



EN

Control

L1.04 - Expert XQ 2.0

L1.05 - Expert XQ 2.0

099-00L105-EW501

Observe additional system documents!

07.06.2019

**Register now
and benefit!
Jetzt Registrieren
und Profitieren!**

www.ewm-group.com



General instructions

WARNING



Read the operating instructions!

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

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

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

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

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

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

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

© 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.

1 Contents

| | | |
|----------|---|-----------|
| 1 | Contents | 3 |
| 2 | For your safety | 6 |
| 2.1 | Notes on the use of these operating instructions | 6 |
| 2.2 | Explanation of icons..... | 7 |
| 2.3 | Part of the complete documentation | 8 |
| 3 | Intended use | 9 |
| 3.1 | Applications..... | 9 |
| 3.2 | Use and operation solely with the following machines | 9 |
| 3.3 | Documents which also apply | 9 |
| 3.4 | Software version | 9 |
| 4 | Quick overview | 10 |
| 4.1 | Machine control – Operating elements | 10 |
| 4.2 | Screen icons | 12 |
| 4.3 | Machine display | 13 |
| 4.3.1 | Actual values, nominal values, hold values..... | 13 |
| 4.3.2 | Main screen | 14 |
| 4.3.2.1 | Main screen variants | 15 |
| 4.3.3 | Initial screen | 15 |
| 4.3.3.1 | Basic settings for operation with two wire feeders (P10)..... | 16 |
| 4.3.3.2 | Change system language | 16 |
| 5 | Operating the machine control | 17 |
| 5.1 | Welding power setting | 17 |
| 5.2 | Direct access keys..... | 17 |
| 5.3 | Context-dependent push-buttons | 17 |
| 5.3.1 | Changing basic settings (machine configuration menu) | 17 |
| 5.3.2 | Lock function | 17 |
| 5.4 | Machine configuration (system)..... | 18 |
| 5.4.1 | Power-saving mode (Standby)..... | 18 |
| 5.4.2 | Access permission (Xbutton)..... | 19 |
| 5.4.2.1 | User information..... | 19 |
| 5.4.2.2 | Activating the Xbutton rights | 19 |
| 5.4.3 | Status information..... | 20 |
| 5.4.3.1 | Errors and warnings | 20 |
| 5.4.3.2 | Running time | 21 |
| 5.4.3.3 | System components..... | 21 |
| 5.4.3.4 | Temperatures..... | 21 |
| 5.4.3.5 | Sensor values | 21 |
| 5.4.4 | System settings | 22 |
| 5.4.4.1 | Date..... | 22 |
| 5.4.4.2 | Time | 22 |
| 5.4.4.3 | Water block | 22 |
| 5.4.4.4 | Special parameter | 23 |
| 5.4.5 | Control..... | 30 |
| 5.4.6 | Operating panel settings | 31 |
| 5.4.7 | Aligning the cable resistance..... | 32 |
| 5.4.8 | Xnet machine..... | 34 |
| 5.4.8.1 | Coupling mobile machines | 34 |
| 5.4.8.2 | Component identification | 34 |
| 5.4.8.3 | Component details | 34 |
| 5.4.8.4 | Errors and warnings | 35 |
| 5.4.8.5 | Status information | 35 |
| 5.4.8.6 | Network | 35 |
| 5.4.8.7 | Clear system memory | 35 |
| 5.4.8.8 | Reset to factory settings | 35 |
| 5.5 | Offline data transfer (USB) | 36 |
| 5.5.1 | Save JOB(s) | 36 |
| 5.5.2 | Load JOB(s) | 36 |
| 5.5.3 | Save configuration..... | 36 |

| | | | |
|----------|---------|---|-----------|
| | 5.5.3.1 | System..... | 36 |
| | 5.5.3.2 | Xnet machine | 36 |
| 5.5.4 | | Load configuration | 37 |
| | 5.5.4.1 | System..... | 37 |
| | 5.5.4.2 | Xnet machine | 37 |
| 5.5.5 | | Load languages and texts | 37 |
| 5.5.6 | | Record on USB drive | 37 |
| | 5.5.6.1 | Register USB drive..... | 37 |
| | 5.5.6.2 | Start recording..... | 37 |
| | 5.5.6.3 | Stop recording..... | 37 |
| 5.6 | | Welding task administration (Menu)..... | 38 |
| 5.6.1 | | JOB selection (material/wire/gas)..... | 38 |
| 5.6.2 | | JOB favourites | 39 |
| | 5.6.2.1 | Saving current settings to Favourites..... | 39 |
| | 5.6.2.2 | Loading saved Favourites | 40 |
| | 5.6.2.3 | Deleting saved Favourites..... | 40 |
| 5.6.3 | | JOB manager..... | 40 |
| | 5.6.3.1 | Copy JOB to number..... | 40 |
| | 5.6.3.2 | Reset current JOB..... | 40 |
| | 5.6.3.3 | Reset all JOBs..... | 40 |
| 5.6.4 | | Program sequence | 41 |
| 5.6.5 | | Programs (P _A 1-15)..... | 42 |
| | 5.6.5.1 | Overview of the welding parameter switching options | 43 |
| | 5.6.5.2 | MIG/MAG welding | 45 |
| | 5.6.5.3 | Advanced settings | 46 |
| | 5.6.5.4 | TIG welding | 47 |
| | 5.6.5.5 | MMA welding..... | 48 |
| 5.6.6 | | Setup mode | 49 |
| 5.6.7 | | WPQR welding data assistant | 50 |
| 5.6.8 | | Welding monitoring | 51 |
| 5.6.9 | | JOB display setting | 51 |
| 5.7 | | Change welding procedure (Arc) | 52 |
| 5.8 | | Online data transfer (network) | 52 |
| | 5.8.1 | Wired local network (LAN)..... | 52 |
| | 5.8.2 | Wireless local network (WiFi) | 53 |
| 6 | | Welding procedure..... | 54 |
| 6.1 | | MIG/MAG welding | 54 |
| 6.1.1 | | Welding type | 54 |
| | 6.1.1.1 | Welding power (operating point) | 54 |
| | 6.1.1.2 | Accessory components for operating point setting | 54 |
| | 6.1.1.3 | Arc length | 54 |
| | 6.1.1.4 | Arc dynamics (choke effect)..... | 54 |
| | 6.1.1.5 | superPuls | 55 |
| 6.1.2 | | Operating modes | 55 |
| | 6.1.2.1 | Explanation of signs and functions..... | 55 |
| | 6.1.2.2 | Automatic cut-out | 67 |
| 6.1.3 | | coldArc XQ / coldArc puls XQ..... | 68 |
| 6.1.4 | | forceArc XQ / forceArc puls XQ..... | 68 |
| 6.1.5 | | rootArc XQ / rootArc pulse XQ | 69 |
| 6.1.6 | | acArc puls XQ..... | 70 |
| 6.1.7 | | wiredArc..... | 71 |
| 6.1.8 | | Standard MIG/MAG torch | 72 |
| 6.2 | | TIG welding | 73 |
| 6.2.1 | | Operating modes (functional sequences)..... | 73 |
| | 6.2.1.1 | Explanation of signs and functions..... | 73 |
| | 6.2.1.2 | Automatic cut-out | 73 |
| 6.2.2 | | Arc ignition | 77 |
| | 6.2.2.1 | Liftarc..... | 77 |
| 6.3 | | MMA welding..... | 78 |
| 6.3.1 | | Hotstart | 78 |

| | | |
|----------|--|-----------|
| 6.3.2 | Antistick | 78 |
| 6.4 | Air arc gouging | 78 |
| 7 | Rectifying faults | 79 |
| 7.1 | Display machine control software version | 79 |
| 7.2 | Warnings | 80 |
| 7.3 | Error messages | 81 |
| 7.4 | Resetting JOBS (welding tasks) to the factory settings | 83 |
| 8 | Appendix | 84 |
| 8.1 | Parameter overview – setting ranges | 84 |
| 8.2 | JOB-List | 85 |
| 8.3 | Searching for a dealer | 92 |

2 For your safety

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.



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

2.3 Part of the complete documentation

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

The illustration shows a general example of a welding system.

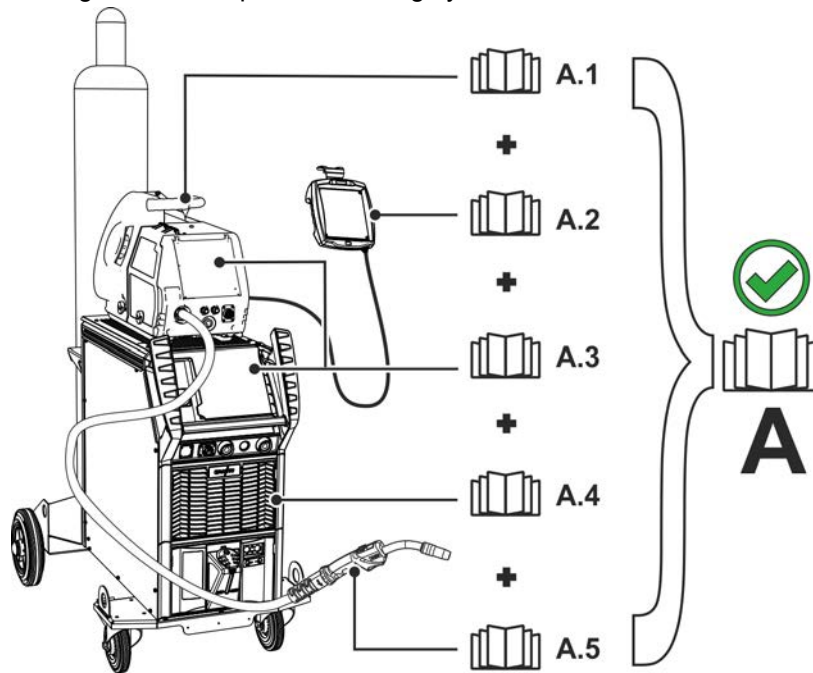


Figure 2-1

The illustration shows a general example of a welding system.

| Item | Documentation |
|------|------------------------|
| A.1 | Wire feeder |
| A.2 | Remote adjuster |
| A.3 | Controller |
| A.4 | Power source |
| A.5 | Welding torch |
| A | Complete documentation |

3 Intended use

⚠ WARNING

§ 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

Device control of multi-process welding machines for arc welding covering the following welding procedures:

| Machine series | Main procedure for MIG/MAG welding | | | | | | | | | Secondary process | | |
|-----------------|------------------------------------|-------------|------------|------------|------------------|------------------|-----------------|-----------------|---------------|------------------------|-------------|---------|
| | Standard arc | | | | Pulsed arc | | | | | TIG welding (lift arc) | MMA welding | Gouging |
| | MIG/MAG XQ | forceArc XQ | rootArc XQ | coldArc XQ | MIG/MAG pulse XQ | forceArc puls XQ | rootArc puls XQ | coldArc puls XQ | acArc puls XQ | | | |
| Titan XQ / XQ C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ |
| Titan XQ AC | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

3.2 Use and operation solely with the following machines

The following system components can be combined:

This description may be applied only to machines with the Expert XQ 2.0 machine control.

| Machine control | Expert XQ 2.0 | Expert XQ 2.0 LG | Expert XQ 2.0 WLG |
|-----------------|-----------------------|------------------|----------------------------|
| Description | No network connection | Version with LAN | Version with Wi-Fi and LAN |

3.3 Documents which also apply

- Operating instructions for the connected welding machines
- Documents of the optional expansions

3.4 Software version

These instructions apply to the following software version:

2.0.D.0

The machine control software version is shown on the screen during the start process > see 4.3.3 chapter.

4 Quick overview

4.1 Machine control – Operating elements

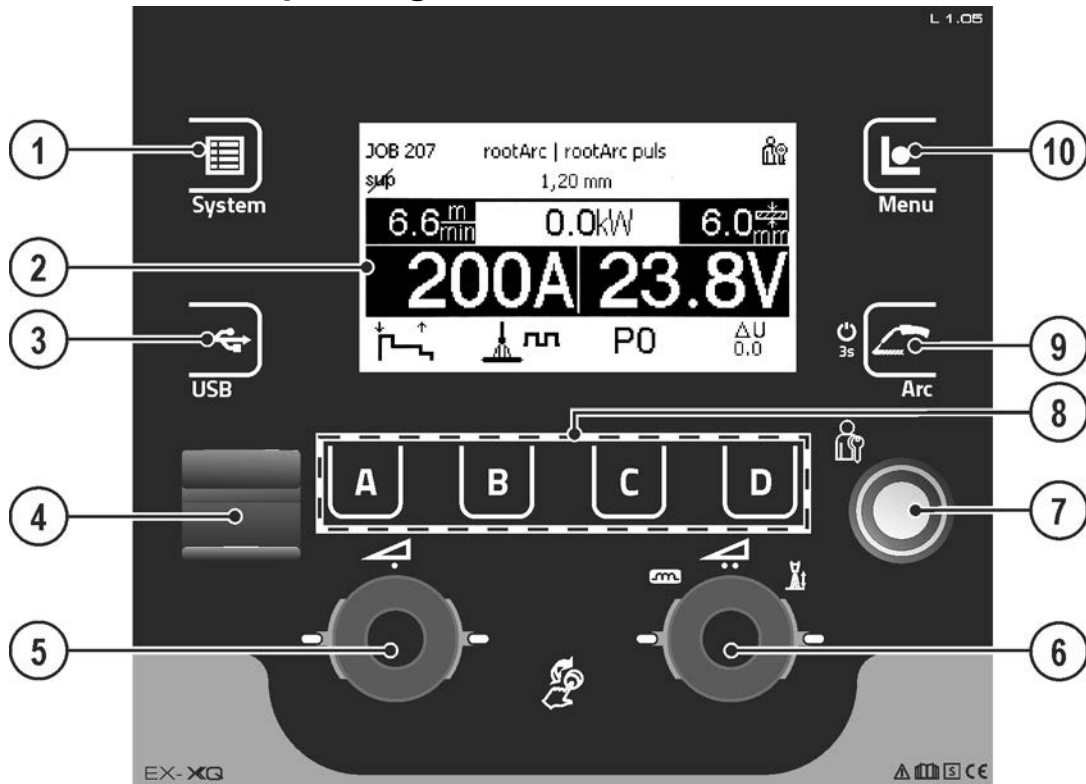





















Figure 4-1

| Item | Symbol | Description |
|------|----------------|--|
| 1 | | System push-button To display and configure the system settings > see 5.4.4 chapter. |
| 2 | | Machine display Graphical machine display showing all machine functions, menus and parameters with their values > see 4.3 chapter. |
| 3 | | USB push-button To use and configure the USB interface > see 5.5 chapter. |
| 4 | | USB interface for offline data transfer Connection capability for a USB flash memory (industrial USB flash memory recommended). |
| 5 | | Click wheel welding power <ul style="list-style-type: none"> ----- Setting the welding power > see 5.1 chapter ----- Setting various parameters values depending on the preselection. It is possible to adjust settings when the backlight is activated. |
| 6 | | Click wheel correction of arc <ul style="list-style-type: none"> ----- Setting the correction of arc length > see 6.1.1.3 chapter ----- Setting the arc dynamics > see 6.1.1.4 chapter It is possible to adjust settings when the backlight is activated. |
| 7 | | Interface (Xbutton) Welding access based on user-defined rights to protect against unauthorised use > see 5.4.2 chapter. |
| 8 | A B C D | Context-dependent push-button > see 5.3 chapter |

| Item | Symbol | Description |
|------|---|---|
| 9 |  | Arc push-button <ul style="list-style-type: none">• Initial state of main screen: Switching of the welding procedure based on the selected material, gas and welding consumable.• Initial state of any sub-menu: Display switches back to the main screen.• Press and hold: After 3 s, the machine switches into locked mode > see 5.3.2 chapter. To unlock, press and hold again for 3 s > see 5.3.2 chapter. |
| 10 |  | Menu push-button To organise welding tasks and configure process parameters. |

4.2 Screen icons

| Symbol | Description |
|------------|--|
| | Shielding gas |
| | Material type |
| | Wire inching |
| | Wire return |
| | Advanced settings |
| | Set-up mode |
| | Non-latched operating mode |
| | Special non-latched operating mode |
| | Latched operating mode |
| | Special latched operating mode |
| JOB | Welding task |
| sup | superPuls |
| | superPuls switched off |
| | Interference |
| | Temperature error |
| | Spot welding operating mode |
| | Material thickness |
| | Disabled; selected function is not available with the current access rights - check access rights. |
| | Wire feed speed |
| | Arc length correction |
| kW | Welding power |
| P | Programs (P0 - P15) > see 5.6.5 chapter |
| | Warning; could be an imminent interference |
| | Wired local network (LAN) |
| | Wireless local network (WiFi) |
| | User logged in |
| | Not possible, check priorities |
| | Xbutton login |
| | Xbutton logout |
| | Arc dynamics |
| | Xbutton version number not recognised |
| | Cancel operation |
| | Confirm operation |
| | Wire diameter (welding consumable) |
| | Menu navigation; one menu back |
| | Menu navigation; expanding the content of the display |

| Symbol | Description |
|---|---|
|  | Save data to USB medium |
|  | Load data from USB medium |
|  | USB data recording |
|  | Screen type 3/4, switching buttons |
|  | Pulse arc welding |
|  | Standard arc welding |
|  | Welding procedure |
|  | Refresh |
|  | After welding, the last weld values (hold values) from the main program are displayed |
|  | Information |
|  | Welding current |
|  | Welding voltage |
|  | Motor current, wire feed motor |
|  | Welding duration |
|  | Plasma gas |
|  | Wire feed speed |
|  | Value correct or applicable |

4.3 Machine display

The machine display shows all the information relevant to the user as text and/or graphics.

4.3.1 Actual values, nominal values, hold values

| Parameter | Before welding | During welding | | After welding | |
|--------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | Nominal value | Actual value | Nominal value | Hold value | Nominal value |
| Welding current | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Material thickness | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Wire feed speed | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Welding voltage | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

4.3.2 Main screen

The main screen shows all the information relevant for the welding process before, while and after it is carried out. In addition, it shows status information on the machine state. The assignment of the context-dependent push-buttons is also shown on the main screen.

The user can choose between different main screens > see 4.3.2.1 chapter.

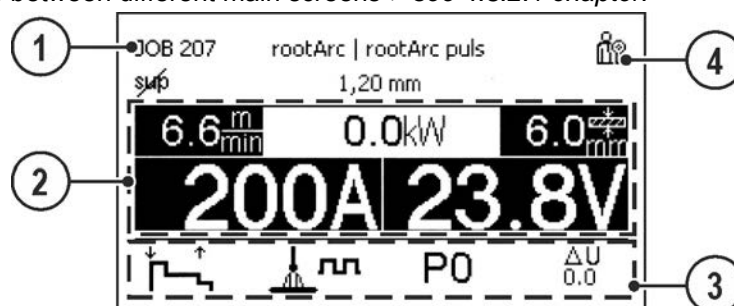


Figure 4-2

| Item | Symbol | Description |
|------|--------|--|
| 1 | | Information on the welding task selected JOB number, process etc. |
| 2 | | Display area for welding data Welding current, welding voltage, wire feed speed, material thickness etc. |
| 3 | | Display area for process parameters Operating mode, voltage correction, program, welding method etc. |
| 4 | | Display area for system status Network status, error status etc. > see 4.2 chapter |

By pressing push-button A for a prolonged time (on the operating mode main screen) it is possible to directly switch to the program sequence.

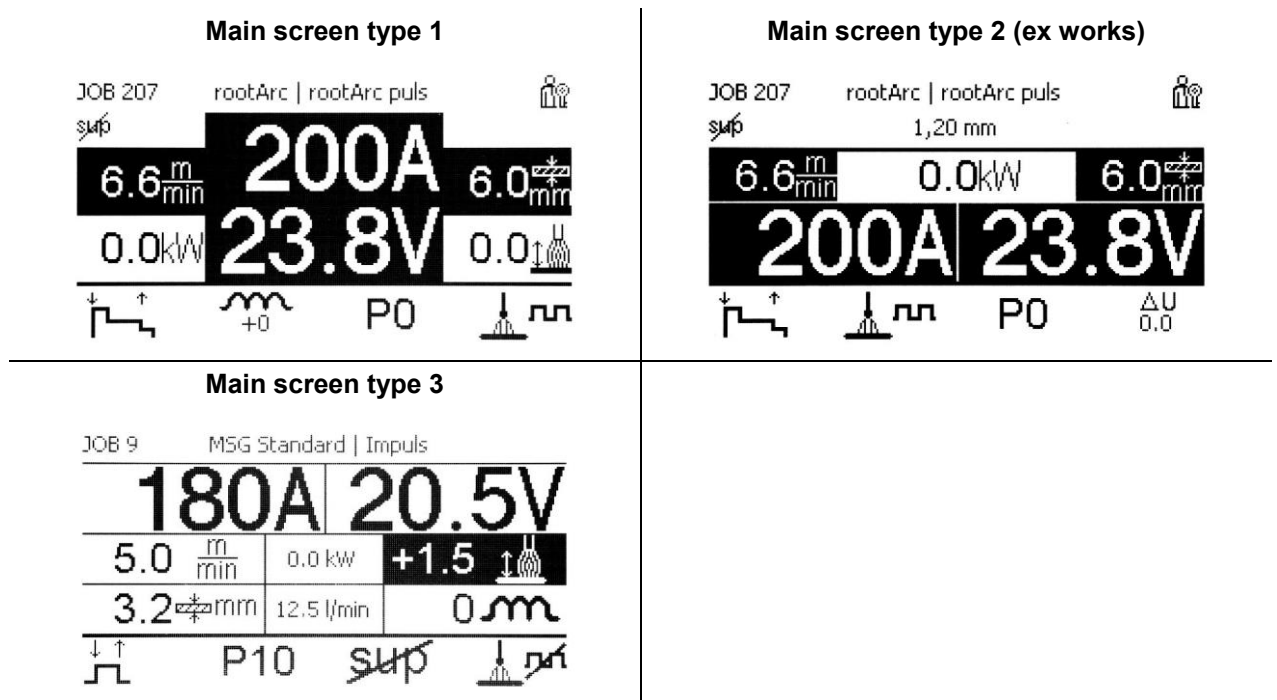
4.3.2.1 Main screen variants


Figure 4-3

You can select the required variant (type of main screen) in the Machine configuration (system) menu > see 5.4.6 chapter.

4.3.3 Initial screen

During the start process the control name, machine software version and selected language are shown on the screen.



Figure 4-4

| Item | Symbol | Description |
|------|--------|---|
| 1 | | Machine control name |
| 2 | | Progress bar Shows the load progress during the start process. |
| 3 | | Advanced settings Display and setting of advanced system parameters > see 4.3.3.1 chapter |
| 4 | | Indication of the system language selected The system language can be changed during the start process > see 4.3.3.2 chapter. |
| 5 | | Control software version |

4.3.3.1 Basic settings for operation with two wire feeders (P10)

The setting is available/required in the following cases only:

- the control is integrated in the wire feeder
- the control is integrated in the power source (compact design)

| Menu item/parameter | Value | Comment |
|---------------------|-------|---------|
| DVX (single) | 0 | |
| DVX-Unit 1 (master) | 1 | |
| DVX-Unit 2 (slave) | 2 | |

With single unit operation (P10 = 0) a second wire feeder may not be connected!

- Remove any connections to the second wire feeder

With double unit operation (P10 = 1 or 2) both wire feeders have to be connected and be set up for this operation at the control with different configurations.

- Configure one wire feeder as master (P10 = 1)
- Configure the other wire feeder as slave (P10 = 2)

Access control

If one of the wire feeders in the welding system is equipped with an access control key switch, it has to be configured as master (P10 = 1). With double unit operation, if more than one wire feeder is equipped with an access control key switch, either one can be configured as master. The wire feeder configured as master is active as soon as the welding machine has been switching on. There are no other functional differences between the wire feeders.

