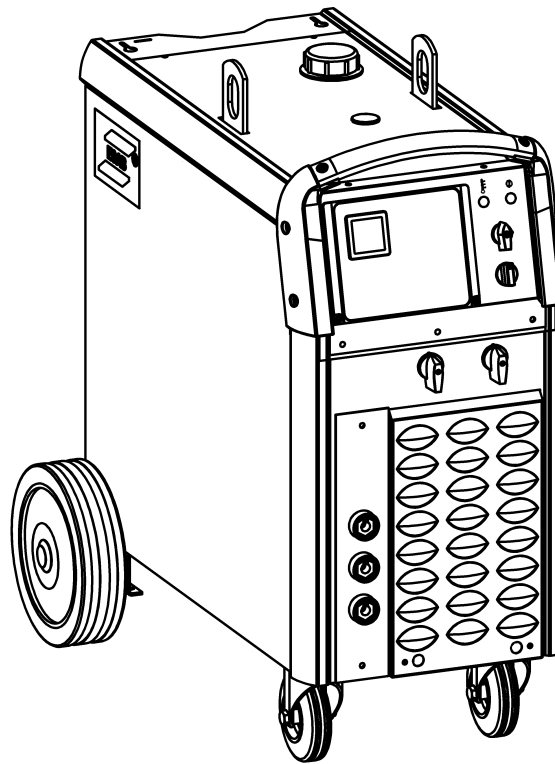


*Origo*<sup>TM</sup>

# *Mig 410*

# *Mig 510*



**Instruction manual**



## DECLARATION OF CONFORMITY

### In Accordance with

The Low Voltage Directive 2006/95/EC of 12 December 2006, entering into force 16 January 2007

The EMC Directive 2004/108/EC of 15 December 2004, entering into force 20 July 2007

### Type of equipment

Welding power sources for MIG/MAG welding

### Brand name or trade mark

ESAB

### Type designation etc.

Origo™ Mig 410 Valid from serial number 627-xxx-xxxx (2006 w.27), 122-xxx-xxxx (2011 w.22)

Origo™ Mig 510 Valid from serial number 627-xxx-xxxx (2006 w.27), 122-xxx-xxxx (2011 w.22)

### Manufacturer or his authorised representative established within the EEA

#### Name, address, telephone No, telefax No:

OZAS-ESAB Sp. z o.o.

ul.A.Struga 10 , 45-073 Opole , Poland

Phone: +48 77 4019200, Fax: +48 77 4019201

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

EN 60974-1, Arc welding equipment – Part 1: Welding power sources

EN 60974-10, Arc welding equipment – Part 10: Electromagnetic compatibility (EMC) requirements

Additional information: Restrictive use, Class A equipment, intended for use in locations other than residential

**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.**

Place and Date  
Opole , 2011-05-31

Signature

Dariusz Brudkiewicz

Clarification

Position  
Managing Director  
OZAS-ESAB Sp. z o.o.

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# 1 SAFETY

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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
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
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.



## **WARNING**

***Do not use the power source for thawing frozen pipes.***



# WARNING



*Arc welding and cutting can be injurious to yourself and others. Take precautions when welding and cutting. Ask for your employer's safety practices which should be based on manufacturers' hazard data.*

**ELECTRIC SHOCK - Can kill**

- Install and earth the 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.**

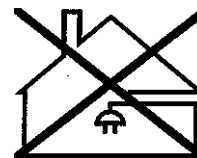
**Read and understand the instruction manual before installing or operating.**

**PROTECT YOURSELF AND OTHERS!**



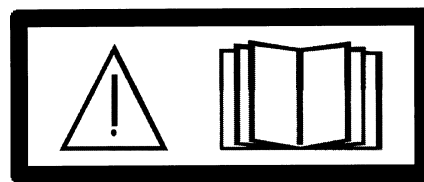
**CAUTION**

*Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility of class A equipment in those locations, due to conducted as well as radiated disturbances.*



**CAUTION**

*Read and understand the instruction manual before installing or operating.*



**CAUTION**

*This product is solely intended for arc welding.*



**Dispose of electronic equipment at the recycling facility!**

In observance of European Directive 2002/96/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.

**ESAB can provide you with all necessary welding protection and accessories.**

---

## **2 INTRODUCTION**

---

The **Mig 410** and **Mig 510** are step-controlled power sources designed for MIG/MAG-welding together with wire feed units Feed 302, 304, 484 and YardFeed 200.

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

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

Mig 410 and Mig 510 are available with a built-in cooling unit to support liquid cooled torches. These units can be equipped with a flow guard (option).

The power source comes in different variants, see page [27](#).

**ESAB's accessories for the product can be found on page [28](#).**

### **2.1 Equipment**

The power source is supplied with:

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

### 3 TECHNICAL DATA

<b>Mig 410</b>		
<b>Voltage</b>	400-415V, 3~50/60 Hz	230/400-415/500V 3~50 Hz 230/440-460 3~60Hz
<b>Permissible load</b> at 100 % 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
<b>Setting range (DC)</b>	50A/16.5V-400A/34V	50A/16.5V-400A/34V
<b>Open circuit voltage</b>	17-45 V	17-45 V
<b>Open circuit power</b>	360 W	360 W
<b>with cooling unit</b>	600 W	600 W
<b>Efficiency at max current</b>	71%	71%
<b>Power factor at max current</b>	0.98	0.98
<b>Control voltage</b>	42 V, 50/60 Hz	42 V, 50/60 Hz
<b>Dimensions LxWxH</b>	812 x 552 x 925	812 x 552 x 925
<b>Weight</b>	144 kg	145 kg
with cooling unit	158 kg	158 kg
<b>Operating temperature</b>	-10 to +40°C	-10 to +40°C
<b>Transportation temperature</b>	-20 to +55°C	-20 to +55°C
<b>Enclosure class</b>	IP 23	IP 23
<b>Application classification</b>	S	S

<b>Mig 510</b>		
<b>Voltage</b>	400-415V, 3~50/60 Hz	230/400-415/500V 3~50 Hz 230/440-460 3~60Hz
<b>Permissible load</b> at 100 % duty cycle	390 A/33,5 V	390 A/33,5 V
at 60 % duty cycle	500 A/39 V	500 A/39 V
<b>Setting range (DC)</b>	50A/16.5V-500A/39V	50A/16.5V-500A/39V
<b>Open circuit voltage</b>	17-50 V.	17-50 V
<b>Open circuit power</b>	440 W	440 W
<b>with cooling unit</b>	620 W	620 W
<b>Efficiency at max current</b>	82%	82%
<b>Power factor at max current</b>	0.92	0.92
<b>Control voltage</b>	42 V, 50/60 Hz	42 V, 50/60 Hz
<b>Dimensions LxWxH</b>	812 x 552 x 925	812 x 552 x 925
<b>Weight</b>	214 kg	215 kg
with cooling unit	228 kg	229 kg
<b>Operating temperature</b>	-10 to +40°C	-10 to +40°C
<b>Transportation temperature</b>	-20 to +55°C	-20 to +55°C
<b>Enclosure class</b>	IP 23	IP 23
<b>Application classification</b>	S	S

<b>Cooling unit</b> (100 % duty cycle)	
P <sub>1l</sub> /min	1200 W at 25° C
P <sub>max</sub>	3.5 bar
Coolant	ESAB's ready mixed coolant
Coolant quantity	5.5 l

**Duty cycle**

The duty cycle refers to the time as a percentage of a ten-minute period that you can weld or cut at a certain load without overloading. The duty cycle is valid for 40° C.

**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.

## 4 INSTALLATION

**The installation must be carried out by a professional.**

**Note!**

Connect the power source to the electricity mains with a network impedance of 0.230Ω (Mig 410w), 0.155Ω (Mig 510w) or lower. If the network impedance is higher, there is a risk of flicker in the illuminators.



