



Aristo®

U82



Instruction manual



EU DECLARATION OF CONFORMITY

According to
The EMC Directive 2014/30/EU
The RoHS Directive 2011/65/EU

Type of equipment

Arc welding control unit

Type designation

U8 ₂	stock code: 0460 820 880
U8 ₂ Plus	stock code: 0460 820 881
U8 ₂ Plus I/O	stock code: 0460 820 882

Brand name or trademark

ESAB

Manufacturer or his authorised representative established within the EEA

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The following harmonised standard in force within the EEA has been used in the design:

EN 60974-10:2014, Arc Welding Equipment - Part 10: EMC requirements

By signing this document, the undersigned declares as manufacturer, or the manufacturer's authorised representative established within the EEA, that the equipment in question complies with the safety requirements stated above.

Date

Signature

Gothenburg 2019-06-14

A handwritten signature in black ink, appearing to read "Pedro Muniz". The signature is fluid and cursive, with a distinct flourish at the end.

Pedro Muniz
Standard Equipment Director

CE 2019

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1 SAFETY

**NOTE!**

The unit is tested by ESAB in a general set-up. The responsibility for safety and function, of the specific set-up, lies with the integrator.

Users of ESAB equipment have the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions. Safety precautions must meet the requirements that apply to this type of equipment. The following recommendations should be observed in addition to the standard regulations that apply to the workplace.

All work must be carried out by trained personnel well-acquainted with the operation of the equipment. Incorrect operation of the equipment may lead to hazardous situations which can result in injury to the operator and damage to the equipment.

1. Anyone who uses the equipment must be familiar with:
 - its operation
 - location of emergency stops
 - its function
 - relevant safety precautions
 - welding and cutting or other applicable operation of the equipment
2. The operator must ensure that:
 - no unauthorised person is stationed within the working area of the equipment when it is started up
 - no-one is unprotected when the arc is struck or work is started with the equipment
3. The workplace must:
 - be suitable for the purpose
 - be free from drafts
4. Personal safety equipment:
 - Always wear recommended personal safety equipment, such as safety glasses, flame-proof clothing, safety gloves
 - Do not wear loose-fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns
5. General precautions:
 - Make sure the return cable is connected securely
 - Work on high voltage equipment **may only be carried out by a qualified electrician**
 - Appropriate fire extinguishing equipment must be clearly marked and close at hand
 - Lubrication and maintenance must **not** be carried out on the equipment during operation

Read and understand the instruction manual before installing or operating.

PROTECT YOURSELF AND OTHERS!



CAUTION!

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding equipment, we urge you to read our booklet, "Precautions and Safe Practices for Arc, Cutting and Gouging", Form 52-529 . Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.



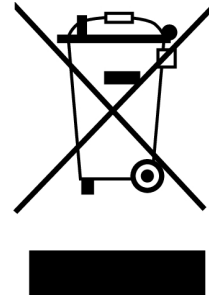
NOTE!

Dispose of electronic equipment at the recycling facility!

In observance of European Directive 2012/19/EC on Waste Electrical and Electronic Equipment and its implementation in accordance with national law, electrical and/or electronic equipment that has reached the end of its life must be disposed of at a recycling facility.

As the person responsible for the equipment, it is your responsibility to obtain information on approved collection stations.

For further information contact the nearest ESAB dealer.



2 INTRODUCTION

To benefit as much as possible from your welding equipment, we recommend that you read this instruction manual.

For general information about operation, see the instruction manuals for the power source and the wire feed unit.

The text presented in the display is available in the following languages: English, Swedish, Finnish, Danish, German, French, Italian, Dutch, Spanish, Portuguese, Hungarian, Polish, Czech, Norwegian, US English, Chinese, Russian and Turkish.

All functions described in this manual might not be available when the control panel is connected to a power source. The menus and functions in the control panel are adapted to the connected power source.






NOTE!

Differences in the panel function may occur, depending on in which product it is installed.

2.1 Control panel Aristo U82

The control panel is supplied with a mounting bracket with screws and an English instruction manual. A 1.2 m cable is mounted on to the panel. A USB memory and an extension cable are available as accessories, see the "ACCESSORIES" chapter of this manual.

Instruction manuals in other languages can be downloaded from the Internet: www.esab.com

1. Place for USB memory
2. Knob for moving cursor
3. Display
4. Soft keys 
5. Menu 
6. Enter 
7. Knob marked with # for increasing or decreasing set values. The value shown on the screen is also marked with #.
8. Knob marked with * for increasing or decreasing set values. The value shown on the screen is also marked with *.



2.1.1 Keys and knobs

Soft keys (4)

The five keys in a row under the display have varying functions. These are “soft” keys, i.e. they can have different functions depending on which menu you are currently working in. The current function for these keys can be seen from the text in the bottom row of the display.

When the function is active, this is indicated by the key turning white:



Menu key (5)



Using the menu key always takes you back to the main menu:

MIG/MAG				
<i>PROCESS</i>		<i>MIG/MAG</i>		
<i>METHOD</i>		<i>SHORT/SPRAY</i>		
<i>QSET</i>		<i>OFF</i>		
<i>WIRE TYPE</i>		<i>Fe ER70S</i>		
<i>SHIELDING GAS</i>		<i>Ar+8%CO2</i>		
<i>WIRE DIAMETER</i>		<i>1.2 mm</i>		
<i>CONFIGURATION▶</i>				
<i>TOOLS▶</i>				
<i>SET</i>	<i>MEASURE</i>	<i>MEMORY</i>	<i>FAST MODE</i>	

Enter key (6)



Using the enter key confirms a selection.

Cursor knob (2)

Using the left-hand knob moves the cursor to different rows in the display.

Plus/minus knobs (7, 8)

The right-hand knobs increase or decrease the value of a setting. To the side of the knobs there is a symbol, a square # or a star *. Most numerical settings can be adjusted with either knob, although certain settings have to be made with a particular knob.

2.2 Location

On the reverse of the control panel there is a fold-out stand that enables you to put the panel down and still view the display in an upright position. The stand also acts as a mounting device, enabling the control panel to be hung on the wire feed unit.



2.3 USB connection

External USB memories can be used to transfer files to and from the control panel.

The files that are produced in the control panel are stored as xml files. The USB memory must be formatted as FAT 32 in order to work.

During normal use there is no risk of “viruses” being able to infect the equipment. To eliminate this risk entirely, we recommend that the USB memory used with this equipment is not used for any other purpose.

Certain USB memories may not work with this equipment. We recommend using USB memories from a reputable supplier. ESAB assumes no responsibility for any damage caused as a consequence of the incorrect use of a USB memory.



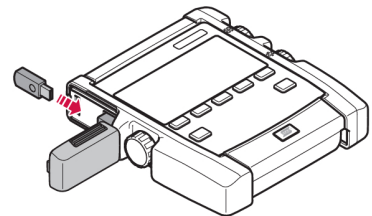
NOTE!

When using U8² in presentation mode together with W8², the USB connected to the U8² is only used to transfer programs. The program is transferred at startup of power source. A separate USB connected to the W8² is used to transfer programs to W8² or to store files.

2.3.1 Program update using USB memory

Proceed as follows:

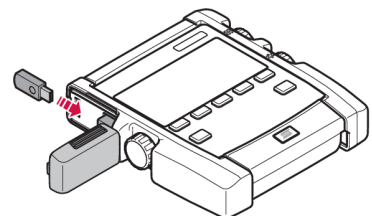
- Turn off the power source's main switch.
- Open the cover on the left-hand end of the control panel.
- Insert the USB memory in the USB connector.
- Close the cover.
- Turn on the power source's main switch.



2.3.2 File transfer using USB memory

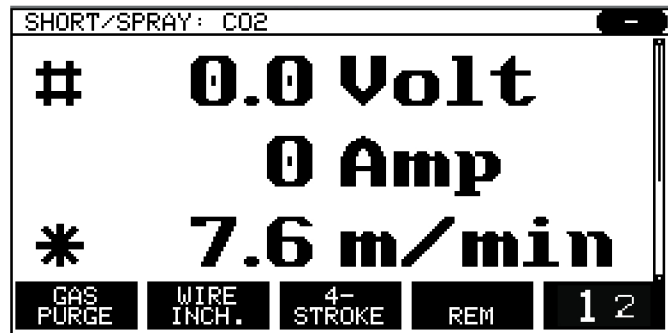
Proceed as follows:

- Open the cover on the left-hand end of the control panel.
- Insert the USB memory in the USB connector.
- Close the cover.
- See more in the "Export/Import" section.



2.4 First step – choice of language

This menu appears in the display the first time you start up the equipment.



The control panel is set to English on delivery. To select your language, proceed as follows.

Press **MENU**  to come to the main menu.

Using the left-hand knob, position the cursor on the *CONFIGURATION* row.

MIG/MAG				
<i>PROCESS</i>		<i>MIG/MAG</i>		
<i>METHOD</i>		<i>SHORT/SPRAY</i>		
<i>QSET</i>		<i>OFF</i>		
<i>WIRE TYPE</i>		<i>Fe ER70S</i>		
<i>SHIELDING GAS</i>		<i>Ar+8%CO2</i>		
<i>WIRE DIAMETER</i>		<i>1.2 mm</i>		
CONFIGURATION▶				
TOOLS▶				
<i>SET</i>	<i>MEASURE</i>	<i>MEMORY</i>	<i>FAST MODE</i>	

Press **ENTER** 

Position the cursor on the *LANGUAGE* row. Press **ENTER** to bring up a list of the languages that are available in the control panel.

CONFIGURATION				
LANGUAGE ENGLISH				
CODE LOCK▶				
REMOTE CONTROLS▶				
MIG/MAG DEFAULTS▶				
MMA DEFAULTS▶				
FAST MODE SOFT KEYS				
DOUBLE STARTS SOURCES				OFF
PANEL REMOTE ENABLE				OFF
WF SUPERVISION				ON
AUTO SAVE MODE				OFF
TRIGGER WELDDATA SWITCH▶				
				QUIT

Position the cursor on the row for your language and press ENTER.

NORSK	
POLSKI	
PORTUGUES	
SUOMI	
SVENSKA	
CHINESE	

2.5 Display

MIG/MAG				
PROCESS				MIG/MAG
METHOD				SHORT/SPRAY
QSET				OFF
WIRE TYPE				Fe ER70S
SHIELDING GAS				Ar+8%CO2
WIRE DIAMETER				1.2 mm
CONFIGURATION▶				
TOOLS▶				
SET	MEASURE	MEMORY	FAST MODE	

The cursor

The control panel's cursor is presented as a shaded field around the text, with the selected text turning white. The selection is displayed in the instruction manual with bold text.

Arrows and scroll bars

Where there is more information behind a row, this is indicated with a black arrow behind the text. A scroll bar is presented to the right of the display if there are more rows in the list.

CONFIGURATION				
LANGUAGE				ENGLISH
CODE LOCK▶				
REMOTE CONTROLS▶				
MIG/MAG DEFAULTS▶				
MMA DEFAULTS▶				
FAST MODE SOFT KEYS▶				
DOUBLE START SOURCES				OFF
PANEL REMOTE ENABLE				OFF
WF SUPERVISION				ON
AUTO SAVE MODE				OFF
				QUIT

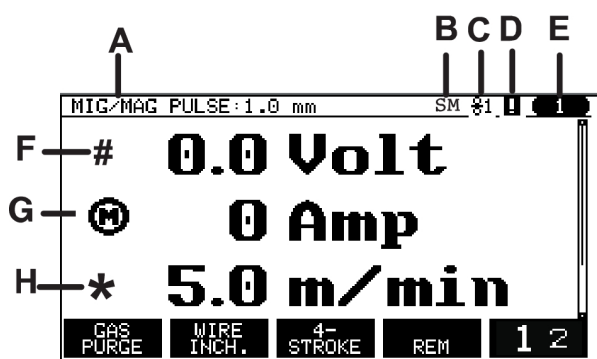
Text boxes

At the bottom of the display are five boxes containing text that describes the current function of the five keys directly below the boxes.

Energy saving mode

To increase the life of the background lighting, it is switched off after three minutes of no activity.

2.5.1 Symbols in the display



- A** The selected weld data set
- B** S = Setting limit activated
M = Measure limit activated
- C** The selected wire feed unit
- D** Icon for VRD status and to display if a error has occurred, see "Icon for VRD and error indication" section.
- E** Recalled memory position number
- F** Select the plus/minus knob marked # to increase or decrease a parameter value.
- G** Measured motor current



- H Select the plus/minus knob marked * to increase or decrease a parameter value.
- I Editing mode, editing memory position

2.5.2 Icon for VRD and error indication

This icon is used for two independent indications:

- Display status of VRD in the connected power source
- Indicate if a error has occurred

The VRD function ensures that the open-circuit voltage does not exceed 35 V when welding is not being carried out. In the power source the VRD function is blocked when the system senses that welding has started. An active or not active VRD function is indicated in the same icon as it is indicated if a error has occurred. See the table below.

Icon	VRD status	Error status
	VRD not active.	A error has occurred, see the "Error log" section in the "TOOLS" chapter.
	VRD is active.	A error has occurred, see the "Error log" section in the "TOOLS" chapter.
	VRD is active.	No errors.
Icon not displayed.	VRD not active.	No errors.



NOTE!

The VRD function works for power sources where it is implemented.

2.6 General information about settings

There are three main types of setting:

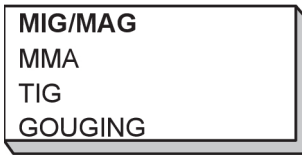
- Setting of numerical values
- Setting with given alternatives
- Setting of ON/OFF mode

2.6.1 Setting of numerical values

When setting a numerical value, one of the two plus/minus knobs is used to increase or decrease a given value. A number of values can also be altered from the remote control unit.

2.6.2 Setting with given alternatives

Some settings are made by selecting an alternative from a list. Such a list might look like this:



Here the cursor is placed on the row for MIG/MAG. By pressing *ENTER* in this position, the MIG/MAG alternative is selected. If you want to choose another alternative instead, position the cursor on the correct row by stepping up or down with the left knob. Then press *ENTER*. Exit the list without making a selection by pressing *QUIT*.

2.6.3 Settings ON/OFF

For some functions, it is possible to set the values ON and OFF. The synergy function during MIG/MAG and MMA welding is an example of such a function. The ON or OFF settings can be selected from a list of alternatives as described above.

2.6.4 QUIT and ENTER

The soft key farthest to the right is used primarily for *QUIT*, although it is occasionally used for other functions.

- Press *QUIT* to move back to the previous menu or screen. Changes are automatically saved when set.



The  key is called *ENTER* in this manual.

- Press *ENTER* to execute a selected choice in a menu or a list.

3 MENUS

The control panel uses several different menus. The menus are: *MAIN MENU*, *CONFIGURATION*, *TOOLS*, *WELD DATA SETTINGS*, *MEASURE*, *WELD DATA MEMORY* and *FAST MODE*. The menu structures are presented in the different sections in this manual. During start-up, a start-up screen containing information about the current program version is also displayed briefly.



Example of the start-up screen

3.1 Main menu

In the *MAIN MENU*, you can change welding process, welding method, wire type, etc. From this menu you can proceed to all other sub-menus.

MIG/MAG				
<i>PROCESS</i>		<i>MIG/MAG</i>		
<i>METHOD</i>		<i>SHORT/SPRAY</i>		
<i>QSET</i>		<i>OFF</i>		
<i>WIRE TYPE</i>		<i>Fe ER70S</i>		
<i>SHIELDING GAS</i>		<i>Ar+8%CO2</i>		
<i>WIRE DIAMETER</i>		<i>1.2 mm</i>		
<i>CONFIGURATION▶</i>				
<i>TOOLS▶</i>				
<i>SET</i>	<i>MEASURE</i>	<i>MEMORY</i>	<i>FAST MODE</i>	

3.1.1 Configuration menu

In the *CONFIGURATION* menu you can change language, alter other basic settings, unit of measurement etc.

CONFIGURATION	
LANGUAGE	ENGLISH
CODE LOCK▶	
REMOTE CONTROLS▶	
MIG/MAG DEFAULTS▶	
MMA DEFAULTS▶	
FAST MODE SOFT KEYS▶	
DOUBLE START SOURCES	OFF
PANEL REMOTE ENABLE	OFF
WF SUPERVISION	ON
AUTO SAVE MODE	OFF
TRIGGER WELD DATA SWITCH▶	
	QUIT

For further information, see the "CONFIGURATION" chapter.

3.1.2 Tools menu

In the *TOOLS* menu you can transfer files, view quality and production statistics, error logs, etc.

TOOLS	
ERROR LOG▶	
EXPORT/IMPORT▶	
FILE MANAGER▶	
SETTING LIMIT EDITOR▶	
MEASURE LIMIT EDITOR▶	
PRODUCTION STATISTICS▶	
QUALITY FUNCTIONS▶	
USER DEFINED SYNERGIC DATA▶	
CALENDAR▶	
USER ACCOUNTS▶	
UNIT INFORMATION▶	
	QUIT

For further information, see the "TOOLS" chapter.

3.1.3 Weld data setting menu

SET Press *SET* to move to *WELD DATA SETTING*. In the *WELD DATA SETTING* menu you can alter various welding parameters. The menu has different appearances depending on which welding process is selected. The example shows MIG/MAG welding with short-/sprayarc.

WELD DATA SETTING				
VOLTAGE			28.2 (+3.5) V	
WIRE SPEED			6.0 M/MIN	
INDUCTANCE			80%	
SYNERGIC MODE			ON	
START DATA▶				
STOP DATA▶				
SETTING LIMITS▶				
MEASURE LIMITS▶				
SPOT WELDING▶				
EDIT DESCRIPTION▶				
CRATER FILL	HOT START	4- STROKE		QUIT

3.1.4 Measure

MEASURE Press *MEASURE* to view measured values for various welding parameters while welding is in progress.

SHORT/SPRAY. Fe ER70S, CO2, 1.2 mm				
#	0.0 Volt			
	0 Amp			
*	6.0 m/min			
GAS	WIRE	4-		
PURGE	INCH	STROKE	REM	1 2

You can change the value of certain parameters in the *MEASURE* screen. Which parameters these are depends on which welding process is set. The parameter values that can be adjusted are always marked with # or *.

The measured values remain in the display even after welding has been completed. You can move to different menus without losing the measurement values. If the set value is altered when welding is not in progress, the measurement value is changed to zero in order to avoid confusion.



NOTE!

When pulsing, you can select whether the voltage value is to be displayed as an average value or a peak value. This setting can be adjusted under MIG/MAG defaults, see the "MIG/MAG defaults" section.

3.1.5 Weld data memory

MEMORY In the *WELD DATA MEMORY* menu you can store, recall, delete and copy various set weld data. The weld data sets can be stored in 255 different memory positions.

<i>WELD DATA MEMORY</i>				
1 -				
2 -				
3 -				
4 -				
5 -				
6 -				
7 -				
<i>STORE</i>			1 2	<i>QUIT</i>

For further information, see the “MEMORY MANAGEMENT” chapter.

3.1.6 Fast mode menu

FAST MODE In the *FAST MODE* menu, you can “link” soft keys to weld data memory positions. These settings are carried out in the *CONFIGURATION* menu. The number of the selected memory position is displayed in the top right corner.

