative	1% to 200% -9.9V to +9.9V
8	Duration	0.01s to 20.0s
9	Slope duration from P_A to P_{END}	0.0s to 20s
10	P_{END} Wire speed, relative Arc length correction	1% to 200% -9.9V to +9.9V
11	Duration (superpulse)	0.0s to 20s
12	Gas post-flow time	0.0s to 20s
13	Superpulses	On / Off

5.12.2.3 Example, tack welding (non-latched)

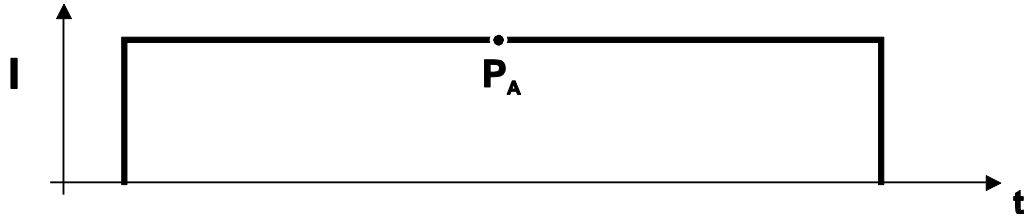


Figure 5-16

Basic parameters

Parameter	Meaning / explanation	Setting range
GASstr	Gas pre-flow time	0.0s to 20.0s
GASend:	Gas post-flow time	0.0s to 20s
RUECK	Wire burn-back length	2 to 500

"P_A" main program

Parameter	Meaning / explanation	Setting range
	Setting the wire speed	

5.12.2.4 Example, aluminium tack welding (non-latched special)

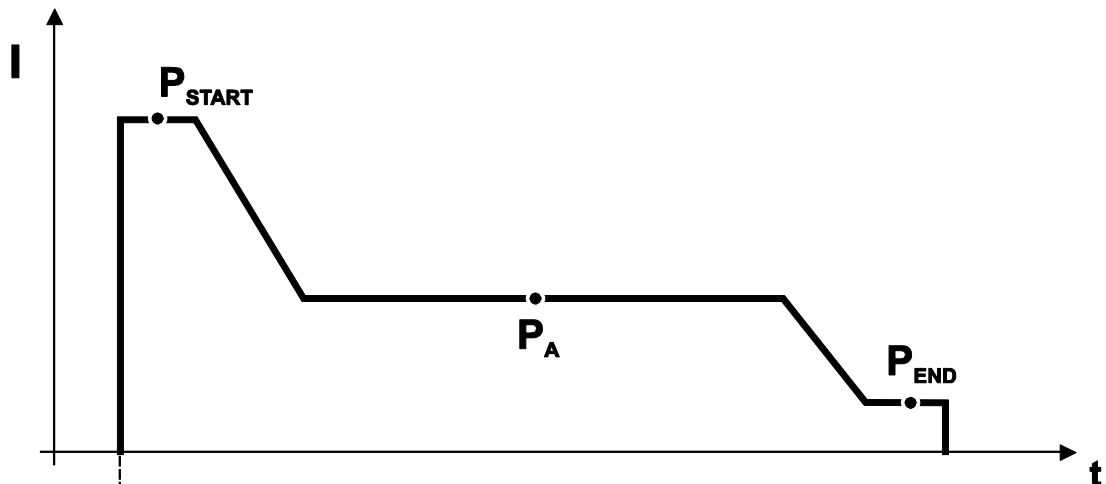


Figure 5-17

Basic parameters

Welding parameter	Meaning / explanation	Setting range
GASstr	Gas pre-flow time	0.0s to 20.0s
GASend:	Gas post-flow time	0.0s to 20.0s
RUECK	Wire burn-back length	2 to 500

"P_{START}" start program

Welding parameter	Meaning / explanation	Setting range
DVstart	Wire speed	0% to 200%
Ustart	Arc length correction	-9.9V to +9.9V
tstart	Duration	0.0s to 20s

"P_A" main program

Welding parameter	Meaning / explanation	Setting range
	Setting the wire speed	

"P_{END}" end-crater program

Welding parameter	Meaning / explanation	Setting range
DVend	Wire speed	0% to 200%
Uend	Arc length correction	-9.9V to +9.9V
tend	Duration	0.0s to 20s

5.12.3 Main program A mode

Different welding tasks or positions on a workpiece demand various welding performances (operating points) or welding programs. The following parameters are stored in each of the up to 16 programs:

- Operating mode
- Welding type
- Superpulses (ON/OFF)
- Wire feed speed (DV2)
- Voltage correction (U2)
- Dynamics (DYN2)

The user can change the main program welding parameters using the following components.