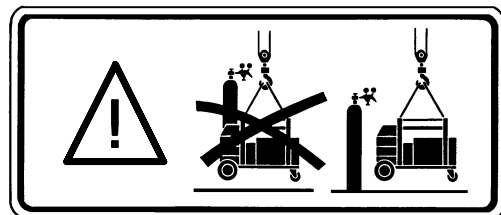
**CAUTION**

*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.*



**WARNING**

**Straps must be used when lifting the power source. The handle is only intended for pulling it.**

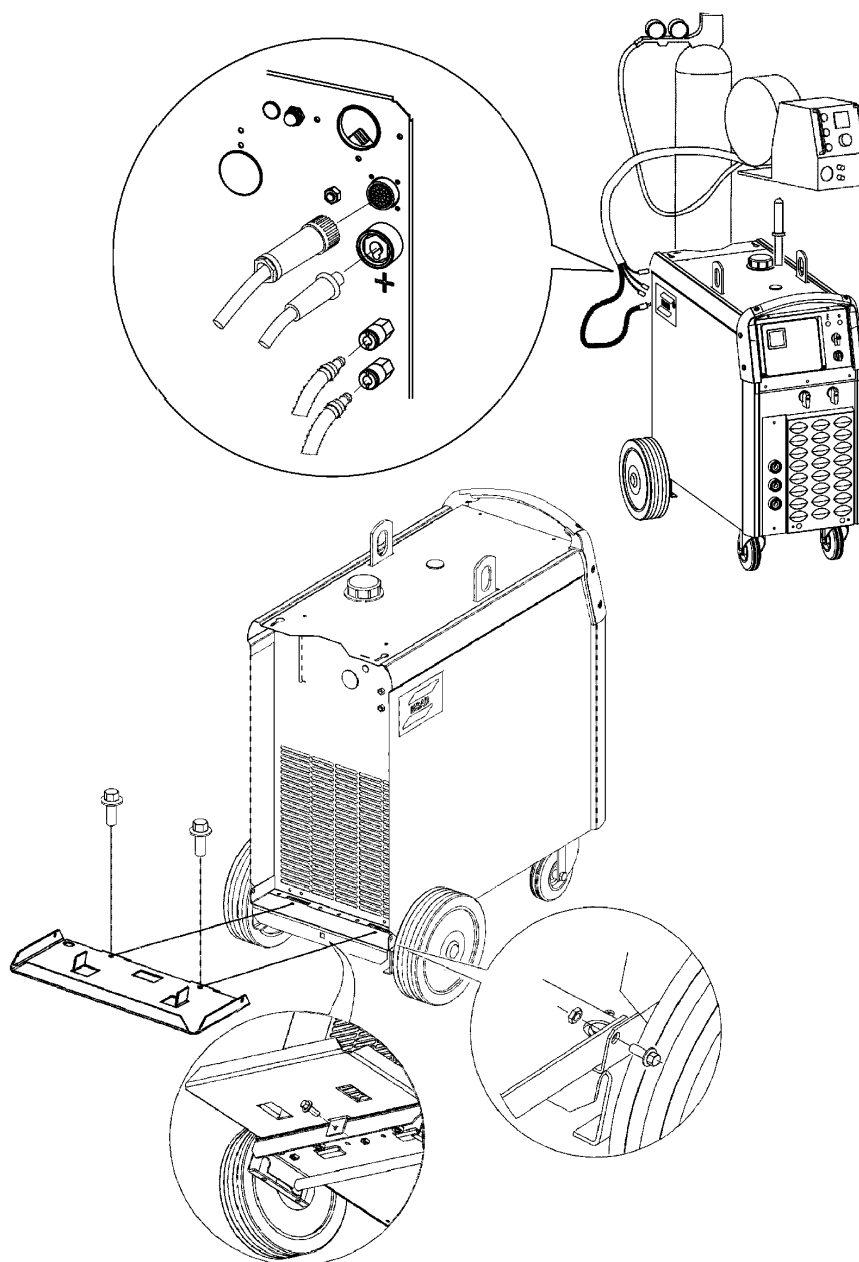


### 4.1 Location

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



## 4.2 Assembly of components

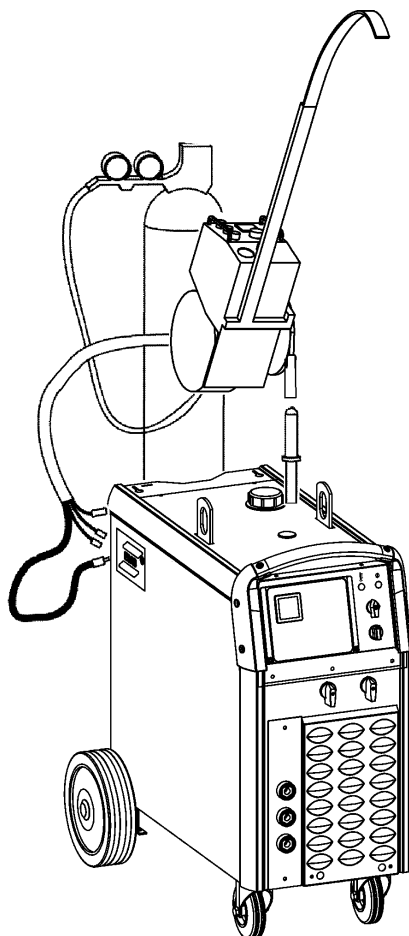


### WARNING

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

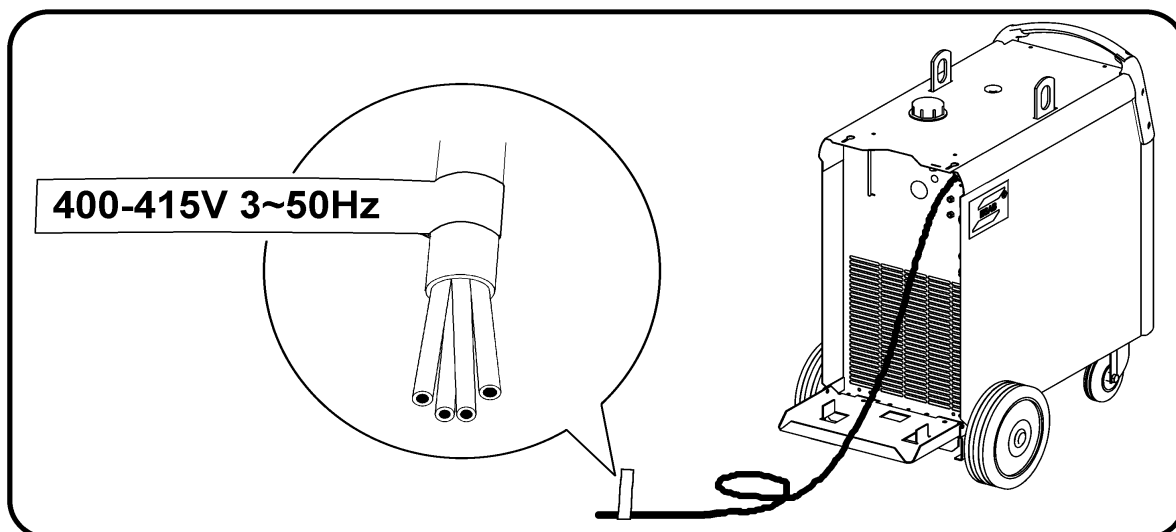
### 4.3 Assembly of counter balance

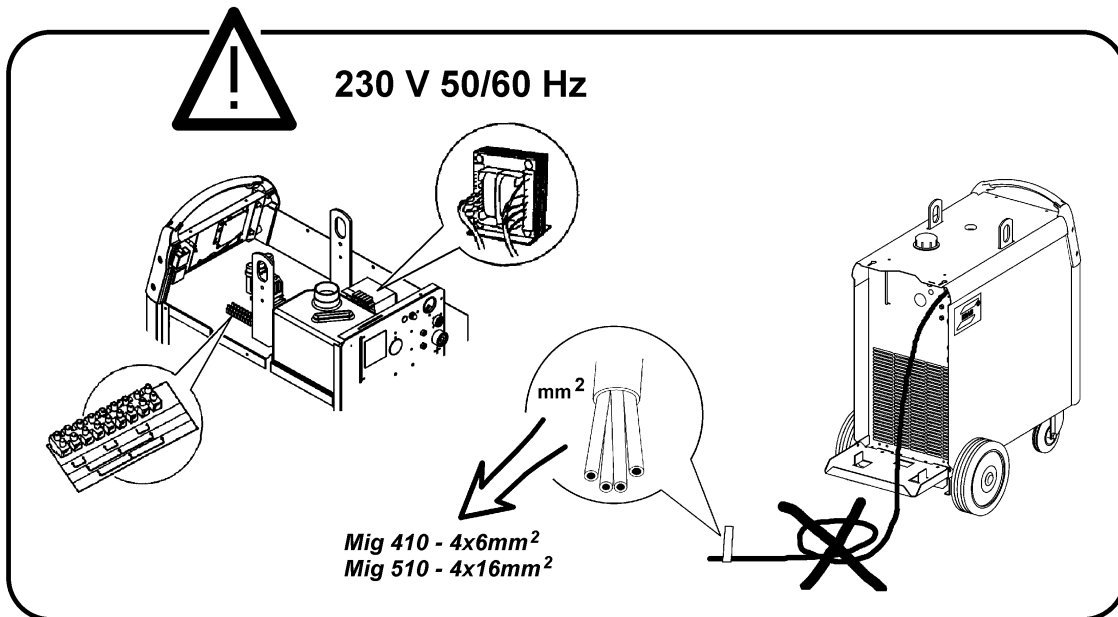
Assemble the stabiliser + CB KIT if the counter balance is to be installed on the power source. The stabiliser + CB KIT is an accessory. The order number can be found on page 28.



**Attention!** Using the counter balance without stabiliser may cause the power source to tip over.

### 4.4 Electrical installation

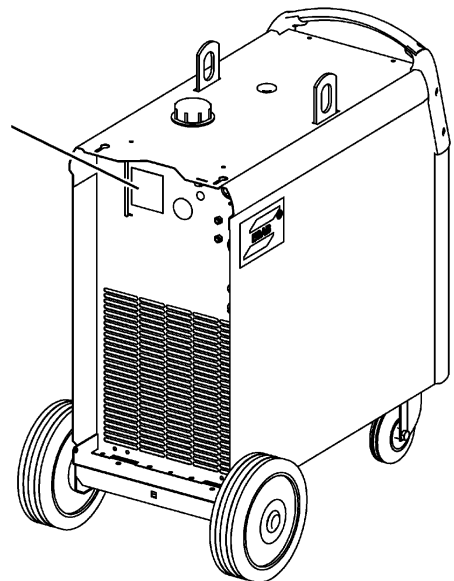




#### 4.5 Mains power supply

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.

*Rating plate with supply connection data*





## Recommended fuse sizes and minimum cable areas

<b>Mig 410</b>	<b>3~ 50 Hz</b>	<b>3~ 50/60 Hz</b>	<b>3~ 50 Hz</b>	<b>3~ 60 Hz</b>	<b>3~ 60 Hz</b>
<b>Voltage V</b>	230	400/415	500	230	440/460
<b>Current A</b> at 100% 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
<b>Cable area mm<sup>2</sup></b>	4 x 6	4 x 2.5	4 x 2.5	4 x 6	4 x 2.5
<b>Fuse, slow A</b>	25	20	20	25	20

<b>Mig 510</b>	<b>3~ 50 Hz</b>	<b>3~ 50/60 Hz</b>	<b>3~ 50 Hz</b>	<b>3~ 60 Hz</b>	<b>3~ 60 Hz</b>
<b>Voltage V</b>	230	400/415	500	230	440/460
<b>Current A</b> at 100% duty cycle	43	25	20	43	23
at 60% duty cycle	68	39	31	68	35
<b>Cable area mm<sup>2</sup></b>	4 x 16	4 x 6	4 x 6	4 x 16	4 x 6
<b>Fuse, slow A</b>	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.*

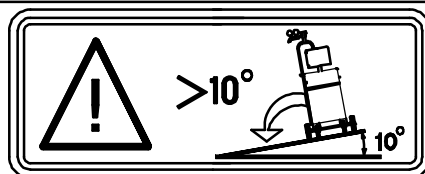
## 5 OPERATION

**General safety regulations for handling the equipment can be found on page 4. Read through before you start using the equipment!**



### WARNING

*Secure the equipment - particularly if the ground is uneven or sloping.*