SHORT/SPRAY. Fe ER70S, CO2, 1.2 mm				7
#	28.5 Volt			
	0 Amp			
*	6.0 m/min			
WELD DATA 1	WELD DATA 2	WELD DATA 3	WELD DATA 4	1 2

For further information, see the “Fast mode soft keys” section.

4 MIG/MAG WELDING

MAIN MENU » PROCESS » MIG/MAG

MIG/MAG welding melts a continuously supplied filler wire, with the weld pool being protected by shielding gas.

Pulsing is used to influence the transfer of the droplets from the arc so that it remains stable and spatter-free, even with low weld data.

For wire diameters that can be used for **MIG/MAG** welding with **SHORT-/SPRAYARC** and with **PULSING**, see the "WIRE AND GAS DIMENSIONS" appendix at the end of this manual.

When the MIG/MAG process is selected, you can choose between four methods by selecting **METHOD** with the left-hand knob and then pressing **ENTER**. Choose **SHORT/SPRAY**, **PULSE** or **SUPERPULSE** and press **ENTER**.

MIG/MAG				
PROCESS		<i>MIG/MAG</i>		
METHOD		<i>SHORT/SPRAY</i>		
QSET		<i>OFF</i>		
WIRE TYPE		<i>Fe ER70S</i>		
SHIELDING GAS		<i>CO2</i>		
WIRE DIAMETER		<i>1.2 mm</i>		
CONFIGURATION▶		<i>MIG/MAG</i>		
TOOLS▶		<i>MIG/MAG</i>		
SET	MEASURE	MEMORY	FAST MODE	

MIG/MAG » METHOD
<i>SHORT/SPRAY</i>
<i>PULSE</i>
<i>SUPERPULSE</i>

4.1 Settings in the weld data setting menu

4.1.1 MIG/MAG welding with short-/sprayarc

The table below shows settings and the menu structure when selecting **MIG/MAG » METHOD » SHORT/SPRAY** and pressing **SET**.

Settings	Setting range	In steps of	Synergy dependent	Adjustable in synergy
<i>Voltage</i>	8 - 60 V	0.25 V (displayed with one decimal)	x	x
<i>Wire speed¹⁾</i>	0.8 - 30.0 m/min	0.1 m/min		x
<i>Inductance</i>	0 - 100%	1%	x	x
<i>Control type⁹⁾</i>	1 - 12, 17	1	x	x
<i>Synergic mode³⁾</i>	OFF or ON	-	-	-
<i>Start data » Gas pre-flow</i>	0.1 - 25 s	0.1 s		x
<i>Start data » Creep start</i>	OFF or ON	-		x

Settings	Setting range	In steps of	Synergy dependent	Adjustable in synergy
Hot start	OFF or ON	-		x
Hot start » Hot start time ⁹⁾	0.0 - 10.0 s	0.1 s		x
Hot start » Hot start wire speed ⁹⁾	Complete wire feed range	0.1 m/min		x
Hot start » voltage ⁹⁾	8.0 - 60.0 V	0.25 V (displayed with one decimal)	x	x
Start data » Touch sense ^{5), 10)}	10 - 16 A (0 - 16 A)			
Hot start » Soft start ¹⁰⁾	OFF or ON	-		x
Start parameter R	8 - 60	0.25 (displayed with one decimal)	x	
Stop data » Crater fill	OFF or ON	-		x
Stop data » Crater fill » Time	0 - 10 s	0.1 s		x
Stop data » Crater fill » Crater fill wire speed	1.5 m/min at current wire feed speed	0.1 m/min		x
Final crater filling voltage	8 - 24.7 V		x	
Final crater filling time	0.0 - 5.0 s	0.1 s	x	
Stop data » Pinch-off pulse ⁹⁾	10 % - 120 %	1 %		x
Stop data » Release pulse ⁶⁾	OFF or ON			
Stop data » Burnback time ⁹⁾	0 - 1 s	0.01 s		x
Stop data » SCT ⁷⁾	OFF, ON or SYNERGIC	-	x	x
Stop data » Gas post-flow	0.1 - 25 s	0.1 s		x
Setting limits	1 - 50	-	-	-
Measure limits	1 - 50	-	-	-
Spot welding » Spot welding ⁸⁾	OFF or ON	-		x
Spot welding » Spot welding time	0 - 25 s	0.1 s		x
Edit description » Keyboard				

¹⁾The setting range is dependent on the wire feed unit used.

³⁾The setting range is dependent on the wire feed unit used. The synergic line on delivery: solid wire (Fe ER70S), shielding gas CO₂ with wire 1.2 mm.

⁵⁾0-16 A is applicable for 5000 series power sources.

⁶⁾The setting range is dependent on the wire feed unit used. Adjusted in the configuration menu MIG/MAG defaults.

⁷⁾When SCT is configured to ON, the setting **Burnback time** is set to -0.05 s. When SCT is configured to OFF, the saved **Burnback time** value is used. When SCT is configured to SYNERGIC, the SCT value (ON or OFF) is picked from the synergic line.

⁸⁾It is not possible to select spot welding (ON) if gun trigger mode is 4-stroke.

⁹⁾Visible depending on setting.

¹⁰⁾Visible depending on connected equipment.

4.1.2 MIG/MAG welding with pulsing

The table below shows settings and the menu structure when selecting MIG/MAG » METHOD » PULSE and pressing SET.

Settings	Setting range	In steps of	Synergy dependent	Adjustable in synergy
Voltage	10 - 50 V	0.25 V (displayed with one decimal)	x	x
Wire speed ¹⁾	0.8 - 30.0 m/min	0.1 m/min		x
Pulse current ^{2), 9)}	100 - 650 A	1 A	x	x
Pulse time ⁹⁾	1.7 - 25.5 ms	0.1 ms	x	
Pulse frequency ⁹⁾	16 - 312 Hz	2 Hz	x	
Background current ⁹⁾	4 - 300 A	1 A	x	
Slope ⁹⁾	1 - 9	1	x	
Synergic mode ³⁾	OFF or ON	-	-	
Internal constants » Ka	0 - 100%	1%	x	
Internal constants » Ki	0 - 100%	1%	x	
Start data » Gas pre-flow	0.1 - 25 s	0.1 s		x
Start data » Creep start	OFF or ON	-		x
Start data » Soft start	OFF or ON	-		x
Start data » Start parameter S	8 - 60	0.25 (displayed with one decimal)	x	
Start data » Hot start	OFF or ON	-		x
Start data » Hot start » Hot start time	0.0 - 10.0 s	0.1 s		x
Start data » Hot start » Hot start wire speed	Complete wire feed range	0.1 m/min		x
Start data » Hot start » Voltage	8.0 - 50.0 V	0.25 V (displayed with one decimal)	x	x
Start data » Touch sense ⁵⁾	10 - 16 A (0 - 16 A)			
Hot start pulse current ²⁾	100 - 650 A	1 A	x	
Hot start background current	4 - 300 A	1 A	x	
Hot start pulse frequency	16 - 312 Hz	2 Hz	x	
Start parameter R	8.0 - 50.0	0.25 (displayed with one decimal)	x	

Settings	Setting range	In steps of	Synergy dependent	Adjustable in synergy
Stop data » Crater fill	OFF or NON-PULSED or PULSED	-		x
Stop data » Crater fill » Time	0 - 10 s	0.1 s		x
Stop data » Crater fill » Final crater fill wire speed	1.5 m/min at current wire feed speed	0.1 m/min		x
Final crater fill voltage	8 - 33.2 V		x	
Final pulse current	100 - max A		x	
Final background current	12 - 50 A		x	
Final frequency	20 - 270 Hz		x	
Final crater filling time	0.0 - 5.0 s	0.1 s	x	
Stop data » Pinch-off pulse	20 % - 200 %	1 %		x
Release pulse ⁶⁾	OFF or ON			
Stop data » Burnback time	0 - 1 s	0.01 s		x
SCT ⁷⁾	OFF, ON or SYNERGIC	-	x	x
Stop data » Gas post-flow	0.1 - 25 s	0.1 s		x
Setting limits	1 - 50	-	-	-
Measure limits	1 - 50	-	-	-
Spot welding » Spot welding ⁸⁾	OFF or ON	-		x
Spot welding » Spot welding time	0 - 25 s	0.1 s		x
Edit description » Keyboard				

¹⁾The setting range is dependent on the wire feed unit used.

²⁾Minimal background current and pulse current are dependent on which product type is used.

³⁾The synergic line on delivery: solid wire (Fe ER70S), shielding gas CO₂ with wire 1.2 mm.

⁵⁾0 - 16 A is applicable for 5000 series power sources.

⁶⁾Adjusted in the configuration menu MIG/MAG defaults.

⁷⁾When SCT is configured to ON, the setting **Burnback time** is set to -0.05 s. When SCT is configured to OFF, the saved **Burnback time** value is used. When SCT is configured to SYNERGIC, the SCT value (ON or OFF) is picked from the synergic line. Default value set to OFF.

⁸⁾It is not possible to select spot welding (ON) if gun trigger mode is 4-stroke.

⁹⁾Visible depending on setting.

¹⁰⁾Visible depending on connected equipment.

4.1.3 MIG/MAG welding with SuperPulse, primary/secondary, short-/sprayarc/pulsing

The table below shows settings and the menu structure when selecting *MIG/MAG » METHOD » SUPERPULSE* and pressing *SET*.

Settings	Setting range	In steps of	Synergy dependent	Adjustable in synergy
<i>Voltage</i>	8 - 60 V	0.25 V (displayed with one decimal)	x	x
<i>Wire speed¹⁾</i>	0.8 - 30.0 m/min	0.1 m/min		x
<i>Phase</i>	Primary or Secondary	-		x
<i>Method</i>	Short-/sprayarc or pulsing	-		x
<i>Voltage</i>	10 - 50 V	0.25 V (displayed with 1 decimal)	x	x
<i>Wire feed speed¹⁾</i>	0.8 - 30.0 m/min	0.1 m/min		x
<i>Inductance</i>	0 - 100%	1%	x	x
<i>Pulse current²⁾</i>	100 - 650 A	1 A	x	
<i>Pulse time</i>	1.7 - 25.5 ms	0.1 ms	x	
<i>Pulse frequency</i>	16 - 312 Hz	2 Hz	x	
<i>Background current</i>	4 - 300 A	1 A	x	
<i>Slope</i>	1 - 9	1	x	
<i>Ka</i>	0 - 100%	1%	x	
<i>Ki</i>	0 - 100%	1%	x	
<i>Regulator type</i>		1		
<i>Synergy³⁾</i>	OFF or ON	-	-	-
<i>Phase weld time</i>	0.10 - 2.50 s	0.01 s		x
<i>Gas pre-flow</i>	0.1 - 25 s	0.1 s		x
<i>Creep start</i>	OFF or ON	-		x
<i>Soft start</i>	OFF or ON	-		x
<i>Start parameter S</i>	8.0 - 60.0	0.25 (displayed with one decimal)	x	
<i>Hot start</i>	OFF or ON	-		x
<i>Hot start time</i>	0.0 - 10.0 s	0.1 s		x
<i>Hot start wire feed</i>	Complete wire feed range	0.1 m/min		x
<i>Hot start voltage</i>	-14 to +27 V			-
<i>Hot start pulse current²⁾</i>	100 - 650 A	1 A	x	
<i>Hot start background current</i>	4 - 300 A	1 A	x	
<i>Hot start pulse frequency</i>	16 - 312 Hz	2 Hz	x	
<i>Start parameter R</i>	8.0 - 50.0	0.25 (displayed with one decimal)	x	

Settings	Setting range	In steps of	Synergy dependent	Adjustable in synergy
<i>Touch sense</i> ⁵⁾	10 - 16 A (0 - 16 A)			X
<i>Crater fill</i>	OFF or NON-PULSED or PULSED	-		X
<i>Crater filling time</i>	0 - 10 s	0.1 s		X
<i>Final crater filling wire feed</i>	1.5 m/min at current wire feed speed	0.1 m/min		X
<i>Final crater filling voltage</i>	8 - 33.2 V		X	
<i>Final pulse current</i>	100 - max A		X	
<i>Final background current</i>	12 - 50 A		X	
<i>Final frequency</i>	20 - 270 Hz		X	
<i>Final crater filling time</i>	0.0 - 5.0 s	0.1 s	X	
<i>Cut-off pulse</i>	%			
<i>Burnback time</i>	0 - 1 s	0.01 s		X
<i>SCT</i> ⁷⁾	OFF, ON or SYNERGIC	-	X	X
<i>Gas post-flow</i>	0.1 - 25 s	0.1 s		X
<i>Setting limits</i>	1 - 50	-	-	-
<i>Measure limits</i>	1 - 50	-	-	-
<i>Spot welding</i>	OFF or ON	-		X
<i>Spot welding time</i>	0 - 25 s	0.1 s		X
<i>Release pulse</i> ⁶⁾	OFF or ON			X

¹⁾The setting range is dependent on the wire feed unit used.

²⁾Minimal background current and pulse current are dependent on which product type is used.

³⁾The synergic line on delivery: solid wire (Fe ER70S), shielding gas CO₂ with wire 1.2 mm.

⁵⁾0 - 16 A is applicable for 5000 series power sources.

⁶⁾Adjusted in CONFIGURATION » MIG/MAG DEFAULTS.

⁷⁾When SCT is configured to ON, the setting **Burnback time** is set to -0.05 s. When SCT is configured to OFF, the saved **Burnback time** value is used. When SCT is configured to SYNERGIC, the SCT value (ON or OFF) is picked from the synergic line.

⁹⁾Visible depending on setting.

¹⁰⁾Visible depending on connected equipment.

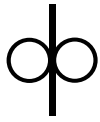
4.2 Function explanations for settings

Voltage

Higher voltage increases the arc length and produces a hotter, wider weld pool.

The voltage setting differs between synergy and non synergy modes. In synergy mode, the voltage is set as a positive or negative offset from the synergic line of the voltage. In non synergy mode, the voltage value is set as an absolute value.

The voltage is set in the measure, *WELD DATA SETTING* or *FAST MODE* menus. When the remote control unit is used, the setting can be adjusted from here.



Wire feed speed

This sets the required feed speed of the filler wire in m/minute.

The wire feed speed is set in the *MEASURE*, *WELD DATA SETTING* or *FAST MODE* menus. When the remote control unit is used, the setting can be adjusted from here.



Inductance

Higher inductance results in a wider weld pool and less spatter. Lower inductance produces a harsher sound but a stable, concentrated arc.

Inductance is set in the *WELD DATA SETTING* menu.

Only applies to MIG/MAG welding with short-/sprayarc.

Control type

Affects the short circuit process and heat in the weld.

The setting should not be altered.

Pulse current

The higher of the two current values in the event of pulsed current.

Pulse current is set in the *WELD DATA SETTING* menu with the synergy function switched off.

Only applies to MIG/MAG welding with pulsing.

Pulse time

The time the pulse current is on during a pulse period.

Pulse current is set in the *WELD DATA SETTING* menu with the synergy function switched off.

Only applies to MIG/MAG welding with pulsing.

Pulse frequency

Time for background current which, along with the time for pulse current, gives the pulse period.

Pulse frequency is set in the *WELD DATA SETTING* menu with the synergy function switched off.

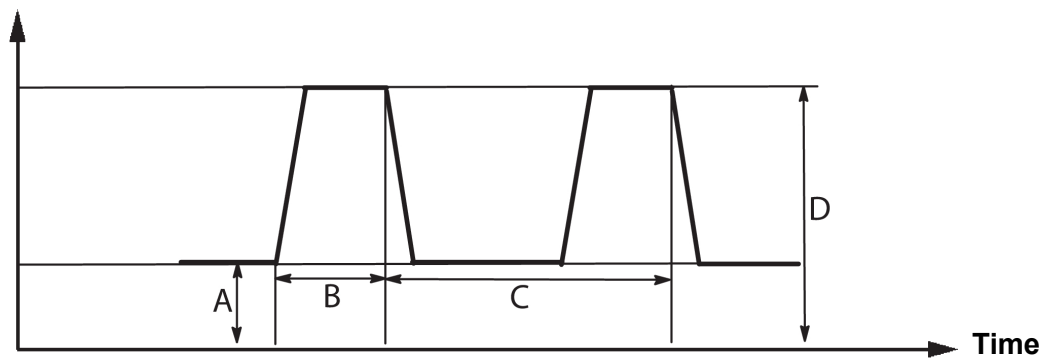
Only applies to MIG/MAG welding with pulsing.

Background current

The lower of the two current values in the event of pulsed current.

Background current is set in the *WELD DATA SETTING* menu with the synergy function switched off.

Only applies to MIG/MAG welding with pulsing.

Current**MIG/MAG welding with pulsing**

A = Background current

B = Pulse time

C = Pulse period time

D = Pulse current

Slope

Slope means that the pulse current slowly increases/decreases to the set value. The Slope parameter can be set in nine stages, with each stage corresponding to 100 μ s.

The slope is important as regards the sound. A steep slope produces a louder and sharper sound. Too gentle a slope can, in the worst case scenario, impair the pulse's ability to cut off the droplet.

Slope is set in the *WELD DATA SETTING* menu with the synergy function switched off.

Only applies to MIG/MAG welding with pulsing.

Ka

Ka is the proportional gain of the arc length regulator. A high value means that the regulator will answer faster in response to arc length variations.

Ka is set in the *WELD DATA SETTING* » *Internal constants* menu with the synergy function switched off.

Only applies to MIG/MAG welding with pulsing.

Ki

Ki is the integral gain of the arc length regulator. Keep this value low to get a stable regulation.

Ki is set in the *WELD DATA SETTING* » *Internal constants* menu with the synergy function switched off.

Only applies to MIG/MAG welding with pulsing.

Synergic mode

Each combination of wire type, wire diameter and gas mixture requires a unique relationship between wire feed speed and voltage (arc length) to obtain a stable, functioning arc. The voltage (arc length) automatically "conforms" to the selected pre-programmed synergic line, which makes it much easier to find the correct welding parameters quickly. The link between wire feed speed and other parameters is known as the synergic line.

For wire and gas combinations, see the "WIRE AND GAS DIMENSIONS" appendix at the end of this manual.

It is possible to order different packages of synergic lines, although these must be installed by an authorised ESAB service engineer.

For the creation of own synergic lines, see the "User defined synergic data" section.

Activation of the synergy takes place in the *WELD DATA SETTING* menu.

Phase

In this function, the choice is made between primary and secondary.

High data is set in primary and low data is set in secondary.

The settings are used to determine whether primary or secondary data should be available for editing. It also determines which data are affected in measuring and remote modes. The wire feed speed shown in the measure screen shows the speed in the selected phase. However, the voltage, current and weld output are based on the measurement under both phases.

You can choose different synergy in the primary and secondary phases.

Primary or secondary phase is set in *MIG/MAG SET* when Superpulse is selected and synergy is switched off.



Gas pre-flow

This controls the time during which shielding gas flows before the arc is struck.

Gas pre-flow is set in the *WELD DATA SETTING* » *START DATA* menu.



Creep start

Creep starting feeds out the wire at 1.5 metres/minute until it makes electrical contact with the workpiece.

Creep start is set in the *WELD DATA SETTING* » *START DATA* menu.

Soft start

Soft start means that when the welding wire short circuits against the workpiece, the wire feed stops. The feed unit begins to reverse the welding wire until the circuit with the workpiece is interrupted and the arc lights. The feed unit then starts to feed the welding wire in the correct direction and a welding start is performed.