	Program switching	JOB switching	Program	Operating mode	superPuls	Wire feed speed	Voltage correction	Dynamics
RC panel Welding power source control:	No	Yes	P0	No	Yes	Yes	Yes	Yes
			P1...15					
R50 ROB Remote control	Yes	Yes	P0	Yes				
			P1...15					
PC 300.NET Software	No		P0	Yes		No		
			P1...15	Yes				

Example 1: Welding workpieces with different sheet metal thicknesses (non-latched)

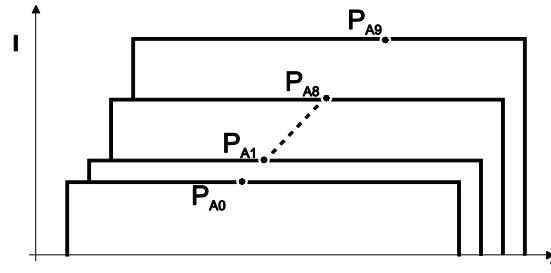


Figure 5-18

Example 2: Welding different positions on a workpiece (latched)

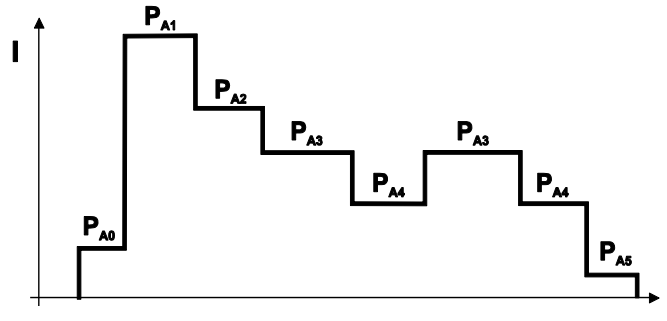


Figure 5-19

Example 3: Aluminium welding of different sheet metal thicknesses (non-latched or latched special)

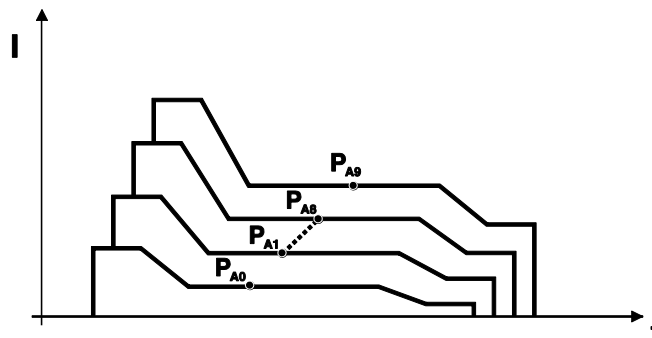


Figure 5-20

NOTE**Up to 16 programs (P_{A0} to P_{A15}) can be defined.**

An operating point (wire speed, arc length correction, dynamics/choke effect) can be defined permanently in each program.

Program P0 is an exception: the settings for operating points are made manually here.

Changes to the welding parameters are saved immediately!

5.12.3.1 Selecting parameters (program A)

NOTE

You can only change the welding parameters if a key switch is installed in the welding system and is turned to position 1.

Operating element	Action	Result	Display
	n x	Change welding data display over to program display. (LED Prog is on)	
		Select program number. Display example: Program "1".	
	n x	Select program sequence parameter "Main program (P _A)". (LED is on)	
		Set wire speed. (Absolute value)	
		Set arc length correction. Display example: "-0.8 V" correction (Setting range: -9.9 V to +9.9 V)	
	1 x	Select "Dynamic" program sequence parameter.	
		Set dynamic. (Setting range 40 to -40) 40: Arc hard and narrow. -40: Arc soft and wide.	

5.13 Organise welding task (JOB)

The remote control is equipped with a data storage medium (Flash ROM). Users can download any welding task (JOB) onto this memory from the memory of the welding machine. This JOB can subsequently be copied via an existing JOB in the free memory of the welding machine (JOB 129 - JOB 169) or onto itself. Likewise, it is also possible to copy this JOB to other welding systems that have been approved for this remote control. The unit will once again return to the main menu if the user does not make any entry within 10 seconds.

