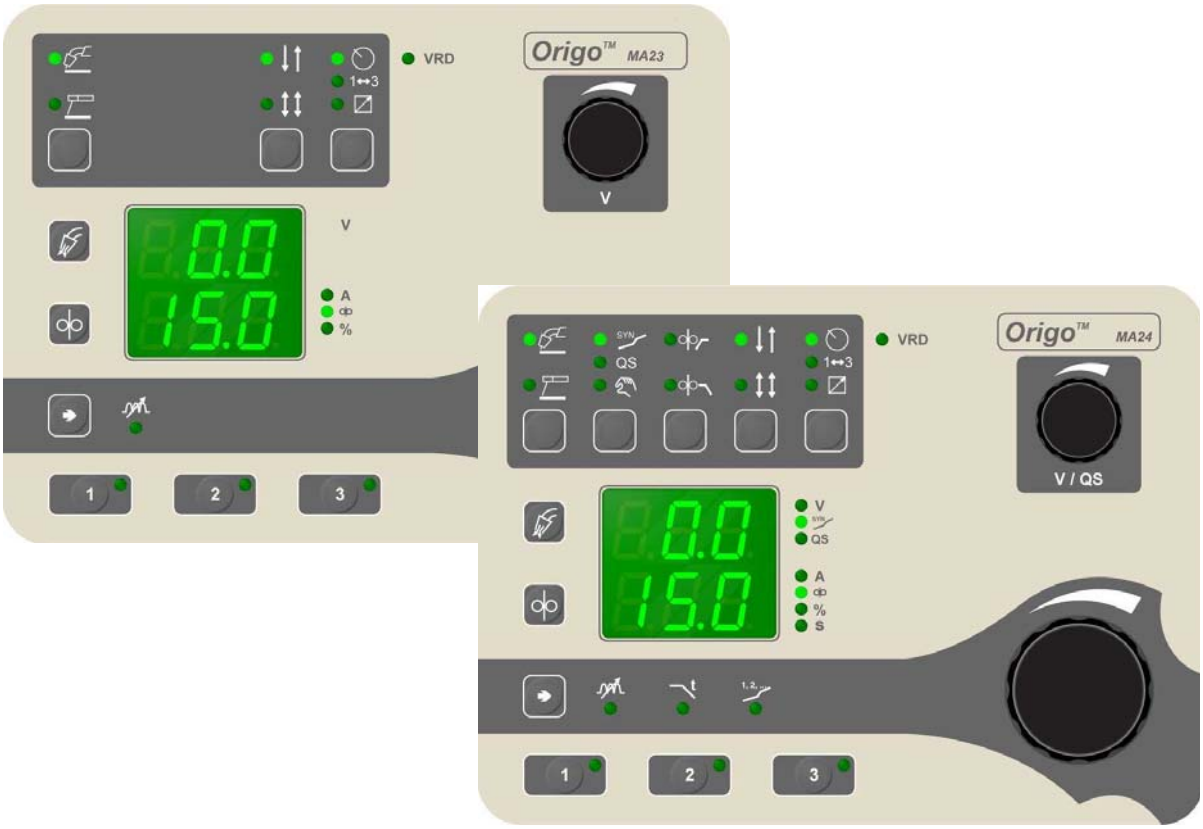
GB

ESAB

Origo™

MA23
MA24



Instruction manual

0460 454 274 GB 20120322

Valid from program version 1.26

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7 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 website, www.esab.com.

7.1 Control panel MA23

1. Setting voltage
2. Setting the wire feed speed, current, (ampere, m/minute or percent)
3. Display
4. Choice of welding method

   MIG/MAG or MMA
7. Choice of 2-stroke or 4-stroke
8. Setting from panel , program change with welding gun trigger switch 1↔3

   or connecting remote control unit
9. Display of VRD function (reduced open-circuit voltage) is active or inactive.
10. Gas flushing
11. Wire inching
12. Indication of which parameter is shown in the display. Volts, amperes, m/min, or percent.
13. Setting the inductance
14. Buttons for weld data memory. See page 12.

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

7.2 Control panel MA24

1 Setting voltage / QSet™

2 Setting the wire feed speed, current, (ampere, m/minute percent or seconds)

3 Display

4 Choice of welding method

MIG/MAG or MMA

5 Choice of QSet™ QS, manual setting or synergy SYN

6 Selection of creep start or crater filling

7 Choice of 2-stroke or 4-stroke

8 Setting from panel, program change with welding gun trigger switch 1↔3

or connecting remote control unit

9 Display of VRD function (reduced open-circuit voltage) is active or inactive.

10 Gas flushing

11 Wire inching

12 Indication of which parameter is shown in the display. Volts, synergy, QSet™, amperes, m/min, seconds or percent.

13 Setting the inductance or crater filling time t

synergy selection 1.2...