Soft start is set in the *WELD DATA SETTING* » *START DATA* menu.

Applies to welding with feed units that support reversed wire feed.

Start parameter R

Start parameter R enables finetuning of the electric arc during the start moment when welding. The parameter can be set from 8.0 to 60.0, in steps of 0.25. This function is only visible and adjustable when synergy is not active (which means that the chosen method is Short Arc).

Hot start

Hot start increases the wire feed speed and the voltage for an adjustable time at the start of the welding process. The main purpose of this is to provide more energy when starting welding, which reduces the risk of poor fusion at the beginning of the joint.

Synergy - hot start

It is possible to increase the wire feed speed during a specific period compared to the present wire feed speed to provide more energy during the weld start and ensure penetration. The speed is set relative to the ordinary wire feed speed. The time starts when the arc is ignited and the length is the set hot start time. Synergy gives an increase in the wire speed of 2 m/min.

Non synergy - hot start

If non synergy is selected, the voltage can be set.

During non synergy and pulsing, voltage, pulse current, background current and frequency can be set.

**NOTE!**

It is possible to set negative values for the hot start wire feed and hot start voltage. This can be used with high weld data to give a smooth weld start by initially “stepping up” the weld data.

Hot start is activated in the measure screen or in the *WELD DATA SETTING » START DATA* menu.

Touch sense

The system detects when the wire comes into contact with the workpiece.

Touch sense is set in the *WELD DATA SETTING » START DATA* menu.

Only applies to robot welding.

Crater filling

Crater filling makes a controlled reduction in the heat and size of the weld pool possible when completing the weld. This makes it easier to avoid pores, thermal cracking and crater formation in the weld joint.

In pulse welding mode, it is possible to choose between pulsed and non pulsed crater filling. Non pulsed crater filling is the faster process. Pulsed crater filling takes a little longer, yet gives spatter free crater filling when appropriate values are used.

Synergy - crater filling

In synergy mode, the crater filling time and the final wire feed speed are set in both pulsed and non pulsed crater filling. The voltage and the pulse parameters drop to the final values with the help of synergy.

Non synergy - crater filling

In non synergy mode, the settings can be changed to give another arc length at the end of crater filling. A final time for the final value of crater filling can also be set.

The final voltage can be set for non pulsed crater filling. The final voltage, final pulse current, final background current and the final frequency can be set for pulsed crater filling.

The final parameter values must always be equal to or lower than the set values for continuous welding. If the settings for continuous welding are lowered below the set final values, they will also lower the final values. The final parameter values will not increase again if the setting for continuous welding is increased.

Example: You have 4 m/min as the final wire feed speed and lower the wire feed speed to 3.5 m/min. The final wire feed speed will also be lowered to 3.5 m/min. The final wire speed remains at 3.5 m/min even when the wire feed speed is increased again.

Crater filling is activated in the measure screen or in the *WELD DATA SETTING » STOP DATA* menu.

Pinch-off pulse

Pinch-off pulse is a pulse that is applied to ensure that a ball is not formed on the wire when welding stops.

Applies to MIG/MAG welding with short/spray arc and short pulsing. When pulsing, completion is synchronised with a pulse, finishing pulse.

Pinch-off pulse is set in the *WELD DATA SETTING » STOP DATA* menu.

**Burnback time**

Burnback time is a delay between the time when the wire starts to brake until the time when the power source switches off the welding voltage. Too short burnback time results in a long wire stickout after completion of welding, with a risk of the wire being caught in the solidifying weld pool. Too long a burnback time results in a shorter stickout, with increased risk of the arc striking back to the contact tip.

Burnback time is set in the *WELD DATA SETTING » STOP DATA* menu.

Short Circuit Termination (SCT)

SCT is a function that gives small repeated short circuits at the end of welding until the wire feeding has totally stopped and contact with the workpiece has been broken.

SCT shall not be used with cored wire.

Termination

Select either Final pulse or SCT (Short Circuit Termination) here.

Termination is set in the *WELD DATA SETTING » STOP DATA* menu.

Applies to welding with feed units that support reversed wire feed.

Release pulse

If the wire becomes stuck in the workpiece, the system detects this. A current pulse is sent out that releases the wire from the surface.

Applies to MIG/MAG welding with short/spray arc and short pulsing. When pulsing, completion is synchronised with a pulse, finishing pulse, which can be set between 20 and 200%.

The setting is adjusted in the *CONFIGURATION » MIG/MAG DEFAULTS* menu.

**Gas post-flow**

This controls the time during which shielding gas flows after the arc is extinguished.

Gas post-flow is set in the *WELD DATA SETTING » STOP DATA* menu.

Setting limits and measure limits

In limits, a limit number is selected. For settings, see the “Setting limit editor” and “Measure limit editor” sections.

Limits are activated in the *WELD DATA SETTING* menu.

● ● ● ● Spot-welding

Spot-welding is welding with short repeated occasions at a preset time.

Spot welding is used when you want to spot weld thin plates together.

Spot welding is activated and spot welding time is set in the *WELD DATA SETTING » SPOT WELDING* menu.



Wire inching

Wire inching is used to feed wire without welding voltage being applied. The wire is fed as long as the button is pressed.



Gas purging

Gas purging is used when measuring the gas flow or to flush any air or moisture from the gas hoses before welding starts. Gas purging occurs for as long as the button is held depressed and occurs without voltage or wire feed starting.

4.2.1 QSet

QSet is used to facilitate setting welding parameters. Using the plus/minus knobs, the arc length is increased or decreased from -18 to + 18 steps.

SHORT ARC

When first starting welding with a new wire type/gas type, QSet automatically sets all the necessary welding parameters. After that QSet stores all the data to produce a good weld. The voltage then automatically conforms to changes in the wire feed speed.

SPRAY

When approaching the spray arc area, the value for QSet must be increased. Disengage the QSet function when welding with pure spray arc. All settings are inherited from QSet, with the exception of the voltage which must be set.

Recommendation: Make the first weld (6 seconds) with QSet on a test piece to obtain all the correct data.

The QSet value is set in the weld data setting menu for process MIG/MAG and method SHORT/SPRAY.

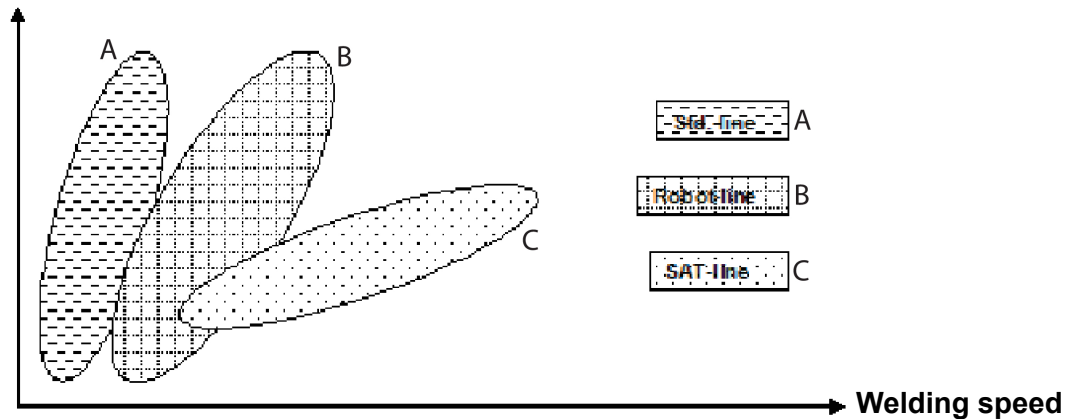
4.2.2 Synergy group

It is possible to choose between the three synergy groups for mechanised welding:

- STANDARD
- ROBOT
- SAT

The relationship between welding speed and plate thickness for the various synergy groups:

Plate thickness



A = STANDARD line

B = ROBOT line

C = SAT line

The **ROBOT** synergy group is used for robotic welding or other mechanised welding. It is suited for higher transfer speeds than when welding on standard lines.

SAT stands for Swift Arc Transfer. This synergy group is suitable for high transfer-speeds, for extreme angles and for plate thicknesses of 2–3 mm.

For wire and gas combinations for SAT, see the "WIRE AND GAS DIMENSIONS" appendix at the end of this manual.

The synergy group is set in the weld data setting menu for process MIG/MAG.

4.3 SuperPulse

MAIN MENU » PROCESS » METHOD



NOTE!

The SuperPulse method is available and visible for selected wire feeders that can handle the added stress of this method.

The SuperPulse method is used for improved control of the weld pool and the solidification process. The weld pool has time to solidify partially between each pulse.

Benefits of using SuperPulse:

- Less sensitivity to root gap variations
- Better control of the weld pool during position welding
- Better control of penetration and penetration profile
- Reduced sensitivity to uneven heat conduction

SuperPulse can be seen as a programmed changeover between two MIG/MAG settings. The time intervals are determined by the primary and secondary phase time settings.

Welding always starts in the primary phase. When hot start is selected, primary data will be used during the hot start time in addition to the phase time for the primary data. Crater filling is always based on secondary data. When a stop command has been activated during the

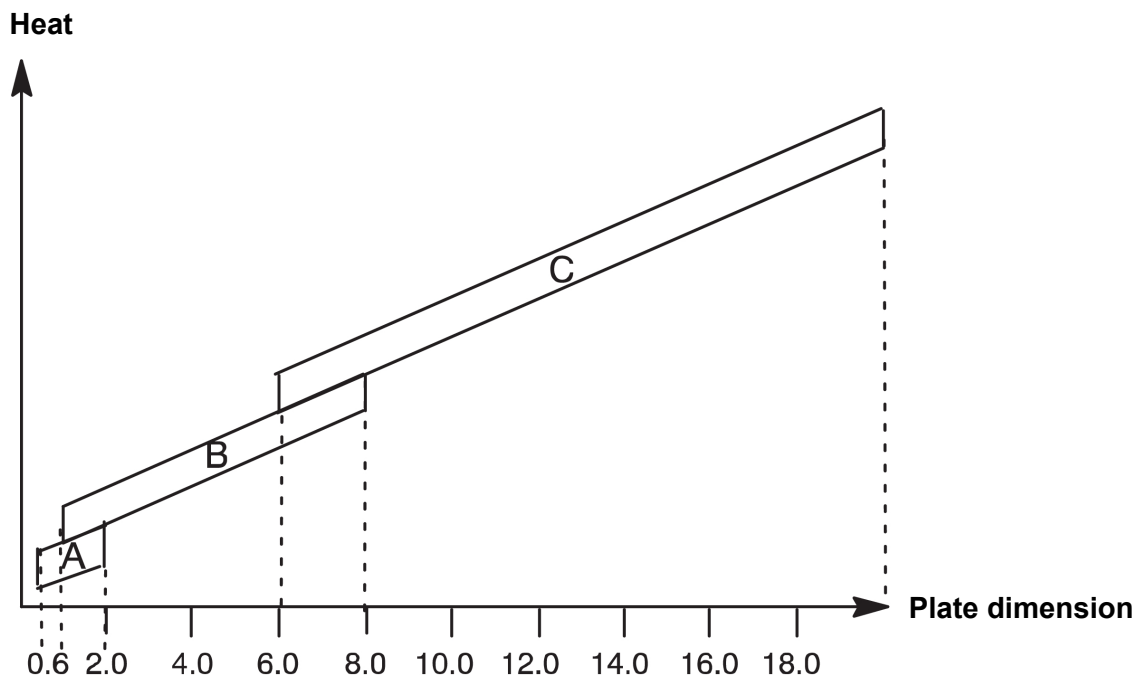
primary phase time, the process immediately switches to secondary data. The weld completion is based on secondary data.

4.3.1 Wire and gas combinations

For wire and gas combinations, see the "WIRE AND GAS DIMENSIONS" appendix at the end of this manual.

4.3.2 Different pulsing methods

Below you can see which pulsing method can be used, depending on the plate thickness that is to be welded.



A = Pulsing in primary phase and **short arc** in secondary phase

B = Pulsing in primary phase and **pulsing** in secondary phase

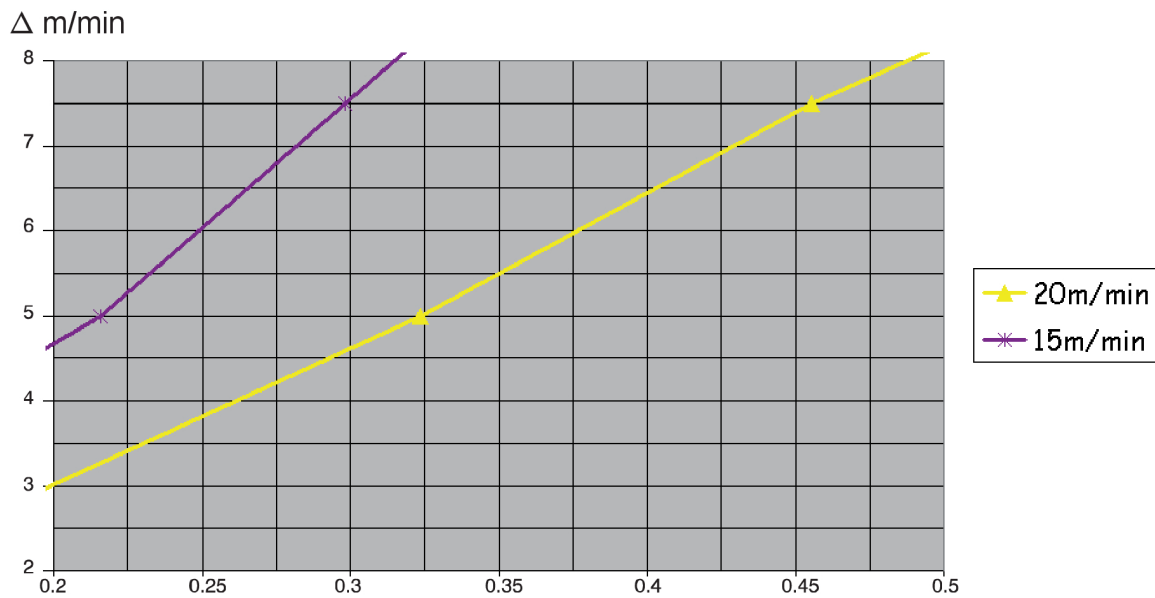
C = Spray in primary phase and **pulsing** in secondary phase

4.3.3 Wire feed unit

Precautionary measures!

When using SuperPulse, there is a considerable load on the wire feed unit. In order of the functional safety of the wire feed unit not to be endangered, follow the limit values in the following diagram.

Difference in the wire feed speed



The graphs for 15 m/min and 20 m/min relate to primary wire feed speed. The cycle time is the sum of primary and secondary phase time.

The difference between primary and secondary wire feed speed may not exceed the speed that is specified by the graphs for primary wire speed.

Example: If the cycle time is 0.25 s and the primary wire feed speed is 15 m/min, the difference between primary and secondary wire feed speed may not exceed 6 m/min.

Weld example A

In this example we will weld a **10 mm plate** with **1.2 mm aluminium wire** and **argon shielding gas**.

Make the following settings using the control panel:

Process	Superpulse	Superpulse
Phase	Primary	Secondary
Method	Short-/Sprayarc	Pulsing
Wire	AlMg ER5356	AlMg ER5356
Shielding gas	Ar	Ar
Wire diameter	1.2 mm	1.2 mm
Voltage	(+1.0 V)	(+3.0 V)
Wire feed speed	15.0 m/min	11.0 m/min
Phase time	0.1 s	0.1 s

Primary and secondary phase time are 0.1 s + 0.1 s = **0.2 s**.

The difference in wire feed speed is 15.0 m/min - 11.0 m/min = **4 m/min**.

Weld example B

In this example we will weld a **6 mm plate** with **1.2 mm aluminium wire** and **argon shielding gas**.

Make the following settings using the control panel:

	Superpulse Primary	Superpulse Secondary
Process		
Phase		
Method	Pulsing	Pulsing
Wire	AlMg ER5356	AlMg ER5356
Shielding gas	Ar	Ar
Wire diameter	1.2 mm	1.2 mm
Voltage	(+1.0 V)	(+2.0 V)
Wire feed speed	12.5 m/min	9.0 m/min
Phase time	0.15 s	0.15 s

Primary and secondary phase time are $0.15\text{ s} + 0.15\text{ s} = \mathbf{0.3\text{ s}}$.

The difference in wire feed speed is $12.5\text{ m/min} - 9.0\text{ m/min} = \mathbf{3.5\text{ m/min}}$.

5 MMA WELDING

MAIN MENU » PROCESS » MMA

MMA welding may also be referred to as welding with coated electrodes. Striking the arc melts the electrode and its coating forms protective slag.

For electrode diameters that can be used for **MMA** welding, see the "WIRE AND GAS DIMENSIONS" appendix at the end of this manual.

MMA				
PROCESS			MMA	
METHOD			DC	
ELECTRODE TYPE			BASIC	
ELECTRODE DIAMETER			3.2 mm	
CONFIGURATION▶				
TOOLS▶				
SET	MEASURE	MEMORY	FAST MODE	

5.1 MMA

The table below shows settings and the menu structure when selecting *MMA* and pressing *SET*.

Settings	Setting range	In steps of	Synergy dependent	Adjustable in synergy
Current ¹⁾	16 - 650 A	1 A		x
Arc force	0 - 100%	1%	x	
Min. current factor	0 - 100%	1%	x	
Control type	0 - 1		x	
Synergic mode	OFF or ON	-	-	-
Hot start	OFF or ON	-	x	
Hot start duration	1 - 30	1	x	
Hot start amplitude	0 - 100%	1	x	
Setting limits	0 - 50	1	-	-
Measure limits	0 - 50	1	-	-
Edit description » Keyboard				

¹⁾Maximum current depending on which product type is being used.

5.2 Function explanations for settings

 **DC, Direct current**

A higher current produces a wider weld pool, with better penetration into the workpiece.

The current is set in the measure screen, weld data setting or fast mode menus.



Arc force

The arc force is important in determining how the current changes in response to a change in the arc length. A lower value gives a calmer arc with less spatter.

The arc force is set in the weld data setting menu when the synergy function is deactivated.

Min. current factor

The setting of min. current factor is employed when using certain specific electrodes.

The setting should not be altered.

Control type

Affects the short circuit process and heat in the weld.

The setting should not be altered.

Synergy

Synergy for MMA welding means that the power source automatically optimises the properties for the electrode type and dimension that have been selected.

Synergy for MMA welding is activated in the weld data setting menu.



Hot start

Hot start increases the weld current for an adjustable time at the start of welding, thus reducing the risk of poor fusion at the beginning of the joint.

Hot start for MMA is activated in the weld data setting menu.

Setting limits and measure limits

In limits, a limit number is selected. For settings, see the "Setting limit editor" and "Measure limit editor" sections in the "TOOLS" chapter.

Limits are activated in the weld data setting menu.

6 TIG WELDING

MAIN MENU » PROCESS » TIG



TIG welding

TIG welding melts the metal of the workpiece, using an arc struck from a tungsten electrode, which does not melt itself. The weld pool and the electrode are protected by shielding gas.



Pulsed current

Pulsing is used for improved control of the weld pool and the solidification process. The pulse frequency is set so slow that the weld pool has time to solidify at least partially between each pulse. In order to set pulsing, four parameters are required: pulse current, pulse time, background current and background time.