4.3.3.2 Change system language

During the start process the user can select or change the system language at the machine control.

- Switch the machine off and on again.
- Press the context-dependent push-button [D] during the start phase (the word WELDING 4.0 is displayed).
- Select the required language by turning the control button.
- Confirm the selected language by pressing the control button (the user can exit the menu by pressing the context-dependent push-button [A] without making any changes).

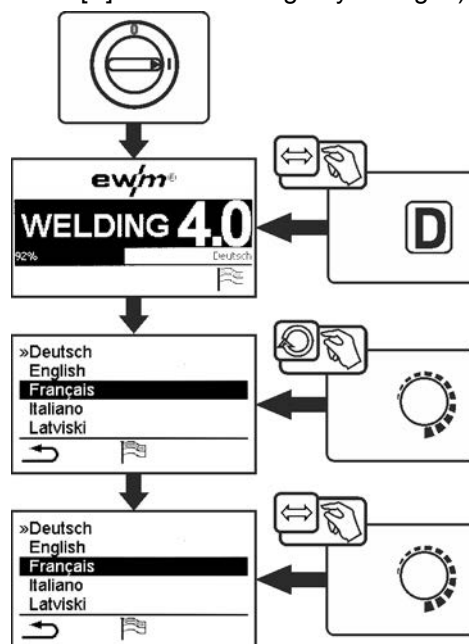


Figure 4-5

5 Operating the machine control

In general the control is operated with the central control button below the machine display.

Select the required menu item by turning (navigate) and pressing (confirm) the central control button. In addition, the context-dependent push-buttons below the machine display can be used for confirmation.

5.1 Welding power setting

The welding power is adjusted with the rotary knob (click wheel) for welding power. You can also adjust the parameters in the operation sequence or settings in the various machine menus.

MIG/MAG settings

The welding power (heat input into the material) can be changed by setting the following three parameters:

- wire feed speed ⌘
- material thickness ⚡
- welding current A

These three parameters are interdependent and always change together. The significant parameter is the wire feed speed in m/min. The wire feed speed can be adjusted in increments of 0.1 m/min (4.0 ipm). The associated welding current and material thickness are determined from the wire feed speed.

The welding current displayed and material thickness are to be understood as guide values for the user and rounded to full amperage and 0.1 mm material thickness.

A change in the wire feed speed, for example by 0.1 m/min, leads to a more or less large change in the welding current displayed or in the material thickness displayed depending on the selected welding wire diameter. The display of the welding current and the material thickness are also dependent on the selected wire diameter.

For example, a change in wire feed speed of 0.1 m/min and a selected wire diameter of 0.8 mm results in a smaller change in the current or thickness of material than a change in wire feed speed of 0.1 m/min and a selected wire diameter of 1.6 mm.

Depending on the diameter of the wire to be welded, it is possible that smaller or larger jumps in the display of material thickness or welding current take place or changes of these values become visible only after several "clicks" on the rotary transducer. As described above, the reason for this is the change in the wire feed speed by 0.1 m/min per click and the resulting change in the current or material thickness as a function of the preselected welding wire diameter.

Please note also that the guide value of the welding current displayed before welding may deviate from the guide value during welding depending on the actual stick-out (free wire end used for welding).

The reason lies in the preheating of the free wire end by the welding current. For example, the preheating in the welding wire increases with the length of the stick-out. This means if the stick-out (free wire end) increases, the actual welding current decreases due to larger preheating in the wire. If the free wire end decreases, the actual welding current increases. This enables the welder to influence the heat input in the component within limits by changing the distance of the welding torch.

Setting of TIG/MMA:

The welding power is set with the parameter "welding current" that can be adjusted in increments of 1 ampere.

5.2 Direct access keys

Several push-buttons on the right and left of the display can be used to directly access the most important menus.

5.3 Context-dependent push-buttons

The bottom push-buttons are so-called context-dependent operating elements. The selection options of these buttons depend on each screen content.

If the ↩ icon is shown on the display the user can skip back to the previous menu item (often assigned to the [A] push-button).

5.3.1 Changing basic settings (machine configuration menu)

The basic welding system functions can be adjusted in the machine configuration menu. Only experienced users should change the settings > see 5.4 chapter.

5.3.2 Lock function

The lock function protects against accidental adjustment of the device settings.

The user can switch the lock function on or off by pressing the button for a long time from each machine control or accessory component with the symbol .

5.4 Machine configuration (system)

In the System menu the user can set the basic machine configuration.

Enter the menu:

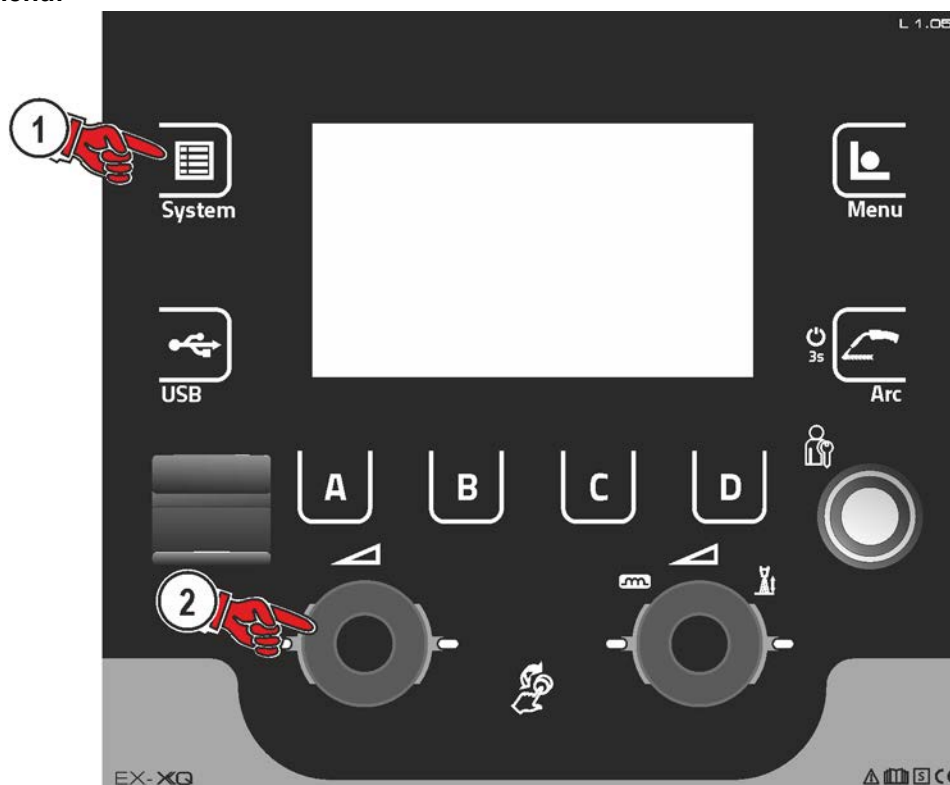


Figure 5-1

5.4.1 Power-saving mode (Standby)

You can activate the power-saving mode by setting a parameter in the configuration menu (time-controlled power-saving mode). When power-saving mode is active, the Expert XQ 2.0 machine controller display is dimmed and only the middle digit of the display is shown in the wire feed unit. Pressing any operating element (e.g. tapping the torch trigger) deactivates power-saving mode and the machine is ready for welding again.

| Menu item/parameter | Value | Comment |
|------------------------------|-------|---|
| Time automatic [min.] | Off | Function switched off |
| | 5-60 | Time to activation of the power-saving mode in case of inactivity. |
| Log off user in standby mode | Yes | The user will be logged off when the power-saving mode is active. |
| | No | The user will not be logged off when the power-saving mode is active. |

5.4.2 Access permission (Xbutton)

The welding system offers two options to prevent unauthorised access to welding parameters or unintentional reconfiguration.

- 1 Key switch (available depending on machine version). With the key switch in position 1 all functions and parameters can be configured without any restriction. In position 0 certain predefined welding parameters or functions cannot be modified (see relevant documentation).
- 2 Xbutton. With this function, permissions can be assigned to users to access those areas of the machine control defined for them. To do so, the user needs a digital key (Xbutton) to log on to the machine via the Xbutton interface. The key itself is configured by the system user (welding supervisor).

If the Xbutton function is activated, the key switch/key switch function is deactivated.

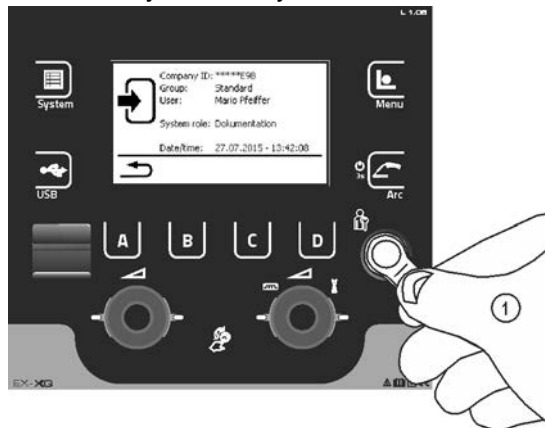


Figure 5-2

To activate Xbutton rights follow these instructions:

1. Set key switch to position "1".
2. Log on with a Xbutton and administrator rights.
3. Set menu option "Xbutton rights active" to "yes".

By following these instructions you make sure not to inadvertently block your access while not owning an Xbutton with administrator rights.

5.4.2.1 User information

User information such as company ID, user name, group etc. are shown.

5.4.2.2 Activating the Xbutton rights

Menu navigation:

| Menu item/parameter | Value | Comment |
|------------------------------|-------|--|
| Xbutton rights active: | Yes | Access rights active |
| | No | Key switch active |
| Reset Xbutton configuration: | Yes | Company ID, group and access rights when logged off will be reset to the factory settings. Xbutton rights will be deactivated. |
| | No | |

5.4.3 Status information

This menu provides the user with information on current system interferences and warnings..

5.4.3.1 Errors and warnings

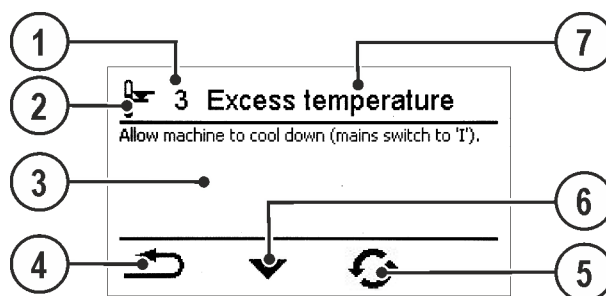


Figure 5-3

| Item | Symbol | Description |
|------|--------|--|
| 1 | | Error number > see 7.3 chapter |
| 2 | | Error icons ----- Warning (prior to interference) ----- Interference (welding process will be stopped) ----- Specific (e.g. temperature error) |
| 3 | | Long error description |
| 4 | | Menu navigation Skip back to previous menu |
| 5 | | Reset message The message can be reset |
| 6 | | Menu navigation (if available) Scroll to next page or message |
| 7 | | Error name |

5.4.3.2 Running time

| Menu item/parameter | Value | Comment |
|--------------------------|--------|--|
| Duty cycle can be reset: | 0:00 h | Values can be reset by pressing or turning the main control button |
| Arc time can be reset: | 0:00 h | |
| Overall duty cycle: | 0:00 h | |
| Overall arc time: | 0:00 h | |

5.4.3.3 System components

A list of all components available in the system is displayed, along with ID number, software version and name.

5.4.3.4 Temperatures

| Menu item / parameter | Value | Comment |
|-----------------------|-------|---|
| Housing inside | - | - |
| Transformer secondary | - | - |
| RCC heatsink | - | - |
| Coolant return | - | - |
| Primary heatsink | - | - |
| Wire heater, unit 1 | - | Display of "---" if no wire heater is installed |
| Wire heater, unit 2 | - | |
| Temperature 8 | - | free |
| Temperature 9 | - | free |
| Temperature 10 | - | free |

5.4.3.5 Sensor values

| Menu item / parameter | Value | Comment |
|-----------------------|--------|---|
| Coolant flow | - | - |
| Wire reserve, unit 1 | 0-100% | Display of "---" if no wire sensor is installed or value could not yet be determined (at least one reel revolution required). |
| Wire reserve, unit 2 | | |

5.4.4 System settings

In this area the user can configure advanced system settings.

5.4.4.1 Date

| Menu item/parameter | Value | Comment |
|---------------------|------------|---------|
| Year: | 2014 | |
| Month: | 10 | |
| Day: | 28 | |
| Date format: | DD.MM.YYYY | |
| | YYYY.MM.DD | |

5.4.4.2 Time

| Menu item/parameter | Value | Comment |
|----------------------|--------------|---------|
| Hour: | 0–24 | |
| Minute: | 0–59 | |
| Time zone (UTC +/-): | -12h to +14h | |
| Summer time: | Yes | |
| | No | |
| Time format: | 24 h | |
| | 12 h AM/PM | |

5.4.4.3 Water block

Permanently switching off the water block may damage the welding torch.

| Menu item / parameter | Value | Comment |
|------------------------------------|-----------------|--|
| Cooling unit postflow time [min.]: | 1-60 min | |
| Cooling unit control: | Automatic | |
| | Permanently ON | |
| | Permanently OFF | |
| Temperature error limit | 50-80 °C | |
| Flow monitoring | On | |
| | Off | |
| Flow error limit | 0.5-2.0 l/min | |
| Reset to factory setting | No | |
| | Yes | Resets the water block parameters to factory settings. |

5.4.4.4 Special parameter

The special parameters of the wire feeder control are used to customize the machine function configuration.

The number of selectable special parameters can deviate between the machine controls used in the welding system.

It may be required to restart the machine in order to apply a parameter change.

Systems with two wire feeder controls show the parameters of the active wire feeder only (special parameter U1 or special parameter U2).

| Menu item/parameter | Value | Comment |
|---------------------|-------|---|
| P1 | 1-0 | Wire inching / wire return ramp time 0 =----- normal inching (10 s ramp time) 1 =----- fast inching (3 s ramp time) (ex works) |
| P2 | 0-1 | Block program "0" 0 =----- Enabled (ex works) 1 =----- P0 blocked |
| P3 | 0-1 | Display mode for Up/Down welding torch with one-digit 7-segment display (two keys) 0 =----- Normal display (ex works) program number/welding power (0–9) 1 =----- Display toggles between program number/welding type |
| P7 | 0-1 | Correction operation, limit value setting 0 =----- Correction operation switched off (ex works) 1 =----- Correction operation switched on |
| P8 | 0-1 | Program switching with standard welding torch 0 =----- No program switching (ex works) 1 =----- Special latched 2 =----- Special latched (n-cycle active) |
| P9 | 0-1 | Tapping start for latched and special latched operation 0 =----- no 4-cycle inching start 1 =----- 4-cycle inching start possible (ex works) |
| P11 | 0-1 | Special latched tapping time 0 =----- Tapping function switched off. 1 =----- 300 ms (ex works) 2 =----- 600 ms |
| P12 | 1-2 | JOB list switching 1 =----- Real JOB list (ex works) 2 =----- Real JOB list and JOB switching activated via accessories |
| P13 | 129 | Lower limit remote JOB switching JOB range of the function torches (MT PC2, PM 2U/D, PM RD2) Lower limit: 129 (ex works) |
| P14 | 169 | Upper limit remote JOB switching JOB range of the function torches (MT PC2, PM 2U/D, PM RD2) Upper limit: 169 (ex works) |
| P16 | 0-1 | JOB batch mode 0 =----- Block JOB mode not enabled (ex works) 1 =----- Block JOB mode enabled |
| P17 | 0-1 | Program selection with standard torch trigger 0 =----- No program selection (ex works) 1 =----- Program selection possible |
| P23 | 0-1 | Program settings for relative programs 0 =----- Combined setting of relative programs possible (ex works). 1 =----- Individual setting of relative programs possible. |

| Menu i-tem/parameter | Value | Comment |
|---------------------------|-------|---|
| P26 | 45 °C | Nominal value of wire spool heater (OW WHS) 0 = -----off = switched off 1 = -----setting range temperature: 25°C - 50°C (45°C ex works) |
| P27 | 0-1 | Operating mode switching at welding start 0 = -----Not enabled (factory setting) 1 = -----Enabled |
| P28 | 30 % | Error threshold of electronic gas flow control Error output in case of gas nominal value deviation |
| Reset to factory setting: | No | |
| | Yes | All special parameters are reset to the corresponding factory setting. |

Wire inching ramp time (P1)

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

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

Program "0", release of program block (P2)

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

Display mode for Up/Down welding torch with one-digit 7-segment display (P3)

Normal display:

- Program mode: Program number
- Up/down operation: Welding power (0=minimum current/9=maximum current)

Toggling display:

- Program mode: Program number and welding procedure (P=pulse/n=not pulse) are toggled
- Up/down operation: Welding power (0=minimum current/9=maximum current) and symbol for up/down operation are toggled

Switching on/off correction operation (P7)

The correction operation is switched on and off for all JOBS and their programs at the same time. A correction operation is specified for wire speed (DV) and welding voltage correction (Ukorr) for each JOB. The correction value is saved separately for each program. The correction range can be maximum 30% of the wire speed and +/-9.9 V welding voltage.

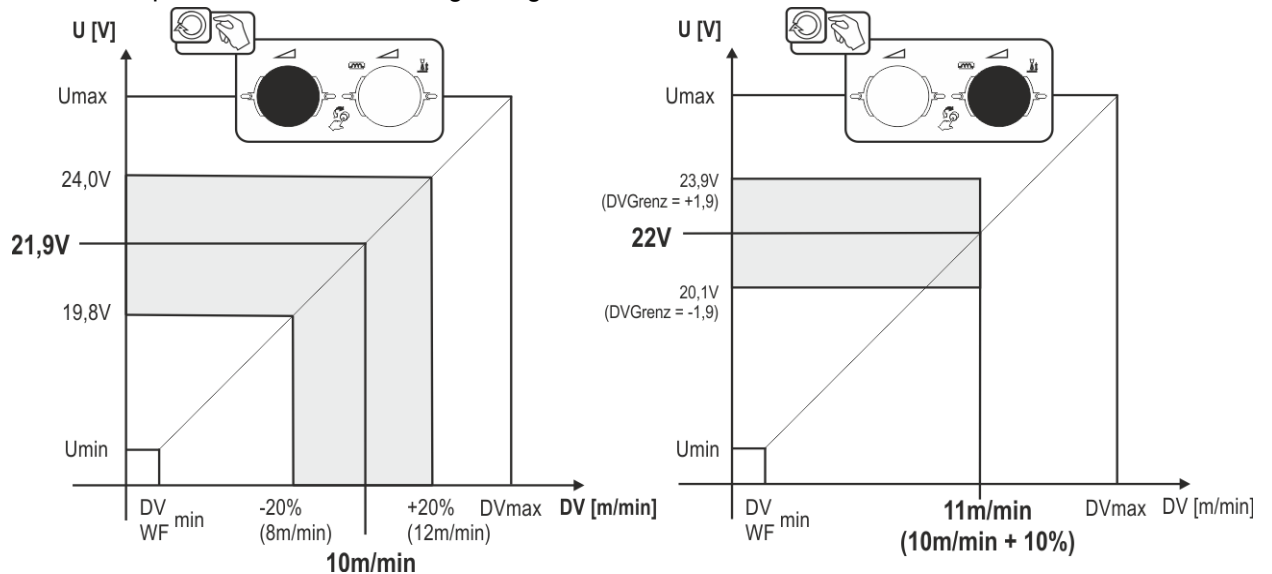


Figure 5-4

Example for the operating point in correction mode:

The wire speed in one program (1 to 15) is set on 10.0 m/min.

This corresponds to a welding voltage (U) of 21,9 V. When the key switch is set to "0" position, welding in this program can only be carried out with these values.

To allow the welder also to perform wire and voltage correction in program mode, the correction mode must be switched on and limit values for wire and voltage must be specified.

Setting of the correction limit value = WFlimit = 20% / Ulimit = 1.9 V

Now the wire speed can be corrected by 20% (8.0 up to 12.0 m/min) and the welding voltage by +/-1.9 V (3.8 V).

In the example the wire speed is set on 11.0 m/min. This corresponds to a welding voltage of 22 V

Now the welding voltage can be corrected by further 1.9 V (20.1 V and 23.9 V).

The values for voltage and wire-speed correction will be reset if the key switch is moved to the "1" setting.

Program switching with standard welding torch (P8)

Special latched (latched absolute program sequence)

- Cycle 1: absolute program 1 is run
- Cycle 2: absolute program 2 is run after completion of "tstart".
- Cycle 3: absolute program 3 is run until the "t3" time has elapsed. The program then switches automatically to absolute program 4.

Accessory components such as remote controls or special torches may not be connected!

Program switching at the wire feed unit control is disabled.

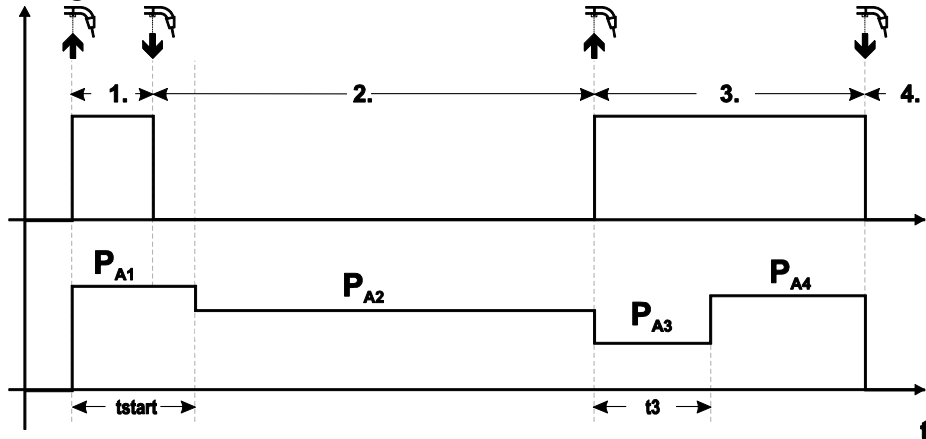


Figure 5-5

Specific latched special (n cycle)

In the n cycle program sequence, the unit starts in the 1st cycle with start program P_{start} from P_1 . In the second cycle, the machine switches to absolute program 2, once the start time "tstart" has elapsed. Tapping switches to other programs (P_{A1} to max. P_{A9}).

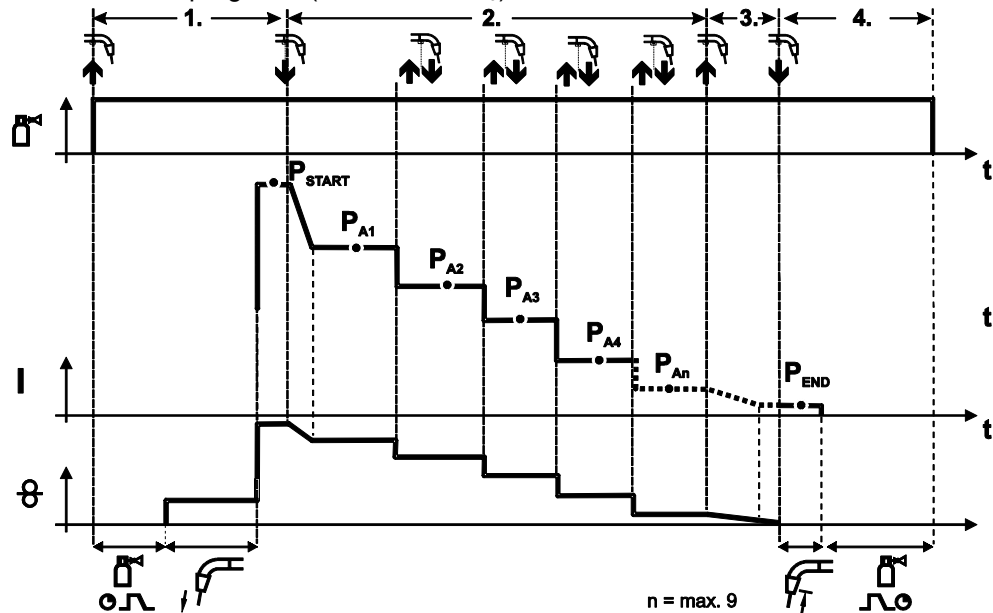


Figure 5-6

The number of programs (P_{An}) corresponds to the cycle number specified under N cycle.