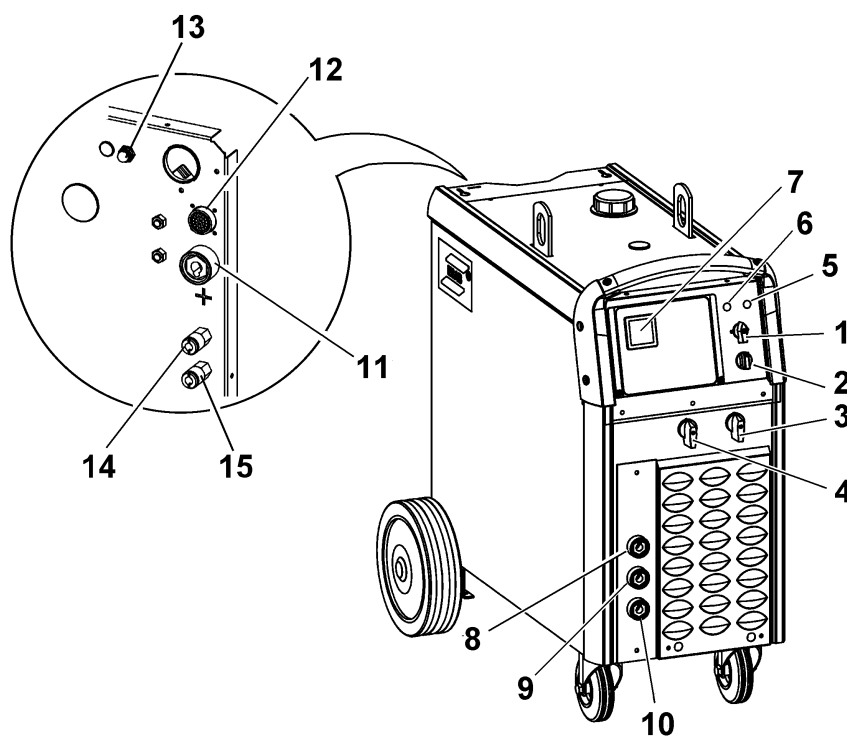
### 5.1 Connection and control devices

- |   |  |    |  |
|---|--|----|--|
| 1 | Mains supply switch                                      | 9  | Connection for return cable (-), medium inductance (Mig 510) |
| 2 | Main supply switch for cooling unit ELP**                | 10 | Connection for return cable (-), low inductance              |
| 3 | Switch, precise control                                  | 11 | Connection for welding current cable (+)                     |
| 4 | Switch, coarse control                                   | 12 | Connection for control cable for wire feeder                 |
| 5 | Indicator lamp, power supply ON                          | 13 | MCB  |
| 6 | Orange indicating lamp, overheating and loss of coolant* | 14 | Connection RED for cooling water from the wire feed unit     |
| 7 | Digital instrument V/A                                   | 15 | Connection BLUE for cooling water to the wire feed unit      |
| 8 | Connection for return cable (-), high inductance         |    |  |

**NOTE!** Cooling water connections only available on certain models.

\* Indicating loss of coolant, only when water flow guard is used, see point 5.5

\*\* ELP = ESAB Logic Pump, see point 5.4



## 5.2 Start

When switched on, the indicator lamps are checked for 2 seconds. Normally, if the power source has not overheated, it should start to work in idle mode, which is indicated by the supply-ON lamp flashing. The fan and the coolant pump stop.

The fan starts once welding starts. The coolant pump starts at the same time 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.

## 5.3 Overheating protection

The power source has 2-step control of the fan speed and overheating protection. If the 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 is indicated by the orange indicating lamp on the front of the unit being permanently lit. The unit resets automatically once the temperature drops.