5.14 Load welding task (JOB) from welding machine to remote control

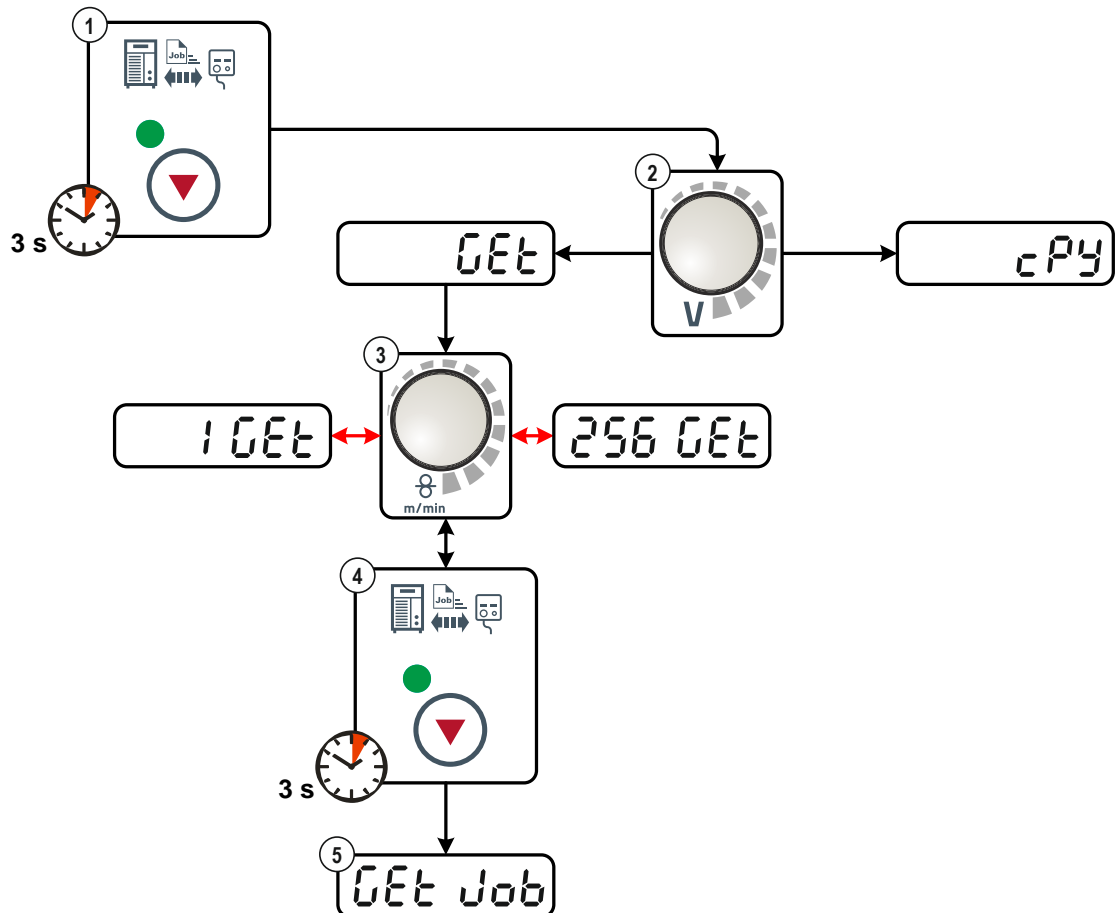


Figure 5-21

Item	Symbol	Description
1		Press organise welding tasks (JOB) push-button for at least 3 sec The remote control switches to the "Organise welding tasks (JOB)" mode.
2		Select function: GET Load welding task (JOB).
3		JOB selection Select any JOB for loading.
4		Press organise welding tasks (JOB) push-button for at least 3 sec JOB is loaded into remote control memory.
5		JOB will be loaded The system returns to the main menu following completion of the loading process.

5.14.1 Copy welding task (JOB) from remote control to welding machine

NOTE

A JOB must first be loaded onto the remote control before it can be copied (also see chapter "Loading the welding task (JOB) from the welding machine to the remote control"). The loaded JOB can subsequently be copied onto itself or to a storage location in the free space of the power source (JOB 129 - JOB 169).