TIG				
PROCESS			TIG	
METHOD			CONSTANT I	
START METHOD			HF-START	
GUN TRIGGER MODE			2-STROKE	
CONFIGURATION ►				
TOOLS ►				
SET	MEASURE	MEMORY	FAST MODE	

6.1 Settings in the weld data setting menu

6.1.1 TIG welding without pulsing

The table below shows settings and the menu structure for TIG welding without pulsing.

Settings	Setting range	In steps of
Start method	HF or LiftArc™	-
Live TIG-start ¹⁾	-	-
Gun trigger mode ²⁾	2 stroke or 4 stroke	-
Below settings are available when selecting <i>PROCESS » TIG</i> and pressing <i>SET</i> .		
Current ¹⁾	4 - 500 A	1 A
Slope up time ²⁾	0 - 25 s	0.1 s
Slope down time ²⁾	0 - 25 s	0.1 s
Gas pre-flow ²⁾	0 - 25 s	0.1 s
Gas post-flow ²⁾	0 - 25 s	0.1 s
HF automatic start pulse ²⁾	OFF or ON	-
HF start pulse ²⁾	4 - 500 A	1 A
Setting limits	0 - 50	1
Measure limits	0 - 50	1
Spot welding » Spot welding	OFF / ON	-

Settings	Setting range	In steps of
<i>Spot welding » Spot welding time</i>	0 - 25 s	0.1 s
<i>Edit description » Keyboard</i>		

¹⁾ Depending on which product type is being used.

²⁾ Not valid or visible for Live TIG-start.

6.1.2 TIG welding with pulsing

The table below shows settings and the menu structure for TIG welding with pulsing.

Settings	Setting range	In steps of
<i>Start method</i>	HF or LiftArc™	-
<i>Gun trigger mode</i>	2 stroke or 4 stroke	-
Below settings are available when selecting <i>PROCESS » TIG</i> and pressing <i>SET</i> .		
<i>Pulse current¹⁾</i>	4 - 500 A	1 A
<i>Background current</i>	4 - 500 A	1 A
<i>Pulse time</i>	0.001 - 5 s	0.001 s
<i>Background time</i>	0.001 - 5 s	0.001 s
<i>Slope up time</i>	0 - 25 s	0.1 s
<i>Slope down time</i>	0 - 25 s	0.1 s
<i>Gas pre-flow</i>	0 - 25 s	0.1 s
<i>Gas post-flow</i>	0 - 25 s	0.1 s
<i>HF automatic start pulse</i>	OFF or ON	-
<i>HF start pulse</i>	4 - 500 A	1 A
<i>Setting limits</i>	0 - 50	1
<i>Measure limits</i>	0 - 50	1
<i>Spot welding » Spot welding</i>	0 - 25 s	0.1 s
<i>Spot welding » Spot welding time</i>	OFF / ON	-
<i>Edit description » Keyboard</i>		

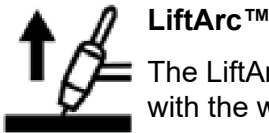
¹⁾ Maximum current depending on which product type is being used.

6.2 Function explanations for settings



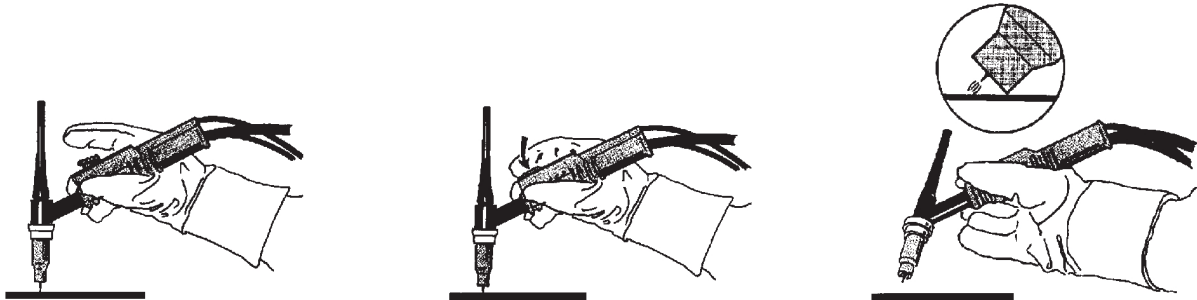
HF start

The HF start function strikes the arc by means of a spark from the electrode to the workpiece as the electrode is brought closer to the workpiece.



LiftArc™

The LiftArc™ function strikes the arc when the electrode is brought into contact with the workpiece and then lifted away from it.



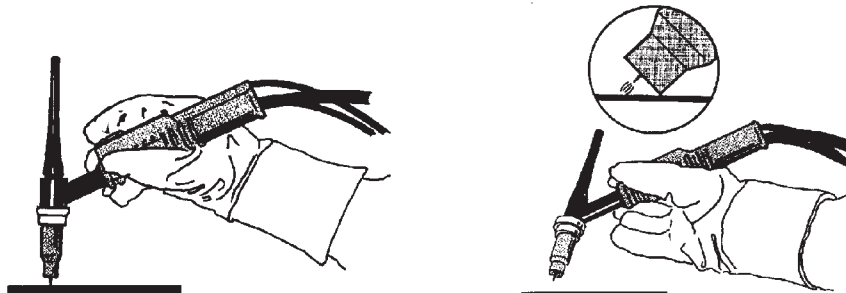
Striking the arc with the LiftArc™ function:

1. The electrode is touched on to the workpiece.
2. The trigger switch is pressed, and a low current starts to flow.
3. The welder lifts the electrode from the workpiece: the arc strikes, and the current rises automatically to the set value.

LiftArc™ is activated in the *MAIN MENU* » *START METHOD*.

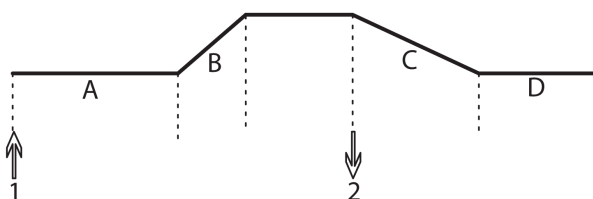
Live TIG-start

With Live TIG start the arc strikes when the tungsten electrode is brought into contact with the workpiece and then lifted away from it.



- Activation of Live TIG-start performed in the *PROCESS* menu.

2-stroke

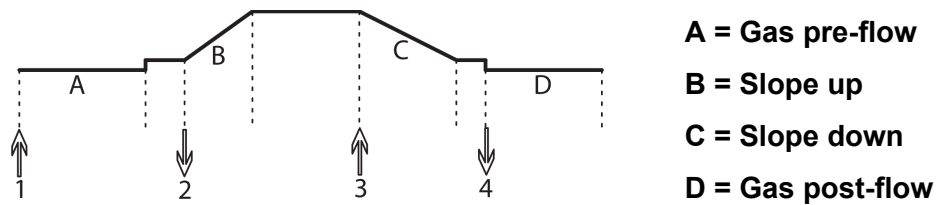


- A = Gas pre-flow**
- B = Slope up**
- C = Slope down**
- D = Gas post-flow**

Functions when using 2 stroke control of the welding torch.

In the 2 stroke control mode, pressing the TIG torch trigger switch (1) starts gas pre-flow (if used) and strikes the arc. The current rises to the set value (as controlled by the slope up function, if in operation). Releasing the trigger switch (2) reduces the current (or starts slope down if in operation) and extinguishes the arc. Gas post-flow follows if it is in operation.

2-stroke is activated in the *MAIN MENU* » *TRIGGER MODE* or in the measure screen.

4-stroke

Functions when using 4 stroke control of the welding torch.

In the 4 stroke control mode, pressing the trigger switch (1) starts gas pre-flow (if used). At the end of the gas pre-flow time, the current rises to the pilot level (a few ampere), and the arc is struck. Releasing the trigger switch (2) increases the current to the set value (with slope up, if in use). At the end of welding, the welder presses the trigger switch again (3), which reduces the current to pilot level again (with slope down, if in use). Releasing the switch again (4) extinguishes the arc and starts gas post-flow.

4-stroke is activated in the *MAIN MENU » TRIGGER MODE* or in the *MEASURE* screen.

Current

A higher current produces a wider weld pool, with better penetration into the workpiece.

The current is set in the measure screen, weld data setting, or fast mode menus.

Only applies to TIG welding with constant current.

Pulse current

The higher of the two current values in the event of pulsed current. When pulsing, slope up and slope down are also pulsed.

Pulse current is set in the *WELD DATA SETTING* menu.

Only applies to TIG welding with pulsing.

Background current

The lower of the two current values in the event of pulsed current.

Background current is set in the *WELD DATA SETTING* menu.

Only applies to TIG welding with pulsing.

Pulse time

The time the pulse current is on during a pulse period.

Pulse time is set in the *WELD DATA SETTING* menu.

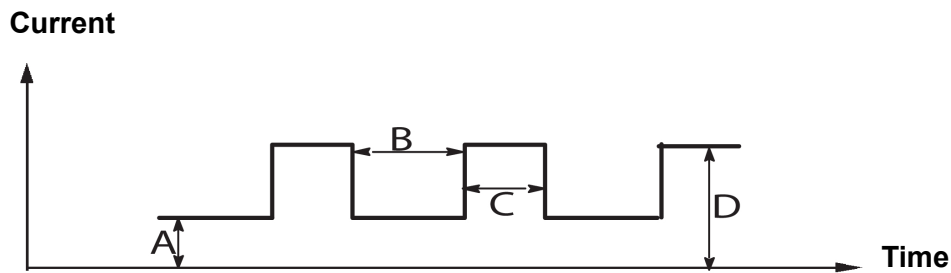
Only applies to TIG welding with pulsing.

Background time

Time for background current which, along with the time for pulse current, gives the pulse period.

Background time is set in the *WELD DATA SETTING* menu.

Only applies to TIG welding with pulsing.



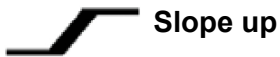
TIG welding with pulsing.

A = Background current

B = Background time

C = Pulse time

D = Pulse current



Slope up

The slope up function means that, when the TIG arc strikes, the current rises slowly to the set value. This provides 'gentler' heating of the electrode, and gives the welder a chance to position the electrode properly before the set welding current is reached.

Slope up is set in the *WELD DATA SETTING* menu.



Slope down

TIG welding uses "slope down", by which the current falls 'slowly' over a controlled time, to avoid craters and/or cracks, when a weld is finished.

Slope down is set in the *WELD DATA SETTING* menu.



Gas pre-flow

This controls the time during which shielding gas flows before the arc is struck.

Gas pre-flow is set in the *WELD DATA SETTING* menu.



Gas post-flow

This controls the time during which shielding gas flows after the arc is extinguished.

Gas post-flow is set in the *WELD DATA SETTING* menu.

HF Automatic start pulse

This function is used to achieve a stable arc rapidly.

● ● ● ● Spot-welding

Spot-welding is welding with short repeated occasions at a preset time.

Spot welding is used when you want to spot weld thin plates together.

Spot welding is activated and spot welding time is set in the *WELD DATA SETTING* » *SPOT WELDING* menu.



Gas purging

Gas purging is used when measuring the gas flow or to flush any air or moisture from the gas hoses before welding starts. Gas purging occurs for as long as the button is held depressed and occurs without voltage or wire feed starting.

Gas purging is activated in the *MEASURE* screen.

7 ARC AIR GOUGING

MAIN MENU » PROCESS » GOUGING

With arc air gouging, a special electrode comprising a carbon rod with a copper casing is used.

An arc is formed between the carbon rod and the workpiece, which melts the material. Air is supplied so that the melted material is blown away.

The following electrode diameters can be selected for arc air gouging: 4.0, 5.0, 6.0, 8.0 and 10 mm.

Arc air gouging is not recommended for power sources below 400 A.

GOUGING				
<i>PROCESS</i>			<i>GOUGING</i>	
<i>ELECTRODE DIAMETER</i>			<i>5 mm</i>	
<i>CONFIGURATION ▶</i>				
<i>TOOLS ▶</i>				
<i>SET</i>	<i>MEASURE</i>	<i>MEMORY</i>	<i>FAST MODE</i>	

7.1 Settings in the weld data setting menu

The table below shows settings and the menu structure when selecting *GOUGING* and pressing *SET*.

Settings	Setting range	In steps of
<i>Voltage</i>	8 - 60 V	1 V
<i>Edit description » Keyboard</i>		

7.2 Function explanations

Voltage

A higher voltage produces a wider weld pool, with better penetration into the workpiece.

The voltage is set in the measure screen, weld data setting or fast mode menus.

8 MEMORY MANAGEMENT

8.1 Control panel working method

The control panel can be said to comprise two units: working memory and weld data memory.

Store \Rightarrow **Welding data memory**

Working memory

\Leftarrow Recall

In the working memory, a complete set of weld data settings is created that can be stored in the weld data memory.

During welding, it is always the content of the working memory that controls the process. It is therefore also possible to recall a weld data set from the weld data memory to the working memory.

Note that the working memory always contains the most recently set weld data settings. They can be recalled from the weld data memory or individually altered settings. In other words, the working memory is never empty or “zeroed”.

MAIN MENU » MEMORY » WELD DATA MEMORY

MIG/MAG				
PROCESS		MIG/MAG		
METHOD		SHORT/SPRAY		
QSET		OFF		
SYNERGY GROUP		STANDARD		
WIRE TYPE		Fe ER70S		
SHIELDING GAS		Ar+8%CO2		
WIRE DIAMETER		1.2 mm		
CONFIGURATION▶				
TOOLS▶				
SET	MEASURE	MEMORY	FAST MODE	

It is possible to **store up to 255 sets of** weld data in the control panel. Each set is given a number from 1 to 255.

You can also **delete** and **copy** data sets and **recall** a set of weld data to the working memory.

Below are examples showing how to store, recall, copy and delete.

8.2 Store

If the weld data memory is empty, the following screen appears in the display.

We are now going to store a set of weld data. It will be given memory position 5. Press **STORE**. Position 1 is displayed. Turn one of the settings knobs until you reach position 5. Press **STORE**.

WELD DATA MEMORY				
<i>STORE</i>				<i>QUIT</i>

Select row five using one of the knobs. Press *STORE*.

WELD DATA MEMORY				
5 -				
<i>STORE</i>				<i>QUIT</i>

The following screen appears in the display.

WELD DATA MEMORY				
5 - (TIG)				
<i>TIG HF-START</i>				
<i>100 AMP</i>				
<i>STORE</i>	<i>RECALL</i>	<i>DELETE</i>	1 2	<i>QUIT</i>

Parts of the content of data set number 5 are presented at the bottom of the display.

8.3 Recall

We are going to recall a stored data set:

Select the row using one of the knobs. Press *RECALL*.

WELD DATA MEMORY				
5 - (TIG)				
<i>TIG HF-START</i>				
<i>100 AMP</i>				
<i>STORE</i>	<i>RECALL</i>	<i>DELETE</i>	1 2	<i>QUIT</i>

Press *YES* to confirm that you want to recall data set number 5.

WELD DATA MEMORY				
5 - (TIG)				
TIG HF-START 100 AMP				
			NO	YES

WELD DATA MEMORY » 5 - (TIG)
RECALL DATA SET 5 FROM MEMORY?

The icon in upper right corner of the measurement display shows which memory position number has been recalled.

TIG : CONSTANT I		5	
0.0 Volt			
#	0 Amp		
0.00 kW			
GAS PURGE	4- STROKE		REM

8.4 Delete

It is possible to delete one or more data sets in the memory menu.

We are going to delete the data set we stored in an earlier example.

Select the data set. Press *DELETE*.

WELD DATA MEMORY				
5 - (TIG)				
TIG HF-START 100 AMP				
STORE	RECALL	DELETE	1 2	QUIT

Press *YES* to confirm that you want to delete.

WELD DATA MEMORY				
5 - (TIG)				
TIG HF-START 100 AMP				
			NO	YES

5 - (TIG) » DELETE
DELETE WELD DATA NR. 5?

Return to the memory menu with the *NO* key.

8.5 Copy

To copy the content of a weld data set to a new memory position, proceed as follows:

Select the memory position you want to copy and press "1 2" (2ND FUNCT).

WELD DATA MEMORY				
5 - (TIG)				
TIG HF-START 100 AMP				
STORE	RECALL	DELETE	1 2	QUIT

Press *COPY*.

WELD DATA MEMORY				
5 - (TIG)				
TIG HF-START 100 AMP				
COPY		EDIT	1 2	QUIT

We are now going to copy the content of memory position 5 to position 50.

Use one of the knobs to step to the selected memory position, in this case position 50.

Press *YES*.

WELD DATA MEMORY				
50 -				
<i>COPY</i>				
<i>DATA SET 5 TO POSITION: 50</i>				
			<i>NO</i>	<i>YES</i>

Weld data number 5 has now been copied to memory position 50.


Return to the memory menu with *QUIT*.

8.6 Edit

To edit the content of a weld data set, proceed as follows:

Select the memory position you want to edit and press "1 2" (2ND FUNCTION). Then press *EDIT*.

WELD DATA MEMORY				
5 - (TIG)				
<i>TIG HF-START</i>				
<i>100 AMP</i>				
<i>COPY</i>		<i>EDIT</i>	<i>1 2</i>	<i>QUIT</i>

Part of the main menu is displayed and the menu shows the symbol  which means that you are in an editing mode.

Select the setting you want to edit and press *ENTER*. Select from the list and press *ENTER* again.

TIG				
<i>START METHOD</i>			<i>HF-START</i>	
<i>GUN TRIGGER MODE</i>			<i>4-STROKE</i>	
<i>TIG HF-START</i>				
<i>100 AMP</i>				
<i>SET</i>				<i>QUIT</i>

Press *SET* to move to *Weld data setting*. Select the values you want to edit and adjust with the plus/minus knobs. End with *QUIT*.

WELD DATA SETTING				
CURRENT		100 A		
SLOPE UP TIME		0.0 S		
SLOPE DOWN TIME		2.0 S		
GAS PREFLOW		0.5 S		
GAS POSTFLOW		5.0 S		
SETTING LIMITS		-		
MEASURE LIMITS		-		
EDIT DESCRIPTION			
GAS PURGE	4-STROKE		REM	QUIT

The setting for weld data number 5 has now been edited and stored.

8.7 Name

To give a stored weld data set its own name, proceed as follows:

Select the memory position you want to name and press "1 2" 2ND FUNCTION. Then press *EDIT*.

WELD DATA MEMORY				
5 - (TIG)				
TIG HF-START				
100 AMP				
COPY		EDIT	1 2	QUIT

Select *SET* » *EDIT DESCRIPTION*. Press *ENTER*.

WELD DATA SETTING				
CURRENT		100 A		
SLOPE UP TIME		0.0 S		
SLOPE DOWN TIME		2.0 S		
GAS PREFLOW		0.5 S		
GAS POSTFLOW		5.0 S		
SETTING LIMITS		-		
MEASURE LIMITS		-		
EDIT DESCRIPTION			
GAS PURGE	4-STROKE		REM	QUIT

Here you have access to a keyboard that is used as follows:

- Position the cursor on the desired keyboard character using the left-hand knob and the arrow keys. Press *ENTER*. Enter a complete character string with a maximum of 40 characters in this way.
- Press *DONE* to store. The alternative you have named can now be seen in the list.