## 5.4 Water connection

The wire feed unit has a **ELP (ESAB Logic Pump)** sensor 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 wire feed units with ELP sensor the pump supply switch on the power source should be in position "ELP/0".

It is recommended to switch the power source off by means of the mains switch before connecting the cooling water hoses to/from the 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.*

## 5.5 Water flow guard

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

The water flow guard is an accessory. The order number is on page [28](#).

## 5.6 Idle mode

The machine has an idle mode. The fan switches off 5 min after welding has finished or 5 min after running at a decreased speed without welding. The pump switches off 3 min after welding has finished. Once both the fan and the pump have switched off, the power-supply lamp on the front panel flashes.

## 5.7 Inductance

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

## 6 MAINTENANCE

*Regular maintenance is important for safe, reliable operation.*



### CAUTION

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

### 6.1 Inspection and cleaning

#### Power source

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, see page 17. This should be done more frequently in dirty environments.

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

The air filter is an accessory. The order number can be found on page 28.

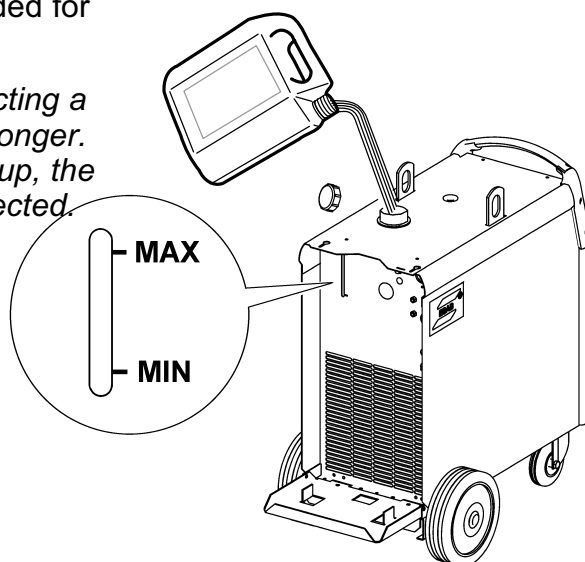
#### Welding gun

- The welding gun's wear parts should be cleaned and replaced at regular intervals in order to achieve trouble-free wire feed. Blow the wire guide clean regularly and clean the contact tip.

### 6.2 Topping up the coolant

ESAB's ready mixed coolant is recommended for use. See accessories on page 28.

**Note!** *Coolant must be topped up if connecting a welding torch that is 5 metres in length or longer. When adjusting the water level by topping up, the coolant hose does not need to be disconnected.*



### CAUTION

*The coolant must be handled as chemical waste.*

## 7 FAULT TRACING

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

Type of fault	Actions
No arc	<ul style="list-style-type: none"> <li>• Check that the mains power supply switch is turned on.</li> <li>• Check that the welding current supply and return cables are correctly connected.</li> <li>• Check that correct current value is set.</li> <li>• Check to see whether the MCB has tripped.</li> </ul>
Welding current is interrupted during welding	<ul style="list-style-type: none"> <li>• Check whether the thermal overload trip has been triggered (indicated by the orange lamp on the front).</li> <li>• Check the main power supply fuses.</li> </ul>
Thermal overload trips trigger frequently	<ul style="list-style-type: none"> <li>• Check to see whether the air filters are clogged.</li> <li>• Make sure that you are not exceeding the rated data for the power source (i.e. that the unit is not being overloaded).</li> </ul>
Poor welding performance	<ul style="list-style-type: none"> <li>• Check that the welding current supply and return cables are correctly connected.</li> <li>• Check that the correct current value is set.</li> <li>• Check that the correct welding wires are being used.</li> <li>• Check the main power supply fuses.</li> </ul>

## 8 ORDERING OF SPARE PARTS

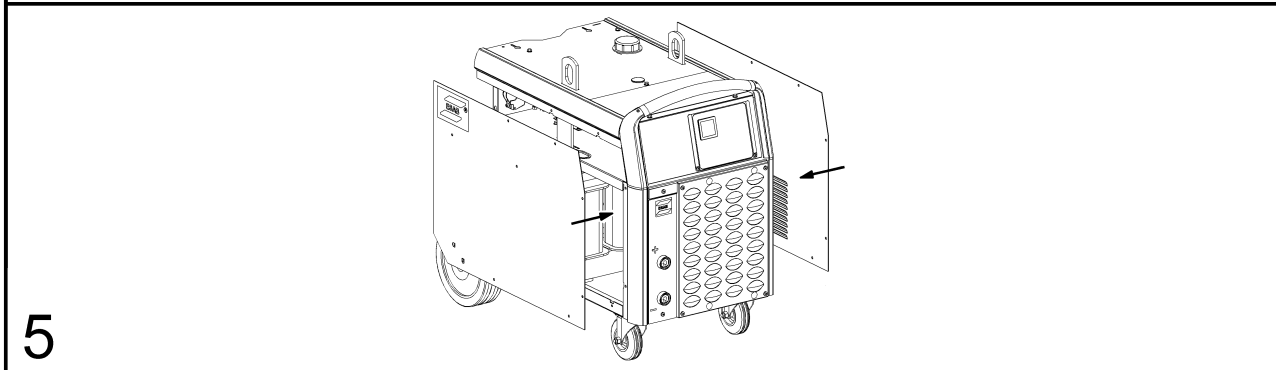
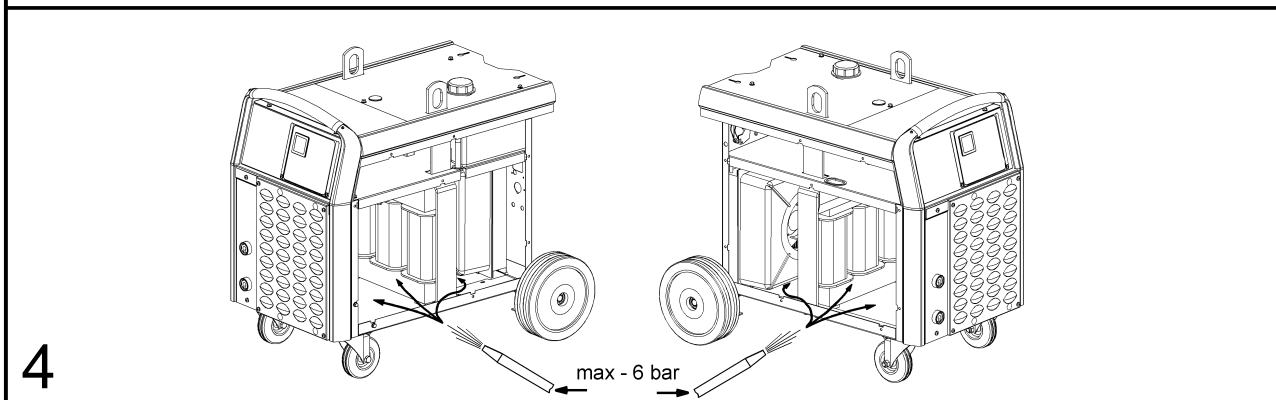
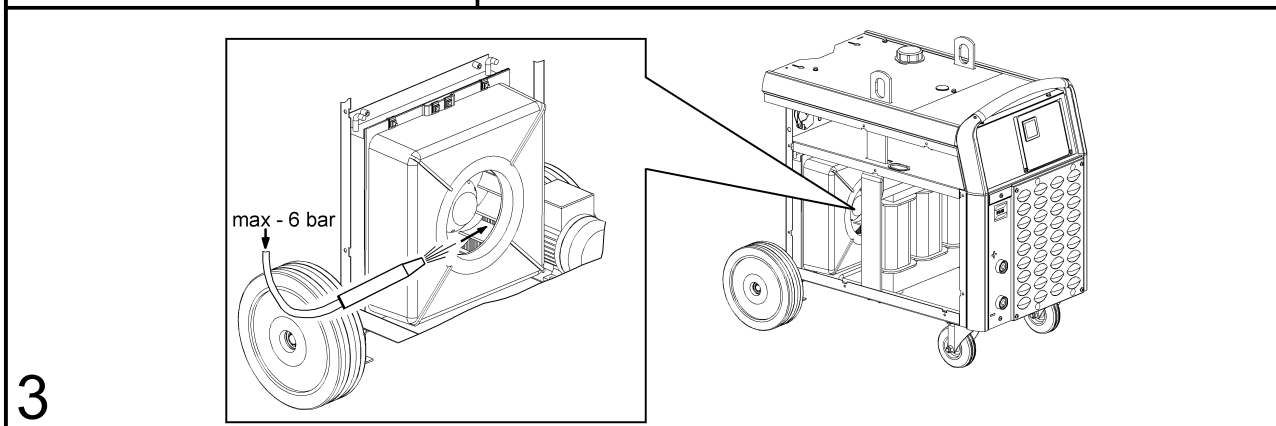
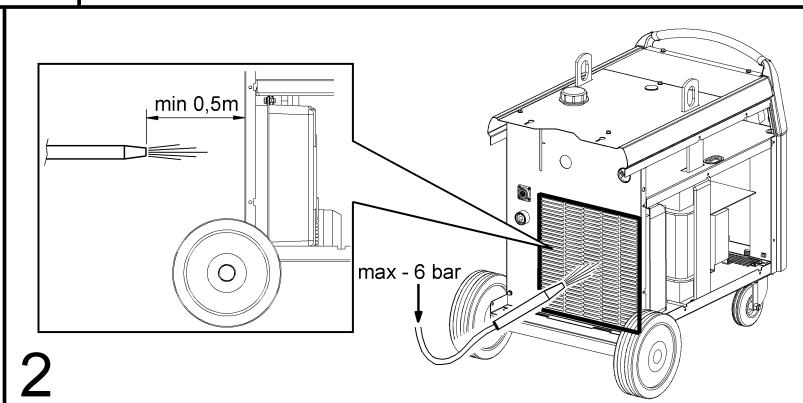
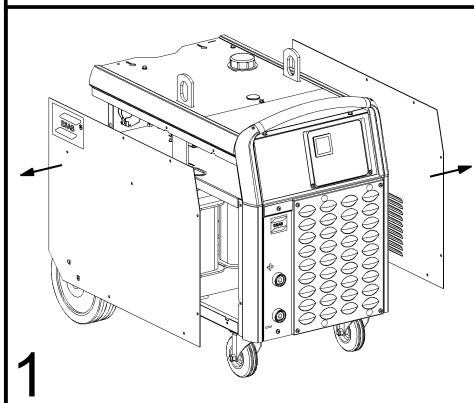
*Repair and electrical work should be performed by an authorised ESAB service technician. Use only ESAB original spare and wear parts.*