1st cycle

- Press and hold torch trigger.
- Shielding gas is expelled (gas pre-flows).
- Wire feed motor runs at "creep speed".
- Arc ignites after the wire electrode makes contact with the workpiece, welding current is flowing (start program P_{START} from P_{A1})

2nd cycle

- Release torch trigger.
- Slope to main program P_{A1} .

The slope to main program P_{A1} is given at the earliest after the set time t_{START} elapses and at the latest when the torch trigger is released. Tapping (pressing briefly and releasing within 0.3 sec) can switch to other programs. Programs P_{A1} to P_{A9} are possible.

3rd cycle

- Press and hold torch trigger.
- Slope to end program P_{END} from P_{AN} . The program can be stopped at any time by pressing the torch trigger longer than 0.3 sec. P_{END} from P_{AN} is then executed.

4th cycle

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

Special latched tapping start (P9)

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

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

Set special latched tapping time (P11)

The tapping time for changing over between the main program and reduced main program can be set in three levels.

0 = no tapping

1 = 320ms (factory setting)

2 = 640ms

JOB list switching (P12)

| Value | Name | Explanation |
|-------|--|---|
| 1 | Real JOB list | JOB numbers correspond to the actual memory cells. Every job can be selected, there will be no memory cells if the selection will be skipped. |
| 2 | Real JOB list, JOB switching active | Like real JOB list. In addition JOB switching with appropriate accessory components such as a function torch is possible. |

Creating user-defined JOB lists

An associated memory area, in which switching with accessory components such as a function torch between JOBS is possible, is created.

- Set special parameters P12 to "2".
- Set switch "Program or Up/Down Function" to "Up/Down" position.
- Select existing JOB, which comes as close as possible to the desired result.
- Copy JOB to one or more destination JOB numbers.

If JOB parameters still need to be adjusted, select destination JOBS one after the other and adjust parameters individually.

- Special parameters P13 to the lower limit and
- Adjust special parameters P14 to the upper limit of the destination JOBS.
- Set switch "Program or Up/down function" to position "Program".

With the accessory component JOBS can be switched in the specified range.

Copying JOBS, "Copy to" function

The possible target range is between 129 - 169.

- First configure special parameter P12 to P12 = 2 or P12 = 1!

Copy JOB by number, see corresponding operating instructions ("Control").

By repeating the last two steps, the same source JOB can be copied to multiple target JOBS.

If the control does not register any user activity for longer than 5 seconds, the parameter display is shown once more and the copy process is complete.

Lower and upper limit of JOB remote switching (P13, P14)

The highest and lowest JOB numbers which can be selected using accessory components, such as the PowerControl 2 torch.

Avoids an accidental changeover into undesirable or undefined JOBS.

Block JOB mode (P16)

The following accessory components support block JOB mode:

- Up/Down welding torch with one-digit 7-segment display (two keys)
Program 0 is always active in JOB 0 and program 1 in all other JOBS

In this operating mode, up to 30 JOBS (welding tasks) divided into three blocks can be called up with accessory components.

The following configurations must be carried out to use the block JOB operation:

- Set the "Program or Up/Down function" changeover switch to "Program"
- Set the JOB list to actual JOB list (special parameter P12 = "1")
- Enable block JOB mode (special parameter P16 = "1")
- Switch to block JOB mode by selecting one of the special JOBS 129, 130 or 131.

Simultaneous operation with interfaces such as RINT X11, BUSINT X11, DVINT X11 or digital accessory components like the R40 remote control is not possible!

Allocation of JOB numbers to the display on the accessory components

| JOB no. | Display/selection on the accessory component | | | | | | | | | |
|----------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Special JOB 1 | 129 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 |
| Special JOB 2 | 130 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 |
| Special JOB 3 | 131 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 |

JOB 0:

This JOB allows you to set the welding parameters manually.

Selection of JOB 0 can be prevented via the key switch or with the "block program 0" parameter (P2).

Key switch position 0, or special parameter P2 = 0: JOB 0 is blocked.

Key switch position 1, or special parameter P2 = 1: JOB 0 can be selected.

JOBS 1-9:

Nine JOBS can be called up in each special JOB (see table).

Nominal values for wire speed, arc correction, dynamics etc must be defined in advance in these JOBS. This can be done easily with the PC300.NET software.

If the software is not available, user-defined JOB lists can be created in the special JOB areas with the "Copy to" function. (See explanations about this in the "Switching JOB lists (P12)" chapter)

Selecting programs with the standard torch trigger (P17)

Allows you to select a program or switch a program before starting welding.

You switch to the next program by tapping the torch trigger. Once the last enabled program is reached, you start again at the beginning.

- Program 0 is the first enabled program, provided that it is not blocked.
(see also special parameter P2).
- The last enabled program is P15.
 - If the programs are not limited by special parameter P4 (see special parameter P4).
 - Or if the programs are limited for the selected JOB by the n cycle setting (see parameter P8).
- Welding starts when the torch trigger is held for longer than 0.64 s.

You can select programs with the standard torch trigger in all operating modes (non-latched, special non-latched, latched and special latched).

Program settings for relative programs (P23)

The start, down-slope and end program relative programs can be set individually or combined for the P0-P15 operating points. When choosing the combined setting, in contrast to the individual setting, the parameter values are saved in the JOB. With the individual setting, the parameter values are identical for all JOBS (except for special JOBS and SP1, SP2 und SP3).

Nominal value wire heater (P26)

Preheating the welding wire in the temperature range of 25°C - 50°C. Setting 45°C ex works.

Operating mode switching at welding start (P27)

With the selected 4-cycle-Special mode, the user can determine by the time of the torch trigger operation in which operating mode (4-cycle or 4-cycle-Special) the program sequence shall be carried out.

Hold torch trigger (longer than 300 ms): Program sequence with **operating mode** 4-cycle-Special (standard).

Tap torch trigger: Device changes to operating mode 4-cycle.

Error threshold of electronic gas flow control (P28)

The set percentage value is the error threshold; if it is undershot or exceeded, an error message > see 7.3 chapter is displayed.

5.4.5 Control

| Menu item / parameter | Value | Comment |
|--|----------------------|---|
| Operation without wire feeder is possible (This parameter controls the system behaviour depending on the connected wire feeder) | No (factory setting) | The wire feeder (WF) can be changed during operation. Operation without a connected wire feeder is not possible. |
| | Yes | The welding system can be operated without a wire feeder connected. |

5.4.6 Operating panel settings

| Menu item / parameter | Value | Comment |
|---|----------|--|
| Type of main screen | 1-3 | - |
| Automatic selection of welding power | Off-30 s | - |
| Display brightness: | 0-100 % | - |
| Display contrast: | 0-100 % | - |
| Display negative: | No | - |
| | Yes | - |
| Non-latched selectable | No | - |
| | Yes | - |
| Latched selectable | No | - |
| | Yes | - |
| Special non-latched selectable | No | - |
| | Yes | - |
| Spot welding selectable | No | - |
| | Yes | - |
| Special latched selectable | No | - |
| | Yes | - |
| P0 of Expert XQ 2.0 can be changed: | No | - |
| | Yes | - |
| Mean value display for superPuls: | Yes | When superPuls is enabled the welding power is displayed as average value. |
| | No | The welding power is displayed by program A even when superPuls is enabled. |
| Hold function: | On | - |
| | Off | - |
| Language | German | - |
| Measuring units | Metric | - |
| | Imperial | - |
| Numbering files consecutively | Yes | The file names are numbered consecutively when saving. |
| | No | One file is always overwritten. |
| Expert XQ 2.0 reset to factory settings | Yes | Only those parameters relevant for Expert XQ 2.0 (e.g. display settings and languages) will be reset. This does not affect system parameters such as Xbutton - activation or JOBs. |
| | No | - |

5.4.7 Aligning the cable resistance

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

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

1 Preparation

- Switch off the welding machine.
- Unscrew the gas nozzle from the welding torch.
- Trim the welding wire so that it is flush with the contact tip.
- Pull the welding wire back a little (about 50 mm) on the wire feeder (by pressing button B - wire return). There should be no more welding wire in the contact tip at this point.

2 Configuration

- Switch on the welding machine
- Press the "System" push-button.
- Select the "Cable resistance alignment" parameter using the main control button. Parameter RL1 must be aligned for all machine combinations. In case of welding systems with a second power circuit – if two wire feeders are to be operated from a single power source, for example – a second alignment with parameter RL2 must be made. To activate the required wire feeder for measurement, briefly activate (tap) the torch trigger of this machine.

3 Alignment / Measurement

- Press the "D" push-button.
- Place the welding torch with the contact tip on a clean spot of the workpiece with a little pressure and press the torch trigger for approx. 2 seconds. A short-circuit current will flow briefly, which is used to determine and display the cable resistance. The value can be between 0 mΩ and 40 mΩ. The new value is immediately saved without requiring further confirmation. If no value is shown on the display, then the measurement failed. The measurement must be repeated.
- Press the "A" push-button after successful measurement.

4 Restoring welding standby mode

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

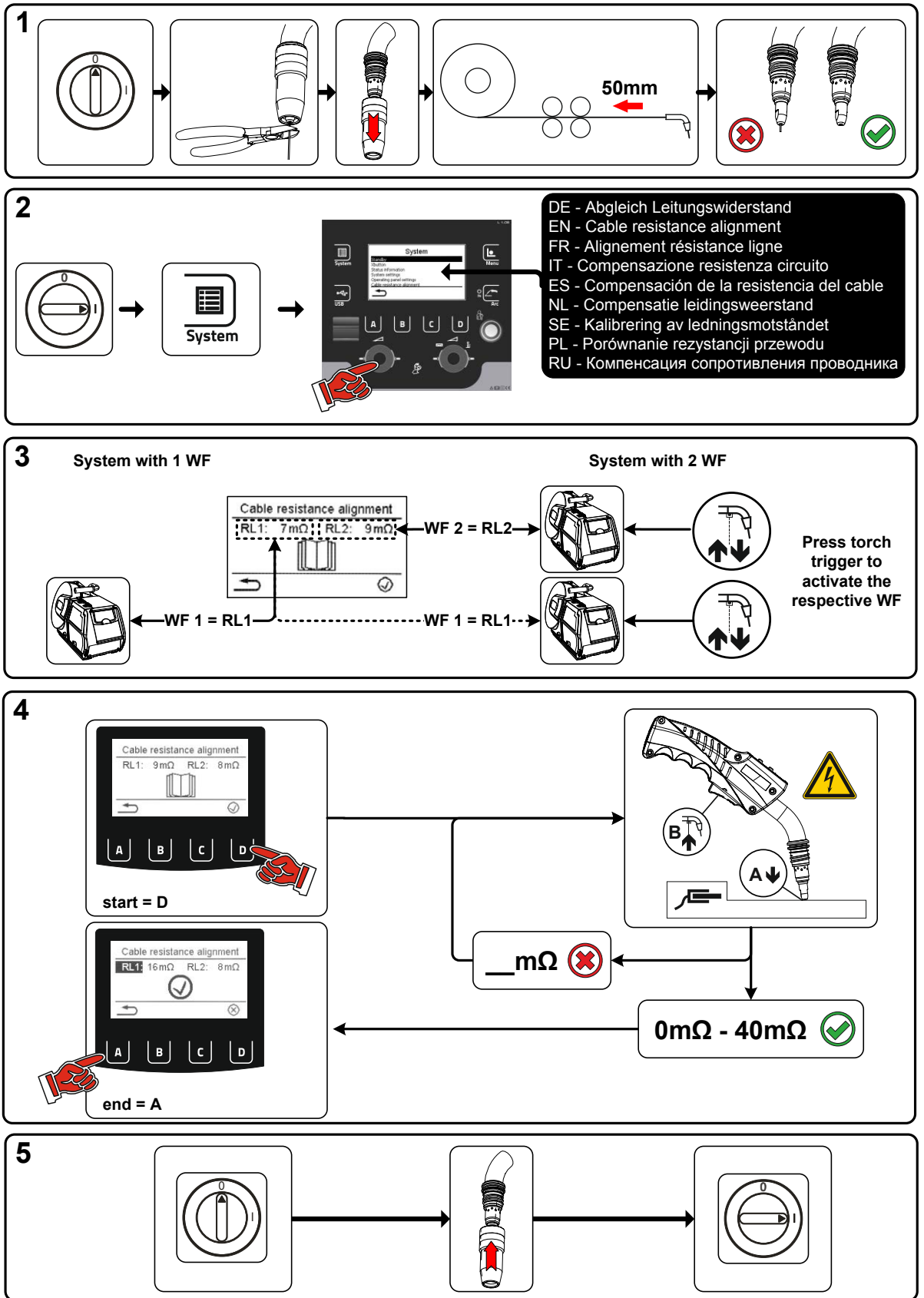


Figure 5-7

5.4.8 Xnet machine

The Xnet machine defines the system component required for operating the Xnet system as part of the Expert 2.0 Net/Gateway to connect to power sources or to record welding data.

5.4.8.1 Coupling mobile machines

QR code for coupling mobile end devices. Upon a successful connection, welding data are displayed on the end device.

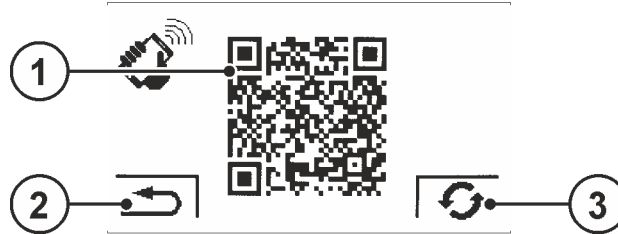


Figure 5-8

| Item | Symbol | Description |
|------|--------|---|
| 1 | | QR code |
| 2 | | Menu navigation Skip back to previous menu |
| 3 | | Reset message The message can be reset and a new QR code may be requested from the network. |

5.4.8.2 Component identification

Bar codes predefined in ewm Xnet are recorded with a manual scanner. Component data are retrieved and displayed in the control.

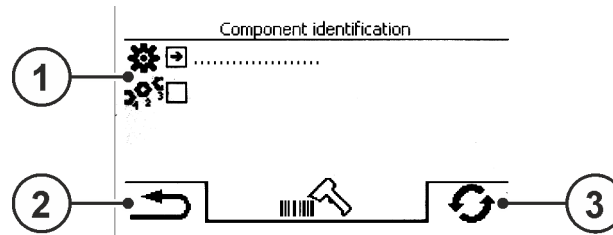


Figure 5-9

| Item | Symbol | Description |
|------|--------|--|
| 1 | | Component data |
| 2 | | Menu navigation Skip back to previous menu |
| 3 | | Reset message The message can be reset |

5.4.8.3 Component details

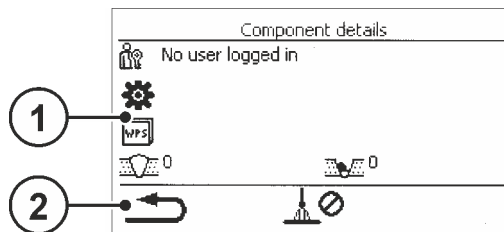


Figure 5-10

| Item | Symbol | Description |
|------|--------|--|
| 1 | | Component data |
| 2 | | Menu navigation Skip back to previous menu |

5.4.8.4 Errors and warnings

A list of all ewm Xnet-specific errors and warnings are displayed with their ID number and description.

5.4.8.5 Status information

| Status information | |
|-------------------------------------|-------|
| Remaining capacity of system memory | 100 % |
| | |

Figure 5-11

5.4.8.6 Network

| Network | Network | WiFi |
|-------------------------------|------------------------------|----------------------------|
| >Device-Name< | Status of network use | Status |
| IP address 004.003.002.001 | DHCP-Configuration DHCP-PLUS | connected |
| Subnet mask 208.192.176.160 | DHCP-Status DHCP-PLUS OK | SSID Network-Name |
| Gateway 139.122.111.094 | | BSSID BSSID-Name |
| MAC address C3:D2:E1:F0:B4:A5 | | Channel number 23 |
| | | WiFi firmware ModulVersion |
| | | |

Figure 5-12

5.4.8.7 Clear system memory


Resets the internal system memory used for saving welding and log data and deletes all data.

All welding data recorded so far, which have not been transferred to the Xnet server via flash drive or network connection, will be permanently deleted.

5.4.8.8 Reset to factory settings

All machine configuration data relating to Xnet will be reset to the factory setting. The system memory data will not be affected, i.e. any welding or log data recorded will be saved.

5.5 Offline data transfer (USB)

 **You may only use this USB interface to exchange data with a USB flash memory. You must not connect any other USB devices such as keyboards, hard disks, mobile telephones, cameras or other devices so as to avoid any damage to the machine. The interface does not provide any load functions either.**

Using the USB interface, data can be transferred between the machine control and a USB storage medium.

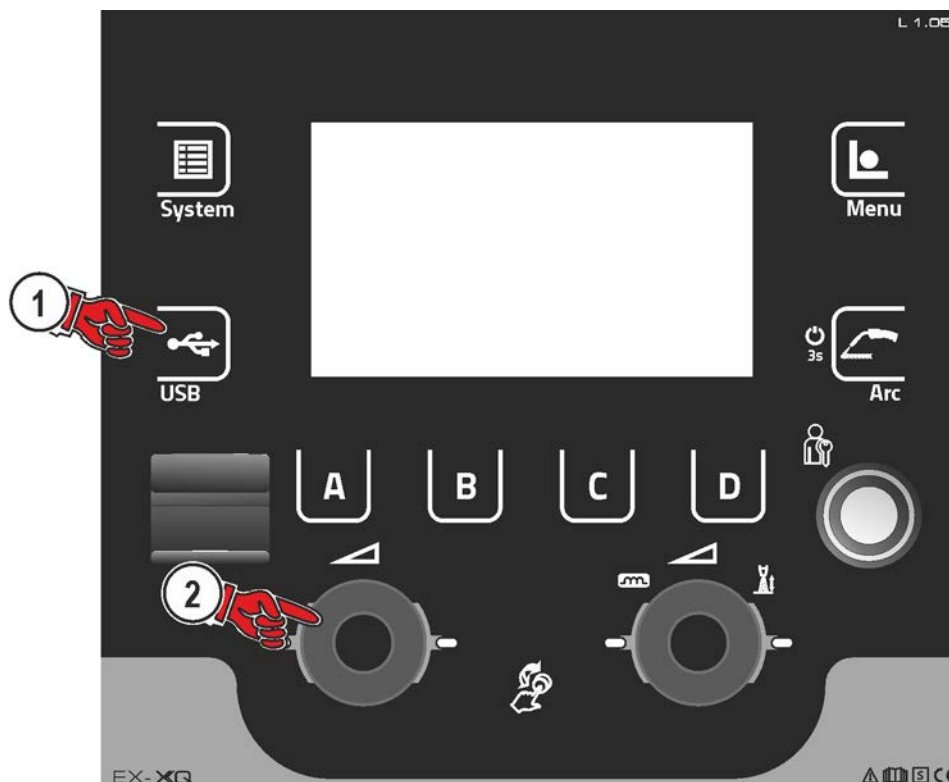


Figure 5-13

5.5.1 Save JOB(s)

Saving a single (JOB) or a range of welding tasks (JOB)s (from-to) from the welding machine to the storage media (USB).

5.5.2 Load JOB(s)

Loading a single JOB or a range of welding tasks (JOBs) (from-to) from the storage media (USB) to the welding machine.

5.5.3 Save configuration

5.5.3.1 System

Configuration data of the power source's system components.

5.5.3.2 Xnet machine

Master configuration

Core data for network communication (independent of machine).

Individual configuration

Machine-related configuration data, matching the current power source only.

5.5.4 Load configuration

5.5.4.1 System

Configuration data of the power source's system components.

5.5.4.2 Xnet machine

Master configuration

Core data for network communication (independent of machine).

Individual configuration

Machine-related configuration data, matching the current power source only.

5.5.5 Load languages and texts

Load a language and text package from the storage medium (USB) to the welding machine.

5.5.6 Record on USB drive


You can record welding data on a storage medium and read or analyse them using the Xnet quality management software when required. For machine variants with network capability (LG/WLG) only!

5.5.6.1 Register USB drive

To identify and allocate the welding data between power source and storage medium the storage medium has to be registered once. This is done by selecting the menu option "Register USB drive" or by starting a data recording process. Successful registration is indicated by a checkmark next to the relevant menu option.

If the storage medium is registered and connected when the power source is being switched on, recording of the welding data starts automatically.

5.5.6.2 Start recording

After confirming the start of data recording the storage medium will be registered (if not registered yet). Data recording starts and is indicated at the main screen by a slow flashing of the  icon.

5.5.6.3 Stop recording

To avoid data loss, finish the recording with this menu option before removing the USB drive or switching off the machine.

Welding data must be imported into the Xnet quality management software using the XWDImport software. This software is an integral part of the Xnet installation.

5.6 Welding task administration (Menu)

In this menu the user can carry out all welding task (JOB) organisation operations.

This machine series offers user-friendly operation and a multitude of features.

- Various welding tasks (JOBS) consisting of welding procedure, material type, wire diameter and shielding gas type have been predefined > see 8.2 chapter.
- The system calculates the required process parameters depending on the operating point specified (one-knob operation via wire feed speed rotary transducer).
- You can adjust additional parameters at the machine control or using the PC300.NET welding parameter software, if required.

Enter the menu:



Figure 5-14

5.6.1 JOB selection (material/wire/gas)

The welding task (JOB) can be set in two ways:

- a) Enter the relevant JOB number. Each welding task has a unique JOB number (for predefined JOBS > see 8.2 chapter, see the JOB list in the annex or the sticker on the machine).
- b) Enter the basic welding parameters: welding procedure, material type, wire diameter and shielding gas type.

5.6.2 JOB favourites

Favourites are additional locations for storing and loading frequently used welding tasks, programs and their settings. The status of the Favourites (loaded, changed, not loaded) is indicated by signal lights.

- Five Favourites are available to save any settings.
- As required, the access control can be adjusted with the key switch or Xbutton function.