KEYBOARD				
A B C D E F G H				
I J K L M N O P				
Q R S T U V W X Y Z				
0 1 2 3 4 5 6 7 8 9				
SPACE CAPS				
-				
0 (MAX 40)				
←	→	DELETE	SYMBOL	DONE

Description of welding data schedule

Each welding data schedule can have a short description. Under the *SET » EDIT DESCRIPTION* menu, the welding data schedule that has just been called up can be given a description of max. 40 characters via the integral keyboard. The current description can also be modified or deleted.

If the requested schedule has a description, this is shown in the *MEMORY*, *MEASURE* and *REMOTE* menu screens instead of the welding data parameters, which are otherwise displayed.

9 CONFIGURATION

MAIN MENU » CONFIGURATION

The list below shows the menu structure:

- *Language*, see the "First step – choice of language" section in the "INTRODUCTION" chapter.
- *Code lock*
- *Remote controls*
- *MIG/MAG defaults*
- *MMA defaults*
- *Fast mode soft keys*
- *Double start sources*
- *Panel remote enable*
- *WF supervision*
- *Personal feeder*
- *Auto save mode*
- *Measure limits stop weld*
- *Login required to weld*
- *Trigger welddata switch*
- *Multiple wire feeders*
- *Quality functions*
- *Maintenance*
- *Unit of length*
- *Measure value frequency*
- *Register key*
- *Lightning display timer*
- *Remote supervision*

9.1 Code lock

MAIN MENU » CONFIGURATION » CODE LOCK

When the lock function is activated and you are in the measure screen, remote mode or fast mode menu, a password (lock code) is required to exit from these menus.

CODE LOCK			
LOCK STATUS			OFF
SET / CHANGE LOCK CODE			
			QUIT

Code lock is activated in the *CONFIGURATION* menu.

9.1.1 Lock code status

In code *LOCK STATUS*, you can activate/deactivate the lock function without deleting the existing lock code in the event you deactivate the function. If no lock code is stored and you try to activate the code lock, the keyboard is displayed for entering a new lock code.

KEYBOARD				
A B C D E F G H				
I J K L M N O P				
Q R S T U V W X Y Z				
0 1 2 3 4 5 6 7 8 9				
SPACE CAPS				
-				
0 (MAX 16)				
←	→	DELETE	SYMBOL	DONE

To exit lock status

When you are in the measure screen or the fast mode menu and the code lock is **deactivated**, you can exit these menus without restrictions by press *QUIT* or *MENU* in order to go to the menu menu.

If it is **activated** and you try to exit, leave REM or press soft button "1 2" (2ND FUNCT), the following screen appears in order to warn the user about the lock protection.

PRESS ENTER FOR LOCK CODE...

Here you can select *QUIT* to undo and return to the previous menu, or proceed by pressing *ENTER* to enter the lock code.

You will then move to the menu with the keyboard, where you can enter the code. Press *ENTER* after each character, and confirm the code by pressing *DONE*.

The following text box appears:

UNIT UNLOCKED!

If the code is not correct, an error message is displayed that offers the option of trying again or returning to the original menu, i.e. the measure screen or the fast mode menu.

If the code is correct, all blocks to other menus will be removed, although *the code lock remains activated*. This means that you can leave the measure screen and the fast mode menu temporarily, yet still retain the lock status when you return to these menus.

9.1.2 Specify/edit lock code

In specify/edit lock code, you can edit an existing lock code or enter a new one. A lock code can comprise a maximum of 16 optional letters or figures.

9.2 Remote controls

MAIN MENU » CONFIGURATION » REMOTE CONTROLS

Different configuration options are available depending on process and the remote control.

Non CAN-bus connected remote control units must be connected via a remote control adapter. The SuperPulse method is not supported by this function.

After connection, activate the remote control unit in the *MEASURE* screen with the soft key *REMOTE*.

9.2.1 Forget override

Place the cursor on the *REMOTE CONTROLS* row. Press *ENTER* to bring up a list of alternatives.

MIG/MAG REMOTE CONTROLS	
<i>FORGET OVERRIDE</i>	<i>ON</i>
<i>DIGITAL OP</i>	<i>5-PROG</i>
<i>ANALOG 1</i>	<i>WIRE SPEED</i>
<i>-MIN</i>	<i>0.8</i>
<i>-MAX</i>	<i>25.0</i>
<i>ANALOG 2</i>	<i>VOLTAGE</i>
<i>-MIN</i>	<i>-10</i>
<i>-MAX</i>	<i>+10</i>
	<i>QUIT</i>

With *FORGET OVERRIDE* set to *ON*, the most recently recalled memory is automatically recalled before each new welding start. This is to eliminate the results of all weld data settings produced during the most recent welding procedure.

9.2.2 Configuration for digital remote control unit

Without remote control adapter

When connecting a CAN-based remote control unit, configuration takes place automatically, *DIGITAL OP*.

With remote control adapter

When using a digital remote control unit, specify which type of remote control unit is being used.

Position the cursor on the *DIGITAL OP* row and press *ENTER* to bring up of list, from which you can select an alternative.

- | | |
|---------------------|---------------------|
| <i>BINARY CODED</i> | • 32-program unit |
| <i>10-PROGR</i> | • 10-program unit * |

* or Welding torch with RS3 program selection

9.2.3 Configuration for analogue remote control unit

Without remote control adapter

When connecting a CAN-based remote control unit, configuration of *ANALOG 1* and *ANALOG 2* takes place automatically. The configuration cannot be altered.

With remote control adapter

With remote control adapter When you use an analogue remote control unit, you can specify on the control panel which (maximum 2) potentiometer(s) you want to use.

The potentiometers are called *ANALOG 1* and *ANALOG 2* in the control panel and refer to their own set parameters for the welding process, e.g. wire feed parameter (*ANALOG 1*) and voltage parameter (*ANALOG 2*) with MIG/MAG.

If you position the cursor on the *ANALOG 1* row and press *ENTER*, this brings up a list.

<i>NONE</i>
<i>WIRE SPEED</i>

9.2.4 Configuration for analogue remote control unit

If you position the cursor on the ANALOG 1 row and press ENTER, this brings up a list.

You can now select whether the potentiometer ANALOG 1 is to be used for *WIRE SPEED* or if it is not to be used, *NONE*.

Select the *WIRE SPEED* row and press ENTER.

If you position the cursor on the ANALOG 2 row and press ENTER, this brings up a list.

<i>NONE</i>
<i>VOLTAGE</i>

If you position the cursor on the ANALOG 2 row and press ENTER, this brings up a list.

You can now select whether the potentiometer ANALOG 2 is to be used for *VOLTAGE* or if it is not to be used, *NONE*.

Select the *VOLTAGE* row and press ENTER.

All configuration for the remote control unit applies to any connected wire feed units. If you remove ANALOG 1 in the configuration, this applies to both wire feed units when you are using twin units.

9.2.5 Scale on inputs

You can set the control range for the potentiometer(s) that is to be used. This is done by specifying a minimum value and a maximum value in the control panel with the plus/minus knobs.

Note that you can set different voltage limits in synergy and non synergy modes. The voltage setting in synergy is a deviation (plus or minus) of the synergy value. In non synergy mode, the voltage setting is an absolute value. The value set applies to synergy when you are in synergy mode. If you are not in synergy mode, this is an absolute value.

There are also different voltage control limits for short-/sprayarc welding and pulsing in non synergy mode.

Value after resetting

Synergy short-/sprayarc and pulsing	min -10 V	max 10 V
Non synergy short-/sprayarc	min 8 V	max 60 V
Non synergy pulsing	min 8 V	max 50 V

9.3 MIG/MAG defaults

MAIN MENU » CONFIGURATION » MIG/MAG DEFAULTS

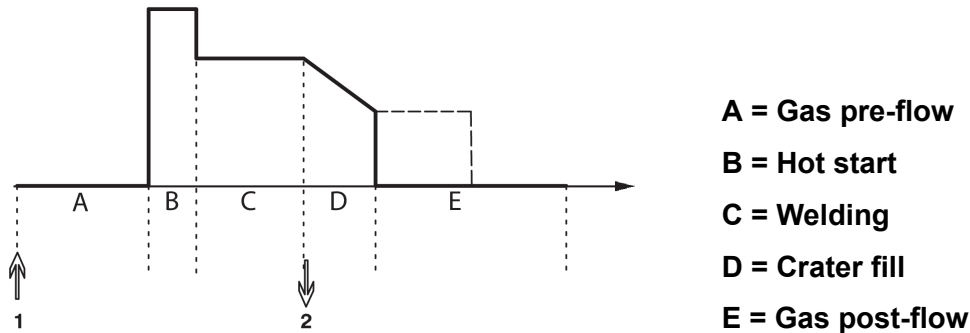
In this menu you can set:

- *Gun trigger mode (2-stroke/4-stroke)*
- *4-stroke configuration*
- *Soft keys configuration*
- *Volt. measure in pulsed*
- *AVC feeder*
- *Release pulse*
- *Voltage regulator flat static*
- *Delay time craterfill active*
- *Weld start arc off delay time*

- *Display Amperage Estimate*
- *Auto stop wire feeding*

9.3.1 Gun trigger mode (2-stroke/4-stroke)

2-stroke



Functions when using 2-stroke control of the welding torch.

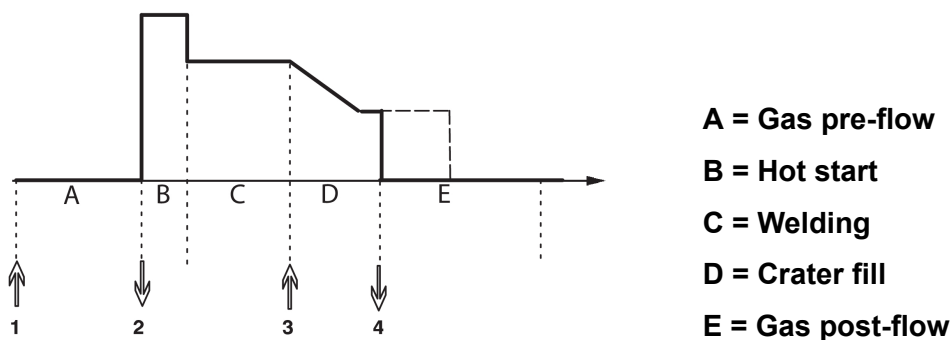
Gas pre-flow (if used) starts when the welding gun trigger switch is pressed (1). The welding process then starts. When the trigger switch is released (2), crater filling starts (if selected) and the welding current is stopped. Gas post-flow starts (if selected).

TIP: Pressing the trigger switch again while crater filling is in progress continues crater filling as long as the switch is held depressed (the dotted line). Crater filling can also be interrupted by quickly pressing and releasing the trigger switch while it is in progress.

2-stroke is activated in the measure screen, the configuration menu or with a soft key in the measure screen.

4-stroke

There are 3 start and 2 stop positions for 4-stroke. This is start and stop position 1. When resetting, position 1 is selected. See the “4-stroke configuration” section.



Functions when using 4-stroke control of the welding torch

Gas pre-flow starts when the welding gun trigger switch is pressed (1). Releasing the trigger switch starts the welding process. Pressing the trigger switch again (3) starts crater filling (if selected) and reduces the welding data to a lower value. Releasing the trigger switch (4) stops welding entirely and starts gas post-flow (if selected).

TIP: Crater filling stops when the trigger switch is released. Keeping it held in instead continues crater filling (the dotted line).

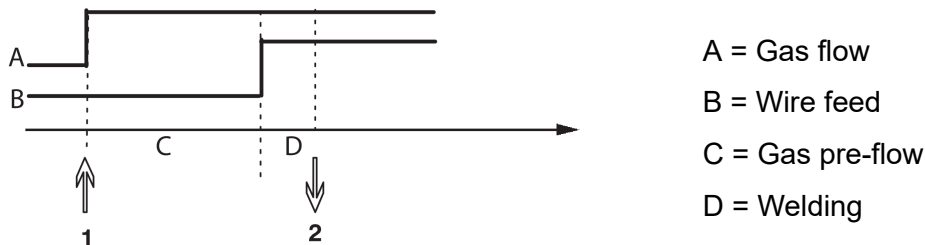
4-stroke is activated in the measure screen, the configuration menu or with a soft key in the measure screen. It is not possible to select gun trigger mode (4-stroke), if spot welding is *ON*.

9.3.2 4-stroke configuration

In 4-stroke configuration, various functions of 4-stroke start and stop can arise.

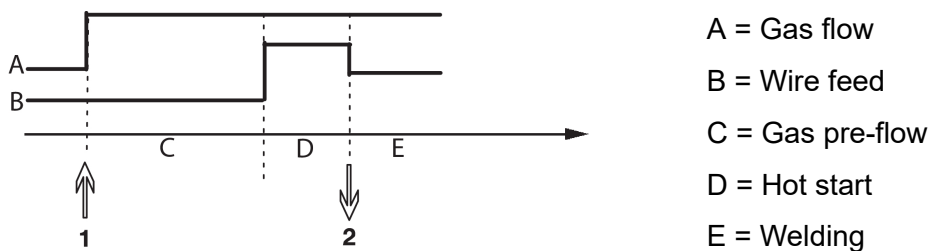
4-stroke start setting

- Trigger-controlled gas pre-flow, see the "4-stroke" section.
- Time-controlled gas pre-flow.



Press in the trigger switch (1), gas pre-flow starts; after the set gas pre-flow time, the welding process starts. Release the trigger switch (2).

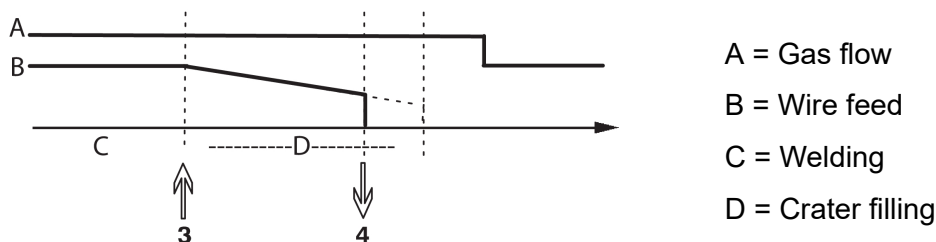
- Trigger-controlled hot start



Press in the trigger switch (1); gas pre-flow starts and hot start runs until the switch is released (2).

4-stroke stop setting

- Time-controlled crater filling with possible extension, see the "4-stroke" section.
- Trigger controlled crater filling time



Press in the trigger switch (3); crater filling commences and expires. If the trigger switch is released (4) within the crater filling time (crater filling time shortened), welding is interrupted.

9.3.3 Soft key configuration

When MIG/MAG welding, the user has the possibility of setting the function of these soft keys by selecting from a list of set options. There are seven soft keys that can be allocated a function.

It is possible to choose between the following options:

- *None*
- *Gas purge*
- *Wire inching*
- *Trigger mode (2/4)*
- *Crater fill ON/OFF*
- *Creep start ON/OFF*
- *Hot start ON/OFF*
- *Trigger data switch*
- *Air purge*
- *Process inhibit*
- *Reverse wire*
- *Clear error*

In the display screen there are two columns: one for *Function* and one for *Soft key* number.

SOFT KEYS SETUP				
<i>Function</i>			<i>Soft key</i>	
NONE				
GAS PURGE			1	
WIRE INCHING			2	
TRIGGER MODE (2/4)			3	
CRATER FILL ON/OFF			4	
CREEP START ON/OFF			5	
HOT START ON/OFF			6	
TRIGGER SWITCH			7	
<i>GAS PURGE</i>	<i>WIRE INCH</i>	<i>4-STROKE</i>	1 2	<i>QUIT</i>

The panel has five soft keys. By pressing the "1 2"(2ND FUNCT) key you obtain a further five soft keys.

When you allocate functions to these keys, they are numbered from the left as follows:

1	2	3	1 2	QUIT
4	5	6	7	1 2

To allocate a new function to a soft key, proceed as follows:

- Position the cursor on the function row with the function *NONE* and press the soft key with the function that is to change key number.
- Repeat this procedure with the key that has the key number that is to be used.
- Position the cursor on the function row you want to give a new key number and press the soft key on which you want to have the function.

You can allocate new functions to the other keys in the same way, by pairing together one of the functions in the left-hand column with a key number in the right-hand column.

9.3.4 Voltage measurement in pulsing

Options for voltage methods in pulsing are as follows:

- Peak value in pulse voltage *PULSE* The voltage is measured only during the pulse section and filtered before the voltage value is presented on the display.
- Voltage average value *AVERAGE*
- Default value set to be *AVERAGE*

The voltage is measured continuously and filtered before the voltage value is presented.

The measurement values that are presented on the display are used as input data for internal and external quality functions.

9.3.5 AVC feeder

When you have connected an AVC wire feed unit (ARC VOLTAGE CONTROL), go into the *CONFIGURATION* menu under *MIG/MAG DEFAULTS*. Press *ENTER* at the AVC wire feed unit row and select *ON*. The equipment is then reconfigured automatically to match an AVC wire feed unit.

When using an arc voltage feeder, the feeder is directly controlled by the welding voltage. There is no communication with the wire feeder in any other way. A special regulator is used to get better performance.

9.3.6 Release pulse

If the wire becomes stuck in the workpiece, the system detects this. A current pulse is sent out that releases the wire from the surface.

In order to obtain this function, select *RELEASE PULSE* in the list under *MIG/MAG DEFAULTS*, then press *ENTER* and select *ON*.

9.3.7 Voltage regulator flat static

VOLTAGE REGULATOR FLAT STATIC shall normally be activated (*ON*).

The function is used for customer specific solutions.

9.3.8 Delay time craterfill active

DELAY TIME CRATERFILL ACTIVE is a delay time that must pass after weld start in order to activate the CRATERFILL function when Crater filling is enabled.

The default value is 1.0 S.

9.3.9 Weld Start Arc Off Delay Time

This delay time defines a time period that starts at **weld start** and ends at **(weld start + WELD START ARC OFF DELAY TIME)**.

If multiple **arc on** and **arc off** events occur during the defined time period then **arc off** events are not forwarded if the last event before the end of the defined time period is an **arc on** event.

If multiple **arc on** and **arc off** events occur during the defined time period and the last event before the end of the defined time period is an **arc off** event then that **arc off** event is forwarded after the end of the defined time period.

Only the first **arc on** event that occurs during the defined time period is forwarded.

Example: If the sequence **arc on**, **arc off** and **arc on** events occur during the defined time period then only the first **arc on** event is forwarded from the power source to connected equipment. The **arc off** event is first delayed in the powersource but then deleted when the the last **arc on** is received.

The default value is 0.00 s.

The function is used for customer specific solutions.

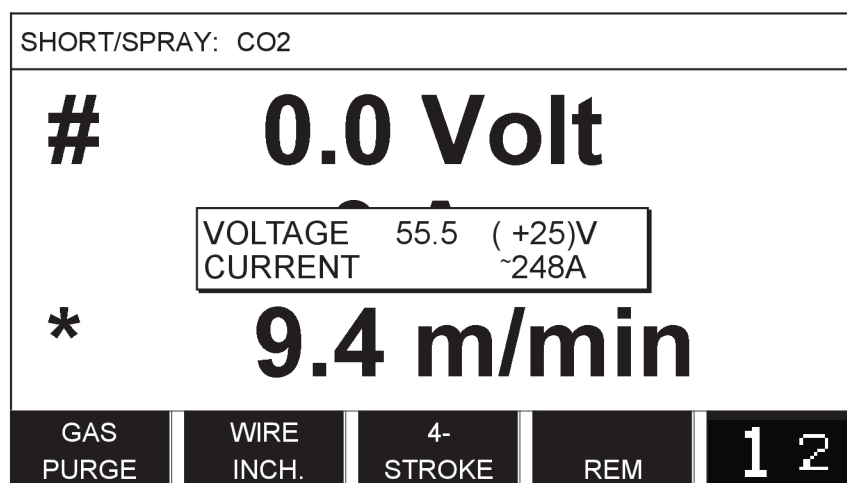
9.3.10 Display Amperage Estimate

Given the chosen synergic line an estimate of the amperage is calculated using the current wire feed speed.