**Mig 410, Mig 510 is designed and tested in accordance with the international and European standards IEC/EN 60974-1 and IEC/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.

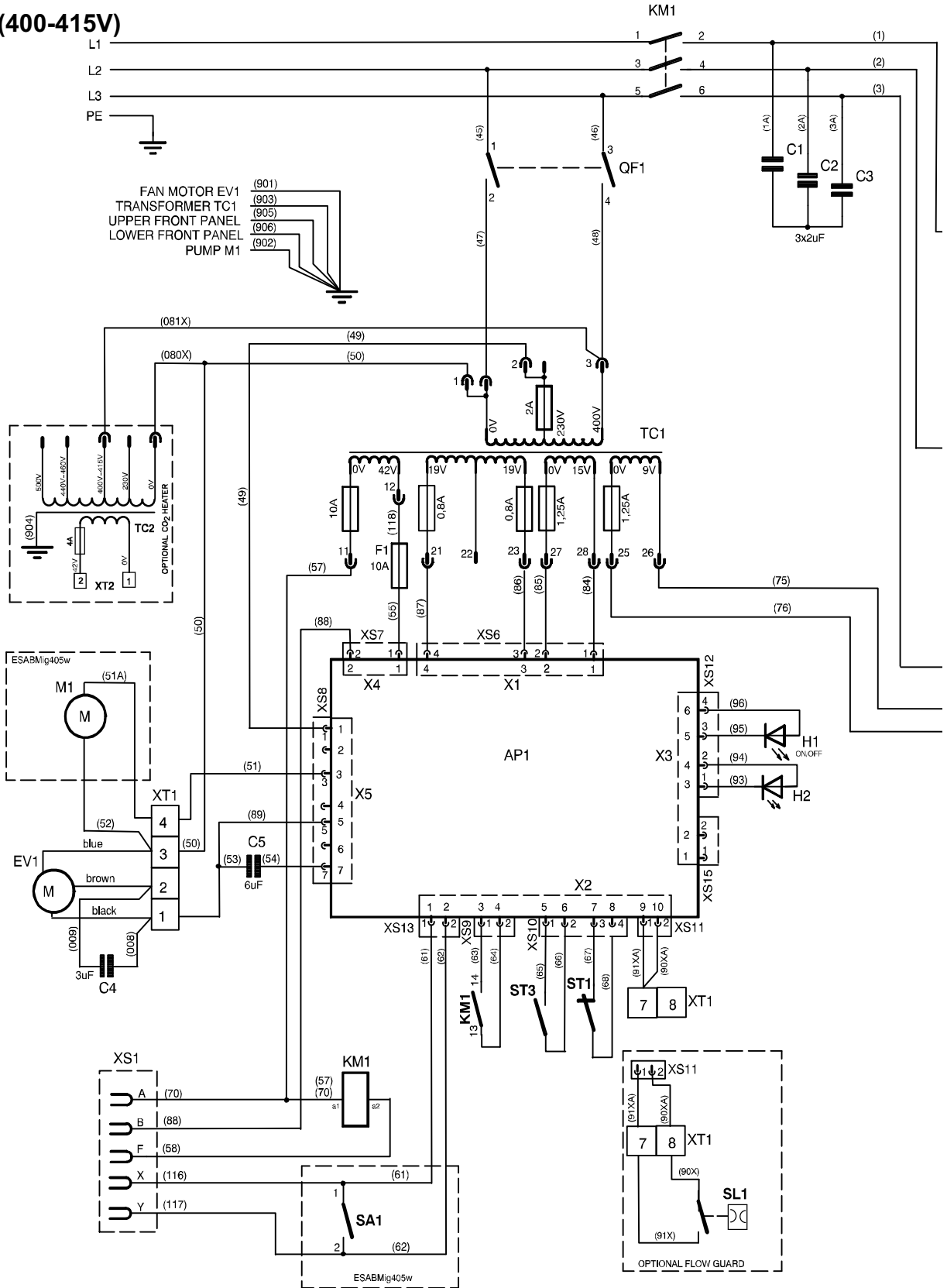


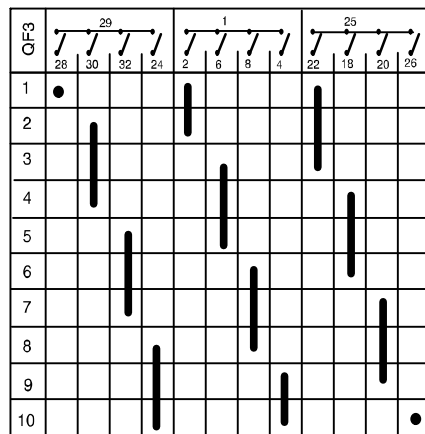
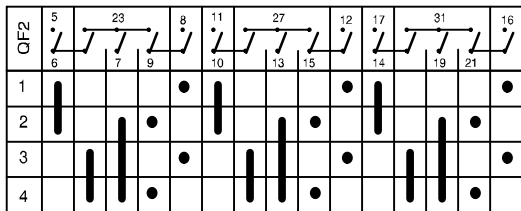
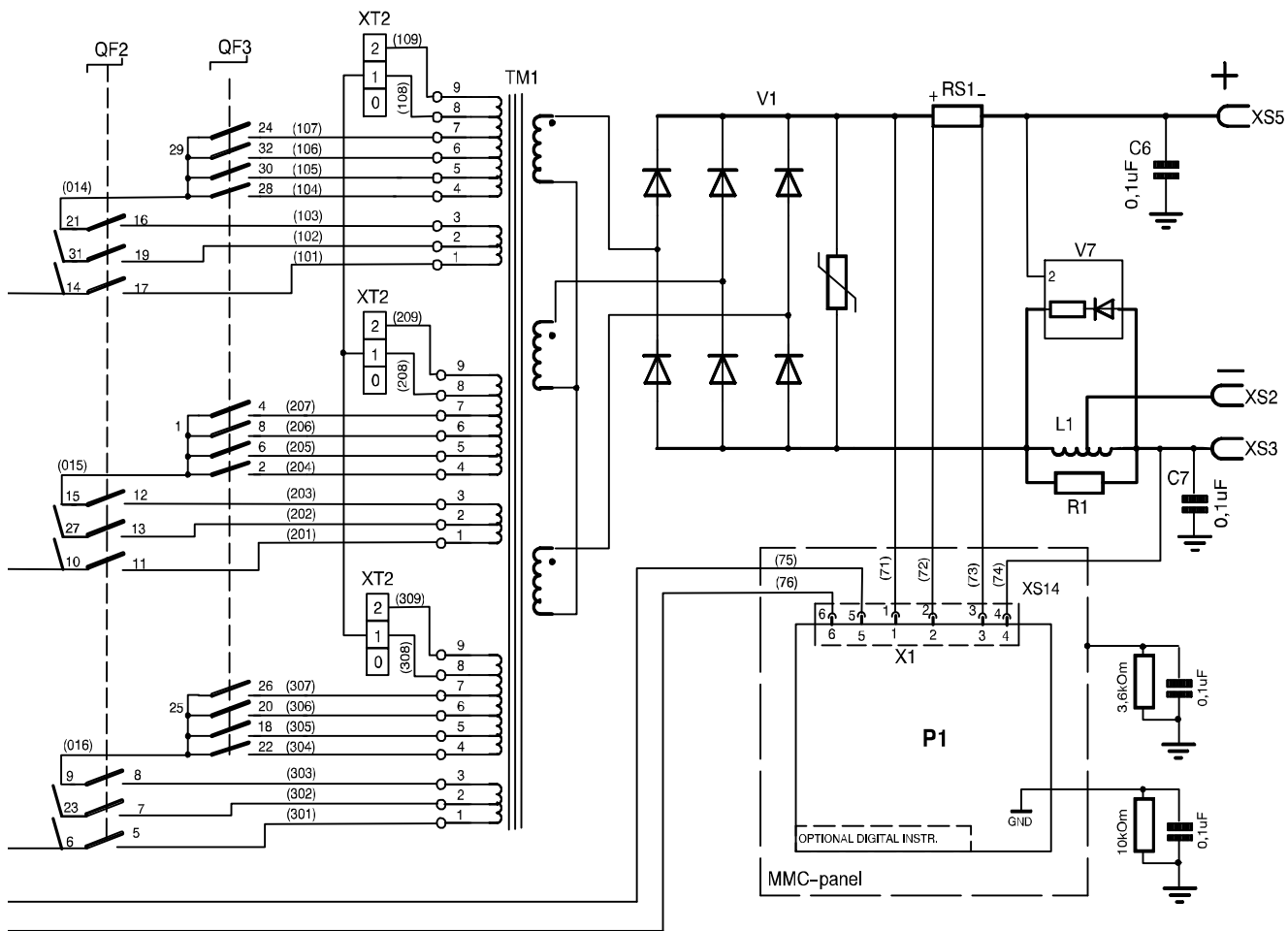
# Cleaning