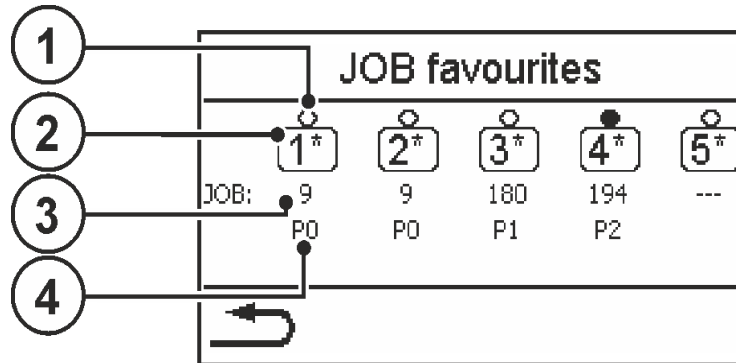


Figure 5-15

| Item | Symbol | Description |
|------|--------|---|
| 1 | | Status of Favourites ● ----- Favourite loaded, settings of the Favourite and the current device settings are identical ●----- Favourite loaded, but settings of the Favourite and the current device settings are not identical (e.g. operating point has been changed) ○ ----- Favourite not loaded (e.g. JOB number has been changed) |
| 2 | | Location number of the Favourite |
| 3 | | Display of the welding task (JOB) Displays the JOB number assigned to the Favourites location (setting “---” means: no JOB assigned) |
| 4 | | Display of the program (P0-P15) Display of the program number assigned to the Favourite location |

5.6.2.1 Saving current settings to Favourites

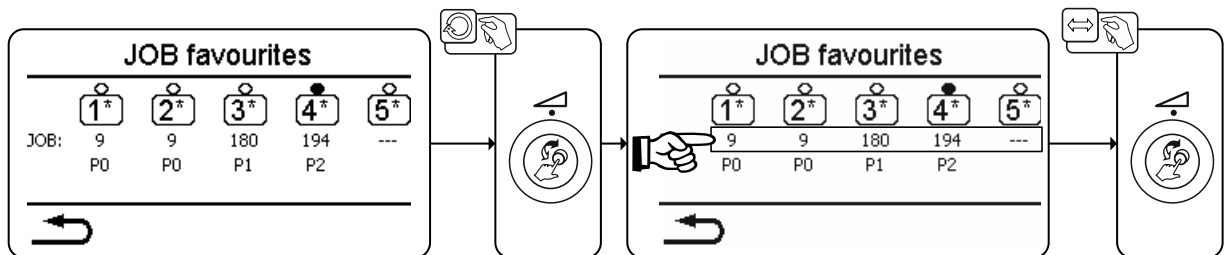


Figure 5-16

- Use the click wheel welding power to switch to the desired Favourite (JOB line).
- Press the click wheel to confirm the current settings in this location.

5.6.2.2 Loading saved Favourites

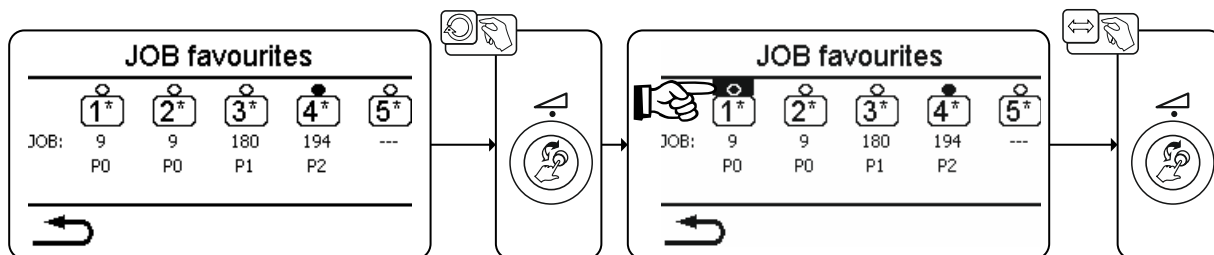


Figure 5-17

- Use the click wheel welding power to switch to the desired Favourite (“Status Favourite” line).
- Press the click wheel to load the appropriate Favourite.

5.6.2.3 Deleting saved Favourites

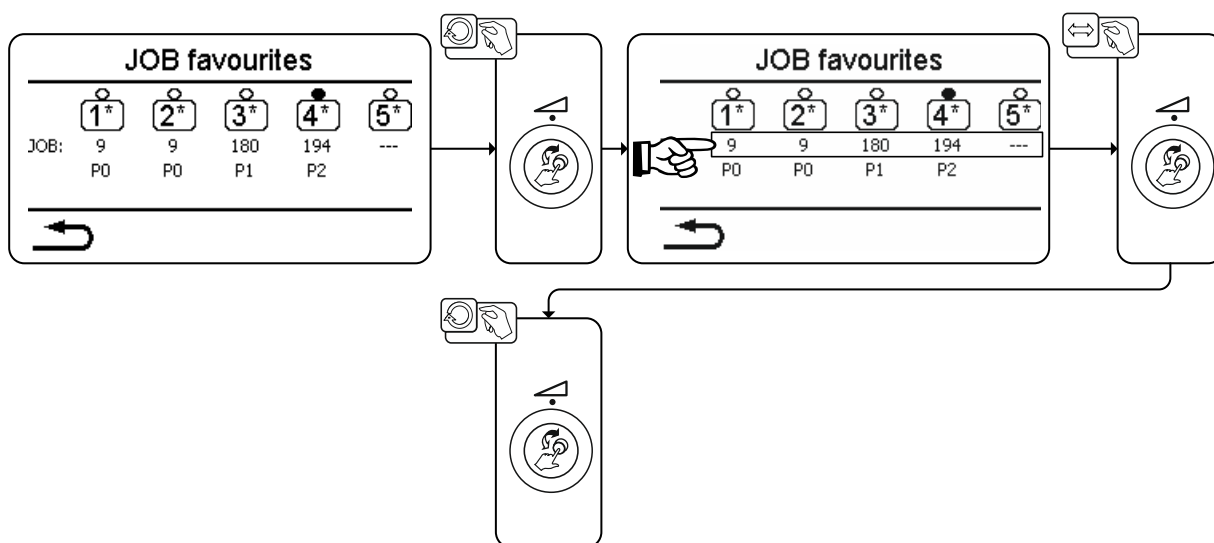


Figure 5-18

- Turn the click wheel welding power to switch to the desired Favourite (JOB line).
- Press the click wheel to confirm the selection of the appropriate Favourite.
- Turn the click wheel to the left to delete the Favourite (indicated by three hyphens “---”)

5.6.3 JOB manager

5.6.3.1 Copy JOB to number

Copy JOB to a number of the definable range (129–169).

5.6.3.2 Reset current JOB

Reset all parameters of the selected JOB to the factory setting

5.6.3.3 Reset all JOBS

Reset all JOBS to the factory setting, except JOBS in the definable range (129–169) > see 7.4 chapter.

5.6.4 Program sequence

In the program sequence, you can select welding parameters and set their values. The number of parameters shown depends on the selected operating mode.

In addition, the user can access advanced settings and the setup mode.

The setting range for the parameter values are summarised in the parameter overview section > see 8.1 chapter.

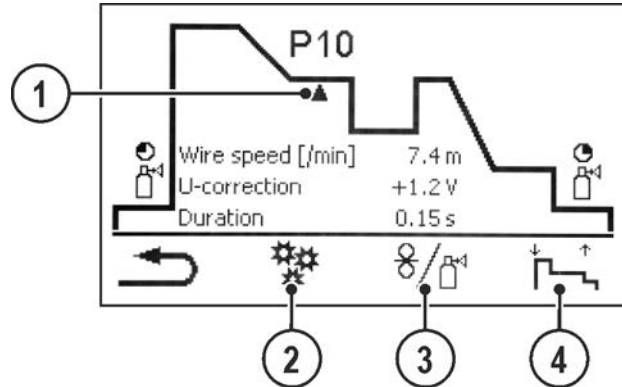


Figure 5-19

| Item | Symbol | Description |
|------|--------|--|
| 1 | ▲ | Parameter position Displays the currently selected welding parameters in the functional sequence |
| 2 | ⚙️ | Advanced settings Display and setting of advanced process parameters |
| 3 | 🔧/🔩 | Setup mode > see 5.6.6 chapter |
| 4 | ⬇️/⬆️ | Operating mode setting |

5.6.5 Programs (P_A 1-15)

In the manual program P0, the user can adjust the operating point in a conventional way using the parameter settings on the machine control. The active program is shown in the main menu of the machine display in the display area for process parameters with the letter "P" and the corresponding program number.

Different welding tasks or positions on a workpiece require different welding power values (operating points) or parameter settings. These settings can be stored in up to 15 programs (P1 to P15) and recalled, as needed, at the machine control or a suitable accessory component (e.g. welding torch).

Welding parameters for program 0 (P0) are changed for decompact machine systems at the machine control of the wire feeder (factory setting). To change the parameters using the Expert 2.0 machine control, the parameter "P0 changeable by Expert 2.0" must be set to "Yes" > see 5.4.6 chapter.

Welding parameters for programs 1 - 15 can be changed on any control connected in the system.

The following parameters and their values are stored in each program:

- Wire feed speed and voltage correction (welding power)
- Operating mode, welding type, dynamics and setting superPuls

Changes to the parameter settings are stored in the selected program without further prompt.

Selection

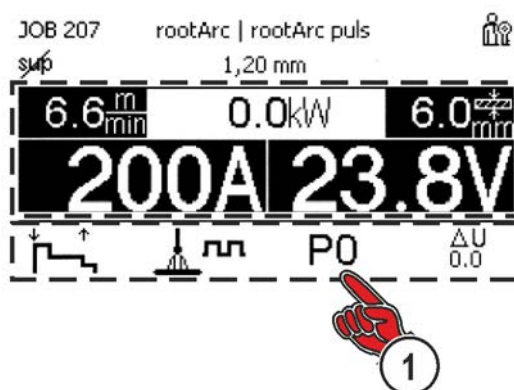


Figure 5-20

5.6.5.1 Overview of the welding parameter switching options

The user can change the welding parameters of the main programs with the following components.

| | Program switching | JOB switching | Process switching | Welding type | Program | Operating mode | Wire feed speed | Voltage correction | Dynamics |
|--|-------------------|---------------|-------------------|--------------|---------|----------------|-----------------|--------------------|----------|
| M3.7 – I/J Wire feeder control | | | ✓ | | P0 | | | ✓ | |
| | | | | | P1-15 | | | ✓ | |
| PC 300.NET Software | | ✗ | ✓ | | P0 | ✓ | | ✗ | |
| | | | | | P1-15 | | | ✓ | |
| MT Up/Down Welding torch | ✓ | | ✗ | | P0 | ✗ | ✓ | | ✗ |
| | | | | | P1-9 | ✗ | ✗ | | ✗ |
| MT 2 Up/Down Welding torch | | ✓ | ✗ | | P0 | ✗ | ✓ | | ✗ |
| | | | | | P1-15 | ✗ | ✗ | | ✗ |
| MT PC 1 Welding torch | ✓ | | ✗ | | P0 | ✗ | ✓ | | ✗ |
| | | | | | P1-15 | ✗ | ✗ | | ✗ |
| MT PC 2 Welding torch | | ✓ | ✗ | | P0 | ✗ | ✓ | | ✗ |
| | | | | | P1-15 | ✗ | ✗ | | ✗ |
| PM 2 Up/Down Welding torch | | ✓ | ✗ | | P0 | ✗ | ✓ | | ✗ |
| | | | | | P1-15 | ✗ | ✗ | | ✗ |
| PM RD 2 Welding torch | | ✓ | ✗ | | P0 | ✗ | ✓ | | ✗ |
| | | | | | P1-15 | ✗ | ✗ | | ✗ |
| PM RD 3 Welding torch | ✓ | ✗ | ✓ | | P0 | | | | |
| | | | | | P1-15 | | ✓ | | |

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

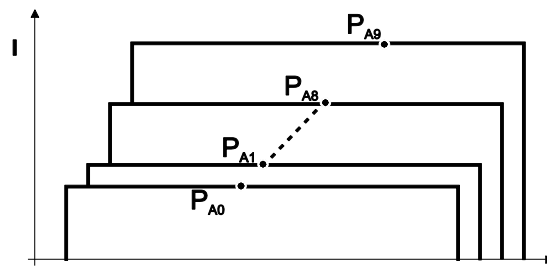


Figure 5-21

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

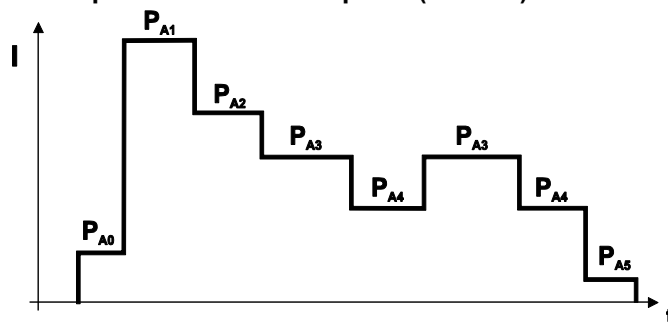


Figure 5-22

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

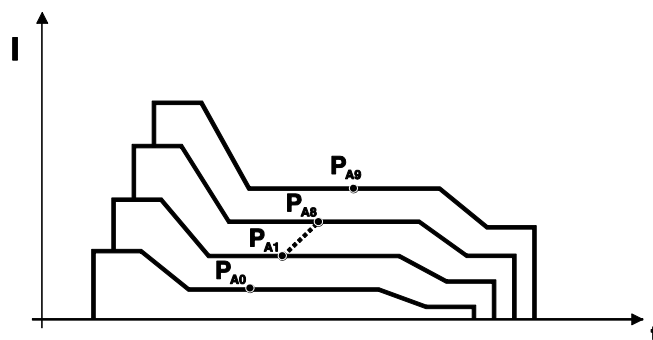


Figure 5-23

5.6.5.2 MIG/MAG welding

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.

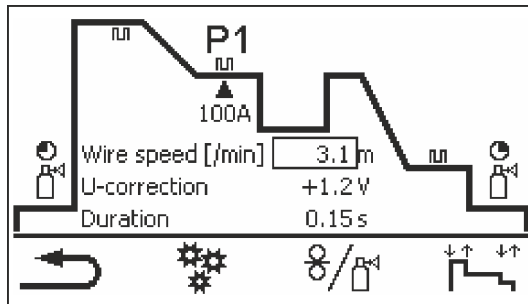


Figure 5-24

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 configured using absolute values, if desired (see Absolute value set point). > see 5.6.9 chapter.

| Menu item/parameter | Program | Comment |
|---------------------|-------------|---|
| Gas pre-flow time | | |
| Gas nominal value | | GFE option/variant (electronic gas volume control) required |
| WF relative | P_{START} | Wire feed speed, relative |
| Duration | | Duration (start program) |
| U correction | | Arc length correction |
| Slope time | | Slope duration from P_{START} to P_A |
| WF (/min.) | P_A | Wire feed speed, absolute |
| U correction | | Arc length correction |
| Duration | | Duration (spot time and superPuls time) |
| Slope time | | Slope duration from P_A to P_B |
| WF relative | P_B | Wire feed speed, relative |
| Duration | | Duration (reduced main program) |
| U correction | | Arc length correction, relative |
| Slope time | | Slope duration from P_B to P_A |
| Slope time | | Slope duration from P_B to P_{END} |
| WF relative | P_{END} | Wire feed speed, relative |
| Duration | | Duration (end program) |
| U correction | | Arc length correction, relative |
| Wire burn-back | | |
| Gas post-flow time | | |

5.6.5.3 Advanced settings

| Menu item/parameter | Value | Comment |
|----------------------------------|---------------|---|
| Process switching | Off | |
| | On | |
| Start program pulsing | Off | |
| | On | |
| End program pulsing | Off | |
| | On | |
| Wire retraction ignition | Off | |
| | Lift arc (PP) | |
| | Lift arc | |
| End pulse duration | 0.0–20 ms | |
| U correction limit | 0.0–9.9 V | Applies with correction operation enabled |
| Wire correction limit | 0–30% | |
| N cycle program limit | Off | |
| | 1-15 | |
| Slope between programs (/100 ms) | Off | |
| | 0.1–2.0 m/min | |
| waveArc | Off | |
| | On | |

5.6.5.4 TIG welding

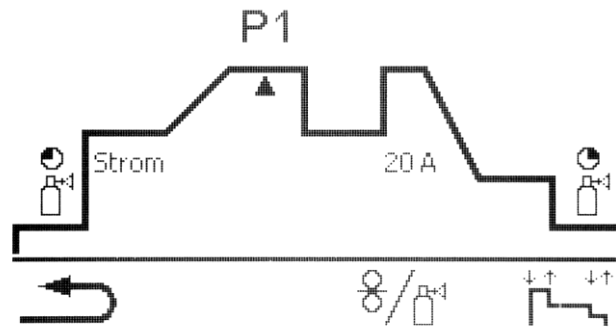


Figure 5-25

| Menu item/parameter | Program | Comment |
|---------------------|-------------|---|
| Gas pre-flow time | | |
| Gas nominal value | | GFE option/variant (electronic gas volume control) required |
| Current | P_{START} | Ignition current |
| Duration | | Duration (start program) |
| Slope time | | Slope duration from P_{START} to P_A |
| Current | P_A | Welding current, absolute |
| Duration | | Pulse time (superPuls) |
| Slope time | | Slope duration from P_A to P_B |
| Current | P_B | Welding current |
| Duration | | Pulse pause time (superPuls) |
| Slope time | | Slope duration from P_B to P_A |
| Slope time | | Slope duration from P_A to P_{END} |
| Current | P_{END} | Welding current |
| Duration | | |
| Gas post-flow time | | |

5.6.5.5 MMA welding

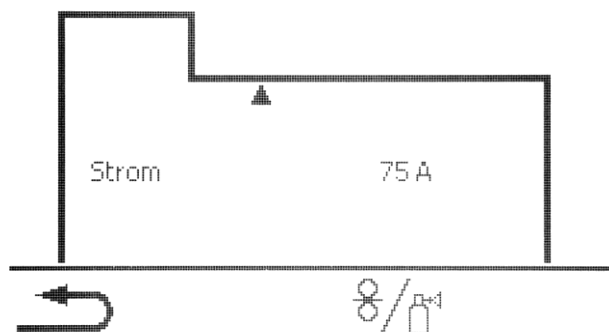


Figure 5-26

| Menu item/parameter | Comment |
|---------------------|-------------------|
| Current | Hot start current |
| Duration | Hot start time |
| Current | Main current |

The hotstart current is a percentage based on the welding current selected.

5.6.6 Setup mode

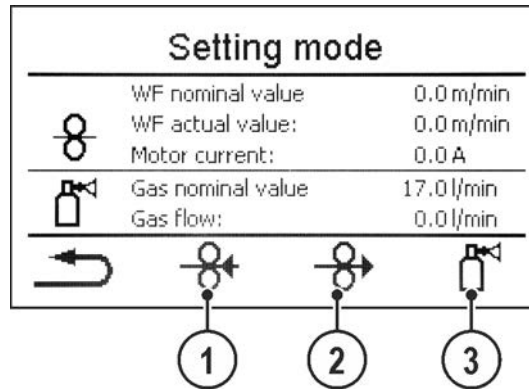


Figure 5-27

| Item | Symbol | Description |
|------|--------|---|
| 1 | | Wire return Results in reverse inching of the wire. Pressing the push-button longer will increase the wire reversing speed. |
| 2 | | Wire inching The wire is inched into the hose package. Pressing the push-button longer will increase the wire inching speed. |
| 3 | | Push-button, gas test/purge hose package <ul style="list-style-type: none"> ----- Gas test: Shielding gas (symbol flashes slowly) will flow for approximately 20 seconds after pressing the push-button once. Press the button again to cancel the process early. ----- Purge hose package: Press push-button for about 5 sec: Shielding gas flows permanently (max 300 s) until the Gas test push-button is pressed again (shielding gas flashes fast). |

All functions run without current (set-up phase). This provides a high degree of safety for the welder, since the arc cannot be inadvertently ignited. The following parameters can be monitored during the wire configuration:

| Menu item/parameter | Value | Comment |
|---------------------|-----------|---|
| WF nominal value | 0.0 m/min | only if the control is integrated in the wire feeder |
| WF actual value | 0.0 m/min | |
| Motor current | 0.0 A | |
| Gas nominal value | 0.0 l/min | GFE option/variant (electronic gas volume control) required |
| Gas flow | 0.0 l/min | |

5.6.7 WPQR welding data assistant

The cooling-down time from 800°C to 500°C essential for the welding result (known also as t8/5 time) can be calculated using the input data in the WPQR welding data assistant. Prerequisite is the prior determination of the heat input. Upon input of the values, the valid t8/5 time is displayed with a black background.

| Menu item/parameter | Value | Comment |
|-------------------------|-------------------|---------|
| Weld length: | 1.0-999.9 cm | |
| Welding speed: | 1.0-999.9 cm/min. | |
| Thermal efficiency: | 10-100% | |
| Heat input: | kJ/mm | |
| Preheating temperature: | 0-499 °C | |
| Material thickness: | 1.0-999.9 mm | |
| Weld seam factor: | 0.01-1.5 | |
| Transition thickness: | mm | |
| t8/5-time: | s | |

5.6.8 Welding monitoring

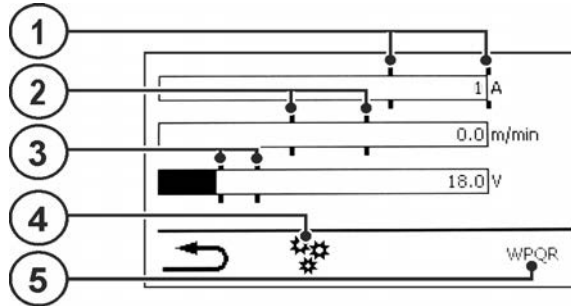


Figure 5-28

| Item | Symbol | Description |
|------|--------|--|
| 1 | | Current tolerance |
| 2 | | WF tolerance |
| 3 | | Voltage tolerance |
| 4 | | Advanced settings Display and setting of advanced system parameters |
| 5 | WPQR | WPQR welding data assistant |

| Menu item / parameter | Value | Comment |
|-----------------------------------|-------------|---|
| Automatic | No | |
| | Yes | The welding monitoring window opens automatically from the main screen after a welding start. A rotary knob actuation automatically switches back to the main window. |
| Errors and warnings | Off | |
| | Warnings | Exceeding a tolerance limit for the duration of the tolerance response time triggers warning 12. |
| | Error | Exceeding a tolerance limit for the duration of the tolerance response time triggers error 61. Please note: Error leads to immediate stop of the ongoing welding! |
| Voltage tolerance | 0-100 % | |
| Current tolerance | 0-100 % | |
| Tolerance response time | 0.00-20.0 s | For voltage and current tolerance |
| Wire feeder tolerance | 0-100 % | |
| Maximum permissible motor current | 0.0-5.0 A | |
| Tolerance response time | 0.00-20.0 s | For WF tolerance and motor current |

5.6.9 JOB display setting

| Menu item/parameter | Value | Comment |
|---------------------------|-------------|---|
| Text for material: | Standard | |
| | Alternative | |
| Text for gas: | Standard | |
| | Alternative | |
| Absolute value set point: | Yes | Ignition current, secondary current and end current are set and displayed as absolute values |
| | No | Ignition current, secondary current and end current are defined and displayed as a percentage of program A (ex works) |

5.7 Change welding procedure (Arc)

In this menu the user can change the welding procedure based on the preselected material, wire and gas (change of process based on welding task).

For changing the welding task (JOB) > see 5.6 chapter

Enter the menu:



Figure 5-29

5.8 Online data transfer (network)

For machine variants with network capability (LG/WLG) only!

The network is used to transfer welding data from manual, automated and welding machines. It can include as many welding machines and computers as require and the collected data can be retrieved from one or several server PCs.

The Xnet software allows the user to monitor all welding parameters in real time and/or to subsequently analyse the saved welding data. The results can be used for process optimisation, welding calculations or checking welding wire batches.

Depending on the welding machine the data are transferred to the server via LAN/WiFi and can then be accessed in a browser window. The user interface and web-based design of the software offer the possibility to analyse and monitor the welding data via a tablet PC.