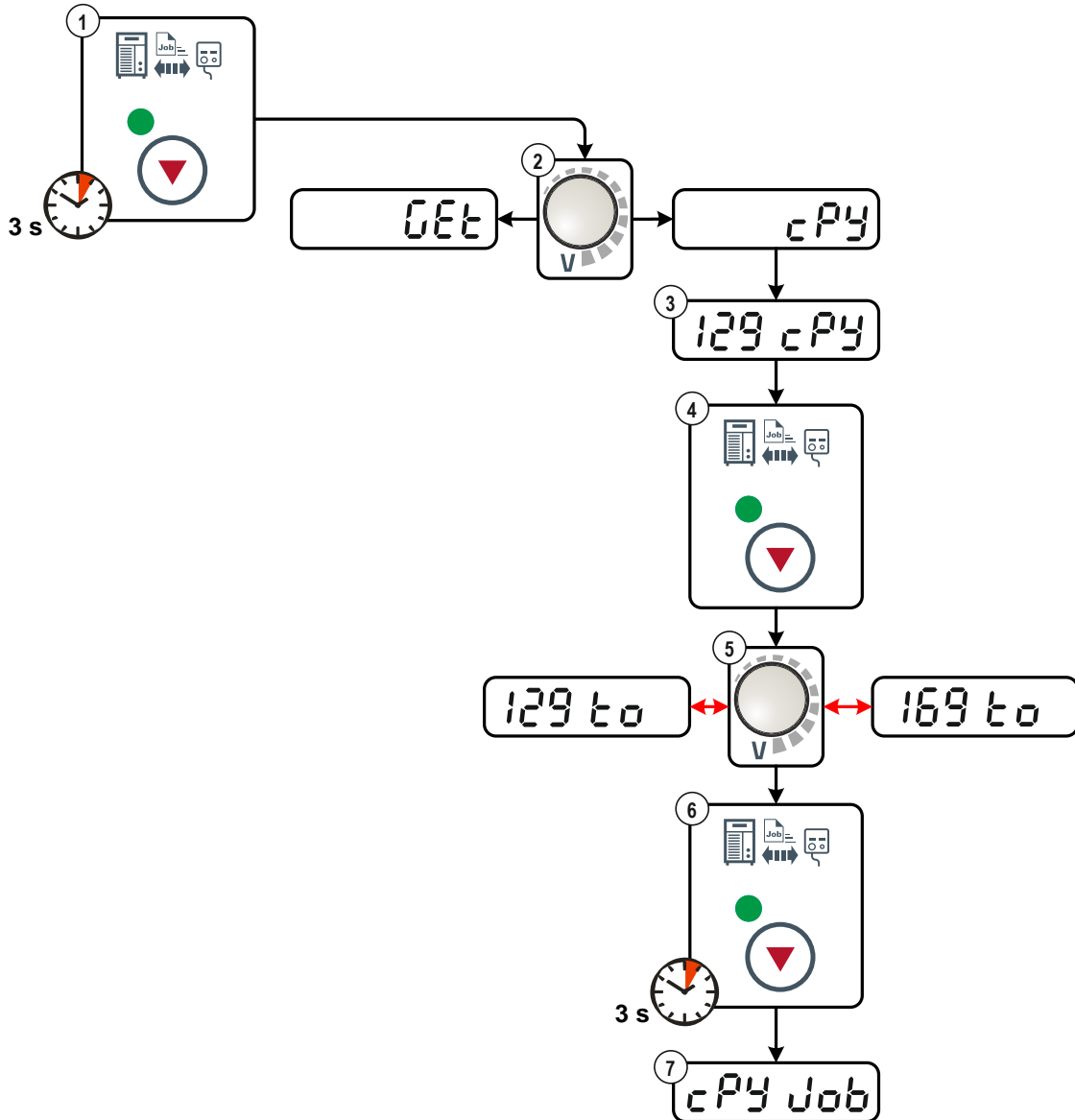










Figure 5-22

Item	Symbol	Description
1		Press organise welding tasks (JOB) push-button for at least 3 sec The remote control switches to the "Organise welding tasks (JOB)" mode.
2		Select function:  Copy welding task (JOB)
3		Display of JOB saved in the remote control Example: JOB 129
4		Press organise welding tasks (JOB) push-button The remote control switches to the target selection of the JOB to be overwritten in the welding machine.
5		Selection of the JOB to be overwritten in the welding machine The JOB loaded in the remote control memory can be copied via an existing JOB in the free memory of the welding machine (JOB 129 - JOB 169) or onto itself.
6		Press organise welding tasks (JOB) push-button for at least 3 sec The copy process is started.
7		JOB is being copied Following completion of the copying process, the program returns to the main menu.

