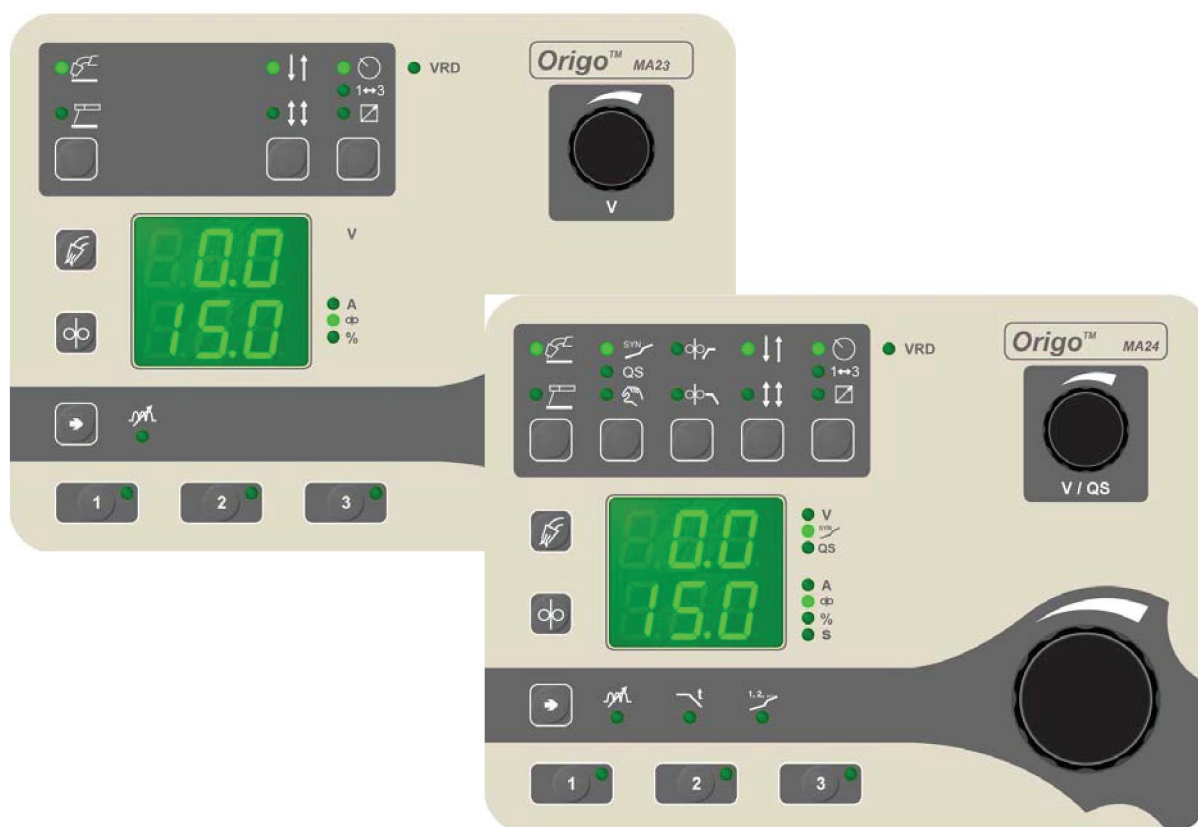


Origo™

MA23

MA24



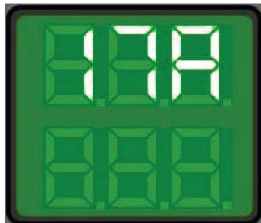
Instruction manual

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1 INTRODUCTION

The manual describes use of **MA23** and **MA24** control panels.

