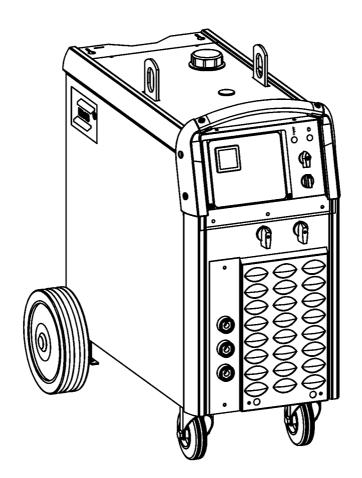


ESABMig 405 ESABMig 505



Instruction manual

0349 301 042 060331 Valid for serial no. 246

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1 DIRECTIVE

DECLARATION OF CONFORMITY

ESAB Welding Equipment AB, S-695 81 Laxå, Sweden, gives its unreserved guarantee that welding power source ESABMig 405, ESABMig 505 from serial number 246 complies with standard IEC/EN 60974-1, in accordance with the requirements of directive (73/23/EEC) and addendum (93/68/EEC) and with standard EN 60974-10 in accordance with the requirements of directive (89/336/EEC) and addendum (93/68/EEC).

Laxå 24.02.2003

Henry Selenius Vice President

ESAB Welding Equipment AB

695 81 LAXÅ SWEDEN

Tel: + 46 584 81000 Fax: + 46 584 411924

2 SAFETY

Users of ESAB welding 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 welding 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 welding 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 welding equipment must be familiar with:
 - its operation
 - · location of emergency stops
 - · its function
 - · relevant safety precautions
 - welding
- 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
- The workplace must:
 - be suitable for the purpose
 - · be free from draughts
- 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.





WARNING



ARC WELDING AND CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURERS' HAZARD DATA.

ELECTRIC SHOCK - Can kill

- Install and earth the welding unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from earth and the workpiece.
- Ensure your working stance is safe.

FUMES AND GASES - Can be dangerous to health

- · Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to take fumes and gases away from your breathing zone and the general area.

ARC RAYS - Can injure eyes and burn skin.

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

FIRE HAZARD

Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

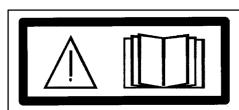
NOISE - Excessive noise can damage hearing

- Protect your ears. Use earmuffs or other hearing protection.
- Warn bystanders of the risk.

MALFUNCTION - Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!



WARNING!

Read and understand the instruction manual before installing or operating.



WARNING!

Do not use the power source for thawing frozen pipes.



This product is solely intended for arc welding.



3 INTRODUCTION

The ESABMig 405 and ESABMig 505 are step switched power sources designed for MIG/MAG-welding together with wire feed units ESABFeed 30, ESABFeed 48 and the most of ESAB wire feeders.

The power units are fan-cooled and equipped with thermal overload protection.

The machines can be fitted with an instrument for display of current and voltage. It incorporates a hold function and can be calibrated.

The machines can be fitted with a flow guard.

ESAB's accessories for the product can be found on page 20.

3.1 Equipment

The power source is supplied with:

- Return cable 5m with return clamp
- Shelf for gas cylinder
- Guide pin for wire feed unit
- Instruction manual

4 TECHNICAL DATA

ESABMig 405				
Voltage	400-415V, 3~50/60 Hz	230/400-415/500V 3~50 Hz 230/440-460 3~60Hz		
Permissible load at100 % duty cycle	280 A/28 V	280 A/28 V		
at 60 % duty cycle	365 A/32 V	365 A/32 V		
at 50 % duty cycle	400 A/34 V	400 A/34 V		
Setting range (DC)	50A/16,5V-400A/34V	50A/16,5V-400A/34V		
Open circuit voltage	17–45 V	17–45 V		
Open circuit power	360 W	360 W		
with cooling unit	600 W	600 W		
Efficiency at max current	71%	71%		
Power factor at max current	0,98	0,98		
Control voltage	42 V, 50/60 Hz	42 V, 50/60 Hz		
Dimensions Ixwxh	812 x 552 x 925	812 x 552 x 925		
Weight	144 kg	145 kg		
with cooling unit	158 kg	158 kg		
Operating temperature	-10 to +40°C	-10 to +40°C		
Enclosure class	IP 23	IP 23		
Application classification	S	S		