5.15 Resetting JOBS (welding tasks) to the factory settings

NOTE

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

5.15.1 Resetting a single JOB

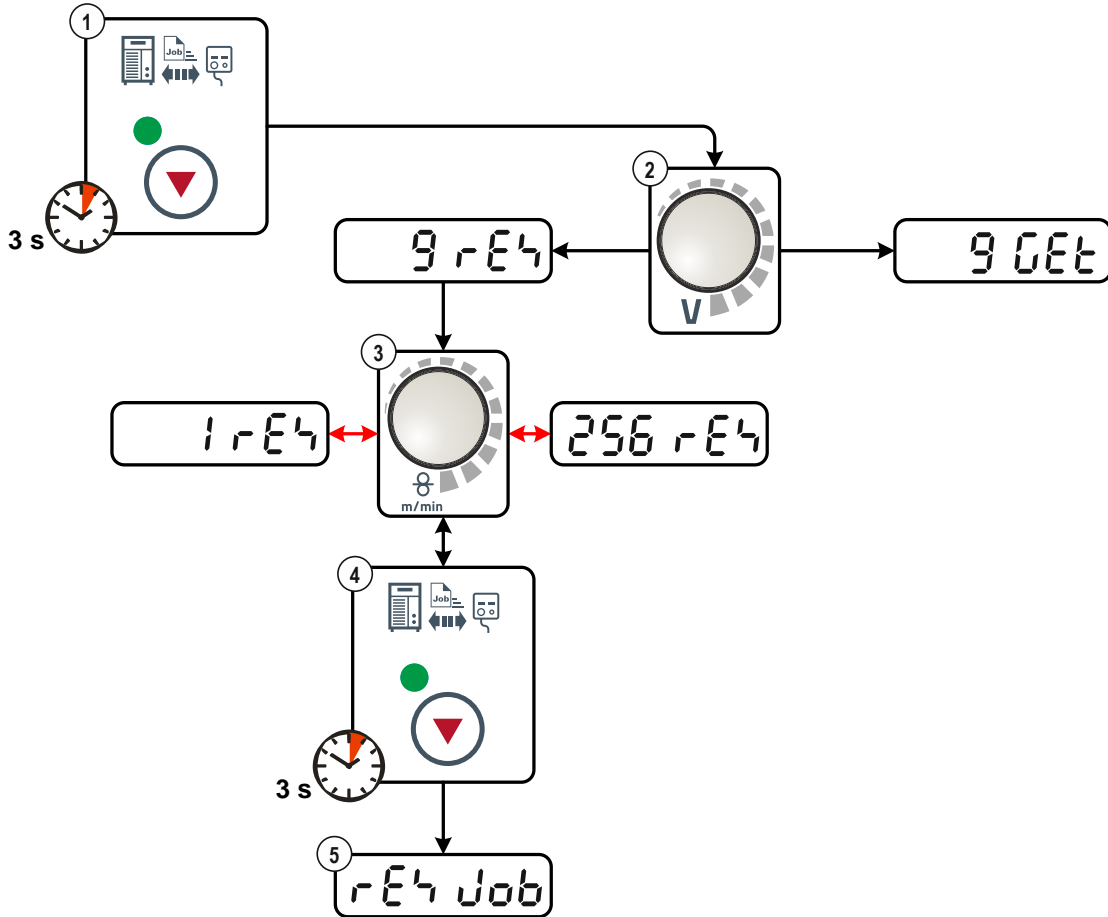


Figure 5-23

Item	Symbol	Description
1		Press organise welding tasks (JOB) push-button for at least 3 sec The remote control switches to the "Organise welding tasks (JOB)" mode.
2	rE4	Select function: rE4 Reset welding task (JOB).
3	8 m/min	JOB selection Select any JOB for loading.
4		Press the "organise welding tasks (JOB)" push-button for at least 3 sec. The JOB will be reset to the factory settings.
5	rE4 Job	JOB will be reset. The system returns to the main menu following completion of the loading process.

5.15.2 Resetting all JOBs

NOTE

JOBs 1–128 and 170–256 will be reset.
Custom JOBs 129–169 are maintained.