Default set to *OFF*.

The amperage estimate is displayed as a reference when the welder does not know what wire feed speed to set. Depending on joint type and the stick out (contact tip to work piece distance) that is used, there will be some deviation between amperage estimate and the actual measured amperage. Large deviation might mean that stick out should be adjusted for optimal weld results.

The estimated amperage is presented in the *MEASURE* menu, when the wire feed speed or the voltage is adjusted.



Estimated amperage is never presented **when welding using ROBOT or SAT synergy groups**, even though *Display Amperage Estimate* is set to *ON*.

9.3.11 Automatic stop wire feeding

In *MIG/MAG DEFAULTS* menu (*MAIN MENU* » *CONFIGURATION* » *MIG/MAG DEFAULTS*) a new feature added, *AUTOMATIC STOP WIRE FEEDING*.

1. When *AUTOMATIC STOP WIRE FEEDING* is set to OFF, whenever the trigger is pressed, feeding will be continuous (based on trigger mode) even when there is no weld/arc.
2. If *AUTOMATIC STOP WIRE FEEDING* is set to ON, a new line will be visible *NO WELD WIRE FEED MAX. TIME*. You can set the value for this parameter from 4 to 30 s (Default is 10 s).

**NOTE!**

1. Automatic wire feed function is available, when welding in 2-stroke and 4-stroke mode.
2. The soft button *WIRE INCH* is not affected with this feature.

9.4 MMA defaults

MAIN MENU » CONFIGURATION » MMA DEFAULTS

Droplet welding

Droplet welding can be used when welding with stainless electrodes. The function involves alternately striking and extinguishing the arc in order to achieve better control of the supply of heat. The electrode needs only to be raised slightly to extinguish the arc.

Select *ON* or *OFF*.

9.5 Fast mode soft keys

The soft keys *WELD DATA 1* to *WELD DATA 4* are displayed in the fast mode menu. These are configured as follows:

Position the cursor on the *SOFT KEY NUMBER* row.

FAST MODE SOFT KEYS			
<i>SOFT KEY NUMBER</i>			1
<i>ASSOCIATED WELD DATA</i>			5
<i>MIG/MAG SHORT/SPRAY SYNERGIC MODE ON</i>			
<i>Fe ER70S, C=2, 1.2 mm</i>			
<i>+ 3.5 VOLT, 7.6 M/MIN</i>			
	<i>STORE</i>	<i>DELETE</i>	<i>QUIT</i>

The keys are numbered 1-4 from left to right. Select the desired key by specifying its number with the aid of the plus/minus knobs.

Then step down with the left-hand knob to the next row *ASSOCIATED WELD DATA*. Here you can browse through the weld data sets that are stored in the weld data memory. Select the desired weld data number using the plus/minus knobs. Press *STORE* to save. To delete the stored set, press *DELETE*.

9.6 Double start sources

When this option is activated (ON) you can start MIG/MAG welding both from the wire feed unit's start input and from the power source's TIG-start input and vice versa. When welding is started from a start signal input it must be stopped from the same input.

9.7 Panel remote enable

MAIN MENU » CONFIGURATION » PANEL REMOTE ENABLE

When the panel is in remote control mode it is not possible to make settings using the panel knobs. For remotes controls that switch between weld memories: The *PANEL REMOTE ENABLE* default set to be *ON*, the current/wire feed or voltage can be set using the control panel and remote control.

If *PANEL REMOTE ENABLE* is used in combination with limits, machine usage can be limited to a specific setting range. This applies to the following settings: wire feed and voltage for MIG/MAG welding, current setting for MMA and TIG welding, pulse current with pulsed TIG.

9.8 WF supervision

MAIN MENU » CONFIGURATION » WF SUPERVISION

WF SUPERVISION shall normally be activated (*ON*). The function is used for customer specific solutions. The function checks if contact between the WDU and the wire feeder is lost, and sets an error in this case.



NOTE!

When using a non-ESAB wire feeder with an ESAB power source, the supervision needs to be deactivated.

9.9 Personal feeder

MAIN MENU » CONFIGURATION » PERSONAL FEEDER

Default set to *ON*.

This option is used to check whether it is connected with Power source or not.

- **OFF CONDITION:** System will display an error when the user turn on or off the feeder or swap the feeders.
- **ON CONDITION:** Would prevent errors when the user turn on or off the feeder or swap the feeders.

9.10 Auto save mode

MAIN MENU » CONFIGURATION » AUTO SAVE MODE

Default set to *OFF*.

The weld data sets are saved in memory positions in the weld data memory.

Auto save mode set to *ON*: When recalling a weld data set, changing the settings and then recalling another weld data set, the first one is updated according to the changed settings.

Saving weld data manually in a memory position disables the next automatic save.

The memory position in which the weld data set is stored is displayed in the top right corner of the measure screen.

9.11 Measure limits stop weld

MAIN MENU » CONFIGURATION » MEASURE LIMITS STOP WELD

Default set to *OFF*.

This function controls the behaviour when a measure limits error arise. It is available for MIG/MAG and TIG wth torch trigger.

There are three settings:

- *ON*
- *ON,SUPERVISE*
- *OFF*

When *MEASURE LIMITS STOP WELD* is activated (*ON*) and a measure limits error arise, the welding will stop immediately.

The *ON,SUPERVISE* setting can be used if the power source *USER ACCOUNTS* functionality is being used. If the *ON,SUPERVISE* setting is selected and a measure limits error arise, the welding will stop immediately **and an administrator or senior user will have to enter his/her password** before welding could be resumed. (For information about user accounts and user account levels, see separate section "User accounts" in this manual.)

9.12 Login required to weld

MAIN MENU » CONFIGURATION » Login required to weld

If *Login required to weld* is activated the user accounts must be activated and a login occurred to be able to weld.

9.13 Trigger weld data switch

MAIN MENU » CONFIGURATION » TRIGGER WELD DATA SWITCH

This function permits changing to different pre-set weld data alternatives by fast-clicking (push button and then release directly) the welding torch's trigger. It is possible to choose between single or double click. Single click means one fast click. Double click means two fast clicks.

FIRST CHANGE IN SEQUENCE ARC OFF can be set to NEXT or START

NEXT - A TRIGGER DATA SWITCH will change memory to next memory in the sequence.

START - A TRIGGER DATA SWITCH during ARC OFF will change memory to the first memory in the sequence if 4 seconds has pasted since the latest Trigger data switch occurred.

A TRIGGER DATA SWITCH within 4 seconds from latest Trigger data switch will change memory to the next memory in the sequence.

It is possible to change between a maximum of 5 selected memory positions, see the "MEMORY MANAGEMENT" chapter.

OFF - No changeover between weld data.

ARC OFF - The user cannot change between memory positions during welding.

ON - The user can always change between memory positions.

3-PROG - Add 3 memory positions. Select 2-stroke (see section 9.3.1). 3-Prog is an extended form of 2-stroke with 3 memories trigger data switch. Trigger data switch will change to memory 1 when the welding gun trigger switch is pressed. The welding process then starts. When the trigger switch is released, Trigger data switch will change to memory 2 and the welding continues. Trigger data switch will change to memory 3 when the welding gun trigger switch is pressed again. When the trigger switch is released for the second time, crater filling starts (if selected) and the welding current is stopped. Gas post-flow starts (if selected).

Activating weld data switch

Position the cursor on the *TRIGGER WELD DATA SWITCH* row and press ENTER. Select *OFF*, *ARC OFF*, *ON* or *3-PROG*. Press ENTER.

TRIGGER WELDDATA SWITCH			
TRIGGER WELDDATA SWITCH		OFF	
CLICK		SINGLE	
FIRST CHANGE IN SEQUENCE ARC OFF		NEXT	
ADD/DELETE WELDDATA		5	
SELECTED WELDDATA			
MIG/MAG SHORT/SPRAY SYNERGIC MODE ON			
Fe ER70S, CO2, 1.2 mm			
+ 3.5 VOLT, 7.6M/MIN			
			QUIT

Choice of weld data from memory

Position the cursor on the *ADD/DELETE WELD DATA* row.

TRIGGER WELDDATA SWITCH			
TRIGGER WELDDATA SWITCH		OFF	
CLICK		SINGLE	
FIRST CHANGE IN SEQUENCE ARC OFF		NEXT	
ADD/DELETE WELDDATA		19	
SELECTED WELDDATA 5 19			
MIG/MAG SHORT/SPRAY SYNERGIC MODE ON			
Fe ER70S, CO2, 1.2 mm			
+ 3.5 volt, 7.6 M/MIN			
	STORE	DELETE	QUIT

Select the numbers for the memories where current weld data is stored using the plus/minus knobs and then press *STORE*.

The *SELECTED WELD DATA* row shows which weld data have been selected and in what order they occur, from left to right. The weld data set for the most recently selected position is displayed under the line in the display.

To remove weld data, follow the same procedure as above but press the *DELETE* key.

9.14 Multiple wire feeders

MAIN MENU » CONFIGURATION » MULTIPLE WIRE FEEDERS

When connecting several wire feed units (max. 4), you have to use wire feed units without a weld data unit, i.e. with an empty panel.

All wire feed units that are supplied to the customer have identity number 1.

9.14.1 Configuring multiple wire feeders

The first thing you have to do when connecting several wire feed units is to change the identity number (node address) of one wire feed unit.

To change the ID number, proceed as follows:

- Connect the first wire feed unit, go to the *MULTIPLE WIRE FEEDERS* menu.
- Press and release the trigger switch to activate the wire feed unit.
- Read on the first row which ID number the wire feed unit has (should be 1 the first time). Select a new ID number between 2 and 4.
Position the cursor on the *SELECT A NEW ID NUMBER* row. Set the desired number between 1 and 4 by stepping with the plus/minus knobs. Press ENTER.

MULTIPLE WIRE FEEDERS	
<i>CURRENT ID NUMBER</i>	-
<i>SELECT A NEW ID NUMBER</i>	1
<i>CONNECTED WIRE FEEDERS ID:</i>	
	<i>QUIT</i>

On the top row, the figure for the ID number will change to the desired number.

- Connect the next wire feed unit.
- Press and release the trigger switch to activate this wire feed unit. You can now see that the unit has ID number 1.

Configuration is now complete and you can start using the equipment as normal. In the same way it is possible to configure and run four wire feed units. The important thing when using several wire feed units is not which ID number they have been given, but that they are given different numbers in order that they can be distinguished.

Do not give the same ID to two wire feed units. If this should occur, rectify the situation by disconnecting one of the units and then starting the above procedure again from the beginning. You can always go to the *MULTIPLE WIRE FEEDERS* menu and check the ID number of the connected wire feed units by pressing the trigger switch.

On the *CONNECTED WIRE FEEDERS ID* row, you can see the ID number of all connected wire feed units.

9.14.2 Weld data memory concept for M1 10P remote controls

Memories and 10P remote controls work with wire feeders with different wire feeder ID's following a concept.

Use the correct range of weld data memory positions for each specific wire feeder ID according to list below:

- Wire feeder ID 1: Memory position 1-10
- Wire feeder ID 2: Memory position 11-20
- Wire feeder ID 3: Memory position 21-30
- Wire feeder ID 4: Memory position 31-40

9.15 Quality functions

MAIN MENU » CONFIGURATION » QUALITY FUNCTIONS

The conditions for logging completed welds are set under *QUALITY FUNCTIONS* in the *CONFIGURATION MENU*.

QUALITY FUNCTIONS				
QUALITY DATA LOG TO FILE				ON
				QUIT

Select the row and press *ENTER*. If *ON* is selected, each weld will be stored as a text file with the extension *.aqd*, with a new file per day. The following information is registered here:

- Time of welding start
- Duration of welding
- Maximum, minimum and average current during welding
- Maximum, minimum and average voltage during welding
- Maximum, minimum and average output during welding

Read more about the quality function in the "TOOLS, Quality functions" section.

9.15.1 Store quality fuction log

MAIN MENU » TOOLS » EXPORT/IMPORT

The quality function log files that are produced in the control panel are stored as xml files. The USB memory must be formatted as FAT in order to work.

Insert a USB memory in the control panel, see the "File manager" section.

Select *QUALITY FUNCTION LOG*, press *EXPORT*.

The file is in a folder called QData. QData is created automatically when you insert a USB memory.

For information about Export/Import, see the "Export/Import" section.

9.16 Maintenance

MAIN MENU » CONFIGURATION » MAINTENANCE

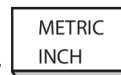
In this menu you set the maintenance interval, i.e. the number of weld starts executed before maintenance should be performed (e.g. change of contact tip). Specify the number of weld starts after which maintenance should be performed, by selecting the *MAINTENANCE INTERVAL* row and pressing *ENTER*. Then adjust the plus/minus knobs until you arrive at your value. When the interval has been passed, fault code 54 is displayed in the error log. Reset by pressing the *RESET* soft key.

When *TOTAL RUNNING TIME LIMIT* is selected instead of the number of starts, an authorised ESAB service technician is contacted.

SERVICE				
MAINTENANCE INTERVAL			0 Welds	
WELD COUNT			0 Welds	
TOTAL RUNNING TIME LIMIT			0d00:00:00	
TOTAL RUNNING TIME			0d00:00:00	
RESET				QUIT

9.17 Unit of length

MAIN MENU » CONFIGURATION » UNIT OF LENGTH



The unit of measurement is selected here, *Metric* or *Inch*:

9.18 Measure value frequency

MAIN MENU » CONFIGURATION » MEASURE VALUE FREQUENCY

The frequency of the measurement value is set here by stepping to a value between 1 and 10 Hz using one of the plus/minus knobs. Measure value frequency affects only measure data in the calculations of quality data.

9.19 Register key

CONFIGURATION » REGISTER KEY

With the function *REGISTER KEY* you can unlock certain functions, which are not included in the basic version of the control panel.

In order to get access to these functions you have to contact ESAB. When you indicate the serial number of the unit you will get a key code, which is to be entered in the menu *REGISTER KEY*.

REGISTER KEY				
Serial No: 00000 - 00000 - 00000				
Key: AAA				
ENTER KEY	ACTIVE			QUIT

Press ENTER KEY and write the key code on the keyboard, which appears in the display. Position the cursor on the desired keyboard character using the left-hand knob and the arrow keys. Press ENTER. When the character string is registred, press DONE.

To activate the key press *ACTIVE*. A message will be shown: *KEY ACTIVATED*. If the registration was unsuccessful, the message will be: *INCORRECT KEY*. Then check the key code and try again.

9.20 Lightning display timer

MAIN MENU » CONFIGURATION » LIGHTING DISPLAY TIMER

Default set to *ON*.

To increase the life of the background lighting, it is switched off after three minutes of no activity.

To change setting, select the row and press *ENTER*.

Set the feature *Lighting display timer* to *ON* in order to switch off the background lighting after three minutes of no activity.

Set the feature to *OFF* to prevent switching off the background lighting. The display will stay on all the time.

This feature is not available when using U8² in presentation mode together with W8².

9.21 Remote supervision

Default set to *ON*.

The *REMOTE SUPERVISION* used to supervise the remote detection within the system.

- **OFF CONDITION:** System will display an error when the remote is connected/disconnected on the feeder and power source.
- **ON CONDITION:** It would prevent errors when the remote is connected/disconnected on the feeder and power source.


10 TOOLS

MAIN MENU » TOOLS

TOOLS				
ERROR LOG▶				
EXPORT/IMPORT▶				
FILE MANAGER▶				
SETTING LIMIT EDITOR▶				
MEASURE LIMIT EDITOR▶				
PRODUCTION STATISTICS▶				
QUALITY FUNCTIONS▶				
USER DEFINED SYNERGIC DATA▶				
CALENDAR▶				
USER ACCOUNTS▶				
UNIT INFORMATION▶				
				QUIT


10.1 Error log

MAIN MENU » TOOLS » ERROR LOG

Error management codes are used to indicate that a error has occurred in the welding process. This is specified in the display with the aid of a popup menu. An exclamation mark  appears in the top right corner of the display.



NOTE!

 disappears from the display as soon as you go into the error log menu.

All errors that arise during the use of the welding equipment are documented as error messages in the error log. Up to 99 error messages can be saved. If the error log becomes full, i.e. if 99 error messages have been saved, the oldest message is automatically deleted when the next error occurs.