ESABMig 505				
Voltage	400-415V, 3~50/60 Hz	230/400-415/500V 3~50 Hz 230/440-460 3~60Hz		
Permissible load				
at100 % duty cycle	390 A/33,5 V	390 A/33,5 V		
at 60 % duty cycle	500 A/39 V	500 A/39 V		
Setting range (DC)	50A/16,5V-500A/39V	50A/16,5V-500A/39V		
Open circuit voltage	17–50 V	17–50 V		
Open circuit power	440 W	440 W		
with cooling unit	620 W	620 W		
Efficiency at max current	82%	82%		
Power factor at max current	0,92	0,92		
Control voltage	42 V, 50/60 Hz	42 V, 50/60 Hz		
Dimensions lxwxh	812 x 552 x 925	812 x 552 x 925		
Weight	214 kg	215 kg		
with cooling unit	228 kg	229 kg		
Operating temperature	-10 to +40°C	-10 to +40°C		
Enclosure class	IP 23	IP 23		
Application classification	S	S		

Duty cycle

The duty cycle refers to the time as a percentage of a ten-minute period that you can weld at a certain load without overloading.

Enclosure class

The **IP** code indicates the enclosure class, i. e. the degree of protection against penetration by solid objects or water. Equipment marked **IP23** is designed for indoor and outdoor use.

Application class

The symbol S indicates that the power source is designed for use in areas with increased electrical hazard.

5 INSTALLATION

The installation must be executed by a professional.



WARNING!

This product is intended for industrial use. In a domestic environment this product may cause radio interference. It is the user's responsibility to take adequate precautions.

Lifting instructions

The power supply should be lifted by means of its lifting eye. The handle is only intended for pulling it along the ground.

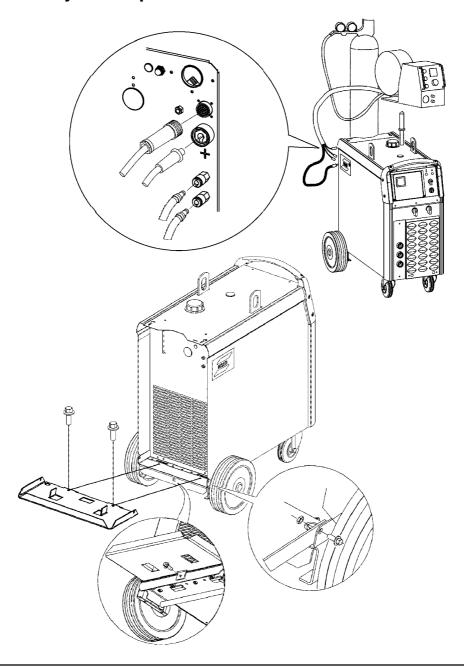




5.1 Placing

Position the welding power source such way that its cooling air inlets and outlets are not obstructed.

5.2 Assembly of components





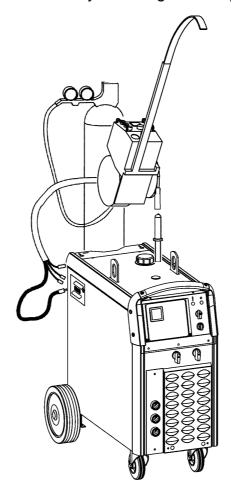
WARNING!

During transport, the rear wheels of the power source are in their forward position. Before use, place the wheels in their rear position.



5.3 Assembly of counter balance

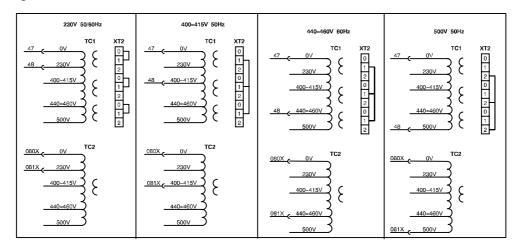
Assemble the stabilizer + CB KIT if the counter balance is to be installed on machine. The stabilizer + CB KIT is an accessory. Ordering number you can find on page 21.



Attention! Utilization of counter balance without stabilizer may cause the machine tipping over.