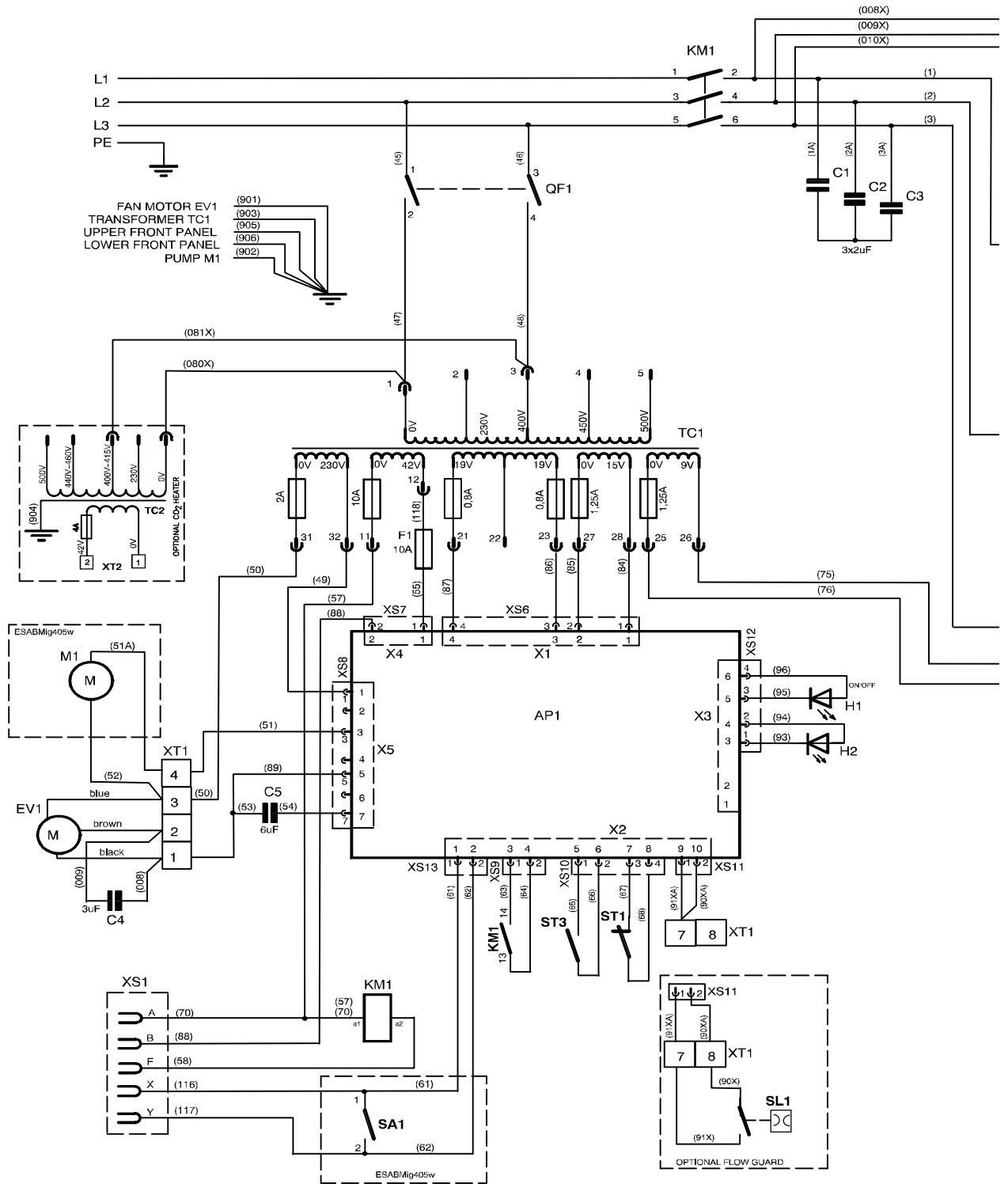
# Diagram

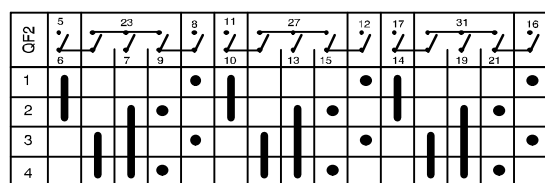
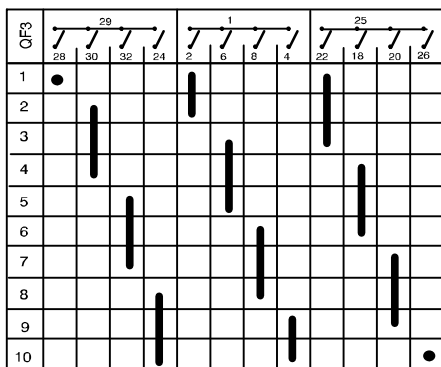
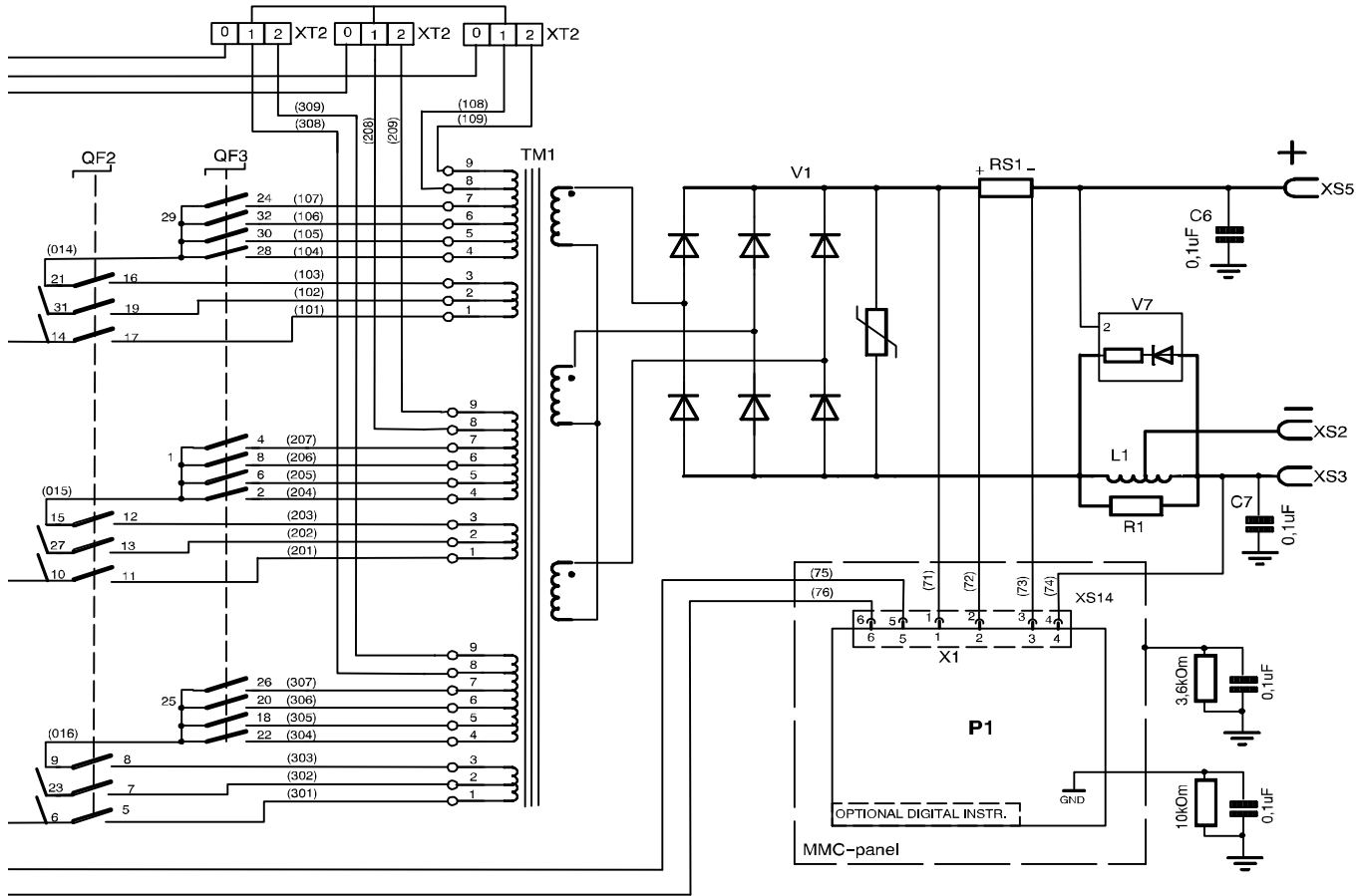
## Mig 410 (400-415V)