14 Buttons for weld data memory. See page 12.

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

8 MIG/MAG WELDING

8.1 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
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
Gas post flow time [1)]	0.1 - 9.9 s	x	x	1 s
VRD	-	x	x	-

[1)] *These functions are hidden functions, see description point 8.3.*
[2)] *These functions cannot be changed while welding is in progress*

8.2 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 on page 14.

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

When activating synergy SYN also select synergy option 1.2... using the setting knob.

QS QSet™

QSet™ , is used to facilitate setting welding parameters.

- 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.

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

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 time

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

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 (if used) starts when the welding gun trigger switch is pressed. The welding process then starts. Releasing the trigger switch stops welding entirely and starts gas post-flow (if selected).

4-stroke

With 4 stroke, the gas pre-flow starts when the welding gun 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 (if selected).

Active panel

Settings are made from the control panel.

1↔3 Changing welding data

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

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

Changing welding data during welding with 2-stroke

During ongoing welding the welding gun's trigger is depressed, to change welding data memory, release the trigger and depress it quickly.

Changing welding data during welding with 4-stroke

During ongoing welding with 4-stroke the welding gun's trigger is released, to change welding data memory, depress 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 machine 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 gun with program selector (RS3).

VRD (Voltage Reducing Device)

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.

8.3 Hidden MIG/MAG functions

There are hidden functions in the control panel.

To access these hidden functions hold the button  depressed 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
L	Gas post-flow
J	Creep start

MA24

Function letter	Function
A	Gas pre-flow
C	Unit of measurement
I	Burnback time
L	Gas post-flow

To leave the function hold the button  depressed for 5 seconds.

 **Gas pre-flow**

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

Unit of measurement

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

 **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.

 **Gas post-flow**

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

 **Creep start**

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

9 MMA WELDING

9.1 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
Hotstart [1]	0 - 99	x	x	0
Weld regulator [1]	1=ArcPlus™ II or 0=ArcPlus™	x	x	-
Min current remote control [1]	0 - 99%	x	x	0 %

[1] *These functions are hidden functions, see description point 9.3.*
[2] *The setting range is dependent on the power source.*

9.2 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 machine before activation. When the remote control unit is activated the panel is inactive.

VRD (Voltage Reducing Device)

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.

9.3 Hidden MMA functions

There are hidden functions in the control panel.

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

MA23 and MA24

Function letter	Function
C	Arc Force
d	Drop welding
H	Hotstart
F	Regulator type
I	Min current

To leave the function hold the button  depressed for 5 seconds.

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.

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.

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.

Welding regulator

Welding regulator is a 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 becoming stuck.

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

Min current

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%.

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10 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 

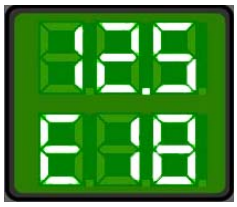
, 

or 

.

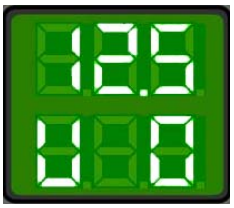
The welding data memory has a back-up battery so that the settings remain even if the machine has been switched off.

11 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.

11.1 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		

11.2 Fault code descriptions

The fault codes that the user 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.
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.

12 ORDERING SPARE PARTS

Spare parts may be ordered through your nearest ESAB dealer, see the last page of this publication.