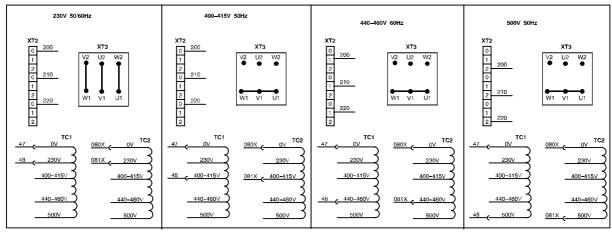
5.4 Electrical installation

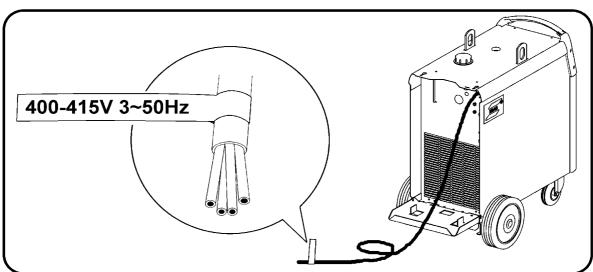
ESABMig 405

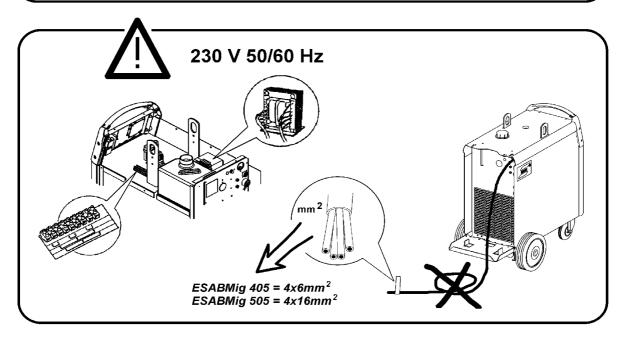




ESABMig 505



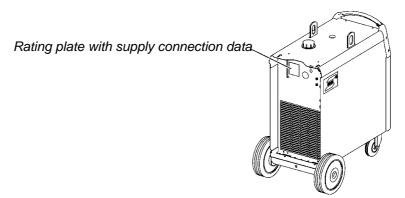






5.5 Mains power supply

Check that the unit is connected to the correct mains power supply voltage, and that it is protected by the correct fuse size. A protective earth connection must be made, in accordance with regulations.



ESABMig 405	3∼ 50 Hz	3∼ 50/60 Hz	3∼ 50 Hz	3∼ 60 Hz	3∼ 60 Hz
Voltage V	230	400/415	500	230	440/460
Current A at100% duty cycle	28	16	13	28	14
at 60% duty cycle	42	24	19	41	21
at 50% duty cycle	45	28	20	45	22
Cable area mm ²	4 x 6	4 x 2,5	4 x 2,5	4 x 6	4 x 2,5
Fuse, slow A	25	20	20	25	20

ESABMig 505	3∼ 50 Hz	3∼ 50/60 Hz	3∼ 50 Hz	3∼ 60 Hz	3∼ 60 Hz
Voltage V	230	400/415	500	230	440/460
Current A at100% duty cycle	43	25	20	43	23
at 60% duty cycle	68	39	31	68	35
Cable area mm ²	4 x 16	4 x 6	4 x 6	4 x 16	4 x 6
Fuse, slow A	63	35	35	63	25

NB: The mains cable areas and fuse sizes as shown above are in accordance with Swedish regulations. They may not be applicable in other countries: make sure that the cable area and fuse sizes comply with the relevant national regulations.



6 OPERATION

General safety regulations for the handling of the equipment can be found on page 3. Read through before you start using the equipment!



WARNING - TIPPING RISK!

There is a risk of tipping while transportation and operation, if the welding machine leans more than 10°. In that case appropriate securing has to be provided!

6.1 Connection and control devices

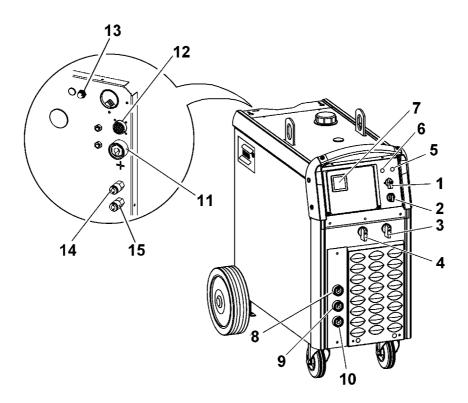
- 1 Mains supply switch
- 2 Main supply switch for cooling unit ELP**
- 3 Switch, precise control
- 4 Switch, coarse control
- 5 Indicating lamp, power supply ON
- 6 Orange indicating lamp, overheating and loss of coolant*
- 7 Space for digital meter (optional), see page 20
- **8** Connection for return cable (–), high inductance

- 9 Connection for return cable (-), medium inductance
- 10 Connection for return cable (–), low inductance
- 11 Connection for welding current cable (+)
- 12 Connection for control cable for wire feeder
- **13** MCB
- 14 Connection RED for cooling water from the wire feed unit
- 15 Connection BLUE for cooling water to the wire feed unit

NOTE! Cooling water connections only available on certain models.