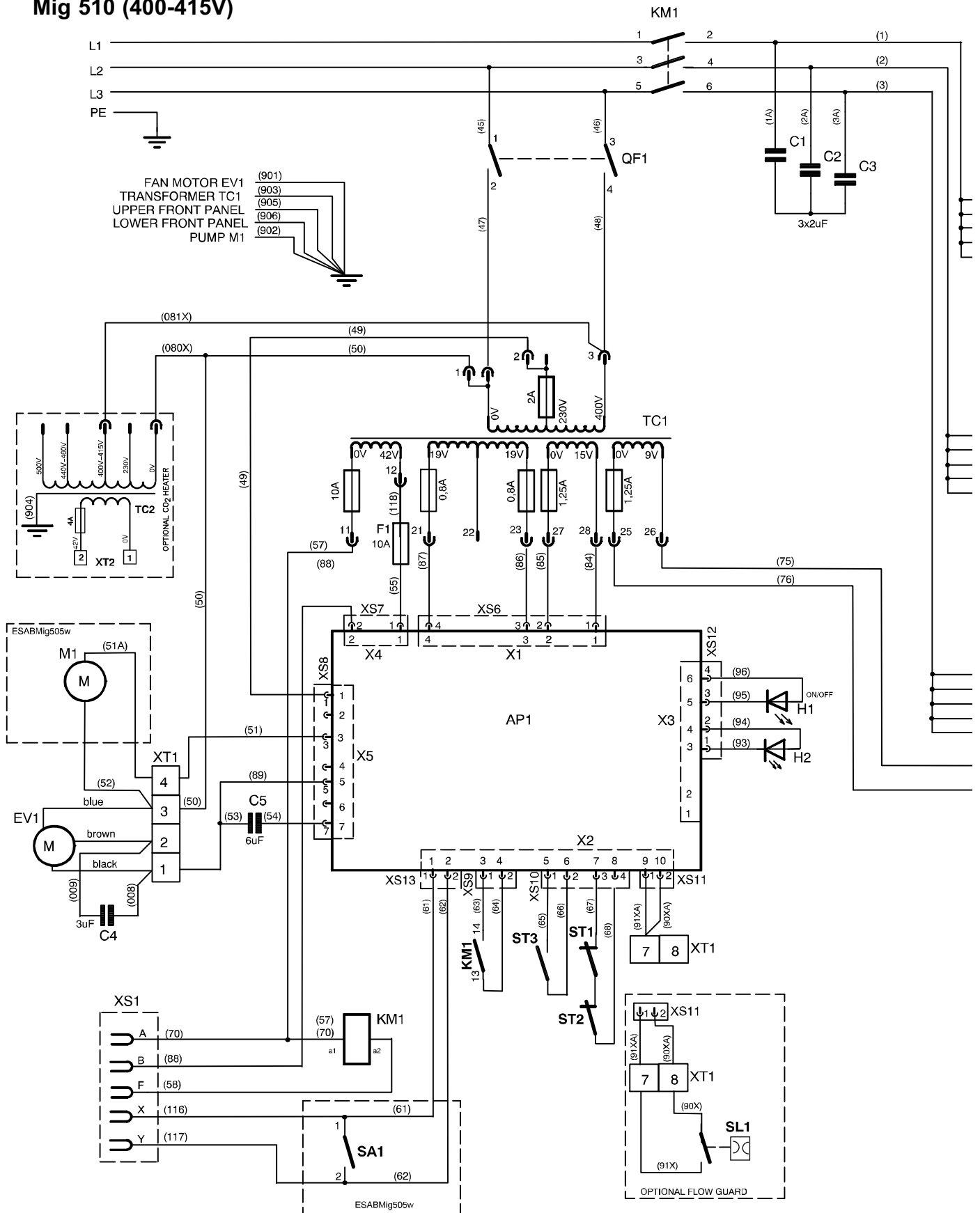


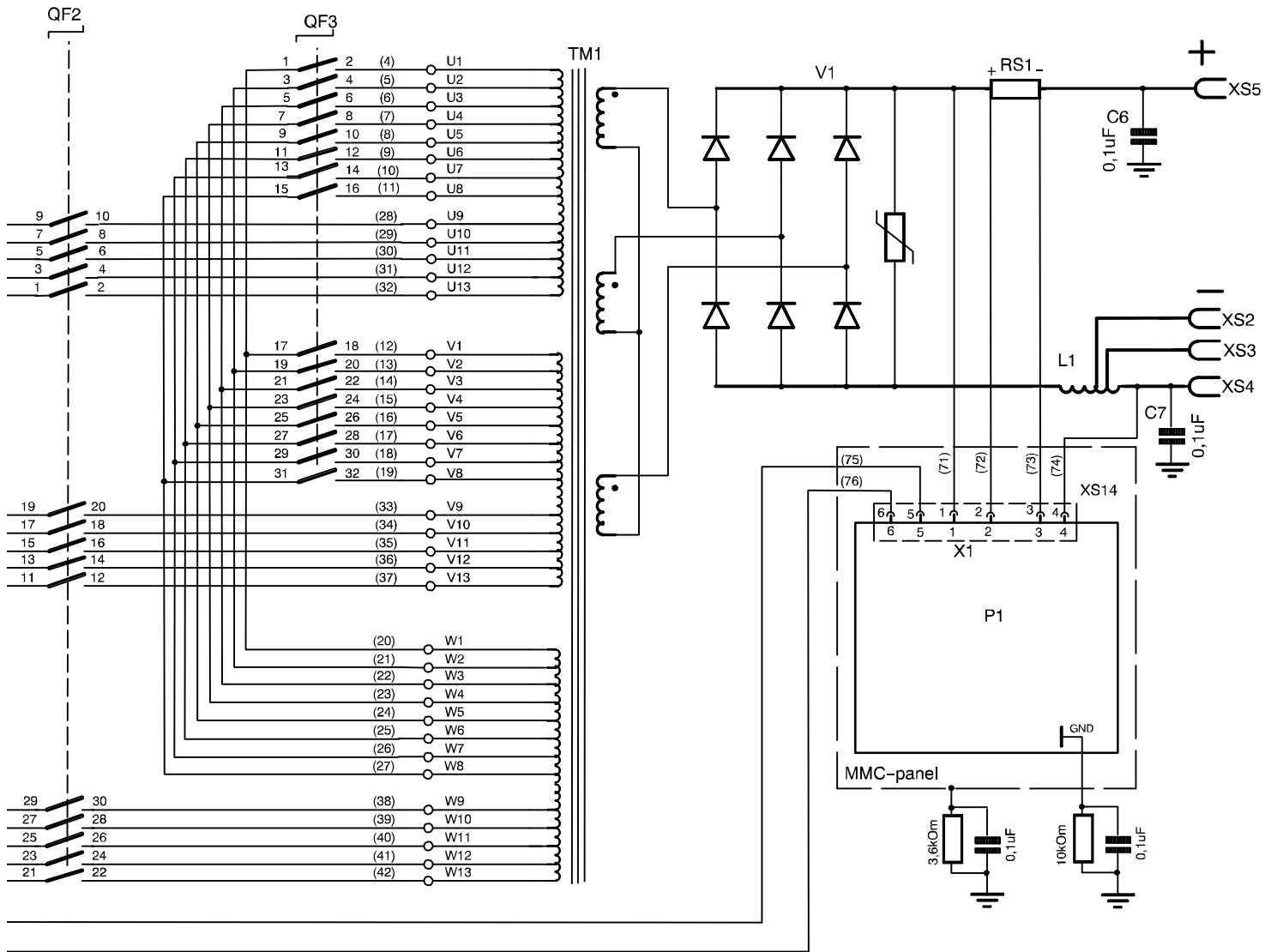