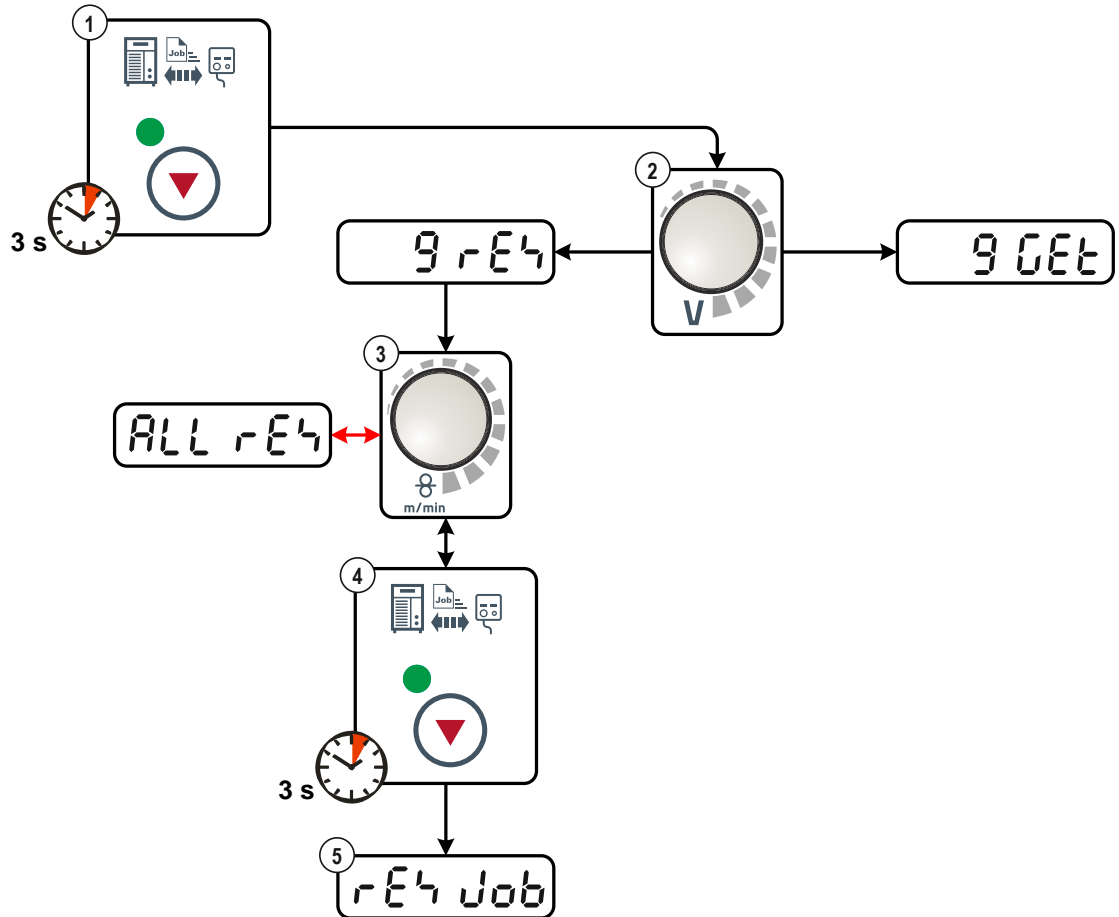


Figure 5-24

Item	Symbol	Description
1		Press organise welding tasks (JOB) push-button for at least 3 sec The remote control switches to the "Organise welding tasks (JOB)" mode.
2		Select function: Reset welding task (JOB).
3		Parameter selection Select parameter rES ALL for the process.
4		Press the "organise welding tasks (JOB)" push-button for at least 3 sec. The JOB will be reset to the factory settings.
5		All JOBs will be reset. The system returns to the main menu following completion of the loading process.

5.16 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.

5.16.1 Selecting, changing and saving parameters

NOTE



ENTER (Enter the menu)

- Switch off the machine at the main switch.
- Press and hold the "left parameter selection" button on the remote control and, at the same time, switch on the machine.

NAVIGATION (Navigate the menu)

- Select parameters by turning the "welding parameter setting" rotary dial.
- Set or change parameters by turning the "arc length correction/select welding program" rotary dial.

EXIT (Exit the menu)

- Press the "right parameter selection" button (switch machine off and on again).