* Indicating loss of coolant, only when water flow guard is used, see point 6.2.4

** ELP = ESAB Logic Pump, see point 6.2.3.





6.2 Function explanations

6.2.1 Start

When switched on, indicating lamps are checked for 2 seconds. Normally, if the machine is not overheated, it should start to work in idle mode, which is indicated by blinking of the supply–ON lamp. The fan and the coolant pump are stopped.

The fan starts from the first start of welding. The coolant pump starts at the same moment, if it is switched on by means of either the ELP switch on the wire feeder, or the pump supply switch on the power source.

6.2.2 Overheating protection

The power source has 2–step control of fan speed and overheating protection. If temperature crosses the threshold point, the fan starts to operate with increased speed. If the internal temperature becomes too high, the welding is interrupted and disabled. This state is indicated by permanent lighting of the orange indicating lamp on the front of the unit. It resets automatically when the temperature falls down.

6.2.3 Water connection

The ESABFeed has a sensor **ELP**, **ESAB** Logic **P**ump, which senses whether the water hoses of the welding gun are connected. When a water–cooled welding gun is connected, the water pump is active. For the ESABFeeds the pump supply switch on the power source should be left in position "0/ELP".

It is recommended to switch the power source off by means of the mains switch ON/OFF for connecting the cooling water hoses to/from the ESABFeed wire feed unit.

The pump supply switch must be in position "I" exclusively for other types of wire feeders, when a water-cooled welding gun is used. When a self-cooled welding gun is used the pump switch must be in position "ELP/0".

Note, if a water-cooled welding gun is used when the pump is inactive, the welding gun might be damaged.

6.2.4 Water flow guard

The water flow guard interrupts and disables the welding in the event of loss of coolant. This state is indicated by blinking of the orange indicating lamp on the front of the power source. If there is a lack of coolant flow, after 1 min the pump is switched off and latched in this state. The pump restarts from this state along with starting of welding.

The water flow guard is an accessory. Ordering number see on page 20.

6.2.5 Idle mode

The machine has an idle mode. The fun is switched off 5 min after the last welding or after 5 min of work with decreased speed without welding. The pump is switched off 3 min after the last welding. When both fan and pump are switched off the power–supply lamp on the front panel is blinking.

6.2.6 Inductance

Higher inductance produces a more flowing weld and fewer spatters. Lower inductance produces a harsher sound and a stable, concentrated arc.



7 MAINTENANCE

Regular maintenance is important for safe, reliable operation.

Note!

All guarantee undertakings from the supplier cease to apply if the customer himself attempts any work in the product during the guarantee period in order to rectify any faults.

7.1 Inspection and cleaning

Check regularly that the power source is free from dirt.

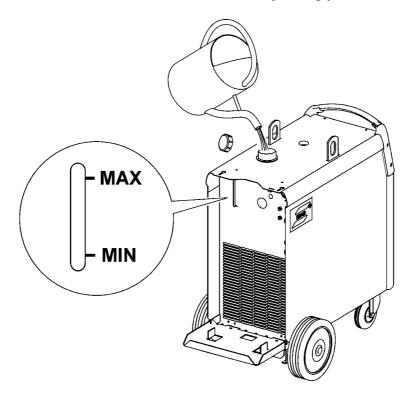
The power source should be regularly blown clean using dry compressed air at reduced pressure. More frequently in dirty environments.

Otherwise the air inlet/outlet may become blocked and cause overheating. To avoid this you can use an airfilter.

The airfilter is an accessory. Ordering number can be found on page 21.

7.2 Topping up the coolant

We recommend a 50/50 % mixture of water and ethylene glycol.





8 FAULT TRACING

Try these recommended checks and inspections before sending for an authorised service technican.