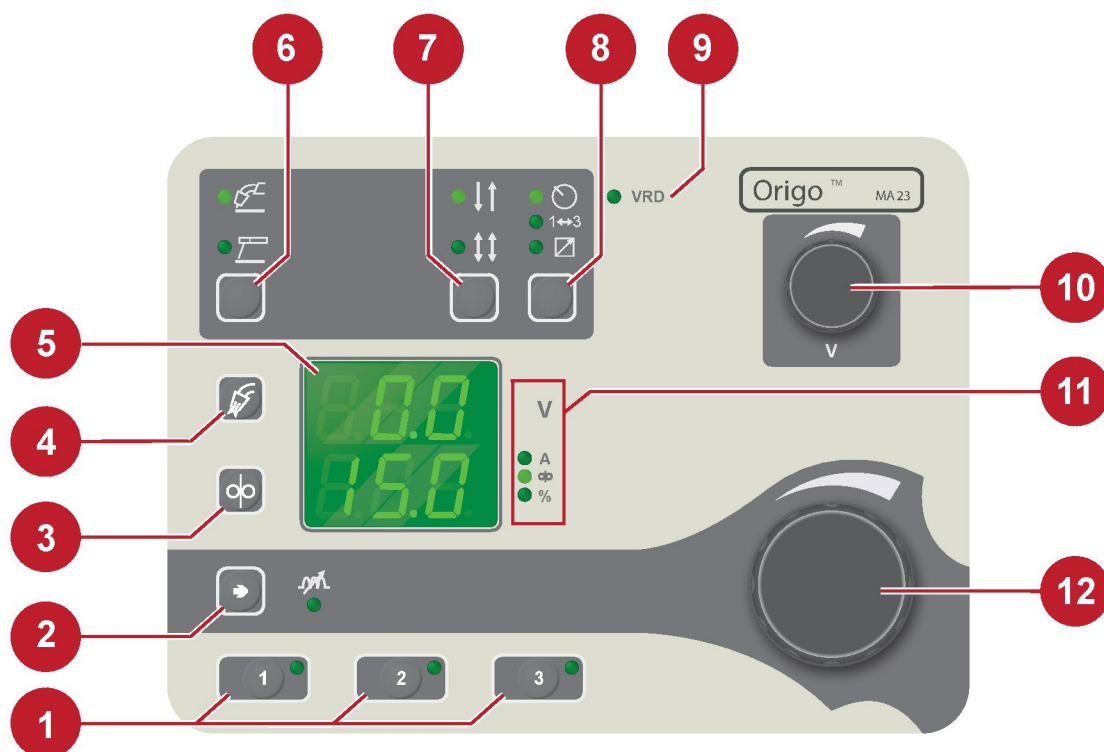
For general information about operation see user's instructions for the power source respectively wire feed unit.



When mains power is supplied the unit runs a self diagnosis of the LEDs and the display, the program version is displayed and in this example the program version is 0.17A