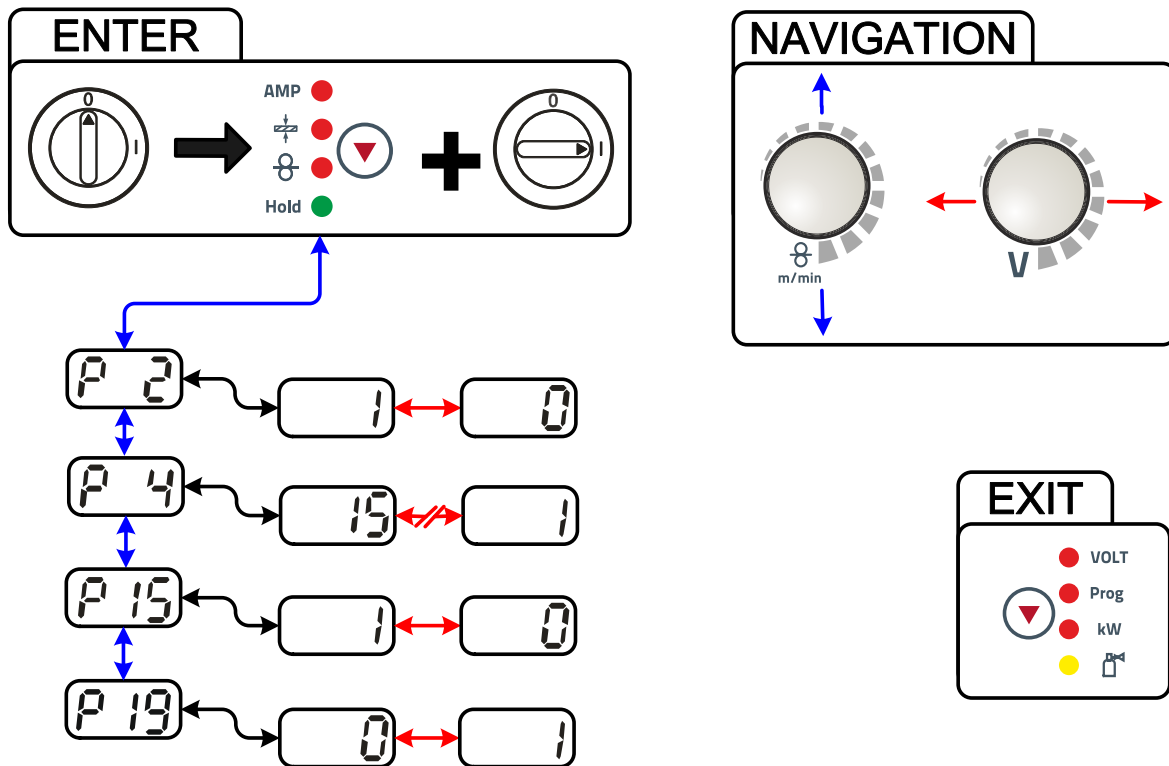


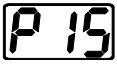



Figure 5-25

Display	Setting/selection
	Block program "0" 0 = P0 enabled (Ex works) 1 = P0 blocked
	Program limitation Programs 1 to max. 15 Ex works: 15
	HOLD function 0 = HOLD values are not displayed 1 = HOLD values are displayed (Ex works)
	Mean value display for super pulses 0 = Function switched off 1 = Function switched on (factory setting)

5.16.1.1 The special parameters in detail

Program "0", releasing the program block (P2)

The program P0 (manual setting) is blocked. Only operation with P1-P15 is possible, irrespective of the key switch position.

Program limit (P4)

Program selection can be limited with special parameter P4.

- The setting is adopted for all JOBS.
- Program selection depends on the position of the "welding torch function" changeover switch (see "Machine description"). Programs can only be switched when the changeover switch is in the "Program" position.
- Programs can be switched by means of a connected remote control or special welding torch.
- It is only possible to switch programs by means of the "arc length correction/select welding program" rotary dial (see "Machine description") if no special welding torch is connected.

Hold function (P15)

Hold function active (P15 = 1)

- Mean values for the last main program parameters used for welding are displayed.

Hold function not active (P15 = 0)

- Setpoint values for the main program parameters are displayed.

Mean value display for super pulses (P19)

Function active (P19 = 1)

- For super pulses, the mean power from program A (P_A) and program B (P_B) is shown in the display (factory setting).

Function inactive (P19 = 0)

- Only power from program A is displayed for super pulses.

5.16.1.2 Reset to factory settings

NOTE

All special parameters will be overwritten by the factory settings!
The welding task (JOB) will be deleted in the remote control memory.

Operating element	Action	Result	Display	
			left	right
		Switch off the welding machine	-	-
AMP Hold		Press and hold the "right parameter selection" push-button on remote control	-	-
		Switch on the welding machine	rob	r50
AMP Hold		Release push-button Wait for about 3 seconds	t1	on
		Switch off the welding machine and restart in order to implement the changes	-	-

5.16.2 Protective flap, welding machine control

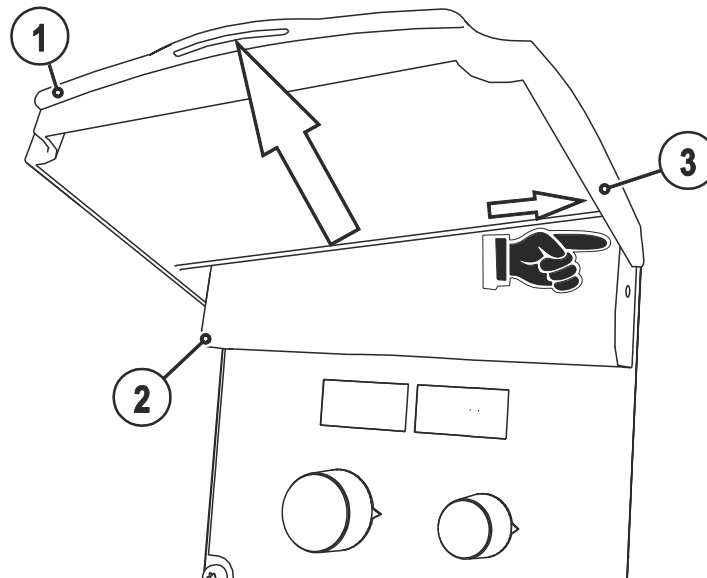


Figure 5-26

Item	Symbol	Description
1		Protective cap
2		Lid
3		Bracket, protective cap

- Push the right-hand bracket of the protective cap to the right and remove the protective cap.

6 Maintenance, care and disposal

6.1 General

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

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

6.2 Maintenance work



DANGER



Do not carry out any unauthorised repairs or modifications!

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

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

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

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

6.3 Maintenance work, intervals

6.3.1 Monthly maintenance tasks

- Check control leads and their strain relief for damage.
- Carry out functional test of operating, signalling, safety and/or adjustment devices.
- Other, general condition

6.4 Disposing of equipment

NOTE



Proper disposal!