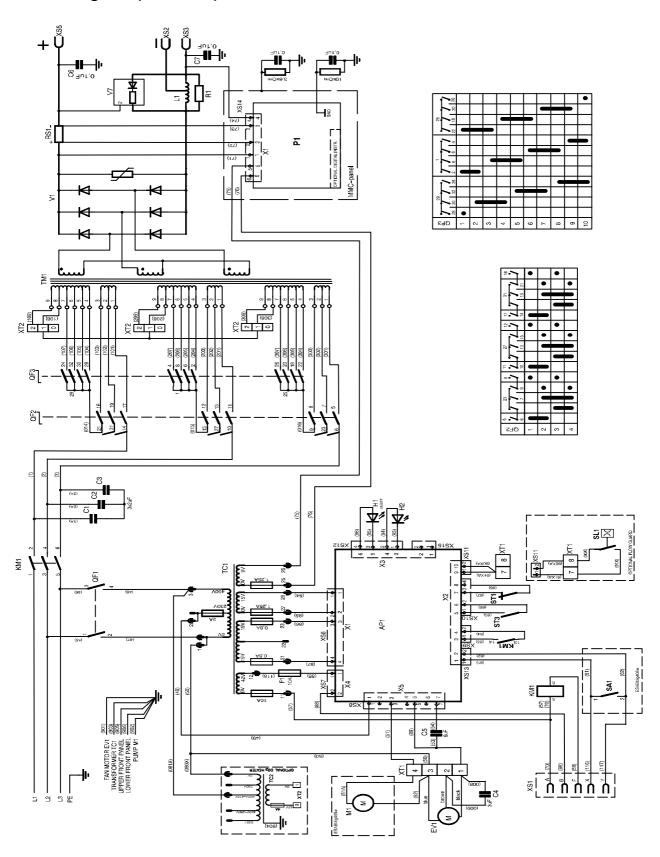
Type of fault	Actions
No arc	Check that the mains power supply switch is turned on.
	Check that the welding current supply and return cables are correctly connected.
	Check that correct current value is set.
	Check to see whether the MCB has tripped.
Welding current is interrupted during welding	Check whether the thermal overload trip has operated (indicated by the orange lamp on the front).
	Check the main power supply fuses.
Thermal overload trips operate frequently	Check to see whether the air filters are clogged.
	Make sure that you are not exceeding the rated data for the power source (i.e. that the unit is not being overloaded).
Poor welding performance	Check that the welding current supply and return cables are correctly connected.
	Check that the correct current value is set.
	Check that the correct welding wires are being used.
	Check the main power supply fuses.

9 ORDERING OF SPARE PARTS

ESABMig 405 & ESABMig 505 is designed and tested in accordance with the international and European standards IEC/EN 60974–1 and EN 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.

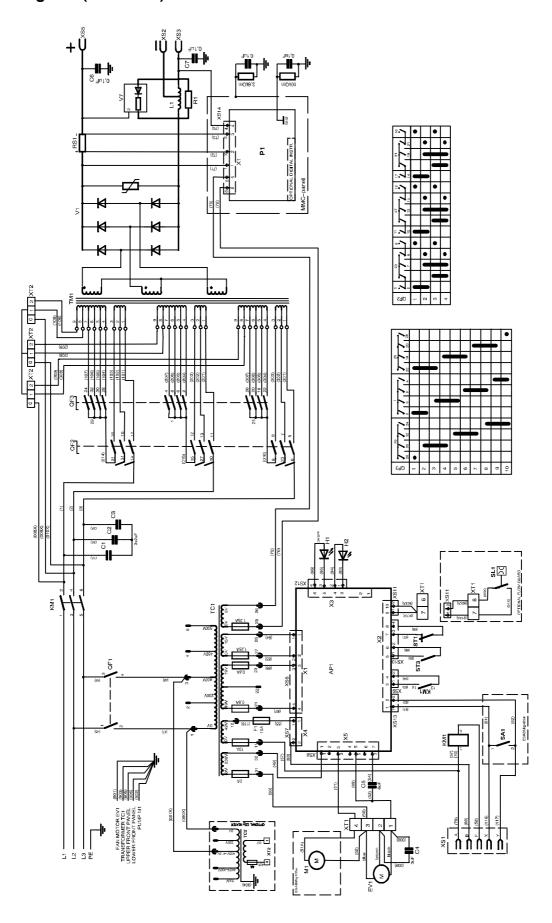
Spare parts may be ordered through your nearest ESAB dealer, see the last page of this publication.