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

1.1 Control panel MA23

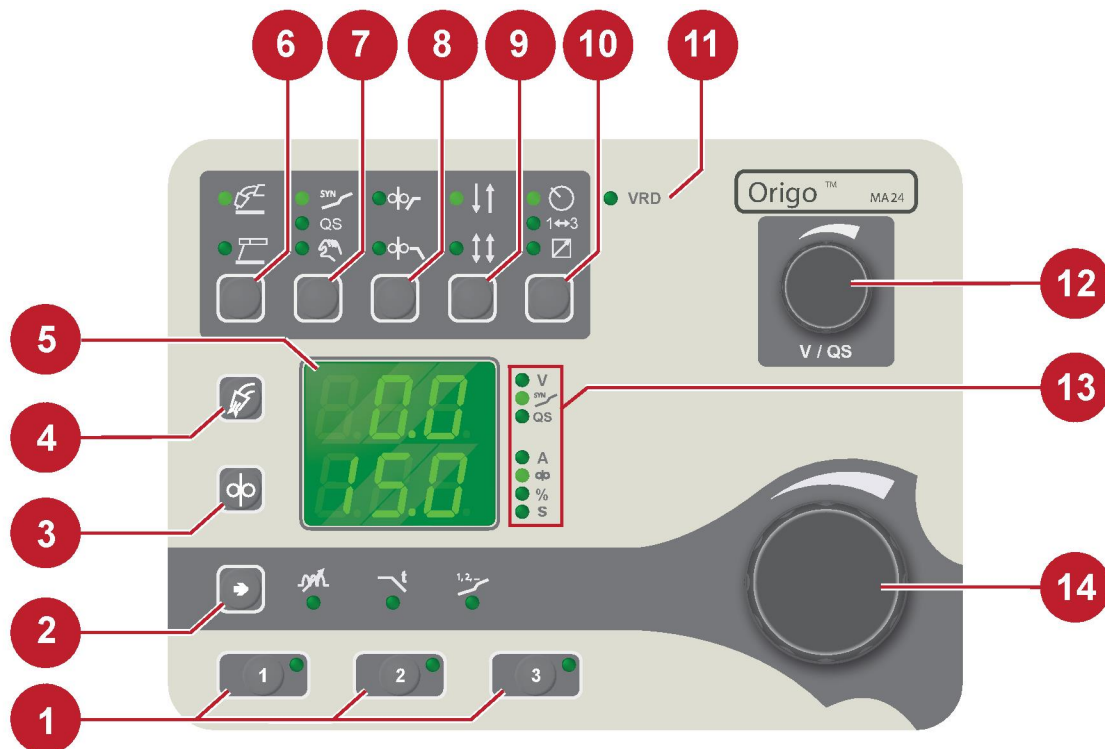


- | | |
|--|---|
| 1. Buttons for weld data memory | 7. Toggling between 2-stroke and 4-stroke |
| 2. Setting of Inductance | 8. Toggling between Setting from panel, Program change with welding torch trigger switch, and Remote control unit |
| 3. Selection of Wire inching | 9. Indication of activated VRD (Voltage Reducing Device) |
| 4. Selection of Gas purging | 10. Setting voltage |
| 5. Display | 11. Indication of which variables and units are shown in the display |
| 6. Toggling between welding method MIG/MAG and MMA | 12. Setting of the parameter shown in the display |

The measured value in the display for arc voltage V and welding current A, is the arithmetic average value = rectified average value.

For an explanation of the M23 and M24 control panel symbols, see section "Symbol Reference".

1.2 Control panel MA24



- | | |
|--|--|
| 1. Buttons for weld data memory | 8. Toggling between Creep start and Crater filling |
| 2. Toggling between Inductance, Crater filling time, and Synergy selection | 9. Toggling between 2-stroke and 4-stroke |
| 3. Selection of Wire inching | 10. Toggling between Setting from panel, Program change with welding torch trigger switch, and Remote control unit |
| 4. Selection of Gas purging | 11. Indication of activated VRD (Voltage Reducing Device) |
| 5. Display | 12. Setting voltage/QSet™ |
| 6. Toggling between welding method MIG/MAG and MMA | 13. Indication of which variables and units are shown in the display |
| 7. Toggling between Synergy, QSet™, and Manual setting | 14. Setting of the parameter shown in the display |

The measured value in the display for arc voltage V and welding current A, is the arithmetic average value = rectified average value.

1.3 Symbol reference

	MIG/MAG welding method		MMA welding method
	Synergy setting		QSet™ setting
	Manual setting		Creep start

	Crater filling		2-Stroke
	4-Stroke		Setting from panel
1↔3	Program change with welding torch trigger switch		Remote control unit
V / QS	Setting voltage / QSet™		Gas purging
	Wire feed speed or Wire inching (Meaning of symbol differs depending on context.)		Crater filling time
	Inductance		Synergy selection
VRD	VRD (Voltage Reducing Device)	V	Voltage
A	Current	%	Percent
S	Seconds		