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

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



6.4.1 Manufacturer's declaration to the end user

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

6.5 Meeting the requirements of RoHS

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

7 Technical data

NOTE



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

7.1 R50 ROB 7POL

Interface	7-pole
Dimensions L x W x H	115 x 235 x 300 mm
Weight	3.2 kg

8 Accessories**8.1 Connection and extension cables**

Type	Designation	Item no.
FRV 7POL 10 m	Extension/connecting cable	092-000201-00000
FRV 7POL 20 m	Extension/connecting cable	092-000201-00001
FRV 7POL 1 m	Extension/connecting cable	092-000201-00002
FRV 7POL 5 m	Extension/connecting cable	092-000201-00003

9 Appendix A

9.1 Overview of EWM branches

Headquarters

EWM AG

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

Technology centre

EWM AG

Forststraße 7-13
56271 Mündersbach · Germany
Tel: +49 2680 181-0 · Fax: -144
www.ewm-group.com · info@ewm-group.com



Production, Sales and Service

EWM AG

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

EWM HIGHTEC WELDING (Kunshan) Ltd.
10 Yuanshan Road, Kunshan · New & High-tech Industry Development Zone
Kunshan · Jiangsu · 215300 · People's Republic of China
Tel: +86 512 57867-188 · Fax: -182
www.ewm-kunshan.cn · info@ewm-kunshan.cn

TEAMWELDER s.r.o.

Tř. 9. května 718 / 31
407 53 Jířkov · Czech Republic
Tel.: +420 412 358-551 · Fax: -504
www.teamwelder.cz · info@teamwelder.cz

Sales and Service Germany

EWM AG

Sales and Logistics Centre
Sälzerstraße 20a
56235 Ransbach-Baumbach · Tel: +49 2623 9276-0 · Fax: -244
www.ewm-ransbach-baumbach.de · info@ewm-ransbach-baumbach.de

EWM AG

Sales and Technology Centre
Grünauer Fenn 4
14712 Rathenow · Tel: +49 3385 49402-0 · Fax: -20
www.ewm-rathenow.de · info@ewm-rathenow.de

EWM AG

Rudolf-Winkel-Straße 7-9
37079 Göttingen · Tel: +49 551-3070713-0 · Fax: -20
www.ewm-goettingen.de · info@ewm-goettingen.de

EWM AG

Sachsstraße 28
50259 Pulheim · Tel: +49 2234 697-047 · Fax: -048
www.ewm-pulheim.de · info@ewm-pulheim.de

EWM AG

Eiserfelder Straße 300
57080 Siegen · Tel: +49 271 3878103-0 · Fax: -9
www.ewm-siegen.de · info@ewm-siegen.de

EWM HIGHTEC WELDING GmbH

Sales and Technology Centre
Draisstraße 2a
69469 Weinheim · Tel: +49 6201 84557-0 · Fax: -20
www.ewm-weinheim.de · info@ewm-weinheim.de

EWM Schweißtechnik Handels GmbH

Karlsdorfer Straße 43
88069 Tettnang · Tel: +49 7542 97998-0 · Fax: -29
www.ewm-tettnang.de · info@ewm-tettnang.de

EWM Schweißtechnik Handels GmbH

Pfaffensteig 17
89143 Blaubeuren · Tel: +49 7344 9191-75 · Fax: -77
www.ewm-blaubeuren.de · info@ewm-blaubeuren.de

EWM Schweißtechnik Handels GmbH

Heinkelstraße 8
89231 Neu-Ulm · Tel: +49 731 7047939-0 · Fax: -15
www.ewm-neu-ulm.de · info@ewm-neu-ulm.de

Sales and Service International

EWM HIGHTEC WELDING GmbH

Wiesenstraße 27b
4812 Pilsdorf · Austria · Tel: +43 7612 778 02-0 · Fax: -20
www.ewm-austria.at · info@ewm-austria.at

EWM HIGHTEC WELDING (Kunshan) Ltd.

10 Yuanshan Road, Kunshan · New & High-tech Industry Development Zone
Kunshan · Jiangsu · 215300 · People's Republic of China
Tel: +86 512 57867-188 · Fax: -182
www.ewm-kunshan.cn · info@ewm-kunshan.cn

EWM HIGHTEC WELDING UK Ltd.

Unit 2B Coopies Way · Coopies Lane Industrial Estate
Morpeth · Northumberland · NE61 6JN · Great Britain
Tel: +44 1670 505875 · Fax: -514305
www.ewm-morpeth.co.uk · info@ewm-morpeth.co.uk

EWM HIGHTEC WELDING Sales s.r.o. / Prodejní a poradenské centrum

Tyršova 2106
256 01 Benešov u Prahy · Czech Republic
Tel: +420 317 729-517 · Fax: -712
www.ewm-benesov.cz · info@ewm-benesov.cz