ESABMig 405 (400-415V)



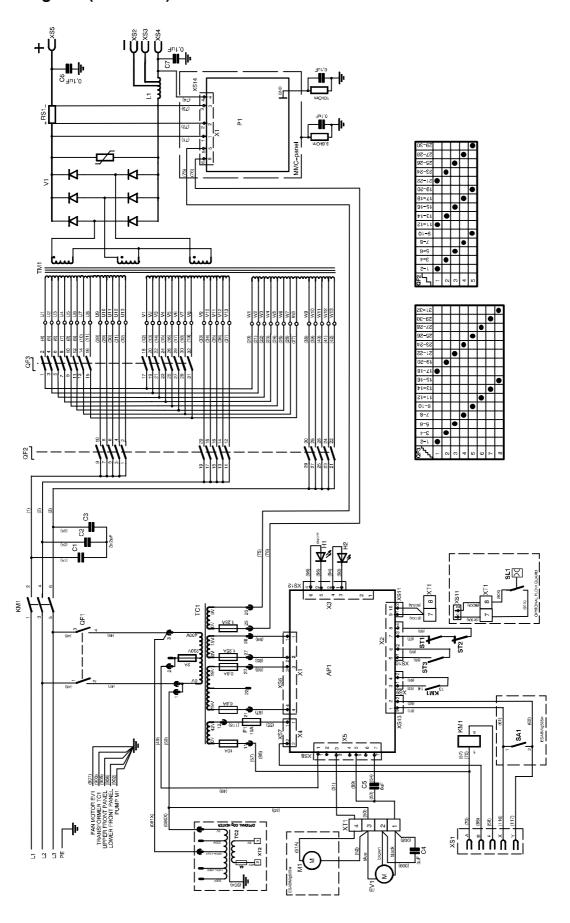
405,505di – **15** –

ESABMig 405 (230-500V)



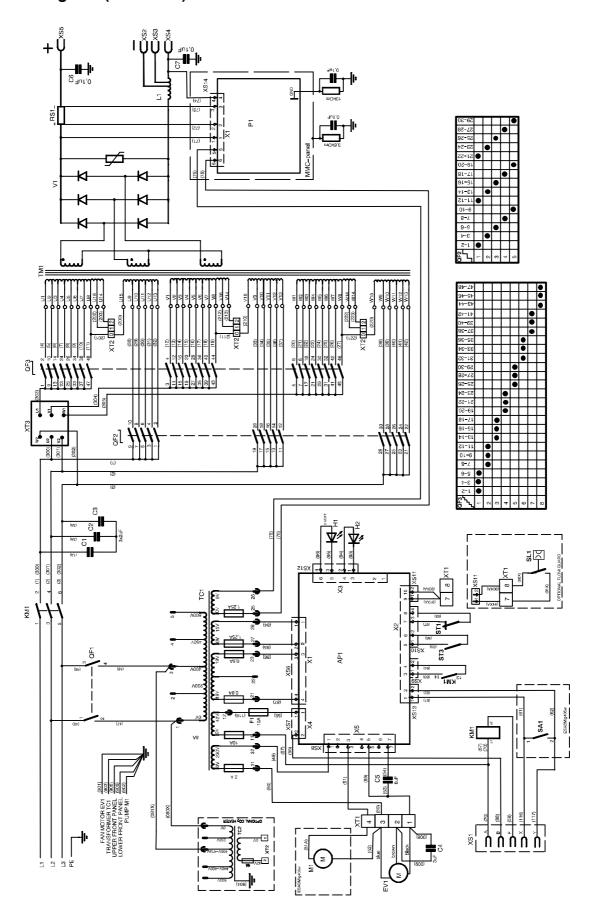
405,505di – **16** –

ESABMig 505 (400-415V)

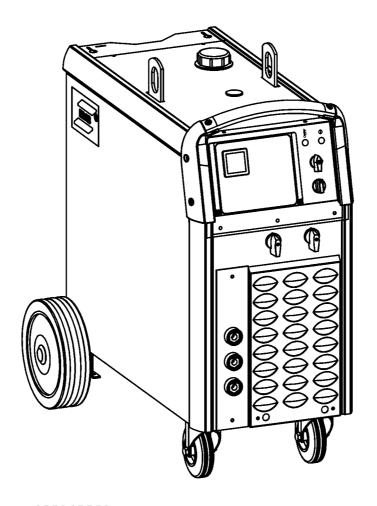


405,505di – **17** –

ESABMig 505 (230-500V)