2 MIG/MAG WELDING

2.1 Settings

Functions	Setting range	MA23	MA24	Default value
Voltage	8 - 60 V	x	x	12 V
Wire feed speed	0.8 - 25 m/min	x	x	5 m/min
Synergy	OFF or ON	-	x	ON
Synergic lines	35 pcs	-	x	-
QSet™	OFF or ON	-	x	OFF
Manual setting	OFF or ON	-	x	ON
Creep start	OFF or ON	-	x	ON
Creep start ¹⁾	0=OFF or 1=ON	x	-	ON
Crater filling	OFF or ON	-	x	ON
Crater filling time	0-5 s	-	x	1.0 s
2/4-stroke ²⁾	2 stroke or 4 stroke	x	x	2-stroke
Active panel	OFF or ON	x	x	ON
Changing trigger data	OFF or ON	x	x	OFF
Memory positions for trigger data ¹⁾	2 or 3 memory positions	x	x	3
Remote control unit	OFF or ON	x	x	OFF
Gas flushing ²⁾	-	x	x	-
Wire inching	-	x	x	-
Inductance	0 - 100	x	x	70%
Welding data memory	1, 2, 3	x	x	-
Gas pre flow time ¹⁾	0.1 - 9.9 s	x	x	0.1 s
Unit of measurement ¹⁾	0 = inch, 1 = mm	x	x	1
Burnback time ¹⁾	50 - 250 ms	x	x	80 ms
SCT ¹⁾	0, 1, 2 or 3	x	x	0
Gas post flow time ¹⁾	0.1 - 9.9 s	x	x	1s
Start parameter R ¹⁾	8 - 60 (in steps of 0.25)	x	x	25
VRD	-	x	x	-

¹⁾ These functions are hidden functions, see section "Hidden MIG/MAG functions".

²⁾ These functions cannot be changed while welding is in progress

2.2 Symbol and function explanation



MIG/MAG welding

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

**Wire feed speed**

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

SYN

**Synergy**

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 in accordance with the pre-programmed synergic line you selected, which makes it much easier to find the correct welding parameters. The connection between the wire feed speed and the other parameters is called the synergic line. See the different synergic lines in section "Wire and gas dimensions".

It is also possible to order other synergy lines, but these must be installed by an authorised ESAB service engineer.

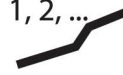
SYN



When activating synergy using the setting knob.

also select synergy option

1, 2, ...

**QSet™**

QSet™, is used to facilitate setting welding parameters.

How to use QSet™:

1. Set Wire feed speed. QSet™ will dynamically adjust voltage to get the optimal welding results.
2. When changing material or thickness: make the first weld (6 seconds) with QSet™ on a test piece to obtain all the correct data, before welding the actual work piece.

QSet™ value fine tuning:

- Turning the knob clockwise increases (+) the arc length.
- Turning the knob anti-clockwise reduces (-) the arc length.

SHORT ARC

When first starting welding with a 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 ARC

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.

**Manual**

Manual operation. The operator must set appropriate values for the wire feed and voltage.

**Creep start**

Creep starting feeds out the wire at 50% of the set speed until it makes electrical contact with the workpiece.

**Crater filling**

Crater filling helps to avoid pores, thermal cracking and crater formation in the weld when welding stops.

**Crater filling time**

When activating crater filling also select crater filling time using the setting knob.

This function cannot be used with QSet™.

**2-stroke**

With 2-stroke, gas pre-flow starts when the welding torch trigger switch is pressed. The welding process then starts. Releasing the trigger switch stops welding entirely and starts gas post-flow.

**4-stroke**

With 4 stroke, the gas pre-flow starts when the welding torch trigger switch is pressed in and the wire feed starts when it is released. The welding process continues until the switch is pressed in again, the wire feed then stops and when the switch is released the gas post-flow starts.

**Active panel**

Settings are made from the control panel.

**Changing welding data**

This function permits changing between different welding data memories by a press on the trigger of the welding torch.

To change without ongoing welding press quickly. If the trigger is pressed down for too long, the program interprets this as a welding start.

**Changing welding data during welding with 2-stroke**

During ongoing welding the welding torch's trigger is pressed down, to change welding data memory, release the trigger and press it quickly.

**Changing welding data during welding with 4-stroke**

During ongoing welding with 4-stroke the welding torch's trigger is released, to change welding data memory, press the trigger and release it quickly.

When activating welding data 1 - 3, select welding data memory 1, 2 or 3.

**Remote control unit**

Settings are made from the remote control unit.

The remote control unit must be connected to the remote control unit socket on the equipment before activation. When the remote control unit is activated the panel is inactive.

With the remote control unit function activated one can change between different welding data memories using a welding torch with program selector (RS3).