The following information can be read in the error log menu:

- The index number of the error
- The date on which the error has occurred, format: YYMMDD
- The time at which the error has occurred
- The unit in which the error has occurred
- The error code
- Additional data depending on the error code, for example the unit that created the error code

ERROR LOG					
Index	Date	Time	Unit	Error	Data
1	121029	13:29:16	8	19	2
2	121029	13:29:21	8	17	
3	171113	09:38:49	8	19	
<i>Error in battery-driven memory</i>					
<i>DELETE</i>		<i>DELETE ALL</i>		<i>UPDATE</i>	
<i>VIEW TOTAL</i>		<i>QUIT</i>			

Units

- | | |
|--------------------|-------------------------|
| 1 = cooling unit | 4 = remote control unit |
| 2 = power source | 5 = AC-unit |
| 3 = wire feed unit | 8 = control panel |

10.1.1 Error code descriptions

Error code	Description
1	<p><i>Failed checksum control in EPROM</i> There is a error in the program memory. This error does not disable any functions. Action: Restart. If the error persists, send for a service technician.</p>
2	<p><i>Failed RAM test in microprocessor</i> The microprocessor is unable to read/write from/to a certain memory position in its internal memory. This error does not disable any functions. Action: Restart. If the error persists, send for a service technician.</p>
3	<p><i>Failed external RAM test</i> The microprocessor is unable to read/write from/to a certain memory position in its external memory. This error does not disable any functions. Action: Restart. If the error persists, send for a service technician.</p>
4	<p><i>Drop down in 5V supply line</i> The power supply voltage is too low. The current welding process is stopped, and cannot be restarted. Action: Turn off the mains power supply to reset the unit. If the error persists, send for a service technician.</p>
5	<p><i>DC voltage outside limits</i> The voltage is too low or too high. Too high a voltage can be due to severe transients on the mains power supply or to a weak power supply (high inductance of the supply or loss of a phase). The power unit is stopped, and cannot be restarted. Action: Turn off the mains power supply to reset the unit. If the error persists, send for a service technician.</p>

Error code	Description
6	<p><i>High temperature</i> The thermal overload cutout has operated.</p> <p>The current welding process is stopped, and cannot be restarted until the cutout has reset.</p> <p>Action: Check that the cooling air inlets or outlets are not obstructed or clogged with dirt. Check the duty cycle being used, to make sure that the equipment is not being overloaded.</p>
7	<p><i>High primary current</i> The power unit takes too much current from the DC voltage that supplies it. The power unit is stopped and cannot be started.</p> <p>Action: Turn off the mains power supply to reset the unit. If the error persists, send for a service technician.</p>
8	<p><i>DC voltage 1 outside safe limits</i> The battery on the circuit board inside the W8² control unit needs to be replaced. If it is not replaced, the entire contents of the battery-backed memory will be lost at power off.</p> <p>Action: Contact an authorised ESAB service technician.</p>
9	<p><i>Power supply 2</i> Error code from external source</p> <p>Action: Check manual for connected units.</p>
10	<p><i>Power supply 3</i> Error code from external source</p> <p>Action: Check manual for connected units.</p>
11	<p><i>Servo error</i> Error code from external source</p> <p>Action: Check manual for connected units.</p>
12	<p><i>Warning state in bus interface</i> The load on the system CAN bus is temporarily too high.</p> <p>The power unit or wire feed unit may have lost contact with the control panel.</p> <p>Action: Check the equipment to ensure that only one wire feed unit or remote control unit is connected. If the error persists, send for a service technician.</p>
14	<p><i>Buss off state - communication breakdown</i> The system's CAN bus has temporarily ceased to work due to excessive load.</p> <p>The current welding process is stopped.</p> <p>Action: Check the equipment to ensure that only one wire feed unit or remote control unit is connected. Turn off the mains power supply to reset the unit. If the error persists, send for a service technician.</p>

Error code	Description
15	<p><i>Message lost in bus communication</i> The microprocessor is unable to process incoming messages sufficiently quickly, with the result that information has been lost.</p> <p>Action: Turn off the mains power supply to reset the unit. If the error persists, send for a service technician.</p>
16	<p><i>High open-circuit voltage</i> The open-circuit voltage has been too high.</p> <p>Action: Turn off the mains power supply to reset the unit. If the error persists, send for a service technician.</p>
17	<p><i>Lost contact with an other unit</i> The current activities will be stopped and the welding start is prevented.</p> <p>This error can be caused by a brake in the connection (i.e. the CAN cable) between the welding data unit and an other unit. Which unit it concerns is displayed in the error log.</p> <p>Action: Check the CAN cabling. If the error persists, send for a service technician.</p>
19	<p><i>Error in battery-driven memory</i> The battery has lost voltage</p> <p>Action: Turn off the mains power supply to reset the unit. The control panel is reset. The settings are in English, with MIG/MAG, SHORT/SPRAY, Fe, CO₂, 1.2 mm. If the error persists, send for a service technician.</p>
22	<p><i>Overflow in transmit buffer</i> The control panel is unable to transmit information to the other units at a sufficiently high speed.</p> <p>Action: Turn off the mains power supply to reset the unit.</p>
23	<p><i>Overflow in receive buffer</i> The control panel is unable to process information from the other units at a sufficiently high speed.</p> <p>Action: Turn off the mains power supply to reset the unit.</p>
25	<p><i>Incompatible weld data format</i> Attempt to store weld data on a USB memory. The USB memory has a different data format than the weld data memory.</p> <p>Action: Use a different USB memory.</p>
26	<p><i>Watchdog reset triggered (Program error)</i> Something has prevented the processor from performing its normal tasks in the program.</p> <p>The program restarts automatically. The current welding process will be stopped. This error does not disable any functions.</p> <p>Action: Review the handling of welding programs during welding. If the error is repeated, send for a service technician.</p>
27	<p><i>No more wire detected</i> Out of wire / Hardware trap error Error code from external source</p> <p>Action: Check manual for connected units.</p>

Error code	Description
28	<p><i>Stack overflow</i> Program execution does not work.</p> <p>Action: Turn off the mains power supply to reset the unit. If the error persists, send for a service technician.</p>
29	<p><i>No water flow detected</i> No cooling water flow Error code from external source</p> <p>This error is generated if sufficient cooling water flow is not reached 10 seconds after wake up from standby mode.</p> <p>Action: Check manual for connected units.</p>
30	<p><i>Regulator time error level exceeded</i> A too long regulator time has occurred (only in MIG/MAG).</p>
32	<p><i>No gas flow detected</i> Error code from external source</p> <p>Action: Check manual for connected units.</p>
54	<p><i>Service interval passed</i> The service interval for changing the contact tip has passed.</p> <p>Action: Replace contact tip.</p>
60	<p><i>Communication error</i> The system's internal CAN-bus has temporarily stopped working due to the load being too high. The current welding process stops.</p> <p>Action: Check that all the equipment is correctly connected. Turn off the mains power supply to reset the unit. If the error persists, send for a service technician.</p>
64	<p><i>Control type load error</i> A not supported control type is sent from the U8² to the power source at start up/ recalled memory.</p> <p>Action: Change the regulator type.</p>
70	<p><i>Current measurement value limit passed</i> The current measurement values have exceeded their limits.</p> <p>Action: Check that the current limit is correctly set as well as the quality of the joint.</p>
71	<p><i>Voltage measurement value limit passed</i> The voltage measurement values have exceeded their limits.</p> <p>Action: Check that the voltage limit is correctly set as well as the quality of the joint.</p>
72	<p><i>Power measurement value limit passed</i> The power measurement values have exceeded their limits.</p> <p>Action: Check that the power limit is correctly set as well as the quality of the joint.</p>

Error code	Description
73	<i>WF current measurement value limit passed</i> The WF current measurement values have exceeded their limits. Action: Check that the WF current limit is correctly set as well as the quality of the joint.
75	<i>Warning synergic data recalculated</i> Synergic data is recalculated. Action: Push the enter key to accept the recalculated data.
76	<i>Login required for welding</i> Weld start denied, owing to the fact that the user is not logged in. This error can only occur if the "Login Required Service" function is active. Action: Activate the user account and log in.
78	<i>Corresponding dip/spray line missing</i> The short/spray line corresponding to the chosen synergy line for pulse welding (constituted by the same material, gas mixture and dimension), is not available. Action: Create the corresponding user defined synergic short/spray line and restart.

10.2 Export/Import

MAIN MENU » TOOLS » EXPORT/IMPORT

In the *EXPORT/IMPORT* menu, it is possible to transfer information to and from the control panel via a USB memory.

The following information can be transferred:

<i>WELD DATA SETS</i>	<i>EXPORT/IMPORT</i>
<i>SYSTEM SETTINGS</i>	<i>EXPORT/IMPORT</i>
<i>SETTING LIMITS</i>	<i>EXPORT/IMPORT</i>
<i>MEASURE LIMITS</i>	<i>EXPORT/IMPORT</i>
<i>ERROR LOG</i>	<i>EXPORT</i>
<i>QUALITY FUNCTION LOG</i>	<i>EXPORT</i>
<i>PRODUCTION STATISTICS</i>	<i>EXPORT</i>
<i>SYNERGIC LINES</i>	<i>EXPORT/IMPORT</i>
<i>BASIC SETTINGS</i>	<i>EXPORT/IMPORT</i>
<i>USER ACCOUNTS</i>	<i>EXPORT/IMPORT</i>

Insert the USB memory. See the "USB connection" section for a description of how to insert the USB memory. Select the row with the information that is to be transferred. Press *EXPORT* or *IMPORT*, depending on whether the information is to be exported or imported.

EXPORT/IMPORT				
WELD DATA SETS				
SYSTEM SETTINGS				
SETTING LIMITS				
MEASURE LIMITS				
ERROR LOG				
QUALITY FUNCTION LOG				
PRODUCTION STATISTICS				
SYNERGIC LINES				
BASIC SETTINGS				
USER ACCOUNTS				
EXPORT	IMPORT			QUIT

10.3 File manager

MAIN MENU » TOOLS » FILE MANAGER

In file manager you can process information both in a USB memory (C:\). File manager makes it possible to delete and copy weld data and quality data manually.

When the USB memory is inserted, the display shows the basic folder of the memory if no folder already has been chosen.

The control panel remembers where you were the last time you used file manager, so that you return to the same place in the file structure when you come back.

FILE MANAGER				
..				
INFO	UPDATE		ALT.	QUIT

In order to ascertain how much storage space remains for the memory, use the *INFO* function.

Update the information by pressing *UPDATE*.

When you want to delete, change name, create new folder, copy or paste, press *ALT*. A list then appears from which you can choose. If (..) or a folder is selected, you can only create a new folder or paste in a file that you have previously copied. If you have selected a file, the options *RENAME*, *COPY* or *PASTE* will be added if you have previously copied a file.

Select a folder or file and press *ALT*.

FILE MANAGER				
..				
WeldData				
NEW FOLDER				
ErrorLog.xml				
QData.xml				
~Weldoffice.dat				
INFO	UPDATE		ALT.	QUIT

This list is displayed when you have pressed *ALT*.

FILE MANAGER » ALT.
COPY
PASTE
DELETE
RENAME
NEW FOLDER

10.3.1 Delete a file/folder

Select the file or folder that is to be deleted and press *ALT*.

Select *DELETE* and press *ENTER*.

FILE MANAGER » ALT.
DELETE
RENAME
NEW FOLDER

The file/folder is now removed. In order to delete a folder it must be empty, i.e. first delete the files contained in the folder.

10.3.2 Rename a file/folder

Select the file or folder that is to be renamed and press *ALT*.

Select *RENAME* and press *ENTER*.

FILE MANAGER » ALT
DELETE
RENAME
NEW FOLDER

A keyboard appears in the display. Use the knob to the left to change row and the arrow keys to move left and right. Select the character/function that is to be used and press *ENTER*.

10.3.3 Create new folder

Select where the new folder is to be located and press *ALT*.

Select *NEW FOLDER* and press *ENTER*.

FILE MANAGER » ALT*DELETE**RENAME****NEW FOLDER***

A keyboard then appears in the display. Use the knob to the left to change row and the arrow keys to move left and right. Select the character/function that is to be used and press *ENTER*.

10.3.4 Copy and paste files

Select the file that is to be copied and press ALT.

Select *COPY* and press *ENTER*.

FILE MANAGER » ALT***COPY****PASTE**DELETE**RENAME**NEW FOLDER*

Position the cursor in the folder in which the copied file is to be located and press ALT.

Select *PASTE* and press *ENTER*.

FILE MANAGER » ALT*COPY****PASTE****DELETE**RENAME**NEW FOLDER*

The copy is saved as Copy of plus the original name, e.g. Copy of WeldData.awd.

10.4 Setting limit editor

MAIN MENU » TOOLS » SETTING LIMIT EDITOR

In this menu you set your own max. and min. values for various welding methods. The limits cannot be above or below the values for which the power source is dimensioned. There are 50 storage points. Select the row for an empty storage point and press *ENTER*. Select process (MIG/MAG, MMA, TIG) and press *ENTER*. For MIG/MAG, the max. and min. values for voltage and wire feed speed can be selected.

SETTING LIMIT EDITOR			
<i>PROCESS</i>		<i>MIG/MAG</i>	
<i>VOLTAGE</i>			
<i>- MIN</i>		<i>8.0 V</i>	
<i>- MAX</i>		<i>60.0 V</i>	
<i>WIRE SPEED</i>			
<i>- MIN</i>		<i>0.8 M/MIN</i>	
<i>- MAX</i>		<i>25.0 M/MIN</i>	
<i>STORE</i>	<i>AUTO</i>	<i>DELETE</i>	<i>QUIT</i>

For MMA and TIG, the max. and min. values for current can be changed.

SETTING LIMITS			
<i>1 MIG</i>			
<i>2 MMA</i>			
<i>3 -</i>			
<i>4 -</i>			
<i>5 -</i>			
<i>6 -</i>			
<i>7 -</i>			
<i>20 - 394 AMP</i>			
			<i>QUIT</i>

When the values have been adjusted, press *STORE*. When asked if the limit value is to be saved at the selected storage point, press *NO* or *YES*. The values of the storage point can be seen under the line at the bottom. In this case, storage point 2 for the MMA limit values is 20 - 394 A.

With *AUTO*, the limits are set automatically according to the limits that have been set for each welding method.

When asked if the setting limits are to be set automatically, press *NO* or *YES* and then *STORE* if the setting is to be retained.

10.5 Measure limit editor

MAIN MENU » TOOLS » MEASURE LIMIT EDITOR

In this menu you set your own measurement values for the various welding methods. There are 50 storage points. Select the row for an empty storage point and press *ENTER*. Select process by pressing *ENTER*. Then select welding process from the list that appears and then press *ENTER* again.

The following values can be selected:

For MIG/MAG

- voltage: time (0-10 s), min., max., min. average, max. average
- current: time (0-10 s), min., max., min. average, max. average
- output: min., max., min. average, max. average
- wire feed unit current: min., max., min. average, max. average

**NOTE!**

To prevent feed problems, especially when robot welding, it is recommended that a max value is given for the feed unit motor current. High motor current indicates feed problems. To give the correct max value it is recommended that the motor current be studied during a month's welding. Then a suitable maximum value is given.

For MMA and TIG

- voltage: time (0-10 s), min., max., min. average, max. average
- current: time (0-10 s), min., max., min. average, max. average
- output: min., max., min. average, max. average

Set the desired value with one of the right-hand knobs and press *STORE*.

In the dialogue box, you are asked if you want to store the selected storage point. Press *YES* to save the value. The values of the storage values can be seen under the line at the bottom.

MEASURE LIMITS				
1 - MIG				
2 - TIG				
3 -				
4 -				
5 -				
6 -				
7 -				
24.0 - 34.0 VOLT, 90 - 120 AMP				
2000 - 3000 Kw				
				<i>QUIT</i>

With *AUTO*, the limits are set automatically according to the most recently used measurement values.

When asked if the measurement values are to be set automatically, press *NO* or *YES* and then *STORE* if the setting is to be retained.

10.6 Production statistics

MAIN MENU » *TOOLS* » *PRODUCTION STATISTICS*

The production statistics will keep track of the total arc time, the total amount of material and the number of welds since the most recent reset. They will also keep track of the arc time and the amount of material used in the most recent weld. For information purposes, the melted wire material per length unit that has been calculated and when the most recent reset occurred are also displayed.

The number of welds does not increase if the arc time has been shorter than 1 second. For this reason, the amount of material used for a short weld of this type is not displayed. However, material consumption and time are included in the total material consumption and time.

PRODUCTION STATISTICS			LAST WELD	TOTAL
ARC TIME			0s	0s
CONSUMED WIRE			0g	0g
BASED ON			0g/m	
NUMBER OF WELDS				0
LAST RESET			081114	08:38:03
RESET	UPDATE			QUIT

When you press *RESET*, all counters are reset. Date and time show the most recent reset.

If you do not reset the counters, these are all automatically reset when one of them has reached its maximum value.

Maximum counter values

Time	999 hours, 59 minutes, 59 seconds
Weight	13350000 grams
Quantity	65535

Material consumption is not counted when using customer specific synergy lines.

10.7 Quality functions

MAIN MENU » TOOLS » QUALITY FUNCTIONS

Quality functions keep track of various interesting weld data for individual welds.

These functions are:

- Time of welding start.
- Duration of welding.
- Maximum, minimum and average current during welding.
- Maximum, minimum and average voltage during welding.
- Maximum, minimum and average output during welding.

In order to calculate the heat input, the selected weld is highlighted. Browse between the welds with the upper right-hand knob (#) and adjust the length of the joint with the lower knob (*). Press *UPDATE* and the welding unit calculates the heat input for the selected weld.

The number of welds since the most recent reset is displayed in the row at the bottom. Information can be stored about a maximum of 100 welds. In the event of more than 100 welds, the first one is overwritten. Welding must last for longer than one second to be registered.

The most recently noted weld is presented in the display, although it is also possible to browse between other noted welds. All logs are deleted when pressing *RESET*.

QUALITY FUNCTIONS				
#WELD: 1 / 4 *W LENGTH: 102 cm				
START 20081009 10 : 14 : 48				
WELD TIME 00 : 00 : 03 WELD DATA:				
HEAT INPUT: 3.12 kJ/mm				
		<i>MAX</i>	<i>MIN</i>	<i>AVE.</i>
<i>I (Amp)</i>		120.00	58.00	81.00
<i>U (V)</i>		12.50	6.50	8.75
<i>P (kW)</i>		3.11	1.47	2.10
NUMBER OF WELDS SINCE RESET: 4				
<i>RESET</i>	<i>UPDATE</i>			<i>QUIT</i>

For information about stored data, see the "CONFIGURATION, Quality functions" section.

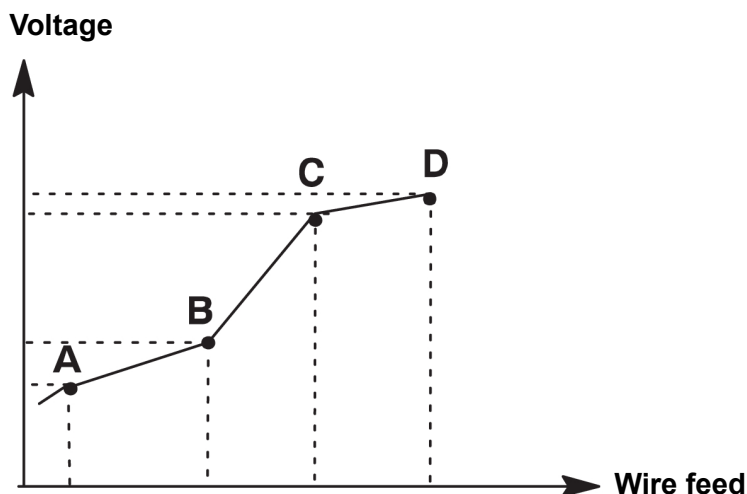
10.8 User defined synergic data

MAIN MENU » TOOLS » USER DEFINED SYNERGIC DATA

It is possible to create your own synergic lines with respect to wire feed speed and voltage. A maximum of ten such synergic lines can be saved.

A new synergic line is created in two steps:

- Define the new synergic line by specifying a number of voltage/wire speed co-ordinates, see points A-D in the following figure:



- Specify the wire/gas combination to which the synergic line is to apply.

10.8.1 Specify voltage/wire co-ordinates

In order to create a synergic line for the short-/sprayarc method, four co-ordinates are required; for the pulsing method, two co-ordinates are required. These co-ordinates must then be saved under separate weld data numbers in the weld data memory.

Short-/Sprayarc

- Bring up the main menu and select the *MIG/MAG* method *SHORT/SPRAY*.
- Key in the desired values for voltage and wire feed speed for the first co-ordinate.

- Bring up the *MEMORY* menu and store the first co-ordinate on any number.
The four co-ordinates for a short-/sprayarc line can be saved as any numbers. When supplied from the factory, they are saved as numbers 96, 97, 98 and 99.
A higher weld data number should contain higher values for voltage, start parameter R, amperage estimate and wire feed speed than the nearest preceding weld data number.
Display of Amperage Estimate is adjusted in the *CONFIGURATION » MIG/MAG DEFAULTS* menu.
The welding parameters inductance and regulator type must have the *same value* in all four weld data numbers.
- Define the number of co-ordinates that are required and then proceed to the “Specify valid wire/gas combination” section.

Pulsing

- Bring up the main menu and select the *MIG/MAG* method *PULSING*.
- Key in the desired values for voltage and wire feed speed for the first co-ordinate.
- Bring up the *MEMORY* menu and store the first co-ordinate on any number.
A higher weld data number should contain higher values for voltage, wire feed speed, pulse frequency, pulse amplitude, start parameter R and background current than the nearest preceding weld data number.
The welding parameters pulse time, Ka, Ki and slope must have the *same value* in both weld data numbers.
- Define the number of co-ordinates that are required and then proceed to the “Specify valid wire/gas combination” section.