405,505di – **18** –



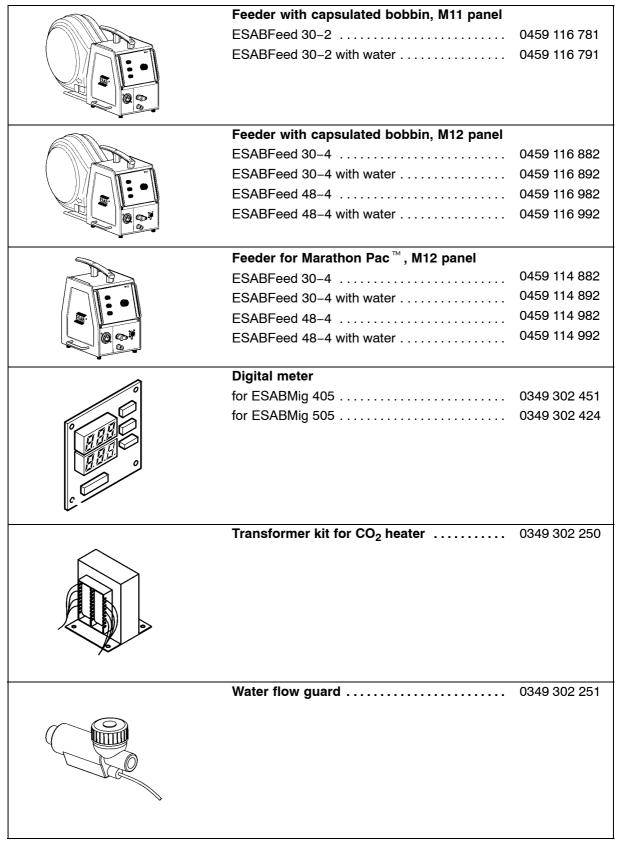
Valid for serial no. 246-XXX-XXXX

Ordering numbers for ESABMig 405, ESABMig 505

0349 302 408	ESABMig 405	400-415V 3~50Hz
0349 302 713	ESABMig 405	230/400-415/500V 3~50Hz; 230/440-460V 3~60Hz
0349 302 407	ESABMig 405w	400-415V 3~50Hz; with water cooler
0349 302 711	ESABMig 405w	230/400-415/500V 3~50Hz; 230/440-460V 3~60Hz; with water cooler
0349 303 563	ESABMig 405	400-415V 3~50Hz; with digital instrument
0349 303 564	ESABMig 405w	400-415V 3~50Hz; with water cooler, with digital instrument
0349 302 404	ESABMig 505	400-415V 3~50Hz
0349 302 436	ESABMig 505	230/400-415/500V 3~50Hz; 230/440-460V 3~60Hz
0349 302 403	ESABMig 505w	400-415V 3~50Hz; with water cooler
0349 302 435	ESABMig 505w	230/400-415/500V 3~50Hz; 230/440-460V 3~60Hz; with water cooler
0349 303 565	ESABMig 505	400-415V 3~50Hz; with digital instrument
0349 303 566	ESABMig 505w	400-415V 3~50Hz; with water cooler, with digital instrument

Accessories

VC	



Filter	0349 302 423
Cable holder	0349 303 362
Connection sets for 400A machines	
Connection set 1,7m	0469 836 880
Connection set 10m	0469 836 881
Connection set 15m	0469 836 882
Connection set 25m	0469 836 883
Connection set 35m	0469 836 884
Connection set 1,7m, water	0469 836 885
Connection set 10m, water	0469 836 886
Connection set 15m, water	0469 836 887
Connection set 25m, water	0469 836 888
Connection set 35m, water	0469 836 889
Connection sets for 500A machines	
Connection set 1,7m	0469 836 890
Connection set 10m	0469 836 891
Connection set 15m	0469 836 892
Connection set 25m	0469 836 893
Connection set 35m	0469 836 894
Connection set 1,7m, water	0469 836 895
Connection set 10m, water	0469 836 896
Connection set 15m, water	0469 836 897
Connection set 25m, water	0469 836 898
Connection set 35m, water	0469 836 899
Stabilizer	0349 303 474
CB (counter balance) KIT	0349 309 748

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