Voltage Reducing Device (VRD)

The VRD function ensures that the open-circuit voltage does not exceed 35 V when welding is not being carried out. This is indicated by a lit VRD LED.

The VRD function is blocked when the system senses that welding has started.

If the VRD function is activated and the open-circuit voltage exceeds the 35 V limit, this is indicated by an error message (16) appearing in the display and welding cannot be started whilst the error message is displayed.

Contact an authorised ESAB service technician to activate the function.



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.



Wire inching

Wire inching is used when one needs to feed wire without welding voltage being applied. The wire is fed as long as the button is depressed.



Inductance

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

2.3 Hidden MIG/MAG functions

There are hidden functions in the control panel.



To access these hidden functions press and hold the button for 5 seconds. The display will show a letter and a value. The knob for wire feed is used to change the value of the selected function.

MA23

Function letter Function

A	Gas pre-flow
C	Unit of measurement
I	Burnback time
J	Creep start
L	Gas post-flow
t	Memory positions for trigger data
o	SCT on/off
S	Start parameter R

MA24**Function letter Function**

A	Gas pre-flow
C	Unit of measurement
I	Burnback time
L	Gas post-flow
t	Memory positions for trigger data
o	SCT on/off
S	Start parameter R

To leave the function press and hold the  button for 5 seconds.

A Gas pre-flow

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

C Unit of measurement

0 = inch/min, 1 = mm/min, Default value = 1

I Burnback time

Burnback time is off by default, because of SCT. To enable burnback, change SCT setting.



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 burnback time results in a shorter stickout, with increased risk of the arc striking back to the contact tip.

L Gas post-flow

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

J Creep start

Creep starting feeds out the wire at 50% of the set speed until it makes electrical contact with the workpiece.

t Memory positions for trigger data

This function gives the possibility to select whether to use trigger data between 2 or 3 programs.

o SCT

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

There are four settings: 0, 1, 2 and 3.

0 = The value is determined by the synergy line (default).

1 = SCT is off for this synergy line. When changing line, the setting is restored to 0 (default).

2 = SCT is off until this setting is changed, regardless of the SCT line value.

3 = SCT is on until this setting is changed, regardless of the SCT line value.

S 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 parameter can only be set in manual mode.

3 MMA WELDING

3.1 Settings

Functions	Setting range	MA23	MA24	Default value
Current	16- max A ²⁾	x	x	100 A
Active panel	OFF or ON	x	x	ON
Remote control unit	OFF or ON	x	x	OFF
Arc force ¹⁾	0 - 99	x	x	5 %
Drop welding ¹⁾	0=OFF or 1=ON	x	x	OFF
Welding regulator type ¹⁾	1=ArcPlus™ II or 0=ArcPlus™	x	x	-
Min current remote control ¹⁾	0 - 99 %	x	x	0 %
Hot start amplitude ¹⁾	0 - 99 %	x	x	0 %

¹⁾ These functions are hidden functions, see description in section "Hidden MMA functions".

²⁾ The setting range is dependent on the power source.

3.2 Symbol and Function explanations



MMA welding

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



Active panel

Settings are made from the control panel.



Remote control unit

Settings are made from the remote control unit.

The remote control unit must be connected to the remote control unit socket on the equipment before activation. When the remote control unit is activated the panel is inactive.



Voltage Reducing Device (VRD)

The VRD function ensures that the open-circuit voltage does not exceed 35 V when welding is not being carried out. This is indicated by a lit VRD LED.

The VRD function is blocked when the system senses that welding has started.

If the VRD function is activated and the open-circuit voltage exceeds the 35 V limit, this is indicated by an error message (16) appearing in the display and welding cannot be started whilst the error message is displayed.

Contact an authorised ESAB service technician to activate the function.

3.3 Hidden MMA functions

There are hidden functions in the control panel.



To access these hidden functions press and hold the button for 5 seconds. The display will show a letter and a value. The knob for wire feed is used to change the value of the selected function.

MA23 and MA24

Function letter Function

C	Arc Force
d	Drop welding
F	Welding regulator type (Welding regulator ArcPlus™)
H	Hot start amplitude
I	Min current remote



To leave the function press and hold the button for 5 seconds.