Wire and gas dimensions

1.2...	Material	ESAB designation	dim (mm)	Wire dim (in.)	Shielding gas	Gas approval code	Regulator type
1	Fe ER70S-6	OK AristoRod 12.50/12.51	0.8	.031"	CO2	EN ISO 14175-C1-C	3
2	Fe ER70S-6	OK AristoRod 12.50/12.51	1.0	.037"	CO2	EN ISO 14175-C1-C	10
3	Fe ER70S-6	OK AristoRod 12.50/12.51	1.2	.045"	CO2	EN ISO 14175-C1-C	10
4	Fe ER70S-6	OK AristoRod 12.50/12.51	0.8	.031"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	1
5	Fe ER70S-6	OK AristoRod 12.50/12.51	1.0	.037"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	10
6	Fe ER70S-6	OK AristoRod 12.50/12.51	1.2	.045"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	1
7	Fe ER70S-6	OK AristoRod 12.50/12.51	0.8	.031"	75%Ar+25%CO2	EN ISO 14175-M21-ArC-25	1
8	Fe ER70S-6	OK AristoRod 12.50/12.51	1.0	.037"	75%Ar+25%CO2	EN ISO 14175-M21-ArC-25	1
9	Fe ER70S-6	OK AristoRod 12.50/12.51	1.2	.045"	75%Ar+25%CO2	EN ISO 14175-M21-ArC-25	1
10	Fe ER70S-6	OK AristoRod 12.50/12.51*	0.9	.035"	82-90% Ar 10-18% CO2	N/A	1
11	ER 308LSI	OK Autrod 308LSi	0.8	.031"	98% Ar 2%CO2	EN ISO 14175-M12-ArC-2	4
12	ER 308LSI	OK Autrod 308LSi	0.9	.035"	98% Ar 2%CO2	EN ISO 14175-M12-ArC-2	4
13	ER 316LSI	OK Autrod 316LSi	1.0	.037"	98%Ar+2%CO2	EN ISO 14175-M12-ArC-2	1
14	ER 316LSI	OK Autrod 316LSi	1.2	.045"	98%Ar+2%CO2	EN ISO 14175-M12-ArC-2	11
15	ER 308LSI	OK Autrod 308LSi*	0.9	.035"	90% He 7.5% Ar 2.5% CO2	EN ISO 14175-Z-HeArC-90/7.5/2.5	1
16	ER 308LSI	OK Autrod 308LSi*	1.2	.045"	90% He 7.5% Ar 2.5% CO2	EN ISO 14175-Z-HeArC-90/7.5/2.5	1
17	Al 5356	OK Autrod 5356	1.0	.037"	100%Ar	EN ISO 14175-I1-Ar	1
18	Al 5356	OK Autrod 5356	1.2	.045"	100%Ar	EN ISO 14175-I1-Ar	1
19	Al 5356	OK Autrod 5356	1.6	.062"	100%Ar	EN ISO 14175-I1-Ar	1
20	Al 4043	OK Autrod 4043	1.0	.037"	100%Ar	EN ISO 14175-I1-Ar	1
21	Al 4043	OK Autrod 4043	1.2	.045"	100%Ar	EN ISO 14175-I1-Ar	1
22	Al 4043	OK Autrod 4043	1.6	.062"	100%Ar	EN ISO 14175-I1-Ar	1
23	Fe MCW E70C-6M	OK Tubrod 14.12	1.2	.045"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	1
24	Fe MCW E70C-6M	OK Tubrod 14.12	1.4	.052"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	1
25	Fe MCW E70C-6M	OK Tubrod 14.12	1.6	.062"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	1
26	Fe MCW E70C-6M	Coreweld C6*	1.2	.045"	92%Ar+8%CO2	EN ISO 14175-M20-ArC-8	1
27	Fe MCW E70C-6M	Coreweld C6*	1.6	.062"	92%Ar+8%CO2	EN ISO 14175-M20-ArC-8	1
28	Fe RCW E71T-1M	OK Tubrod 15.14	1.2	.045"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	1
29	Fe RCW E71T-1M	OK Tubrod 15.14	1.4	.052"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	1
30	Fe RCW E71T-1M	OK Tubrod 15.14	1.6	.062"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	1
31	Fe RCW E71T-1	Dual Shield all-position*	1.2	.045"	75%Ar+25%CO2	EN ISO 14175-M21-ArC-25	1
32	Fe RCW E71T-1	Dual Shield all-position*	1.4	.052"	75%Ar+25%CO2	EN ISO 14175-M21-ArC-25	1
33	Fe RCW E71T-1	Dual Shield all-position*	1.6	.062"	75%Ar+25%CO2	EN ISO 14175-M21-ArC-25	1
34	Fe BCW E71T-5	OK Tubrod 15.00	1.2	.045"	82%Ar+18%CO2	EN ISO 14175-M21-ArC-18	1
35	Fe RCW E71T-1	Dual Shield 7100 LH*	1.2	.045"	CO2	EN ISO 14175-C1-C	3
Other Info		*=US					

Order number

Ordering no.	Denomination
0459 773 889	Control panel Origo™ MA23
0459 773 886	Control panel Origo™ MA24
0460 454 270	Instruction manual SE
0460 454 271	Instruction manual DK
0460 454 272	Instruction manual NO
0460 454 273	Instruction manual FI
0460 454 274	Instruction manual GB
0460 454 275	Instruction manual DE
0460 454 276	Instruction manual FR
0460 454 277	Instruction manual NL
0460 454 278	Instruction manual ES
0460 454 279	Instruction manual IT
0460 454 280	Instruction manual PT
0460 454 281	Instruction manual GR
0460 454 282	Instruction manual PL
0460 454 283	Instruction manual HU
0460 454 284	Instruction manual CZ
0460 454 285	Instruction manual SK
0460 454 286	Instruction manual RU
0460 454 287	Instruction manual US
0460 454 289	Instruction manual EE
0460 454 290	Instruction manual LV
0460 454 291	Instruction manual SL
0460 454 292	Instruction manual LT
0460 454 293	Instruction manual CN
0459 839 024	Spare parts list

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