5.8.1 Wired local network (LAN)

| Status description | Status display |
|--|---|
| No physical connection to a network | Deactivated LAN symbol |
| Connection to the network, the machine has been configured, no data transfer | Activated LAN symbol |
| Connection to the network, the machine has been configured and transfers data | LAN symbol flashing |
| Connection to the network, the machine has been configured and tries to connect to the data server | LAN symbol flashing in the specified rhythm |

5.8.2 Wireless local network (WiFi)

| Status description | Status display |
|--|---|
| No physical connection to a network | Deactivated WiFi symbol |
| Connection to a network, no data transfer | Activated WiFi symbol |
| Connection to a network, transferring data | WiFi symbol flashing |
| Connection to the network, the machine has been configured and tries to connect to the data server | LAN symbol flashing in the specified rhythm |

6 Welding procedure

The welding task is selected in the JOB selection menu (material/wire/gas) > see 5.6.1 chapter.

The basic settings of the relevant welding procedure, such as operating mode or arc length correction, can be selected on the main screen on the process parameter panel > see 4.3.2 chapter.

The program sequence settings are set in the program sequence menu > see 5.6.4 chapter.

6.1 MIG/MAG welding

6.1.1 Welding type

Different forms of MIG/MAG processes are referred to as welding type.

Standard (Welding with standard arc)

Depending on the set combination of wire feed speed and arc voltage, the arc types short arc, transitional arc or spray arc can be used for welding.

Pulse (Welding with pulsed arc)

A targeted change in the welding current generates current pulses in the arc, which lead to a 1 drop per pulse of material transfer. The result is an almost spatter-free process, suitable for welding of all materials, in particular high-alloy CrNi steels or aluminium.

Positionweld (Positional welding)

A combination of the pulse/standard or pulse/pulse welding types, which is particularly suitable for positional welding due to factory-optimized parameters.

6.1.1.1 Welding power (operating point)

The welding power is adjusted according to the principle of one-knob operation. The user can set their operating point optionally as wire feed speed, welding current or material thickness. The optimum welding voltage for the operating point is calculated and set by the welding machine. If necessary, the user can correct this welding voltage > see 6.1.1.3 chapter.

Application example (setting via material thickness)

The required wire feed speed is not known and is to be determined.

- Select welding task JOB 76(> see 5.6 chapter): material = AlMg, gas = Ar 100%, wire diameter = 1.2 mm.
- Switch the display to material thickness.
- Measure the material thickness (workpiece).
- Set the measured value, e.g. 5 mm, at the machine control.
This set value corresponds to a specific wire feed speed. Switching the display to this parameter will show the associated value.

In this example, a material thickness of 5 mm corresponds to a wire feed speed of 8.4 m/min.

The material thickness details in the welding programs generally refer to fillet welds in the PB welding position. They should be regarded as guideline values and may differ in other welding positions.

6.1.1.2 Accessory components for operating point setting

The operating point can be set at various accessory components as well, such as remote control, special welding torches or robot and industrial bus interfaces (optional interface for automated welding required, not available for all machines of this series).

See the operating instructions for the machine in question for a more detailed description of the individual machines and their functions.

6.1.1.3 Arc length

When required, the arc length (welding voltage) can be adjusted for the welding task in hand by +/- 9.9 V.

6.1.1.4 Arc dynamics (choke effect)

This function can be used to adjust the arc between a narrow, hard arc with deep penetration (positive values) and a wide and soft arc (negative values). In addition, the selected settings are displayed with signal lights below the rotary knobs.

6.1.1.5 superPuls

In superPuls mode, the program toggles between the main program (PA) and the reduced main program (PB). This function is e.g. used for thin sheet welding to reduce the heat input in a controlled manner or for positional welding without the need for weaving.

The combination of superPuls and other EWM welding processes offers a multitude of possibilities. For example, to enable the welding of vertical-up welds without the "Christmas tree" technique, when selecting program 1 > see 5.6.5 chapter the relevant superPuls variant (depending on the material) is activated as well. The required superPuls parameters are defined ex works.

The welding power 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 toggled using special parameter P19, > see 5.4.4.4 chapter.

6.1.2 Operating modes

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).

6.1.2.1 Explanation of signs and functions

| Symbol | Meaning |
|---|---|
|  | Press torch trigger |
|  | Release torch trigger |
|  | Tap torch trigger (press briefly and release) |
|  | Shielding gas flowing |
| I | Welding output |
|  | Wire electrode is being conveyed |
|  | Wire creep |
|  | Wire burn-back |
|  | Gas pre-flows |
|  | Gas post-flows |
|  | Non-latched |
|  | Special, non-latched |
|  | Latched |
|  | Special, latched |
| t | Time |
| P _{START} | Ignition program |
| P _A | Main program |
| P _B | Reduced main program |
| P _{END} | End program |
| t2 | Spot time |

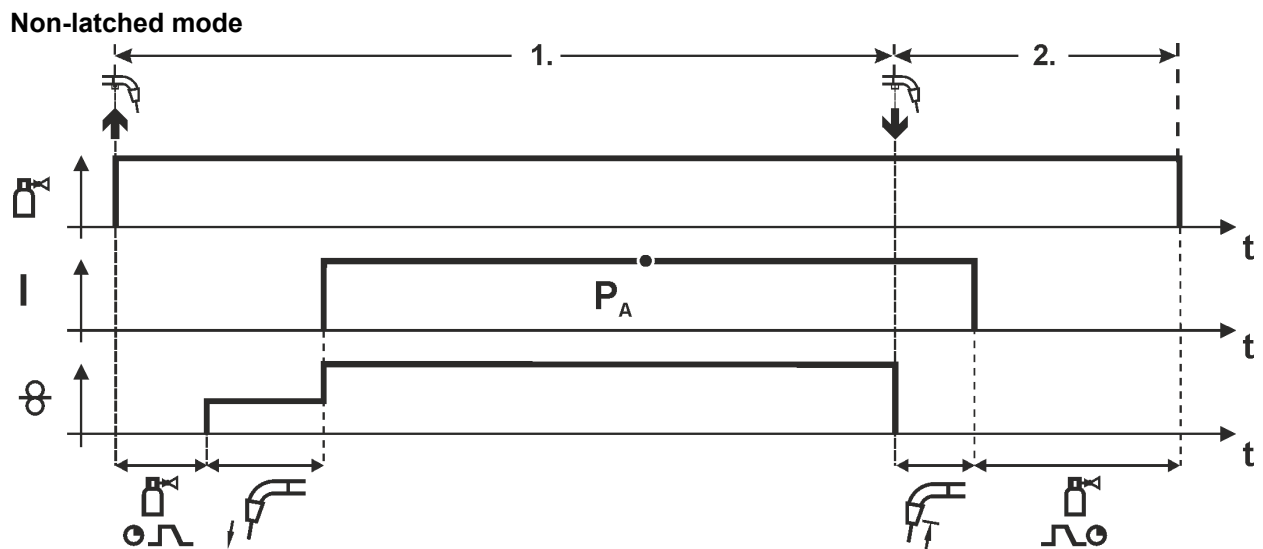


Figure 6-1

Step 1

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

Step 2

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

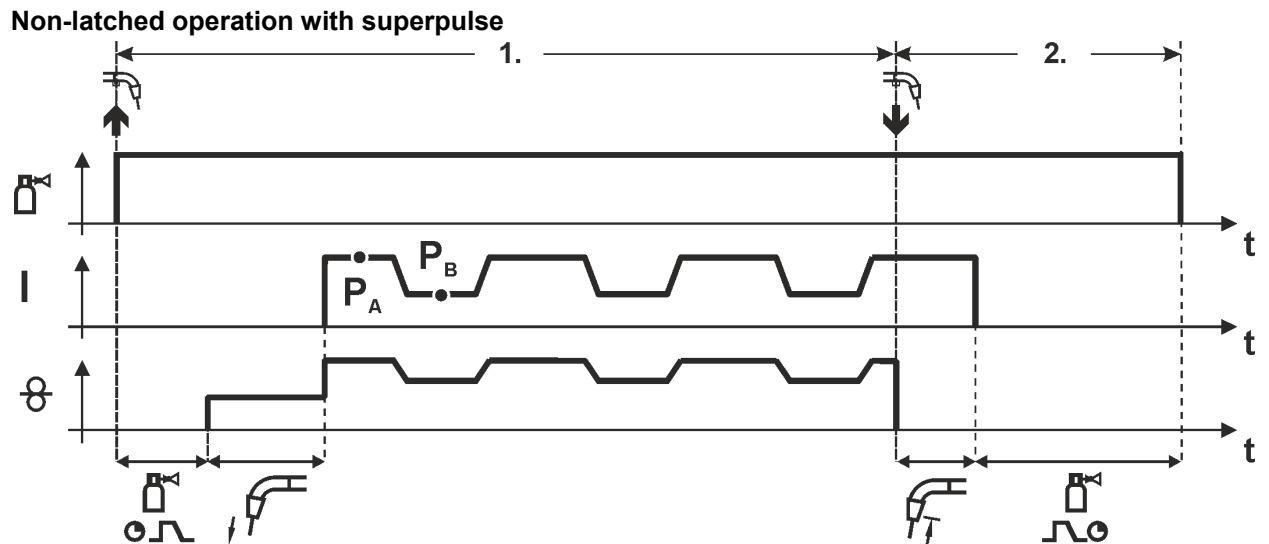


Figure 6-2

Step 1

- Press and hold torch trigger.
- Shielding gas is expelled (gas pre-flows).
- Wire feed motor runs at “creep speed”.
- Arc ignites after the wire electrode makes contact with the workpiece; welding current flows.
- Start the super pulse function beginning with main program P_A :
The welding parameters change at the specified times between main program P_A and the reduced main program P_B .

Step 2

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

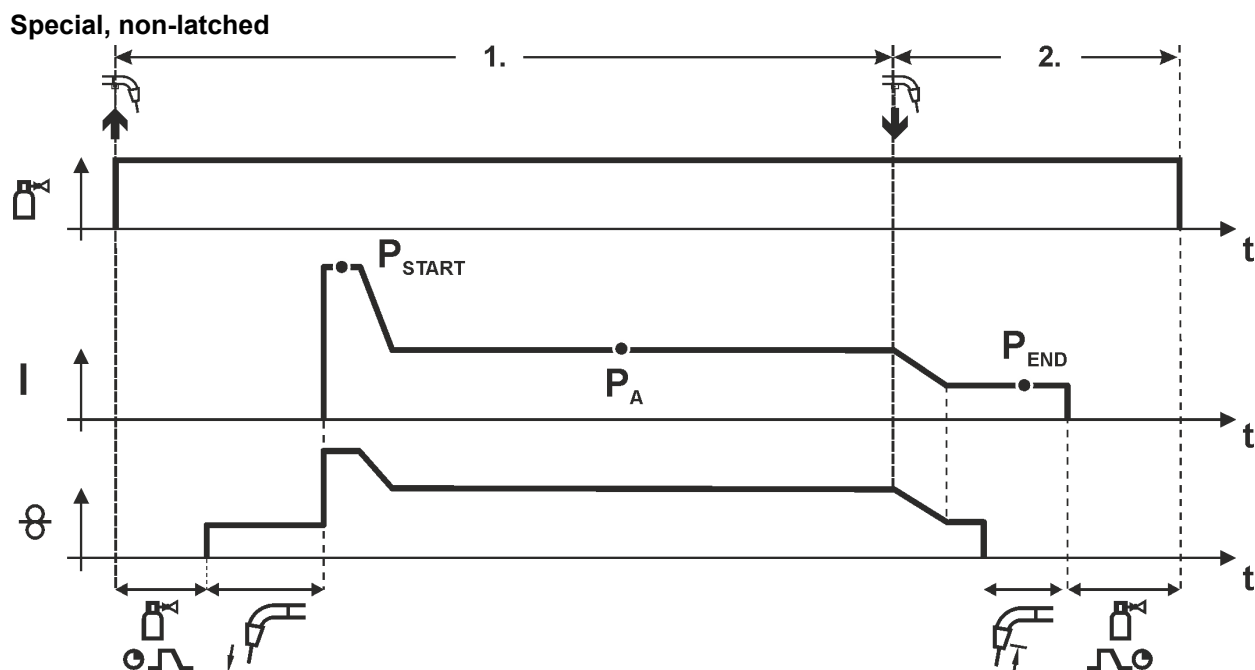


Figure 6-3

Step 1

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at “creep speed”.
- Arc ignites after the wire electrode makes contact with the workpiece, welding current is flowing (start program P_{START} for the time t_{start})
- Slope to main program P_A .

Step 2

- Release torch trigger
- Slope to end program P_{END} for the time t_{end} .
- WF motor stops.
- Arc is extinguished after the preselected wire burn-back time expires.
- Gas post-flow time elapses.

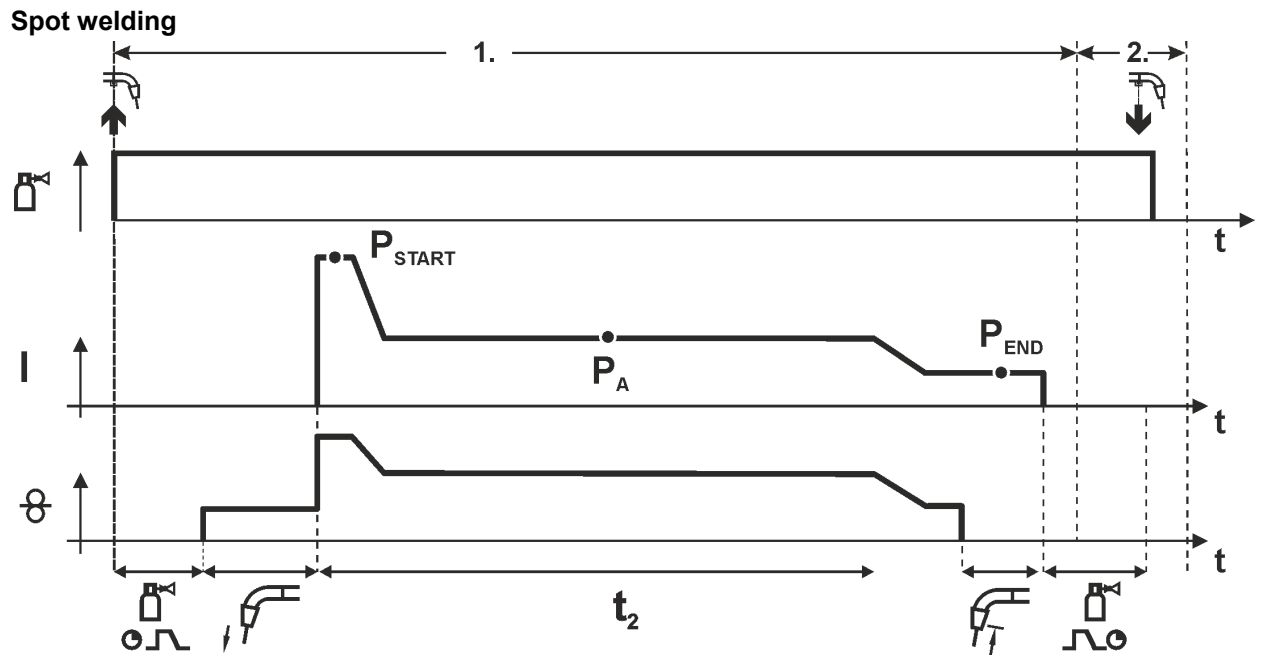


Figure 6-4

The ignition time t_{start} must be added to the spot time t_2 .

1st cycle

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at "creep speed"
- Arc ignites after the wire electrode makes contact with the workpiece, welding current is flowing (start program P_{START} , spot time starts)
- Slope to main program P_A
- After the set spot time elapses, slope goes to end program P_{END} .
- Wire feed motor stop welding.
- Arc is extinguished after the pre-selected wire burn-back time elapses
- Gas post-flow time elapses.

2nd cycle

- Release torch trigger

Releasing the torch trigger (step 2) interrupts the welding process even if the spot time has not yet elapsed (slope to end program P_{END}).

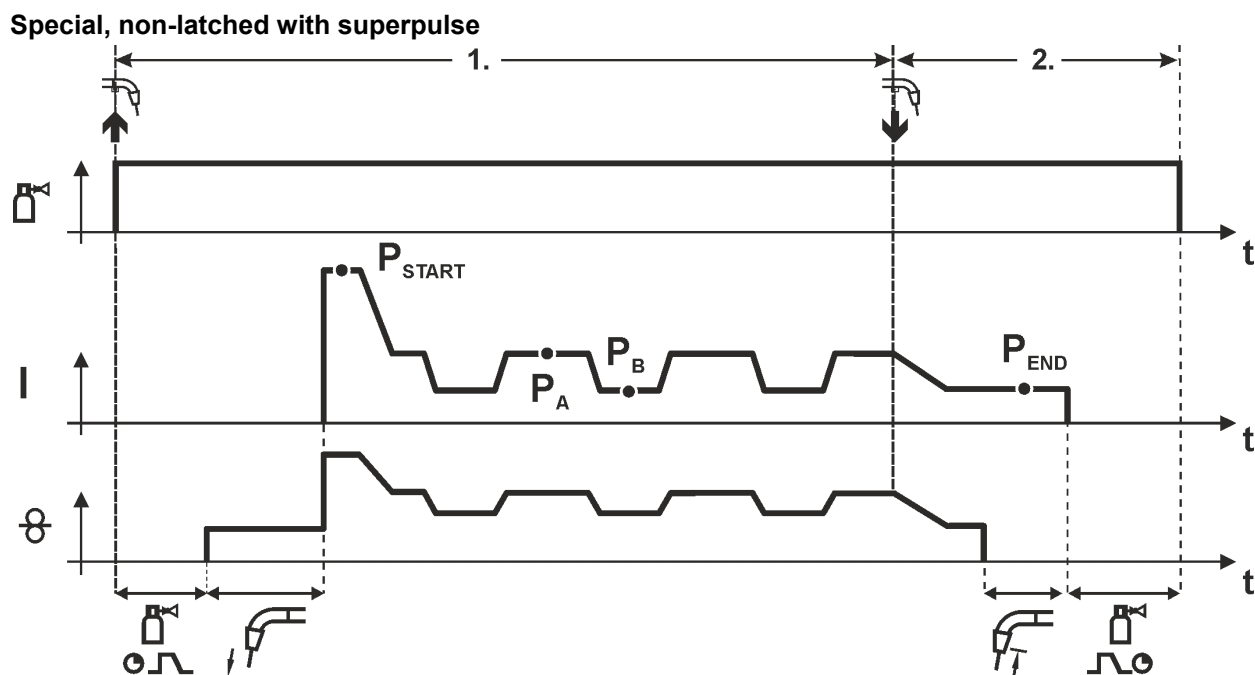


Figure 6-5

Step 1

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at “creep speed”.
- Arc ignites after the wire electrode makes contact with the workpiece, welding current 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 change at the specified times between main program P_A and the reduced main program P_B .

Step 2

- Release torch trigger
- Super pulse function is ended.
- Slope to end program P_{END} for the time t_{end} .
- WF motor stops.
- Arc is extinguished after the preselected wire burn-back time expires.
- Gas post-flow time elapses.

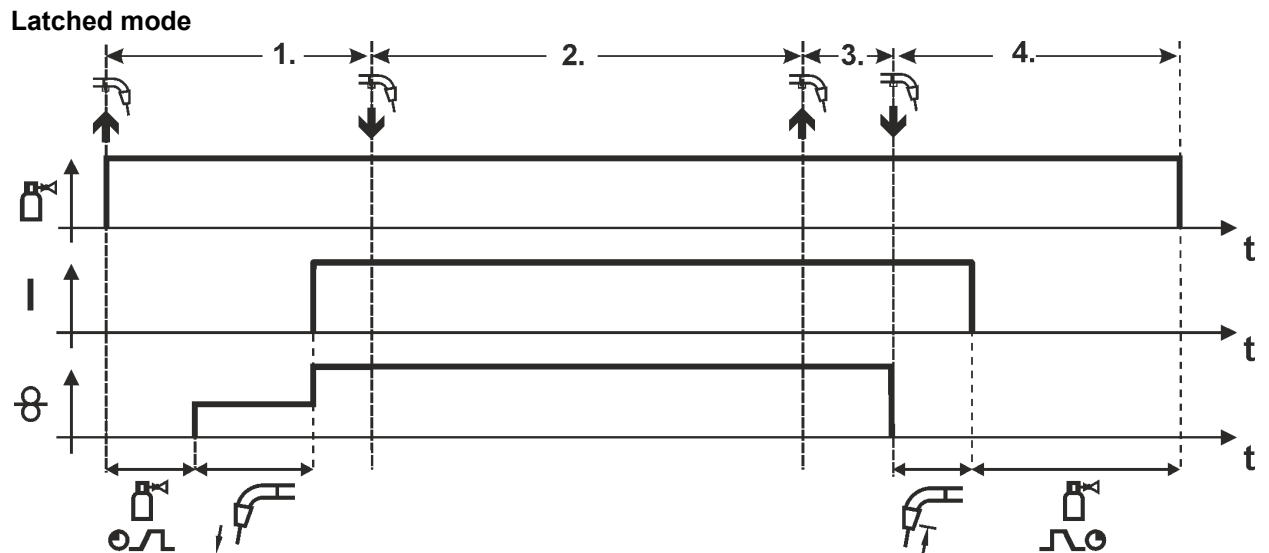


Figure 6-6

Step 1

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

Step 2

- Release torch trigger (no effect)

Step 3

- Press torch trigger (no effect)

Step 4

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

Latched mode with superpulse

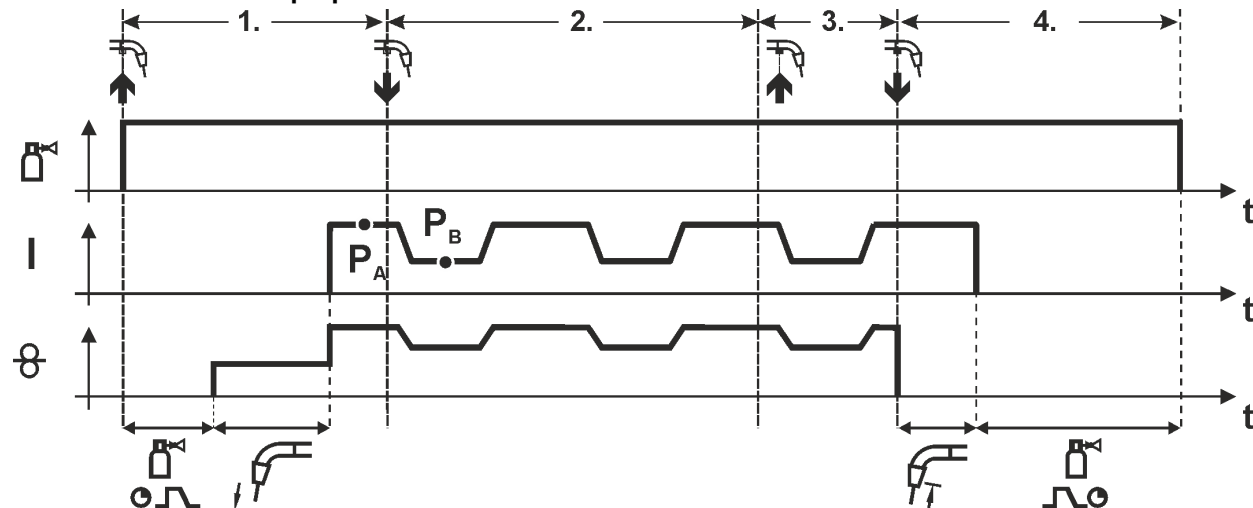


Figure 6-7

Step 1:

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at “creep speed”.
- Arc ignites after the wire electrode makes contact with the workpiece; welding current flows.
- Start the super pulse function beginning with main program P_A .
The welding parameters change at the specified times between main program P_A and the reduced main program P_B .

Step 2:

- Release torch trigger (no effect)

Step 3:

- Press torch trigger (no effect)

Step 4:

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

Latched with changing welding method (process switching)

Exclusively for devices with pulsed arc welding type > see 3.1 chapter.