C 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.

d Drop welding

Drop 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.

F Welding regulator ArcPlus™

Welding regulator ArcPlus™ is a new type of control that produces a more intense, more concentrated and calmer arc. It recovers more quickly after a spot short-circuit, which reduces the risk of the electrode getting stuck to the work-piece.

- ArcPlus™ (0) is recommended with basic type of electrode
- ArcPlus™ II (1) is recommended with rutile and cellulosic type of electrode

H Hot start amplitude



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.

When Hot start is activated, the Hot start amplitude parameter can be used to set the preferred level of the weld current during the hot start time, in percentage of the set weld current. If for instance the set weld current is 100 A and the Hot start amplitude is set to 10 %, the weld current during the hot start time will be 110 A.

I Min current remote

Used to set the minimum current for the remote control.

If the max current is 100 A and the min current is to be 50 A, set the concealed function min current to 50 %.

If the max current is 100 A and the min current is to be 90 A, set the min current to 90 %.

4 WELDING DATA MEMORY

Three different welding data programs can be stored in the control panel memory.

Hold button  ,  or  pressed in for 5 seconds to store welding data in the memory. The welding data is stored when the green indicator lamp starts to flash.

To switch between the different welding data memories press button  , 
or  .

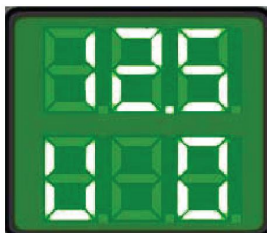
The welding data memory has a back-up battery so that the settings remain even if the equipment has been switched off.

5 FAULT CODES



Fault codes are used to indicate that a fault has occurred in the equipment. They are given in the lower part of the display with an E followed by a fault code number.

A unit number is displayed to indicate which unit has generated the fault.



Fault code numbers and unit numbers are shown alternately.

Fault indication indicates that the control panel (U 0) has lost contact with the power source.

If several faults have been detected only the code for the last occurring fault is displayed. Press any function button or turn any knob to remove the fault indication from the display.



NOTE!

If the remote control is activated, deactivate the remote control by pressing to remove the fault indication.



5.1 List of fault codes

U 0 = welding data unit

U 2 = power source

U 5 = multivoltage

U 1 = cooling unit

U 4 = remote control unit

5.2 Fault code descriptions

The fault codes that the users can correct themselves are given below. If a different code appears, call a service technician.

Fault code	Description
E 6	High temperature The thermal overload cut-out has tripped. The current welding process is stopped and cannot be restarted until the temperature has fallen. Action: Check that the cooling air inlets or outlets are not blocked or clogged with dirt. Check the duty cycle being used, to make sure that the equipment is not being overloaded.
E 12	Communication error (warning) The load on the system's CAN-bus is temporarily too high. The power unit / wire feed unit has lost contact with the control panel. Action: Check the equipment and ensure that only one wire feed unit or remote control unit is installed. If the fault persists, send for a service technician.

Fault code	Description
E 16	High open-circuit voltage Open circuit voltage has been too high. Action: Turn off the mains power supply to reset the unit. Send for a service technician if the fault persists.
E 17	Lost contact The control panel has lost contact with the wire feed unit. The current welding process stops. Action: Check the cables. If the fault persists, send for a service technician.
E 18	Lost contact The control panel has lost contact with the power source. The current welding process stops. Action: Check the cables. If the fault persists, send for a service technician.
E 27	Out of wire The wire feed unit is not feeding out any wire. The current welding process will be stopped and prevents welding start. Action: Load a new wire.
E 29	No cooling water flow The flow monitor switch has tripped. The current welding process is stopped and starting is prevented. Action: Check the cooling water circuit and the pump.
E 32	No gas flow The gas flow is less than 6 l/min. Start prevented. Action: Check the gas valve, hoses and connectors.
E 40	Incompatible units Incorrect wire feed unit is connected. Start is prevented. Action: Connect the correct wire feed unit.
E 41	Lost contact with the cooling unit The control panel has lost contact with the cooling unit. Switch off the power source! Action: Check the wiring. If the fault persists, send for a service technician.
E 44	Control panel not configured for the connected power source Applies to MA24: The currently connected power source is of another type than the one last connected to the panel. Action: Connect the control panel to a power source of the same type as the one last connected or configure the control panel for the appropriate type of power source.