10.8.2 Specify valid wire/gas combination

Position the cursor on the *WIRE* row and press ENTER.

MAKE CUSTOMISED SYNERGIC LINES	
<i>WIRE</i>	<i>Fe ER70S</i>
<i>SHIELDING GAS</i>	<i>CO2</i>
<i>WIRE DIMENSION</i>	<i>0.6 mm</i>
<i>SYNERGIC DESIGN SCHEDULE 1</i>	<i>96</i>
<i>SYNERGIC DESIGN SCHEDULE 2</i>	<i>97</i>
<i>SYNERGIC DESIGN SCHEDULE 3</i>	<i>98</i>
<i>SYNERGIC DESIGN SCHEDULE 4</i>	<i>99</i>
<i>DELETE</i>	<i>QUIT</i>

Select an alternative that is displayed in the list and press *ENTER*. Select in the same way for *SHIELDING GAS* and press *ENTER*.

MAKE CUSTOMISED SYNERGIC LINES » WIRE
<i>Fe ER70S</i>
<i>Ss ER316LSi</i>
<i>Duplex ER2209</i>
<i>AlMg ER5356</i>
<i>AlSi ER4043</i>
<i>Fe E70 MCW</i>

Select an alternative that is displayed in the list and press *ENTER*.

**MAKE CUSTOMISED SYNERGIC LINES
» SHIELDING GAS**

CO2
Ar 18%CO2
Ar2%O2
Ar
He
ArHeO2

Select in the same way for *WIRE DIAMETER* and press ENTER.

**MAKE CUSTOMISED SYNERGIC LINES
» WIRE DIAMETER**

0.6 mm
0.8 mm
1.0 mm
1.2 mm
1.4 mm
1.6 mm

Select the *SYNERGIC DESIGN SCHEDULE 1* row and press STORE.

The operation is now complete – a synergic line has been defined.



NOTE!

A corresponding short-/sprayarc synergy is needed for each pulsing instance.

When you create a new synergic line for the pulsing method, you therefore always receive a warning message stating that a corresponding line has not been created for the short-/sprayarc method. The message reads: *WARNING! No corresponding synergic line for short-/sprayarc.*

10.8.3 Create your own wire/gas alternative

The lists of wire/gas alternatives can be extended with up to ten alternatives of your own. At the bottom of each list there is a blank row (---). By positioning the cursor on this row and pressing ENTER, you gain access to a keyboard that enables you to enter your own alternatives.

Select the row and press ENTER

Ar15%CO2
Ar8%O2
Ar30%He
Ar30%He2%H2
Ar30%HeO5%CO2

The keyboard of the control panel is used as follows:

- Position the cursor on the desired keyboard character using the left-hand knob and the arrow keys. Press ENTER. Enter a complete character string with a maximum of 16 characters in this way.
- Press *DONE*. The alternative you have named can be seen in the list.

KEYBOARD				
A B C D E F G H				
I J K L M N O P				
Q R S T U V W X Y Z				
0 1 2 3 4 5 6 7 8 9				
SPACE CAPS				
-				
0 (MAX 16)				
←	→	<i>DELETE</i>	<i>SYMBOL</i>	<i>DONE</i>

Delete a named alternative as follows:

- Select your own wire/gas alternative from the relevant list.
- Press *DELETE*.



NOTE!

A named wire/gas alternative *cannot be deleted* if it is included in the weld data set that is currently in the working memory.

10.9 Calendar

MAIN MENU » TOOLS » CALENDAR

Date and time are set here.

Select the row that is to be set: *YEAR*, *MONTH*, *DAY*, *HOUR*, *MINUTES*, *SECONDS* or *UTC TIME ZONE*. Set the correct value using one of the right-hand knobs. Press *SET*.

DATE & TIME	
<i>YEAR</i>	2018
<i>MONTH</i>	<i>FEB</i>
<i>DAY</i>	07
<i>HOUR</i>	12
<i>MINUTES</i>	16
<i>SECONDS</i>	46
<i>UTC TIME ZONE</i>	+0.0
20180207 12:20:50	
	<i>SET</i> <i>QUIT</i>

10.10 User accounts

MAIN MENU » TOOLS » USER ACCOUNTS

Occasionally it is particularly important from a quality perspective that the power source cannot be used by unauthorised parties. The user accounts function makes it possible to use the power source only after login.

If you choose not to have this function, but instead want the power source and control panel to be unlocked for all users, select *USER ACCOUNTS » OFF*.

Instructions below apply when *USER ACCOUNTS* is set to *ON*.

User name, account level and password are registered in the menu *USER ACCOUNTS*.

Add new user

Select *USER NAME*, press enter. Step down to an empty row and press enter.

Enter a new user name on the keyboard using the left-hand knob, the right and left arrows and enter.

There is space for 16 user accounts. In the quality data files it will be evident which users have executed a particular weld.

Under *ACCOUNT LEVEL* choose between:

- *ADMIN* (administrator), full access (can add new users)
- *SENIOR USER*, can access everything except:
 - code lock
 - multiple wire feeders
 - calendar
 - user accounts
- *NORMAL USER*, can access the measure menu
- *WELD MEMORY USER*, can access the measure menu but cannot change voltage or wire feed speed
 - A memory welder can access the weld data memory to recall other memories.
 - A memory welder cannot store or edit weld data memories.

In the *USER PASSWORD* row, enter a password using the keyboard. When the power source is switched on and the control panel activated, you are asked in the display to enter your password.

USER ACCOUNTS				
USER NAME			ADMINISTRATOR	
<i>ACCOUNT LEVEL</i>			<i>ADMIN</i>	
<i>USER PASSWORD</i>				
<i>USER ACCOUNTS</i>			<i>OFF</i>	
<i>STORE</i>	<i>DELETE</i>			<i>QUIT</i>

Change user

TOOLS » CHANGE USER

When *USER ACCOUNTS* is *ON*, this menu is visible. It gives a possibility to change user.

Enter a password for a user and log in or choose *QUIT* to return to the *TOOLS* menu.

CHANGE USER				
ENTER PASSWORD				
<i>QUIT</i>			<i>LOGIN</i>	<i>ENTER PASSWRD</i>

10.11 Unit information

MAIN MENU » TOOLS » UNIT INFORMATION

In this menu you can see the following information:

- *Machine ID*
- *Node ID*
 - 2 = power source
 - 3 = wire feed
 - 8 = control panel
- *Software Version*

UNIT INFORMATION				
<i>Machine ID</i>		<i>Node ID</i>	<i>Software Version</i>	
	44	8	1.00A	
	23	2	2.00A	
	5	3	1.18A	
WELD DATA UNIT				
				<i>QUIT</i>

11 ORDERING SPARE PARTS



CAUTION!

Repair and electrical work should be performed by an authorised service technician. Use only original spare and wear parts.

U8² is designed and tested in accordance with the international and European standards 60974-1 and 60974-10. It is the obligation of the service unit which has carried out the service or repair work to make sure that the product still conforms to the said standard.

Spare parts and wear parts can be ordered through your nearest ESAB dealer, see [esab.com](https://www.esab.com). When ordering, please state product type, serial number, designation and spare part number in accordance with the spare parts list. This facilitates dispatch and ensures correct delivery.

WIRE AND GAS DIMENSIONS

U82 Plus - MIG/MAG welding with SHORT-/SPRAYARC

Wire type	Shielding gas	Wire diameter
Low alloy or unalloyed wire (Fe ER70S)	CO ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 18% CO ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 2% O ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 5% O ² + 5% CO ²	0.8 1.0 1.2 1.6*
	Ar + 8% CO ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 23% CO ²	0.8 1.0 1.2 1.6*
	Ar + 15% CO ² + 5% O ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 16% CO ²	0.8 1.0 1.2 1.6*
	Ar + 25% CO ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 2% CO ²	0.8 1.0 1.2 1.6*
	Ar + 5% O ²	1.0 1.2
Stainless solid wire (Ss ER316LSi)	Ar + 2% O ²	0.8 1.0 1.2 1.6*
	Ar + 30% He + 1% O ²	0.8 1.0 1.2 1.6*
	Ar + 2% CO ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 3% CO ² + 1% H ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 32% He + 3% CO ² + 1% H ²	0.8 0.9 1.0 1.2 1.6*
Stainless solid wire (Ss ER307Si)	Ar + 2% O ²	1.0 1.2
	Ar + 2% CO ²	0.8 1.0 1.2
Stainless duplex wire (Duplex ER2209)	Ar + 2% O ²	1.0 1.2
	Ar + 30% He + 1% O ²	1.0
	Ar + 2% CO ²	0.8 1.0 1.2
Magnesium-alloyed aluminium wire (AlMg ER5356)	Ar	0.9 1.0 1.2 1.6*
Silicon-alloyed aluminium wire (AlSi ER4043)	Ar	0.9 1.0 1.2 1.6*
	Ar + 50% He	0.9 1.0 1.2 1.6*
Metal powder cored wire (Fe E70 MCW)	Ar + 18% CO ²	1.0 1.2 1.4* 1.6*
	Ar + 8% CO ²	1.0 1.2 1.4* 1.6*
Rutile flux cored wire (Fe E70 RFCW)	CO ²	1.2 1.4* 1.6*
	Ar + 18% CO ²	1.2 1.4* 1.6*
Basic flux cored wire (Fe E70 BFCW)	CO ²	1.0 1.2 1.4* 1.6*
	Ar + 18% CO ²	1.0 1.2 1.4* 1.6*
	SELF-SHIELDING	1.2 1.6*

Wire type	Shielding gas	Wire diameter
Stainless flux cored wire (Ss RFCW)	Ar + 18% CO ²	1.2
	Ar + 8% CO ²	1.2
	SELF-SHIELDING	1.6* 2.4*
Duplex rutile flux cored wire (Ss DUP E2209)	Ar + 18% CO ²	1.2
Metal powder cored stainless wire (Ss MCW)	Ar + 8% CO ²	1.2
	Ar + 2% O ²	1.2
	Ar + 18% CO ²	1.2
	Ar + 2% CO ²	1.2
ERNiCrMo	Ar + 50% He	0.9
Silicon bronze (ERCuSi-A)	Ar + 1% O ²	1.0 1.2
	Ar	1.0 1.2
Ss ER347Si	Ar + 2% CO ²	0.8 1.0 1.2
Almg ER5087	Ar	1.0 1.2 1.6
Copper and aluminium wire (ERCuAl-A1)	Ar	1.0 1.2
	Ar + 1% O ²	1.0 1.2
Rutile flux cored wire (Fe RCW Dual-S)	CO ²	1.2

*) Only for power sources above 400 V

U82 Plus - MIG/MAG welding with PULSE

Wire type	Shielding gas	Wire diameter
Low alloy or unalloyed wire (Fe ER70S)	Ar + 18% CO ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 2% O ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 2% CO ²	0.8 1.0 1.2 1.6*
	Ar + 5% O ² + 5% CO ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 8% CO ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 23% CO ²	0.8 1.0 1.2 1.6*
	Ar + 16% CO ²	0.8 1.0 1.2 1.6*
	Ar + 25% CO ²	0.9
Stainless solid wire (Ss ER316LSi)	Ar + 5% O ²	1.0 1.2
	Ar + 2% O ²	0.8 0.9 1.0 1.2 1.6*
	Ar 30% He + O ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 2% O ²	0.8 0.9 1.0 1.2 1.6*
	Ar + 3% CO ² + 1% H ²	0.8 0.9 1.0 1.2 1.6
Stainless solid wire (Ss ER308LSi)	Ar + 32% He + 3% CO ² + 1% H ²	0.8 0.9 1.0 1.2 1.6
	Ar + 2% CO ²	0.9 1.0 1.2 1.6
Stainless solid wire (Ss ER309LSi)	Ar + 2% O ²	0.9
	Ar + 2% CO ²	1.0 1.2

Wire type	Shielding gas	Wire diameter
Stainless solid wire (Ss 309 MoL)	Ar + 2% CO ²	1.0 1.2
Stainless solid wire (Ss ER307Si)	Ar + 2% O ²	1.0 1.2
	Ar + 2% CO ²	1.0 1.2
Stainless duplex wire (Duplex ER2209)	Ar + 2% O ²	1.0 1.2
	Ar + 30% He + 1% O ²	1.0 1.2
	Ar + 2% CO ²	0.8 1.0 1.2
Magnesium-alloyed aluminium wire (AlMg ER5356)	Ar	0.8 0.9 1.0 1.2 1.6*
	Ar + 50% He	1.2
	Ar + 30% He	1.2
Magnesium-alloyed aluminium wire (AlMg ER5183)	Ar	1.6
Silicon-alloyed aluminium wire (AlSi ER4043)	Ar	0.9 1.0 1.2 1.6*
	Ar + 50% He	0.9 1.0 1.2 1.6*
	Ar + 30% He	0.9 1.0 1.2
Silicon-alloyed aluminium wire (AlSi ER4047)	Ar	1.2 1.6
Metal powder cored wire (Fe E70 MCW)	Ar + 18% CO ²	1.0 1.2 1.4* 1.6*
	Ar + 8% CO ²	1.0 1.2 1.4* 1.6*
Metal powder cored stainless wire (Ss MCW)	Ar + 2% O ²	1.2
	Ar + 2% CO ²	1.2
	Ar + 8% CO ²	1.2
ERNiCrMo	Ar	1.0 1.2
	Ar + 50% He	0.9 1.0 1.2
	Ar + 30% He + 2% H ²	1.0
	Ar + 30% He + 0.5% CO ²	1.0 1.2
Silicon bronze (ERCuSi-A)	Ar + 1% O ²	1.0 1.2
	Ar	1.0 1.2
Stainless wire (1.3964)	Ar + 8% O ²	1.0LOW 1.0HIGH
Copper and aluminium wire (ERCuAl-A1)	Ar	1.0 1.2
	Ar + 1% O ²	1.0 1.2
Aluminium solid wire (Al99,5 ER1100)	Ar	1.2
SS ER 347Si	Ar + 2% CO ²	0.8 1.0 1.2

*) Only for power sources above 400 V

MMA welding

Electrode type	Electrode diameter
Basic	1.6 2.0 2.5 3.2 4.0 4.5 5.0 5.6* 6.0*
Rutile	1.6 2.0 2.5 3.2 4.0 4.5 5.0 5.6* 6.0* 7.0*
Cellulose	2.5 3.2

*) Only for power sources above 400 V

Carbon, arc air

Electrode diameters (mm): 4.0 5.0 6.0 10.0 13.0

U8² Plus - MIG/MAG - ROBOT synergy group - with SHORT-/SPRAYARC

Wire type	Shielding gas	Wire diameter (mm)
AlMg ER5356	Ar	1.2, 1.6
AlSi ER4043	Ar	1.2, 1.6
ERCuSi-A	Ar	0.8, 1.0
ERCuAl-A1	Ar	1.0
ERCuSi-A	Ar + 1% CO ²	0.8, 1.0
Fe ER70S	Ar + 18% CO ²	0.8, 0.9, 1.0, 1.2
Fe ER70S	Ar + 8% CO ²	0.8, 0.9, 1.0, 1.2
Fe ER70S	CO ²	0.8, 0.9, 1.0, 1.2
Fe MCW 14.11	Ar + 18% CO ²	1.2, 1.4
Fe MCW 14.11	Ar + 8% CO ²	1.2, 1.4
Fe MCW 14.13	Ar + 18% CO ²	1.2, 1.4
Fe MCW 14.13	Ar + 8% CO ²	1.2, 1.4
Ss 307	Ar + 2% CO ²	0.8, 1.0, 1.2
Ss 307	Ar + 2% CO ²	0.8, 1.0, 1.2
Ss ER308LSi	Ar + 2% CO ²	0.8, 0.9, 1.0, 1.2
Ss 430 Lnb-Ti	Ar + 2% CO ²	1.0
Ss 430LNb	Ar + 2% CO ²	1.0
Ss 430Ti	Ar + 2% CO ²	0.9, 1.0

U8² Plus - MIG/MAG - ROBOT synergy group - with PULSE

Wire type	Shielding gas	Wire diameter (mm)
AlMg ER5356	Ar	1.2, 1.6
AlSi ER4043	Ar	1.2, 1.6
ERCuAl-A1	Ar	1.0
ERCuSi-A	Ar + 1% CO ²	1.0
Fe ER70S	Ar + 18% CO ²	0.8, 0.9, 1.0, 1.2
Fe ER70S	Ar + 8% CO ²	0.8, 0.9, 1.0, 1.2
Ss 307	Ar + 2% CO ²	0.8, 1.0, 1.2
Ss ER308LSi	Ar + 2% CO ²	0.8, 0.9, 1.0, 1.2
Ss 430LNb	Ar + 2% CO ²	0.8, 1.0
Ss 430Ti	Ar + 2% CO ²	0.9, 1.0

U8² Plus - MIG/MAG - SAT synergy group

Wire type	Shielding gas	Wire diameter (mm)	Work area m/min
Fe ER70S	Ar + 8% CO ²	1.0	16 - 25
Fe ER70S	Ar + 18% CO ²	1.0	16 - 25
Fe ER70S	Ar + 8% CO ²	0.9	16 - 29
Fe ER70S	Ar + 18% CO ²	0.9	17 - 29
Fe ER70S	Ar + 8% CO ²	0.8	19 - 29
Fe ER70S	Ar + 18% CO ²	0.9	19 - 29
Ss 307	Ar + 2% CO ²	0.8	20 - 26
Ss 307	Ar + 2% CO ²	1.0	12 - 21
Fe MCW 14.11	Ar + 8% CO ²	1.2	6.5 - 14
Fe MCW 14.11	Ar + 18% CO ²	1.2	7 - 14
Fe MCW 14.11	Ar + 8% CO ²	1.4	5.9 - 12
Fe MCW 14.11	Ar + 18% CO ²	1.4	6.6 - 12
Ss 430LNb	Ar + 2% CO ²	1.0	14.2 - 25
Ss 430Ti	Ar + 2% CO ²	0.9	16 - 27
Ss 430Ti	Ar + 2% CO ²	1.0	14.2 - 25
Ss 430 Lnb-Ti	Ar + 2% CO ²	1.0	14.2 - 27.5
Ss ER308LSi	Ar + 2% CO ²	1.0	15-27.5
Ss ER308LSi	Ar + 2% CO ²	0.9	16 - 28
Ss ER308LSi	Ar + 2% CO ²	0.8	18 - 29.5

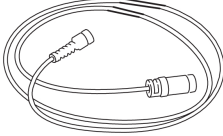


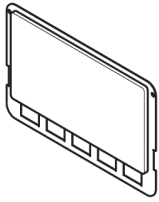
ORDERING NUMBERS

Ordering no.	Denomination
0460 820 880	Control panel Aristo® U8 ² *
0460 820 881	Control panel Aristo® U8 ² Plus*
0460 820 882	Control panel Aristo® U8 ² Plus I/O*
0460 820 883	Control panel Aristo® U8 ² Plus I/O 255*
0459 839 037	Spare parts list

* For functional differences, see the "Functional differences" section.

Technical documentation is available on the Internet at: www.esab.com

ACCESSORIES

0460 877 891	Extension cable (connectors included) 7.5 m 12-poles	
0457 043 880	Adapter set 230 V AC / 12 V DC, for control box (for training with the control box disconnected from the machine).	
0462 062 001	USB Memory stick	
0349 312 604	Display protection U8²	



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