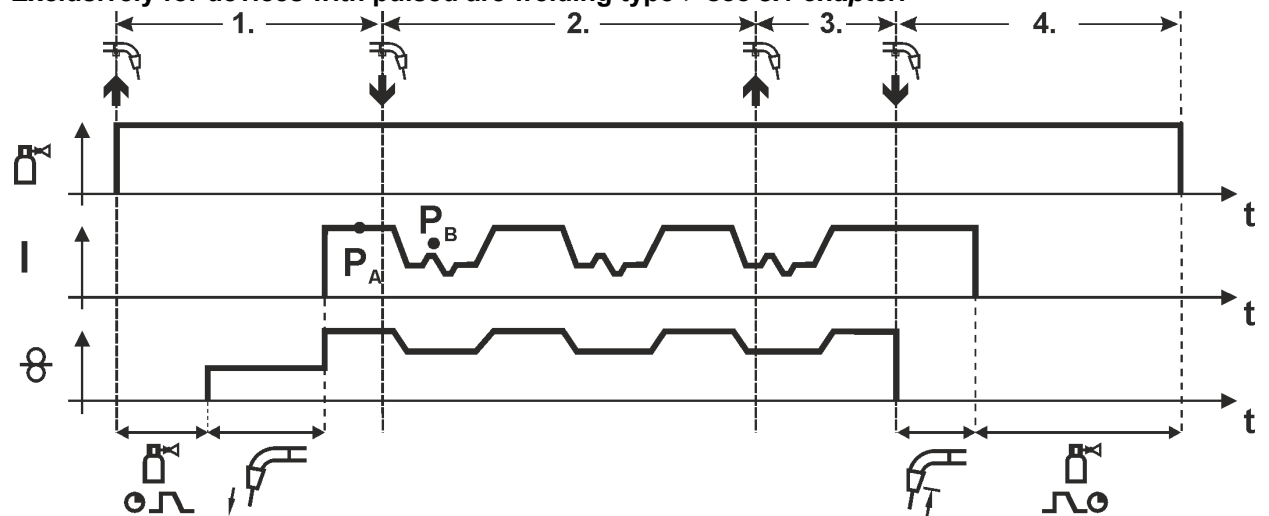


Figure 6-8

1st cycle:

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at "creep speed"
- Arc ignites after the wire electrode makes contact with the workpiece; welding current flows
- Start the process alternation starting with process P_A :
The welding processes alternate between the process P_A stored in the JOB and the opposite process P_B at the specified times (t_2 and t_3)

If a standard process is stored in the JOB, this means that there is a permanent alternation between the processes, starting with the standard process and followed by the pulse process. The same applies if the situation is reversed.

2nd cycle:

- Release torch trigger (no effect)

3rd cycle:

- Press torch trigger (no effect)

4th cycle:

- Release torch trigger
- Super pulse function is ended
- WF motor stops
- Arc is extinguished after the pre-selected wire burn-back time elapses
- Gas post-flow time elapses

This function can be activated using the PC300.NET software.

Refer to the software operating instructions.

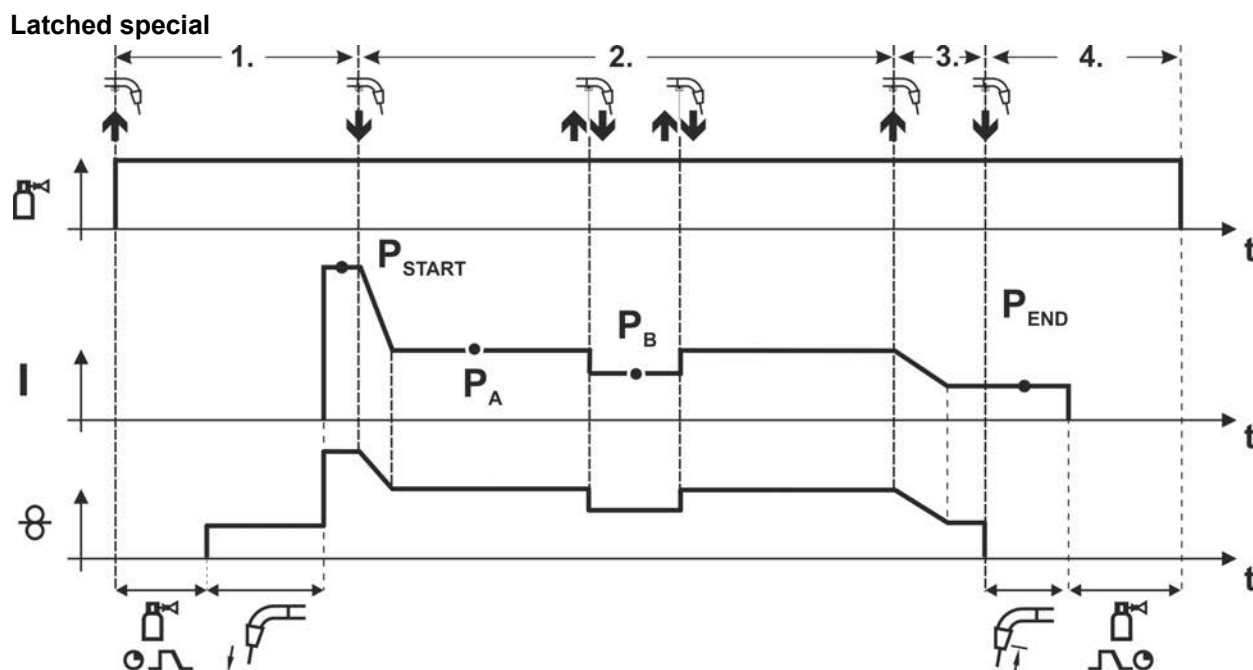


Figure 6-9

Step 1

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at “creep speed”.
- Arc ignites after the wire electrode makes contact with the workpiece, welding current is flowing (start program P_{START})

Step 2

- Release torch trigger
- Slope to main program P_A .

The slope on main program P_A is given at the earliest after the set time t_{START} elapses and at the latest when the torch trigger is released.

Tapping¹⁾ can be used to change over to the reduced main program P_B .

Repeated tapping will switch back to the main program P_A .

Step 3

- Press and hold torch trigger
- Slope to end program P_{END} .

Step 4

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

¹⁾ Prevent tapping (brief press and release within 0.3 seconds)

If the welding current is to be prevented from switching over to the reduced main program P_B by tapping, the parameter value for WF3 needs to be set to 100% ($P_A = P_B$) in the program sequence.

Special latched with changing welding method by tapping (process switching)

Exclusively for devices with pulsed arc welding type > see 3.1 chapter.

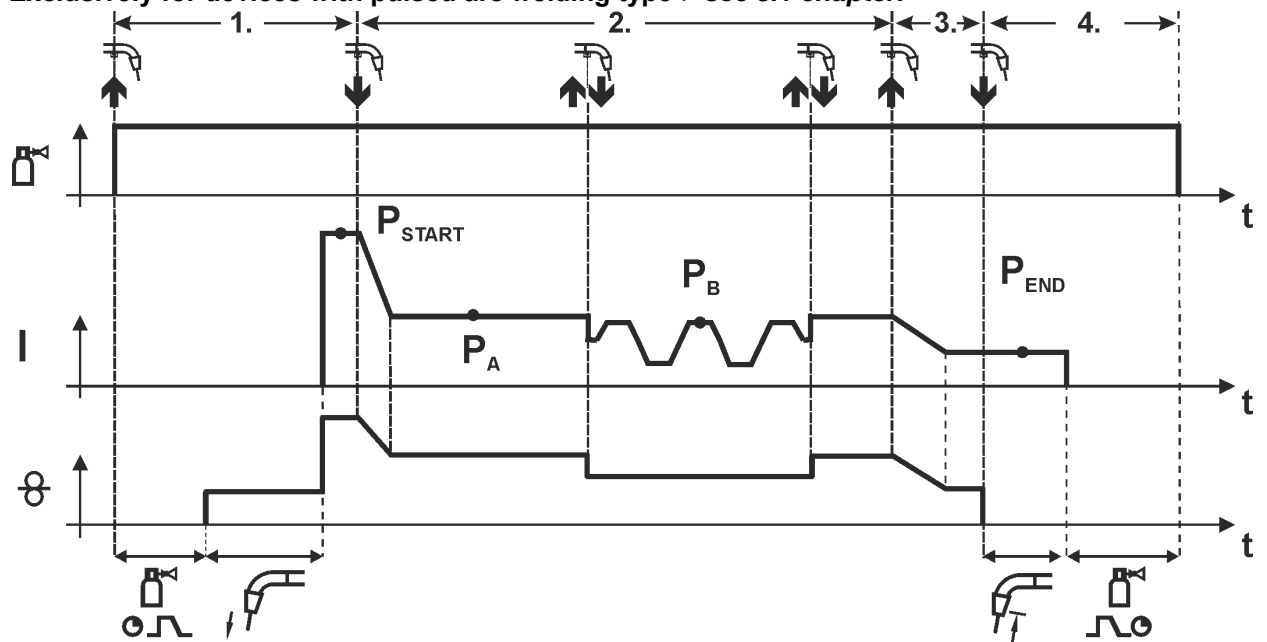


Figure 6-10

1st cycle

- Press and hold torch trigger.
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at "creep speed"
- Arc ignites after the wire electrode makes contact with the workpiece, welding current is flowing (start program P_{START})

2nd cycle

- Release torch trigger
- Slope on main program P_A

The slope on main program P_A is given at the earliest after the set time t_{START} elapses and at the latest when the torch trigger is released.

Tapping (pressing the torch trigger for less than 0.3 sec.) changes over the welding process (P_B).

If a standard process has been defined in the main program, tapping changes to the pulse process, and tapping again will return to the standard process, etc.

3rd cycle

- Press and hold torch trigger
- Slope to end program P_{END}

4th cycle

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

This function can be activated using the PC300.NET software.

Refer to the software operating instructions.

Special latched with changing welding method (process switching)

Exclusively for devices with pulsed arc welding type > see 3.1 chapter.

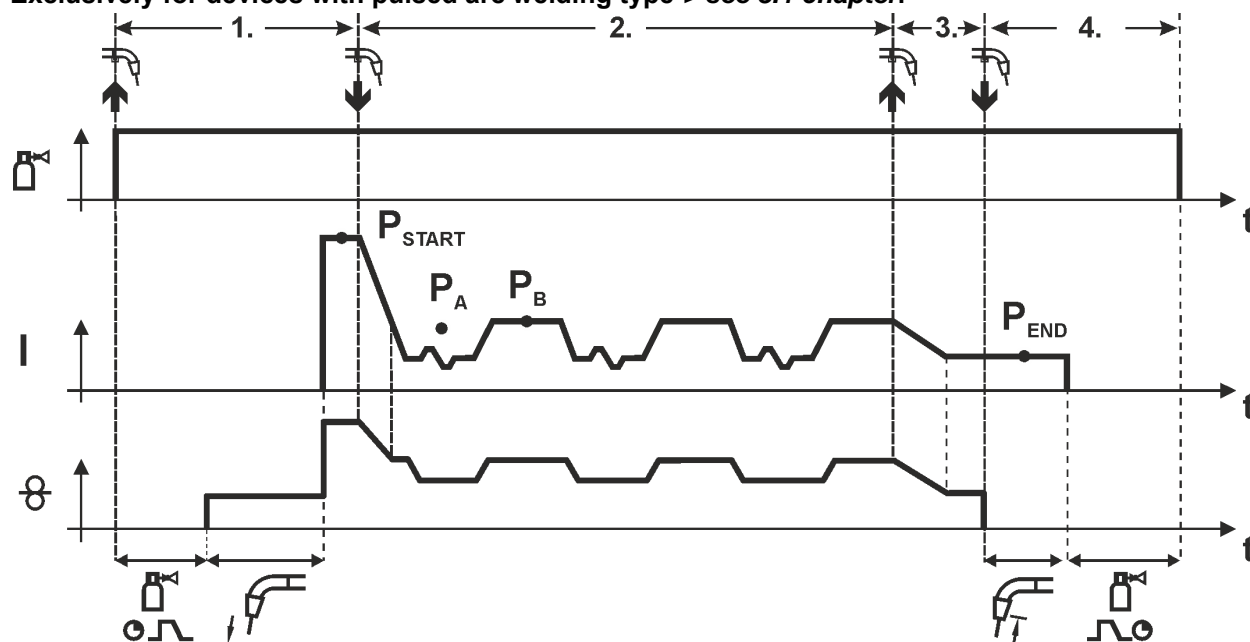


Figure 6-11

1st cycle

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at "creep speed"
- Arc ignites after the wire electrode makes contact with the workpiece, welding current is flowing (start program P_{START} for the time t_{start})

2nd cycle

- Release torch trigger
- Slope on main program P_A
- Start the process alternation starting with process P_A :
The welding processes alternate between the process P_A stored in the JOB and the opposite process P_B at the specified times (t_2 and t_3)

If a standard process is stored in the JOB, this means that there is a permanent alternation between the processes, starting with the standard process and followed by the pulse process. The same applies if the situation is reversed.

3rd cycle

- Press the torch trigger
- Super pulse function is ended
- Slope in the end program P_{END} for the time t_{end}

4th cycle

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

This function can be activated using the PC300.NET software.

Refer to the software operating instructions.

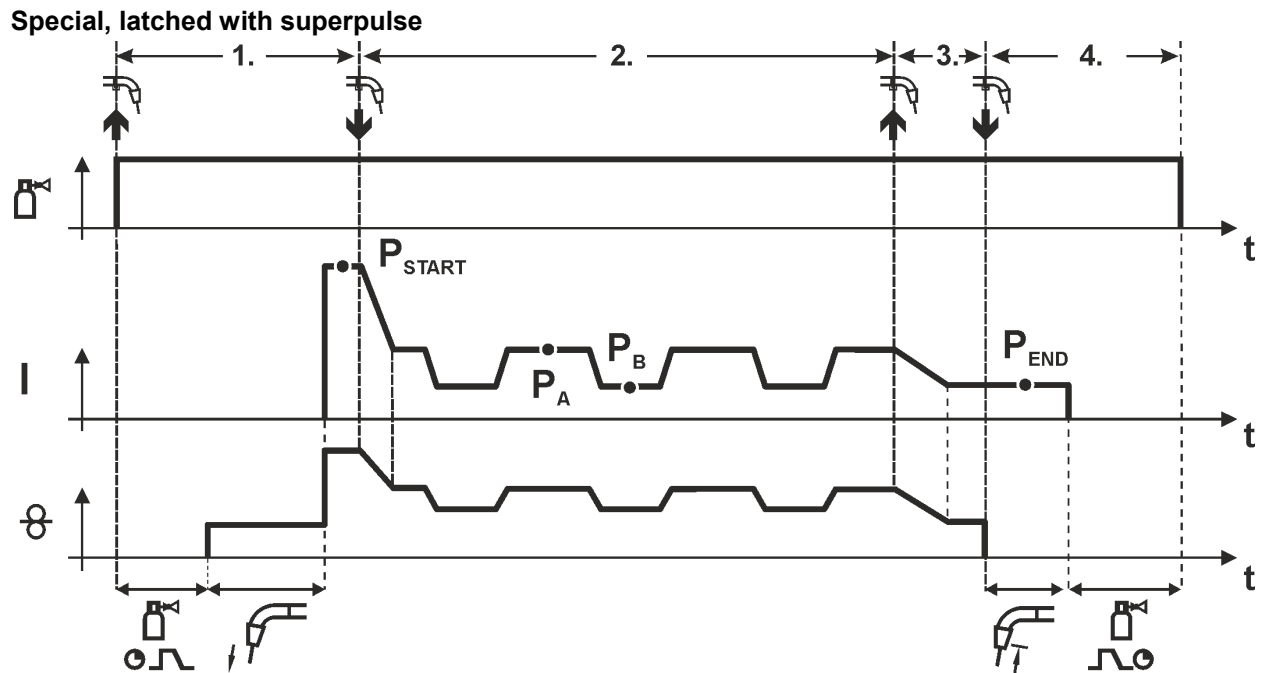


Figure 6-12

Step 1

- Press and hold torch trigger
- Shielding gas is expelled (gas pre-flows)
- Wire feed motor runs at “creep speed”.
- Arc ignites after the wire electrode makes contact with the workpiece, welding current is flowing (start program P_{START} for the time t_{start}).

Step 2

- Release torch trigger
- Slope on main program P_A .
- Start the super pulse function beginning with main program P_A :
The welding parameters change at the specified times between main program P_A and the reduced main program P_B .

Step 3

- Press the torch trigger.
- Super pulse function is ended.
- Slope in the end program P_{END} for the time t_{end} .

Step 4

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

6.1.2.2 Automatic cut-out

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

- During ignition
5 s after the start of the welding process, no welding current flows (ignition error).
- During welding
The arc is interrupted for more than 5 s (arc interruption).

6.1.3 coldArc XQ / coldArc puls XQ

Heat-reduced, low-spatter short arc for high dimensional stability welding and brazing of thin metal sheets with excellent gap-bridging.



Figure 6-13

After selecting the coldArc process > see 5.6 chapter you benefit from:

- Less distortion and reduced discolouration thanks to minimised heat input
- Considerably reduced spatter thanks to virtually power-free material transfer
- Easy welding of the root passes in all plate thicknesses and in all positions
- Perfect gap bridging even with inconsistent gap widths
- Manual and automated applications

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! (and the operating instructions for the welding torch.)

This function can only be enabled with the PC300.NET software.

(See operating instructions for the software)

6.1.4 forceArc XQ / forceArc puls XQ

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

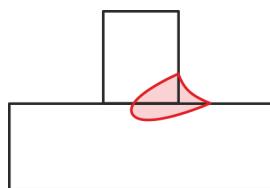


Figure 6-14

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

You can make use of these properties after selecting the forceArc process > see 5.6 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, torch hose packages and, if applicable, intermediate hose packages. Avoid loops!
- Use welding torches, preferably water-cooled, that are suitable for the higher power range.
- Use welding wire with adequate copper coating when welding steel. The wire spool should have layer spooling.

Unstable arc!

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

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

6.1.5 rootArc XQ / rootArc pulse XQ

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



Figure 6-15

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

Unstable arc!

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

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

6.1.6 acArc puls XQ

The alternating current welding process acArc puls XQ makes MIG aluminium welding even easier in manual and automated modes. Clean weld seams with no traces of powder on the thinnest metal sheets, even with AlMg alloys, are possible with acArc puls XQ.

Advantages

- Perfect aluminium welding, especially in thin sheet metal due to directed heat reduction
- Excellent gap bridging, also facilitates automated applications
- Minimised heat input - reduces the risk of burn-through
- Less welding fume emissions
- Clean weld seams due to greatly reduced magnesium burn-off
- Easy and safe handling of the arc for manual and automated welding

A constant change of polarity (see following figure) takes place during the process.

The heat input from the material shifts to the welding consumable and the droplet size increases significantly (compared to the direct current welding process). This ensures excellent bridging of air gaps and reduced welding fume emissions.

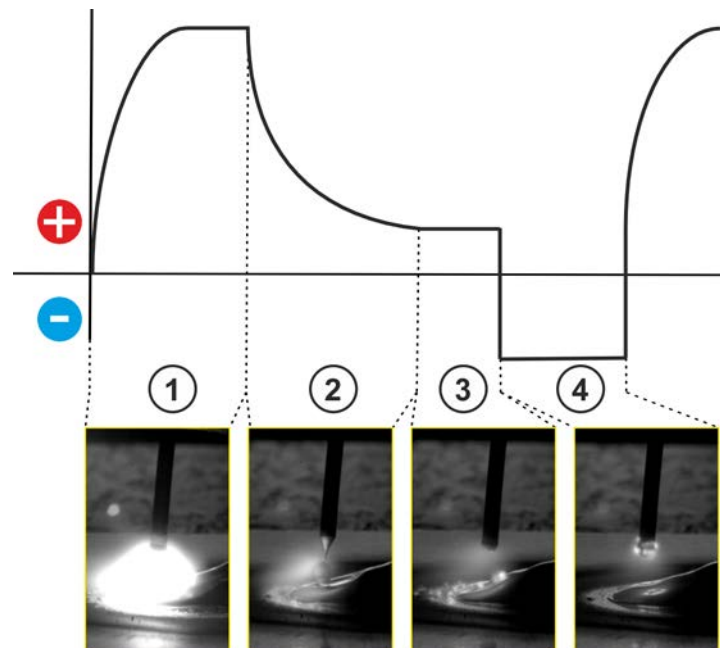


Figure 6-16

| Item | Symbol | Description |
|------|--------|--|
| 1 | | Droplet formation in the pulse phase |
| 2 | | Droplet detachment after the pulse phase |
| 3 | | Fundamental current phase |
| 4 | | Cleaning and preheating the wire in the negative phase |

With the rotary knob “arc dynamics”, the negative phase in the process can be influenced.

| | Setting of the dynamics | Welding properties |
|--|---|---|
| | Left turn (more minus), negative phase gets longer | <ul style="list-style-type: none"> • ----- More power on the wire • ----- Droplet volume increases • ----- Process becomes cooler |
| | Right turn (more plus), negative phase gets shorter | <ul style="list-style-type: none"> • ----- More power on the workpiece • ----- Droplet volume decreases • ----- Process becomes hotter |

The basic requirement for optimum welding results is the application-specific equipment of the wire feed system. For the acArc puls XQ welding process, the entire wire feed system of the Titan XQ AC series is factory-equipped with components for aluminium welding consumables! Recommended system components:

- Power source of type Titan XQ 400 AC puls D
- Wire feeder of type Drive XQ AC
- Welding torch series of type PM 551 W RD3 X Alu

Note the following equipment and setting features of the wire feed system:

- Wire feed rolls (set contact pressure depending on welding consumables and hose package lengths)
- Central torch connection (use guide tube instead of capillary tube)
- Combined liner (PA liner with matching inner diameter for welding consumables)
- Use contact tips with forced contact

6.1.7 wiredArc

Welding process with active wire control for stable and uniform penetration characteristics and perfect arc length stability, even in difficult applications and positional welding.

With a GMAW arc, the welding current (AMP) changes with the change of the stick-out. If, for instance, the stick-out is extended, the welding current decreases at constant wire feed speed (DG). Thus, the heat input into the workpiece (molten metal) decreases and the penetration reduces.

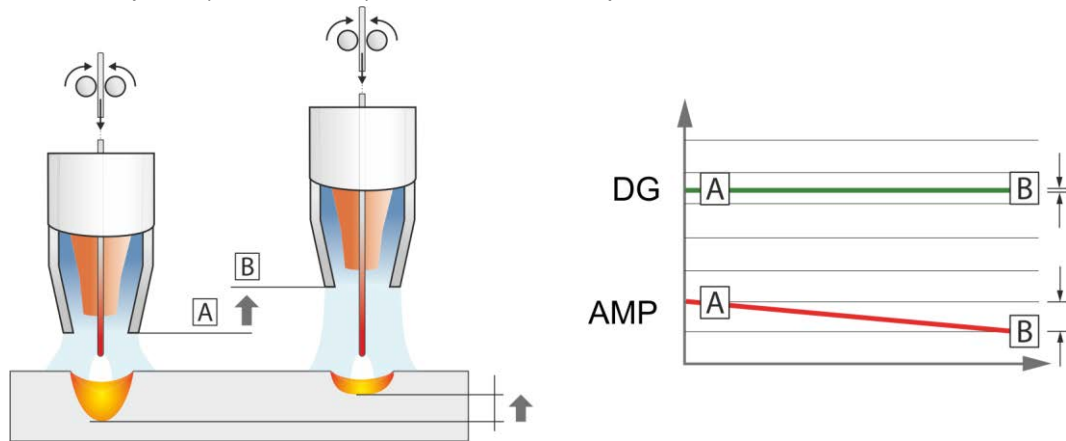


Figure 6-17

With the EWM wiredArc arc with wire control, the welding current (AMP) changes with the change of the stick-out only slightly. The compensation of the welding current takes place with an active control of wire feed speed (DG). If, for instance, the stick-out is extended, the wire feed speed will be increased. Due to this, the welding current remains almost constant and thus the heat input into the workpiece remains almost constant. As a result, the penetration changes with the change of the stick-out only slightly.