6 ORDERING SPARE PARTS

Spare parts may be ordered through your nearest ESAB dealer, see the back cover of this document. 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

Synergic lines

 Material	Typical ESAB filler metal	 Gas	 Ø	0,030 in 0,8 mm	0,035 in 0,9 mm	0,040 in 1 mm	0,045 in 1,2 mm	0,052 in 1,4 mm	1/16 in 1,6 mm
Fe (ER70S)	OK AristoRod 12.50/12.51	CO ₂ (C1)		1		2	3		
Fe (ER70S)	OK AristoRod 12.50/12.51	Ar+18%CO ₂ (M21)		4	5	6	7		
Fe (ER70S)	OK AristoRod 12.50/12.51	Ar+25%CO ₂ (M21)		8		9	10		
Ss (ER316LSi)	OK Autrod 316LSi	Ar+2%CO ₂ (M12)		11	12	13	14		
Ss (ER316LSi)	OK Autrod 316LSi	He+7.5%Ar+2.5%CO ₂ (M12)			15		16		
AlMg (ER5356)	OK Autrod 5356	Ar (I1)				17	18		19
AlSi (ER4043)	OK Autrod 4043	Ar (I1)				20	21		22
Fe MCW (E70C)	OK Tubrod 14.12	Ar+18%CO ₂ (M21)					23	24	25
Fe MCW (E70C)	Coreweld C6	Ar+8%CO ₂ (M20)					26		27
Fe RFCW (E71T)	OK Tubrod 15.14	Ar+18%CO ₂ (M21)					28	29	30
Fe RFCW (E71T)	Dual Shield	Ar+25%CO ₂ (M21)					31	32	33
Fe BFCW (E71T)	OK Tubrod 15.00	Ar+18%CO ₂ (M21)					34		
Fe RFCW (E71T)	Dual Shield	CO ₂ (C1)					35		

ORDERING NUMBERS

MA23, MA24



Ordering no.	Denomination
0459 773 889	Control panel Origo™ MA23
0459 773 886	Control panel Origo™ MA24
0459 839 024	Spare parts list

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

ESAB subsidiaries and representative offices

Europe

AUSTRIA

ESAB Ges.m.b.H
Vienna-Liesing
Tel: +43 1 888 25 11
Fax: +43 1 888 25 11 85

BELGIUM

S.A. ESAB N.V.
Heist-op-den-Berg
Tel: +32 15 25 79 30
Fax: +32 15 25 79 44

BULGARIA

ESAB Kft Representative Office
Sofia
Tel: +359 2 974 42 88
Fax: +359 2 974 42 88

THE CZECH REPUBLIC

ESAB VAMBERK s.r.o.
Vamberk
Tel: +420 2 819 40 885
Fax: +420 2 819 40 120

DENMARK

Aktieselskabet ESAB
Herlev
Tel: +45 36 30 01 11
Fax: +45 36 30 40 03

FINLAND

ESAB Oy
Helsinki
Tel: +358 9 547 761
Fax: +358 9 547 77 71

GREAT BRITAIN

ESAB Group (UK) Ltd
Waltham Cross
Tel: +44 1992 76 85 15
Fax: +44 1992 71 58 03

ESAB Automation Ltd
Andover
Tel: +44 1264 33 22 33
Fax: +44 1264 33 20 74

FRANCE

ESAB France S.A.
Cergy Pontoise
Tel: +33 1 30 75 55 00
Fax: +33 1 30 75 55 24

GERMANY

ESAB Welding & Cutting GmbH
Langenfeld
Tel: +49 2173 3945-0
Fax: +49 2173 3945-218

HUNGARY

ESAB Kft
Budapest
Tel: +36 1 20 44 182
Fax: +36 1 20 44 186

ITALY

ESAB Saldatura S.p.A.
Bareggio (Mi)
Tel: +39 02 97 96 8.1
Fax: +39 02 97 96 87 01