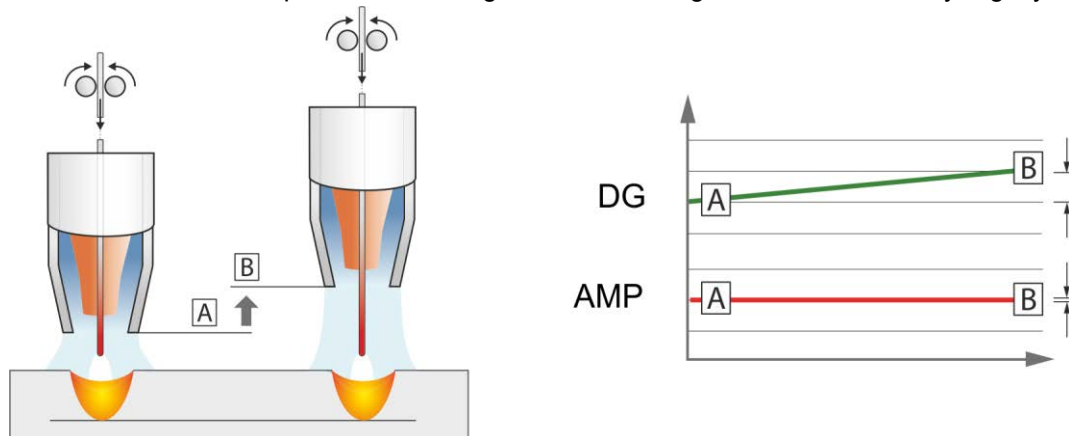



Figure 6-18

6.1.8 Standard MIG/MAG torch

The MIG welding torch trigger is essentially used to start and stop the welding process.

| Operating elements | Functions |
|---|--|
|  Torch trigger | <ul style="list-style-type: none">• Start/stop welding |











Additional functions such as program switching (before or after welding) are possible by tapping the torch trigger (depending on machine type and control configuration).

The following parameters must be configured accordingly in the menu Special Parameters > see 5.4.4.4 chapter .

6.2 TIG welding

6.2.1 Operating modes (functional sequences)

6.2.1.1 Explanation of signs and functions

| Symbol | Meaning |
|---|--|
|  | Press torch trigger |
|  | Release torch trigger |
|  | Tap torch trigger (press briefly and release) |
|  | Shielding gas flowing |
| I | Welding output |
|  | Gas pre-flows |
|  | Gas post-flows |
|  | Non-latched |
|  | Special, non-latched |
|  | Latched |
|  | Special, latched |
| t | Time |
| P _{START} | Ignition program |
| P _A | Main program |
| P _B | Reduced main program |
| P _{END} | End program |
| tS1 | Slope duration from P _{START} to P _A |

6.2.1.2 Automatic cut-out

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

- During ignition
5 s after the start of the welding process, no welding current flows (ignition error).
- During welding
The arc is interrupted for more than 5 s (arc interruption).

Non-latched mode

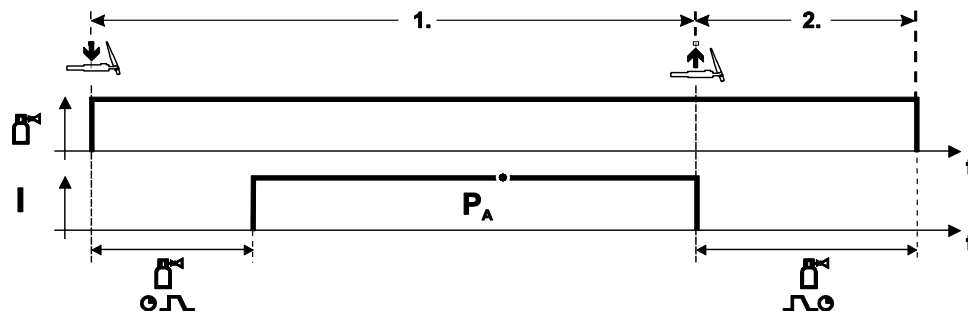


Figure 6-19

Selection

- Select non-latched operating mode

Step 1

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

The arc is ignited using liftarc.

- Welding current flows with pre-selected setting.

Step 2

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

Special, non-latched

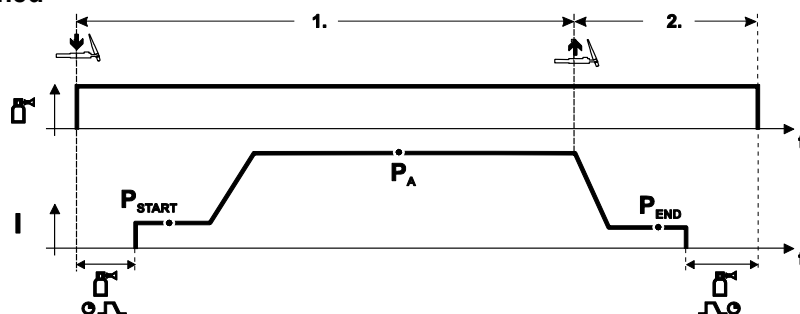


Figure 6-20

Selection

- Select non-latched special mode

Step 1

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

The arc is ignited using liftarc.

- Welding gas flows with pre-selected setting in start program "P_{START}".
- After the "t_{start}" ignition current time elapses, the welding current rises with the set upslope time "t_{S1}" to the main program "P_A".

Step 2

- Release torch trigger.
- The welding current reduces with the downslope time "t_{Se}" to the end program "P_{END}".
- After the end current time "end" elapses, the arc will extinguish.
- Gas post-flow time elapses.

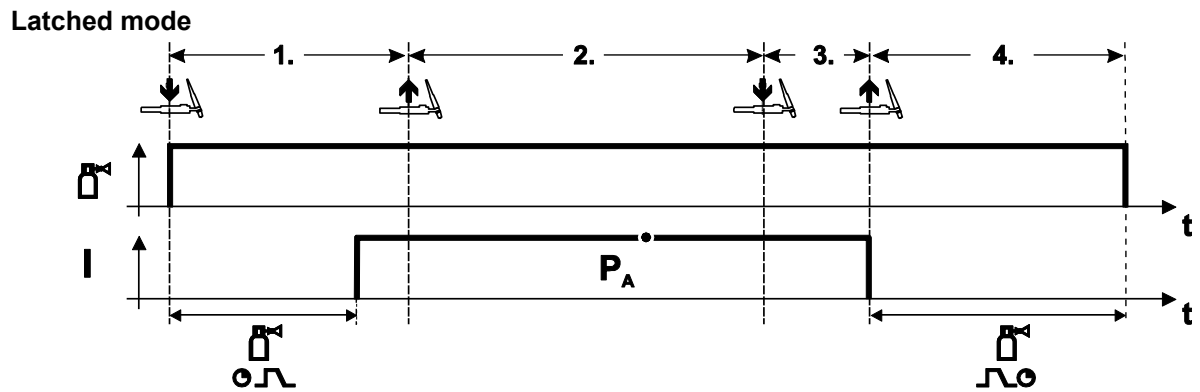


Figure 6-21

Selection

- Select latched operating mode .

Step 1

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

The arc is ignited using liftarc.

- Welding current flows with pre-selected setting.

Step 2

- Release torch trigger (no effect)

Step 3

- Press torch trigger (no effect)

Step 4

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

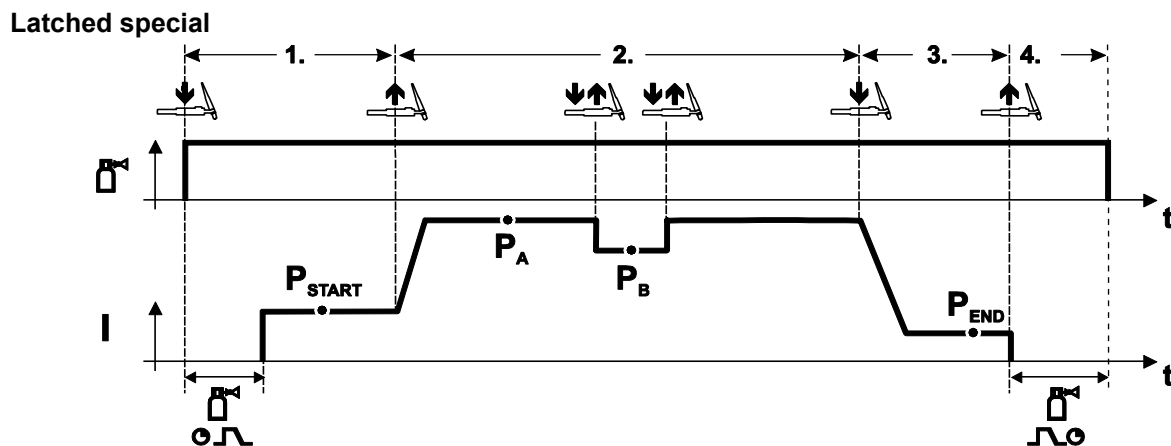


Figure 6-22

Selection

- Select latched special mode

Step 1

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

The arc is ignited using liftarc.

- Welding gas flows at pre-selected setting in start program "P_{START}".

Step 2

- Release torch trigger.
- Slope on main program "P_A".

The slope on main program P_A is given at the earliest after the set time t_{START} elapses and at the latest when the torch trigger is released.

Tapping can be used to switch to the reduced main program "P_B". Repeated tapping will switch back to the main program "P_A".

Step 3

- Press the torch trigger.
- Slope to end program "P_{END}".

Step 4

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

6.2.2 Arc ignition

6.2.2.1 Liftarc

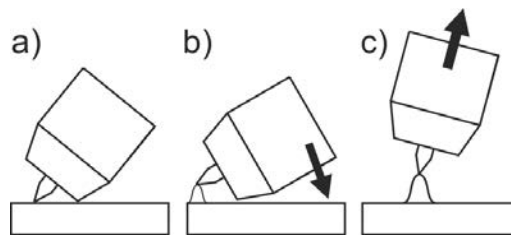


Figure 6-23

The arc ignites through contact with the workpiece:

- Carefully place the torch gas nozzle and tungsten electrode tip against the workpiece (lift arc current flows independent of the set main current)
- 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).
- Lift the torch off and bring into normal position.

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

6.3 MMA welding

6.3.1 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).

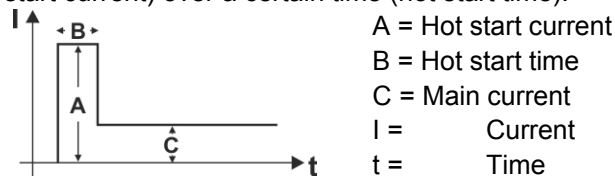
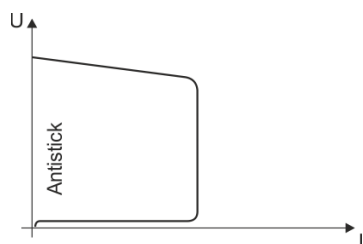


Figure 6-24

6.3.2 Antistick



The Antistick feature prevents the electrode from annealing.

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

Figure 6-25

6.4 Air arc gouging

During gouging, an arc burns between a carbon electrode and the workpiece, heating the workpiece until it is molten. At the same time, the molten metal is blown out with compressed air. Special electrode holders with a compressed-air connection and carbon electrodes are required for gouging.

7 Rectifying faults


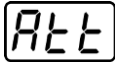
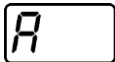
All products are subject to rigorous production checks and final checks. If, despite this, something fails to work at any time, please check the product using the following flowchart. If none of the fault rectification procedures described leads to the correct functioning of the product, please inform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

7.1 Display machine control software version

Identifying the machine software is key to quick troubleshooting by the authorised service technician. The version number is shown on the initial screen of the machine control for about 5 seconds (switch the machine off and on again) > see 4.3.3 chapter.

7.2 Warnings

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

| Display type - machine control | Display |
|--------------------------------|---|
| Graphic display |  |
| two 7-segment displays |  |
| one 7-segment display |  |

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

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

| No. | Warning | Possible cause |
|-----|--|---|
| 1 | Excess temperature | A shutdown is imminent due to excess temperature. |
| 4 | Shielding gas ^[2] | Check shielding gas supply. |
| 5 | Coolant flow ^[3] | Flow rate ($\leq 0.7\text{l/min}$ / $\leq 0.18\text{ gal./min}$) ^[1] |
| 6 | low wire | Only a small amount of wire is left on the spool. |
| 7 | CAN bus failure | Wire feeder not connected, automatic circuit-breaker of wire feed motor (reset the tripped automatic circuit-breaker by actuating). |
| 8 | Welding circuit | The welding circuit inductance is too high for the selected welding task. |
| 10 | Partial inverter | One of several partial inverters is not supplying welding current. |
| 11 | Excess temperature, coolant ^[3] | Coolant ($\geq 65^\circ\text{C}$ / $\geq 149^\circ\text{F}$) ^[1] |
| 12 | Welding monitor | The actual value of a welding parameter is outside the specified tolerance field. |
| 13 | Contact error | The resistance in the welding circuit is too high. Check earth connection. |
| 32 | Tacho error | Fault of wire feeder, permanent overload of the wire drive. |
| 33 | WF excess current | Overcurrent detection of the main WF drive. |
| 34 | JOB unknown | JOB selection was not performed because the JOB number is unknown. |
| 35 | WF excess current slave | Overload of the slave WF drive (front drive push/push system or intermediate drive). |
| 36 | Slave tacho error | Fault of wire feeder, permanent overload of the slave WF drive (front drive push/push system or intermediate drive). |
| 37 | FST bus failure | Wire feeder not connected, automatic circuit-breaker of wire feed motor (reset the tripped automatic circuit-breaker by actuating). |

^[1] factory setting

^[2] option

^[3] only machine series Titan XQ


7.3 Error messages

A welding machine error will be signalled by an error code (see table) on the control display. In the event of an error, the power unit shuts down.

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

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

Legend for categories (reset error)

- The error message will disappear once the error has been rectified.
- The error message can be reset by pressing a context-dependent push-button with the  icon.
- The error message can only be reset by switching the machine off and on again.

| Err | Category | | | Error | Possible cause | Remedy |
|-----|----------|----|----|------------------------------------|--|--|
| | a) | b) | c) | | | |
| 3 | ✓ | ✓ | ✗ | Tacho error | Error of wire feeder | Check connections (connections, pipes) |
| | | | | | Permanent overload of the wire drive | Do not place the liner in tight radii; check wire core for smooth movement |
| 4 | ✓ | ✗ | ✗ | Excess temperature | Power source overheated | Allow the power source to cool down (mains switch to "1") |
| | | | | | Fan blocked, dirty or defective | Check fan and clean or replace |
| | | | | | Air inlet or outlet blocked | Check air inlet and outlet |
| 5 | ✗ | ✗ | ✓ | Mains overvoltage | Mains voltage is too high | Check the mains voltages and compare with the power source connection voltages |
| 6 | ✗ | ✗ | ✓ | Mains undervoltage | Mains voltage is too low | |
| 7 | ✗ | ✓ | ✗ | Low coolant level | Flow rate too low (< = 0.7 l/min) / (< = 0.18 gal/min) ^{[1][3]} | Check coolant flow, clean water block, remove kinks in hose package, adjust flow threshold |
| | | | | | Coolant volume too low | Fill coolant |
| | | | | | Pump does not run | Turn the pump shaft |
| | | | | | Air in the coolant circuit | Vent coolant circuit |
| | | | | | Hose package not completely filled with coolant | Switch machine off / on (pump runs for 2 min) |
| | | | | | Operation with gas-cooled welding torch | Connect coolant feed and coolant return (insert hose bridge); deactivate water block |
| | | | | | Failure of automatic circuit-breaker ^[4] | Press to reset automatic circuit-breaker |
| 8 | ✓ | ✓ | ✗ | Shielding gas error ^[2] | No shielding gas | Check shielding gas supply |
| | | | | | Pre-pressure too low | Remove kinks in the hose package; nominal value: 4-6 bar primary pressure |
| 9 | ✗ | ✗ | ✓ | Sec. overvoltage | Overvoltage at output: Inverter error | Inform Service |
| 10 | ✗ | ✗ | ✓ | Earth fault (PE error) | Connection between welding wire and machine casing | Remove electrical connection |
| 11 | ✓ | ✓ | ✗ | Quick shut-down | Removing the logical signal "robot ready" during the process | Eliminate errors on the higher-level control |

| Err | Category | | | Error | Possible cause | Remedy |
|-----|----------|----|----|---|--|--|
| | a) | b) | c) | | | |
| 22 | ✓ | ✗ | ✗ | Coolant excess temperature ^[3] | Coolant is overheating ($\geq 70^{\circ}\text{C}$ / $\geq 158^{\circ}\text{F}$) ^[1] measured in the coolant return line | Allow the power source to cool down (mains switch to "1") |
| | | | | | Fan blocked, dirty or defective | Check fan, clean or replace |
| | | | | | Air inlet or outlet blocked | Check air inlet and outlet |
| 32 | ✗ | ✗ | ✓ | Error I>0 ^[3] | | Inform Service |
| 33 | ✗ | ✗ | ✓ | Error UIST ^[3] | Short circuit in welding circuit before welding | Eliminate short circuit in welding circuit; remove external sensor voltage |
| 38 | ✗ | ✗ | ✓ | Error IIST ^[3] | Short circuit in welding circuit before welding | Eliminate short circuit in welding circuit |
| 48 | ✗ | ✓ | ✗ | Ignition error | No ignition occurred during a process start with automated machines | Check the wire feeding, check the connections of the load cables in the welding circuit, clean corroded surfaces on the workpiece before welding if applicable |
| 49 | ✗ | ✓ | ✗ | Arc interruption | An arc interruption occurred during welding with an automated system | Check wire feeding; adjust welding speed. |
| 51 | ✓ | ✗ | ✗ | Emergency stop | The emergency stop circuit of the power source has been activated. | Disable the activation of the emergency stop circuit (release protective circuit) |
| 52 | ✗ | ✗ | ✓ | No wire feeder | After switching on the automated system, no wire feeder was detected | Check or connect control cables of wire feeders; check the identification number of the automated wire feeder (for 1DV: number 1, for 2DV: each a wire feeder with number 1 and a wire feeder with number 2) |
| 53 | ✗ | ✓ | ✗ | No wire feeder 2 | Wire feeder 2 not detected | Check or connect the control lines of the wire feeders |
| 54 | ✗ | ✗ | ✓ | VRD error ^[2] | Open circuit voltage reduction error | if necessary, disconnect external machine from the welding circuit; inform Service |
| 55 | ✗ | ✓ | ✗ | WF excess current | Overcurrent detection on wire feeder | Do not place the liner in tight radii; check wire core for smooth movement |
| 56 | ✗ | ✗ | ✓ | Mains phase failure | One phase of the mains voltage has failed | Check mains connection, mains plug and mains fuses |
| 57 | ✗ | ✓ | ✗ | Slave tacho error | Wire feeder fault (slave drive) | Check connectors, cables, connections |
| | | | | | Permanent overload of the wire drive (slave drive) | Do not place the liner in tight radii; check wire core for smooth movement |
| 58 | ✗ | ✓ | ✗ | Short circuit | Check welding circuit for short circuit | Check welding circuit; isolate welding torch before depositing |
| 59 | ✗ | ✗ | ✓ | Incompatible machine | A machine connected to the system is not compatible | Please disconnect the incompatible machine from the system |

| Err | Category | | | Error | Possible cause | Remedy |
|-----|----------|----|----|---------------------------------|--|---|
| | a) | b) | c) | | | |
| 60 | ✗ | ✗ | ✓ | Incompatible software | A machine's software is not compatible. | Inform Service |
| 61 | ✗ | ✓ | ✗ | Welding monitor | The actual value of a welding parameter is outside the specified tolerance field | Observe tolerance fields; adjust welding parameters |
| 62 | ✗ | ✗ | ✓ | System component ^[3] | System component not found | Inform Service |

^[1] factory setting

^[2] option

^[3] only machine series Titan

^[4] not machine series Titan

7.4 Resetting JOBs (welding tasks) to the factory settings

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

Instructions on how to reset welding tasks (JOBs) to the factory setting can be found in the JOB manager > see 5.6.3 chapter chapter.

8 Appendix

8.1 Parameter overview – setting ranges

| Parameter | Setting range | | | | | Comment |
|-----------------------------------|---------------|--------|------|---|------|--|
| | Standard | Unit | Min. | | Max. | |
| MIG/MAG | | | | | | |
| Gas pre-flow time | 0,1 | s | 0 | - | 20 | |
| Gas nominal value | | l/min. | | | | GFE option |
| Start program P _{START} | | | | | | |
| WF relative | 55 | % | 1 | - | 200 | |
| Duration | 0,1 | s | 0,00 | - | 20,0 | |
| U correction | 0 | V | -9,9 | - | 9,9 | |
| Slope time | 0,6 | s | 0,00 | | 20,0 | |
| Main program P _A | | | | | | |
| WF [l/min.] | 0,01 | m/min. | 0,00 | - | 20,0 | |
| U correction | 0 | V | -9,9 | - | 9,9 | |
| Duration | 0,15 | s | 0,00 | - | 20,0 | |
| Slope time | 0,10 | s | 0,00 | - | 20,0 | |
| Down-slope program P _B | | | | | | |
| WF relative | 60 | % | 0 | - | 200 | |
| Duration | 0,40 | s | 0,0 | - | 20,0 | |
| U correction | 0 | V | -9,9 | - | 9,9 | |
| Slope time | 0,05 | s | 0,00 | - | 20,0 | |
| Slope time | 0,00 | s | 0,00 | - | 20,0 | |
| End program P _{END} | | | | | | |
| WF relative | 100 | % | 0 | - | 200 | |
| Duration | 0,00 | s | 0,0 | - | 20,0 | |
| U correction | 0 | V | -9,9 | - | 9,9 | |
| Wire burn-back | 15 | | 0 | | 499 | |
| Gas post-flow time | 0,5 | s | 0,0 | | 20,0 | |
| TIG | | | | | | |
| Gas pre-flow time | 0,1 | s | 0 | - | 20 | |
| Ignition current AMP% | 50 | % | 0 | - | 200 | % of main current AMP |
| Start time | 0,5 | s | 0,00 | - | 20,0 | |
| Up-slope time | 0,5 | s | 0,0 | - | 20,0 | |
| Pulse current | 140 | % | 1 | | 200 | |
| Pulse time | 0,2 | s | 0,01 | - | 20,0 | |
| Slope time | 0,1 | s | 0,00 | - | 20,0 | Time from main current AMP to secondary current AMP% |
| Secondary current AMP% | 50 | % | 1 | | 200 | % of main current AMP |
| Pulse pause time | 0,2 | s | 0,01 | - | 20,0 | |
| Slope time | 0,1 | s | 0,00 | - | 20,0 | Time from main current AMP to secondary current AMP% |
| Down-slope time | 0,5 | s | 0,0 | - | 20,0 | |
| End current AMP% | 30 | % | 0 | - | 200 | % of main current AMP |

| Parameter | Setting range | | | | | Comment |
|--------------------|---------------|------|------|---|-------|---------|
| | Standard | Unit | Min. | | Max. | |
| End current time | 0,5 | s | 0,00 | - | 20,0 | |
| Gas post-flow time | 5 | s | 0,0 | - | 20,0 | |
| MMA | | | | | | |
| Hot start current | 120 | % | 1 | - | 200 | |
| Hot start time | 0,5 | s | 0,0 | - | -10,0 | |
| Arcforce | 0 | | -40 | - | 40 | |

8.2 JOB-List

| JOB no. | Processes | Material | Gas | Diameter [mm] |
|---------|-----------------------|--------------------------|-------------------------|---------------|
| 1 | GMAW standard | G3Si1 / G4Si1 | 100% CO2 | 0,8 |
| 2 | GMAW standard | G3Si1 / G4Si1 | 100% CO2 | 0,9 |
| 3 | GMAW standard | G3Si1 / G4Si1 | 100% CO2 | 1,0 |
| 4 | GMAW standard | G3Si1 / G4Si1 | 100% CO2 | 1,2 |
| 5 | GMAW standard | G3Si1 / G4Si1 | 100% CO2 | 1,6 |
| 6 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 0,8 |
| 7 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 0,9 |
| 8 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,0 |
| 9 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,2 |
| 10 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,6 |
| 11 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 0,8 |
| 12 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 0,9 |
| 13 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,0 |
| 14 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,2 |
| 15 | Standard GMAW / pulse | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,6 |
| 26 | Standard GMAW / pulse | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 27 | Standard GMAW / pulse | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 28 | Standard GMAW / pulse | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 29 | Standard GMAW / pulse | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 30 | Standard GMAW / pulse | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 31 | Standard GMAW / pulse | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 32 | Standard GMAW / pulse | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 33 | Standard GMAW / pulse | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 34 | Standard GMAW / pulse | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 35 | Standard GMAW / pulse | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 36 | Standard GMAW / pulse | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 37 | Standard GMAW / pulse | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 38 | Standard GMAW / pulse | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 39 | Standard GMAW / pulse | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 40 | Standard GMAW / pulse | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |

| JOB no. | Processes | Material | Gas | Diameter [mm] |
|---------|------------------------|-----------------------|-----------------------------|---------------|
| 41 | Standard GMAW / pulse | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 42 | Standard GMAW / pulse | CrNi 22 9 3 / 1.4462 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 43 | Standard GMAW / pulse | CrNi 22 9 3 / 1.4462 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 44 | Standard GMAW / pulse | CrNi 22 9 3 / 1.4462 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 45 | Standard GMAW / pulse | CrNi 22 9 3 / 1.4462 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 46 | Standard GMAW / pulse | CrNi 22 9 3 / 1.4462 | Ar-78 / He-20 / CO2-2 (M12) | 0,8 |
| 47 | Standard GMAW / pulse | CrNi 22 9 3 / 1.4462 | Ar-78 / He-20 / CO2-2 (M12) | 1,0 |
| 48 | Standard GMAW / pulse | CrNi 22 9 3 / 1.4462 | Ar-78 / He-20 / CO2-2 (M12) | 1,2 |
| 49 | Standard GMAW / pulse | CrNi 22 9 3 / 1.4462 | Ar-78 / He-20 / CO2-2 (M12) | 1,6 |
| 50 | coldArc / coldArc puls | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 51 | coldArc / coldArc puls | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 52 | coldArc / coldArc puls | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 55 | coldArc / coldArc puls | AlMg4.5Mn | Ar-100 (I1) | 1,0 |
| 56 | coldArc / coldArc puls | AlMg4.5Mn | Ar-100 (I1) | 1,2 |
| 59 | coldArc / coldArc puls | AlSi | Ar-100 (I1) | 1,0 |
| 60 | coldArc / coldArc puls | AlSi | Ar-100 (I1) | 1,2 |
| 63 | coldArc / coldArc puls | Al99 | Ar-100 (I1) | 1,0 |
| 64 | coldArc / coldArc puls | Al99 | Ar-100 (I1) | 1,2 |
| 66 | coldArc Brazing | CuSi | Ar-100 (I1) | 0,8 |
| 67 | coldArc Brazing | CuSi | Ar-100 (I1) | 1,0 |
| 68 | coldArc Brazing | CuSi | Ar-100 (I1) | 1,2 |
| 70 | coldArc Brazing | CuAl | Ar-100 (I1) | 0,8 |
| 71 | coldArc Brazing | CuAl | Ar-100 (I1) | 1,0 |
| 72 | coldArc Brazing | CuAl | Ar-100 (I1) | 1,2 |
| 74 | Standard GMAW / pulse | AlMg4.5Mn | Ar-100 (I1) | 0,8 |
| 75 | Standard GMAW / pulse | AlMg4.5Mn | Ar-100 (I1) | 1,0 |
| 76 | Standard GMAW / pulse | AlMg4.5Mn | Ar-100 (I1) | 1,2 |
| 77 | Standard GMAW / pulse | AlMg4.5Mn | Ar-100 (I1) | 1,6 |
| 78 | Standard GMAW / pulse | AlMg4.5Mn | Ar-70 / He-30 (I3) | 0,8 |
| 79 | Standard GMAW / pulse | AlMg4.5Mn | Ar-70 / He-30 (I3) | 1,0 |
| 80 | Standard GMAW / pulse | AlMg4.5Mn | Ar-70 / He-30 (I3) | 1,2 |
| 81 | Standard GMAW / pulse | AlMg4.5Mn | Ar-70 / He-30 (I3) | 1,6 |
| 82 | Standard GMAW / pulse | AlSi | Ar-100 (I1) | 0,8 |
| 83 | Standard GMAW / pulse | AlSi | Ar-100 (I1) | 1,0 |
| 84 | Standard GMAW / pulse | AlSi | Ar-100 (I1) | 1,2 |
| 85 | Standard GMAW / pulse | AlSi | Ar-100 (I1) | 1,6 |
| 86 | Standard GMAW / pulse | AlSi | Ar-70 / He-30 (I3) | 0,8 |
| 87 | Standard GMAW / pulse | AlSi | Ar-70 / He-30 (I3) | 1,0 |
| 88 | Standard GMAW / pulse | AlSi | Ar-70 / He-30 (I3) | 1,2 |
| 89 | Standard GMAW / pulse | AlSi | Ar-70 / He-30 (I3) | 1,6 |
| 90 | Standard GMAW / pulse | Al99 | Ar-100 (I1) | 0,8 |
| 91 | Standard GMAW / pulse | Al99 | Ar-100 (I1) | 1,0 |
| 92 | Standard GMAW / pulse | Al99 | Ar-100 (I1) | 1,2 |
| 93 | Standard GMAW / pulse | Al99 | Ar-100 (I1) | 1,6 |

| JOB no. | Processes | Material | Gas | Diameter [mm] |
|---------|-----------------------|---------------|-------------------------|---------------|
| 94 | Standard GMAW / pulse | Al99 | Ar-70 / He-30 (I3) | 0,8 |
| 95 | Standard GMAW / pulse | Al99 | Ar-70 / He-30 (I3) | 1,0 |
| 96 | Standard GMAW / pulse | Al99 | Ar-70 / He-30 (I3) | 1,2 |
| 97 | Standard GMAW / pulse | Al99 | Ar-70 / He-30 (I3) | 1,6 |
| 98 | Standard GMAW / pulse | CuSi | Ar-100 (I1) | 0,8 |
| 99 | Standard GMAW / pulse | CuSi | Ar-100 (I1) | 1,0 |
| 100 | Standard GMAW / pulse | CuSi | Ar-100 (I1) | 1,2 |
| 101 | Standard GMAW / pulse | CuSi | Ar-100 (I1) | 1,6 |
| 102 | Standard GMAW / pulse | CuSi | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 103 | Standard GMAW / pulse | CuSi | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 104 | Standard GMAW / pulse | CuSi | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 105 | Standard GMAW / pulse | CuSi | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 106 | Standard GMAW / pulse | CuAl | Ar-100 (I1) | 0,8 |
| 107 | Standard GMAW / pulse | CuAl | Ar-100 (I1) | 1,0 |
| 108 | Standard GMAW / pulse | CuAl | Ar-100 (I1) | 1,2 |
| 109 | Standard GMAW / pulse | CuAl | Ar-100 (I1) | 1,6 |
| 110 | Brazing | CuSi | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 111 | Brazing | CuSi | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 112 | Brazing | CuSi | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 113 | Brazing | CuSi | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 114 | Brazing | CuSi | Ar-100 (I1) | 0,8 |
| 115 | Brazing | CuSi | Ar-100 (I1) | 1,0 |
| 116 | Brazing | CuSi | Ar-100 (I1) | 1,2 |
| 117 | Brazing | CuSi | Ar-100 (I1) | 1,6 |
| 118 | Brazing | CuAl | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 119 | Brazing | CuAl | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 120 | Brazing | CuAl | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 121 | Brazing | CuAl | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 122 | Brazing | CuAl | Ar-100 (I1) | 0,8 |
| 123 | Brazing | CuAl | Ar-100 (I1) | 1,0 |
| 124 | Brazing | CuAl | Ar-100 (I1) | 1,2 |
| 125 | Brazing | CuAl | Ar-100 (I1) | 1,6 |
| 126 | Gouging | | | |
| 127 | TIG (lift arc) | | | |
| 128 | MMA | | | |
| 129 | Special JOB 1 | Special | Special | Spezial |
| 130 | Special JOB 2 | Special | Special | Spezial |
| 131 | Special JOB 3 | Special | Special | Spezial |
| 132 | | Free JOB | | |
| 133 | | Free JOB | | |
| 134 | | Free JOB | | |
| 135 | | Free JOB | | |
| 136 | | Free JOB | | |
| 137 | | Free JOB | | |
| 138 | | Free JOB | | |
| 139 | | Free JOB | | |
| 140 | | Block 1/ JOB1 | | |

| JOB no. | Processes | Material | Gas | Diameter [mm] |
|---------|--------------------------|----------------|----------------------|---------------|
| 141 | | Block 1/ JOB2 | | |
| 142 | | Block 1/ JOB3 | | |
| 143 | | Block 1/ JOB4 | | |
| 144 | | Block 1/ JOB5 | | |
| 145 | | Block 1/ JOB6 | | |
| 146 | | Block 1/ JOB7 | | |
| 147 | | Block 1/ JOB8 | | |
| 148 | | Block 1/ JOB9 | | |
| 149 | | Block 1/ JOB10 | | |
| 150 | | Block 2/ JOB1 | | |
| 151 | | Block 2/ JOB2 | | |
| 152 | | Block 2/ JOB3 | | |
| 153 | | Block 2/ JOB4 | | |
| 154 | | Block 2/ JOB5 | | |
| 155 | | Block 2/ JOB6 | | |
| 156 | | Block 2/ JOB7 | | |
| 157 | | Block 2/ JOB8 | | |
| 158 | | Block 2/ JOB9 | | |
| 159 | | Block 2/ JOB10 | | |
| 160 | | Block 3/ JOB1 | | |
| 161 | | Block 3/ JOB2 | | |
| 162 | | Block 3/ JOB3 | | |
| 163 | | Block 3/ JOB4 | | |
| 164 | | Block 3/ JOB5 | | |
| 165 | | Block 3/ JOB6 | | |
| 166 | | Block 3/ JOB7 | | |
| 167 | | Block 3/ JOB8 | | |
| 168 | | Block 3/ JOB9 | | |
| 169 | | Block 3/ JOB10 | | |
| 171 | coldArc / coldArc puls | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,0 |
| 172 | coldArc / coldArc puls | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,2 |
| 173 | rootArc / rootArc puls | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,0 |
| 174 | rootArc / rootArc puls | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,2 |
| 179 | forceArc / forceArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,0 |
| 180 | forceArc / forceArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,2 |
| 181 | forceArc / forceArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,6 |
| 182 | coldArc | G3Si1 / G4Si1 | CO2-100 (C1) | 0,8 |
| 183 | coldArc | G3Si1 / G4Si1 | CO2-100 (C1) | 0,9 |
| 184 | coldArc | G3Si1 / G4Si1 | CO2-100 (C1) | 1,0 |
| 185 | coldArc | G3Si1 / G4Si1 | CO2-100 (C1) | 1,2 |
| 188 | GMAW Non-synergic | Special | Special | Spezial |
| 189 | forceArc / forceArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 0,8 |
| 190 | forceArc / forceArc puls | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 0,8 |
| 191 | coldArc / coldArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 0,8 |
| 192 | coldArc / coldArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 0,9 |
| 193 | coldArc / coldArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,0 |
| 194 | coldArc / coldArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,2 |

| JOB no. | Processes | Material | Gas | Diameter [mm] |
|---------|--------------------------|--------------------|-------------------------|---------------|
| 195 | coldArc / coldArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,6 |
| 197 | coldArc Brazing | AlSi | Ar-100 (I1) | 1,0 |
| 198 | coldArc Brazing | AlSi | Ar-100 (I1) | 1,2 |
| 201 | coldArc Brazing | ZnAl | Ar-100 (I1) | 1,0 |
| 202 | coldArc Brazing | ZnAl | Ar-100 (I1) | 1,2 |
| 204 | rootArc | G3Si1 / G4Si1 | CO2-100 (C1) | 1,0 |
| 205 | rootArc | G3Si1 / G4Si1 | CO2-100 (C1) | 1,2 |
| 206 | rootArc / rootArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,0 |
| 207 | rootArc / rootArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,2 |
| 208 | coldArc - Mg/Mg | Mg | Ar-70 / He-30 (I3) | 1,2 |
| 209 | coldArc - Mg/Mg | Mg | Ar-70 / He-30 (I3) | 1,6 |
| 212 | Flux cored wire rutile | FCW CrNi Rutile | CO2-100 (C1) | 1,2 |
| 213 | Flux cored wire rutile | FCW CrNi Rutile | CO2-100 (C1) | 1,6 |
| 216 | Standard GMAW / pulse | AlMg3 | Ar-100 (I1) | 1,0 |
| 217 | Standard GMAW / pulse | AlMg3 | Ar-100 (I1) | 1,2 |
| 218 | Standard GMAW / pulse | AlMg3 | Ar-100 (I1) | 1,6 |
| 220 | coldArc - St/Al | ZnAl | Ar-100 (I1) | 1,0 |
| 221 | coldArc - St/Al | ZnAl | Ar-100 (I1) | 1,2 |
| 224 | coldArc - St/Al | AlSi | Ar-100 (I1) | 1,0 |
| 225 | coldArc - St/Al | AlSi | Ar-100 (I1) | 1,2 |
| 229 | Flux cored wire metal | FCW CrNi Metal | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 230 | Flux cored wire metal | FCW CrNi Metal | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 233 | Flux cored wire rutile | FCW CrNi Rutile | Ar-82 / CO2-18 (M21) | 1,2 |
| 234 | Flux cored wire rutile | FCW CrNi Rutile | Ar-82 / CO2-18 (M21) | 1,6 |
| 235 | Flux cored wire metal | FCW Steel Metal | Ar-82 / CO2-18 (M21) | 0,8 |
| 237 | Flux cored wire metal | FCW Steel Metal | Ar-82 / CO2-18 (M21) | 1,0 |
| 238 | Flux cored wire metal | FCW Steel Metal | Ar-82 / CO2-18 (M21) | 1,2 |
| 239 | Flux cored wire metal | FCW Steel Metal | Ar-82 / CO2-18 (M21) | 1,6 |
| 240 | Flux cored wire rutile | FCW CrNi Rutile | Ar-82 / CO2-18 (M21) | 0,8 |
| 242 | Flux cored wire rutile | FCW CrNi Rutile | Ar-82 / CO2-18 (M21) | 1,0 |
| 243 | Flux cored wire rutile | FCW CrNi Rutile | Ar-82 / CO2-18 (M21) | 1,2 |
| 244 | Flux cored wire rutile | FCW CrNi Rutile | Ar-82 / CO2-18 (M21) | 1,6 |
| 245 | forceArc / forceArc puls | Al99 | Ar-100 (I1) | 1,2 |
| 246 | forceArc / forceArc puls | Al99 | Ar-100 (I1) | 1,6 |
| 247 | forceArc / forceArc puls | AlMg4.5Mn | Ar-100 (I1) | 1,2 |
| 248 | forceArc / forceArc puls | AlMg4.5Mn | Ar-100 (I1) | 1,6 |
| 249 | forceArc / forceArc puls | AlSi | Ar-100 (I1) | 1,2 |
| 250 | forceArc / forceArc puls | AlSi | Ar-100 (I1) | 1,6 |
| 251 | forceArc / forceArc puls | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 252 | forceArc / forceArc puls | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 253 | forceArc / forceArc puls | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 254 | forceArc / forceArc puls | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,0 |
| 255 | forceArc / forceArc puls | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,2 |
| 256 | forceArc / forceArc puls | G3Si1 / G4Si1 | Ar-90 / CO2-10 (M20) | 1,6 |
| 258 | Standard GMAW / pulse | AlMg4.5Mn | Ar-50/He-50 (I3) | 1,2 |
| 259 | Standard GMAW / pulse | AlMg4.5Mn | Ar-50/He-50 (I3) | 1,6 |
| 260 | Flux cored wire rutile | FCW Steel Rutile | CO2-100 (C1) | 1,2 |

| JOB no. | Processes | Material | Gas | Diameter [mm] |
|---------|---|--------------------------------|-----------------------------|---------------|
| 261 | Flux cored wire rutile | FCW Steel Rutile | CO2-100 (C1) | 1,6 |
| 263 | Flux cored wire metal | High-strength steels / Special | Ar-82 / CO2-18 (M21) | 1,2 |
| 264 | Flux cored wire basic | FCW Steel Basic | Ar-82 / CO2-18 (M21) | 1,2 |
| 268 | Surfacing | NiCr 6617 / 2.4627 | Ar-70 / He-30 (I3) | 1,2 |
| 269 | Surfacing | NiCr 6617 / 2.4627 | Ar-70 / He-30 (I3) | 1,6 |
| 271 | Surfacing | NiCr 6625 / 2.4831 | Ar-70 / He-30 (I3) | 1,0 |
| 272 | Surfacing | NiCr 6625 / 2.4831 | Ar-70 / He-30 (I3) | 1,2 |
| 273 | Surfacing | NiCr 6625 / 2.4831 | Ar-70 / He-30 (I3) | 1,6 |
| 275 | Surfacing | NiCr 6625 / 2.4831 | Ar-78 / He-20 / CO2-2 (M12) | 1,0 |
| 276 | Surfacing | NiCr 6625 / 2.4831 | Ar-78 / He-20 / CO2-2 (M12) | 1,2 |
| 277 | Surfacing | NiCr 6625 / 2.4831 | Ar-78 / He-20 / CO2-2 (M12) | 1,6 |
| 279 | Standard GMAW / pulse | CrNi 25 20 / 1.4842 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 280 | Standard GMAW / pulse | CrNi 25 20 / 1.4842 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 282 | Standard GMAW / pulse | CrNi 23 12 / 1.4332 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 283 | Standard GMAW / pulse | CrNi 23 12 / 1.4332 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 284 | Standard GMAW / pulse | CrNi 23 12 / 1.4332 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 285 | Standard GMAW / pulse | CrNi 23 12 / 1.4332 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 290 | forceArc / forceArc puls Flux cored wire metal | FCW Steel Metal | Ar-82 / CO2-18 (M21) | 0,8 |
| 291 | forceArc / forceArc puls Flux cored wire metal | FCW Steel Metal | Ar-82 / CO2-18 (M21) | 1,0 |
| 292 | forceArc / forceArc puls Flux cored wire metal | FCW Steel Metal | Ar-82 / CO2-18 (M21) | 1,2 |
| 293 | forceArc / forceArc puls Flux cored wire metal | FCW Steel Metal | Ar-82 / CO2-18 (M21) | 1,6 |
| 303 | forceArc / forceArc puls | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 304 | forceArc / forceArc puls | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 305 | forceArc / forceArc puls | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 307 | forceArc / forceArc puls | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 308 | forceArc / forceArc puls | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 309 | forceArc / forceArc puls | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 311 | forceArc / forceArc puls | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 312 | forceArc / forceArc puls | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 313 | forceArc / forceArc puls | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 315 | forceArc / forceArc puls | CrNi 22 9 3 / 1.4462 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 316 | forceArc / forceArc puls | CrNi 22 9 3 / 1.4462 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 317 | forceArc / forceArc puls | CrNi 22 9 3 / 1.4462 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 319 | forceArc / forceArc puls | CrNi 25 20 / 1.4842 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 320 | forceArc / forceArc puls | CrNi 25 20 / 1.4842 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 323 | forceArc / forceArc puls | CrNi 23 12 / 1.4332 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 324 | forceArc / forceArc puls | CrNi 23 12 / 1.4332 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 325 | forceArc / forceArc puls | CrNi 23 12 / 1.4332 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |

| JOB no. | Processes | Material | Gas | Diameter [mm] |
|---------|-------------------------------|------------------------------|-------------------------|---------------|
| 326 | coldArc / coldArc puls | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 327 | coldArc / coldArc puls | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 328 | coldArc / coldArc puls | CrNi 19 12 3 Nb / 1.4576 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 330 | coldArc / coldArc puls | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 331 | coldArc / coldArc puls | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 332 | coldArc / coldArc puls | CrNi 18 8 / 1.4370 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 334 | coldArc / coldArc puls | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 335 | coldArc / coldArc puls | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 336 | coldArc / coldArc puls | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 338 | coldArc / coldArc puls | CrNi 22 9 3/1.4462/Duplex | Ar-97.5 / CO2-2.5 (M12) | 0,8 |
| 339 | coldArc / coldArc puls | CrNi 22 9 3/1.4462/Duplex | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 340 | coldArc / coldArc puls | CrNi 22 9 3/1.4462/Duplex | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 350 | Self-shielded flux cored wire | FCW Steel Rutile | No Gas | 0,9 |
| 351 | Self-shielded flux cored wire | FCW Steel Rutile | No Gas | 1,0 |
| 352 | Self-shielded flux cored wire | FCW Steel Rutile | No Gas | 1,2 |
| 359 | wiredArc / wiredArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,0 |
| 360 | wiredArc / wiredArc puls | G3Si1 / G4Si1 | Ar-82 / CO2-18 (M21) | 1,2 |
| 367 | wiredArc / wiredArc puls | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 368 | wiredArc / wiredArc puls | CrNi 19 9 / 1.4316 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 371 | wiredArc / wiredArc puls | CrNi 19 12 3 / 1.4430 | Ar-97.5 / CO2-2.5 (M12) | 1,0 |
| 384 | wiredArc / wiredArc puls | AlMg4.5Mn | Ar-50/He-50 (I3) | 1,2 |
| 385 | wiredArc / wiredArc puls | AlMg4.5Mn | Ar-50/He-50 (I3) | 1,6 |
| 386 | Surfacing | Co-based | Ar-100 (I1) | 1,2 |
| 387 | Surfacing | Co-based | Ar-100 (I1) | 1,6 |
| 388 | Surfacing | CrNi 23 12 / 1.4332 | Ar-97.5 / CO2-2.5 (M12) | 1,2 |
| 389 | Surfacing | CrNi 23 12 / 1.4332 | Ar-97.5 / CO2-2.5 (M12) | 1,6 |
| 391 | acArc puls ^[1] | AlMg4.5Mn | Ar-100 (I1) | 1,0 |
| 392 | acArc puls ^[1] | AlMg4.5Mn | Ar-100 (I1) | 1,2 |
| 393 | acArc puls ^[1] | AlMg4.5Mn | Ar-100 (I1) | 1,6 |
| 394 | acArc puls ^[1] | AlSi | Ar-residue/O2-0.03 | 1,0 |
| 395 | acArc puls ^[1] | AlSi | Ar-residue/O2-0.03 | 1,2 |

^[1] active only in machine series Titan XQ AC.

8.3 Searching for a dealer

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



"More than 400 EWM sales partners worldwide"