THE NETHERLANDS

ESAB Nederland B.V.
Amersfoort
Tel: +31 33 422 35 55
Fax: +31 33 422 35 44

NORWAY

AS ESAB
Larvik
Tel: +47 33 12 10 00
Fax: +47 33 11 52 03

POLAND

ESAB Sp.zo.o.
Katowice
Tel: +48 32 351 11 00
Fax: +48 32 351 11 20

PORTUGAL

ESAB Lda
Lisbon
Tel: +351 8 310 960
Fax: +351 1 859 1277

ROMANIA

ESAB Romania Trading SRL
Bucharest
Tel: +40 316 900 600
Fax: +40 316 900 601

RUSSIA

LLC ESAB
Moscow
Tel: +7 (495) 663 20 08
Fax: +7 (495) 663 20 09

SLOVAKIA

ESAB Slovakia s.r.o.
Bratislava
Tel: +421 7 44 88 24 26
Fax: +421 7 44 88 87 41

SPAIN

ESAB Ibérica S.A.
San Fernando de Henares
(MADRID)
Tel: +34 91 878 3600
Fax: +34 91 802 3461

SWEDEN

ESAB Sverige AB
Gothenburg
Tel: +46 31 50 95 00
Fax: +46 31 50 92 22

ESAB International AB
Gothenburg
Tel: +46 31 50 90 00
Fax: +46 31 50 93 60

SWITZERLAND

ESAB Europe GmbH
Baar
Tel: +41 1 741 25 25
Fax: +41 1 740 30 55

UKRAINE

ESAB Ukraine LLC
Kiev
Tel: +38 (044) 501 23 24
Fax: +38 (044) 575 21 88

North and South America

ARGENTINA

CONARCO
Buenos Aires
Tel: +54 11 4 753 4039
Fax: +54 11 4 753 6313

BRAZIL

ESAB S.A.
Contagem-MG
Tel: +55 31 2191 4333
Fax: +55 31 2191 4440

CANADA

ESAB Group Canada Inc.
Mississauga, Ontario
Tel: +1 905 670 02 20
Fax: +1 905 670 48 79

MEXICO

ESAB Mexico S.A.
Monterrey
Tel: +52 8 350 5959
Fax: +52 8 350 7554

USA

ESAB Welding & Cutting
Products
Florence, SC
Tel: +1 843 669 44 11
Fax: +1 843 664 57 48

Asia/Pacific

AUSTRALIA

ESAB South Pacific
Archerfield BC QLD 4108
Tel: +61 1300 372 228
Fax: +61 7 3711 2328

CHINA

Shanghai ESAB A/P
Shanghai
Tel: +86 21 2326 3000
Fax: +86 21 6566 6622

INDIA

ESAB India Ltd
Calcutta
Tel: +91 33 478 45 17
Fax: +91 33 468 18 80

INDONESIA

P.T. ESABindo Pratama
Jakarta
Tel: +62 21 460 0188
Fax: +62 21 461 2929

JAPAN

ESAB Japan
Tokyo
Tel: +81 45 670 7073
Fax: +81 45 670 7001

MALAYSIA

ESAB (Malaysia) Snd Bhd
USJ
Tel: +603 8023 7835
Fax: +603 8023 0225

SINGAPORE

ESAB Asia/Pacific Pte Ltd
Singapore
Tel: +65 6861 43 22
Fax: +65 6861 31 95

SOUTH KOREA

ESAB SeAH Corporation
Kyungnam
Tel: +82 55 269 8170
Fax: +82 55 289 8864

UNITED ARAB EMIRATES

ESAB Middle East FZE
Dubai
Tel: +971 4 887 21 11
Fax: +971 4 887 22 63

Africa

EGYPT

ESAB Egypt
Dokki-Cairo
Tel: +20 2 390 96 69
Fax: +20 2 393 32 13

SOUTH AFRICA

ESAB Africa Welding & Cutting
Ltd
Durbanvill 7570 - Cape Town
Tel: +27 (0)21 975 8924

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