# Mig 410 (230-500V)





# Mig 510 (400-415V)

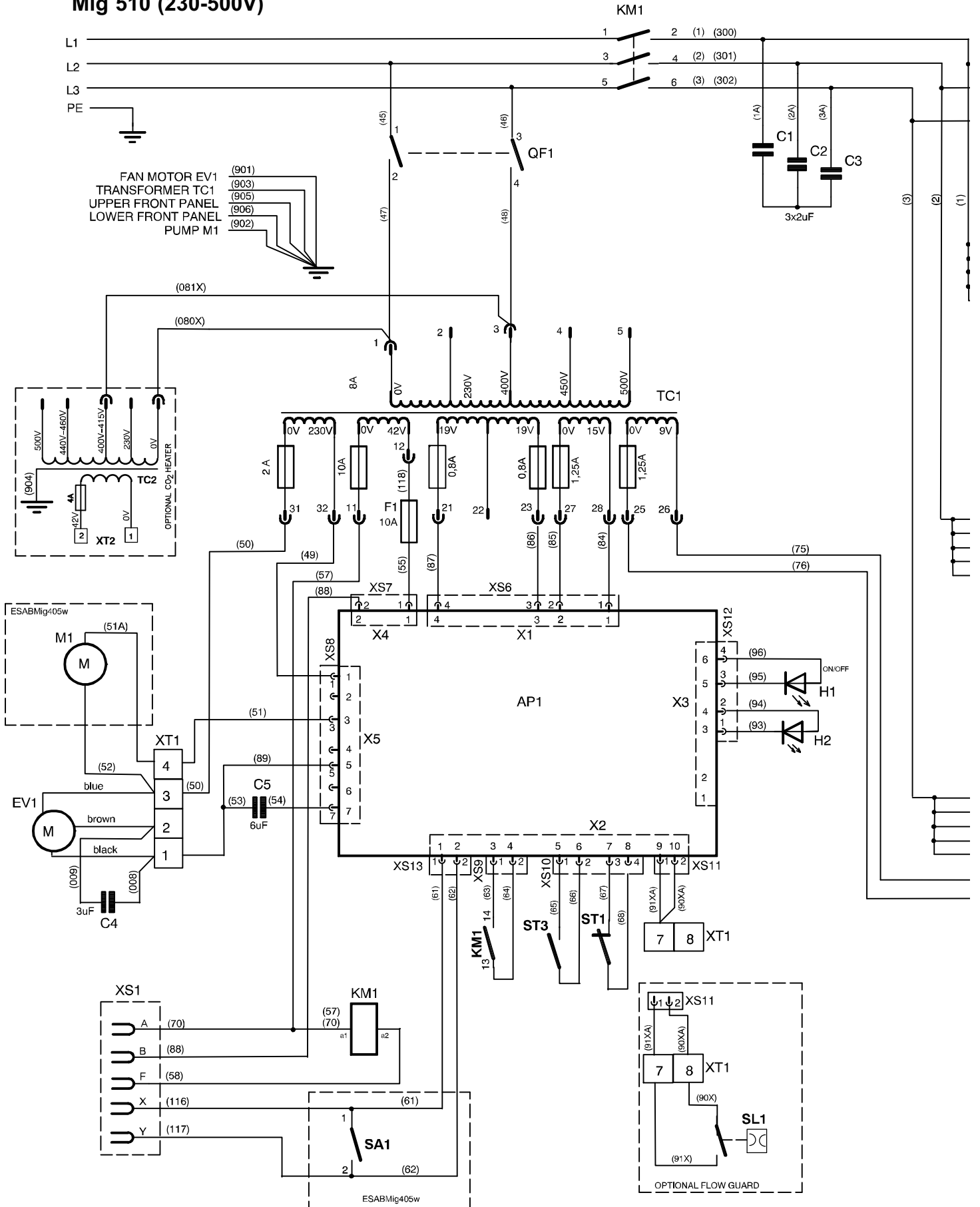




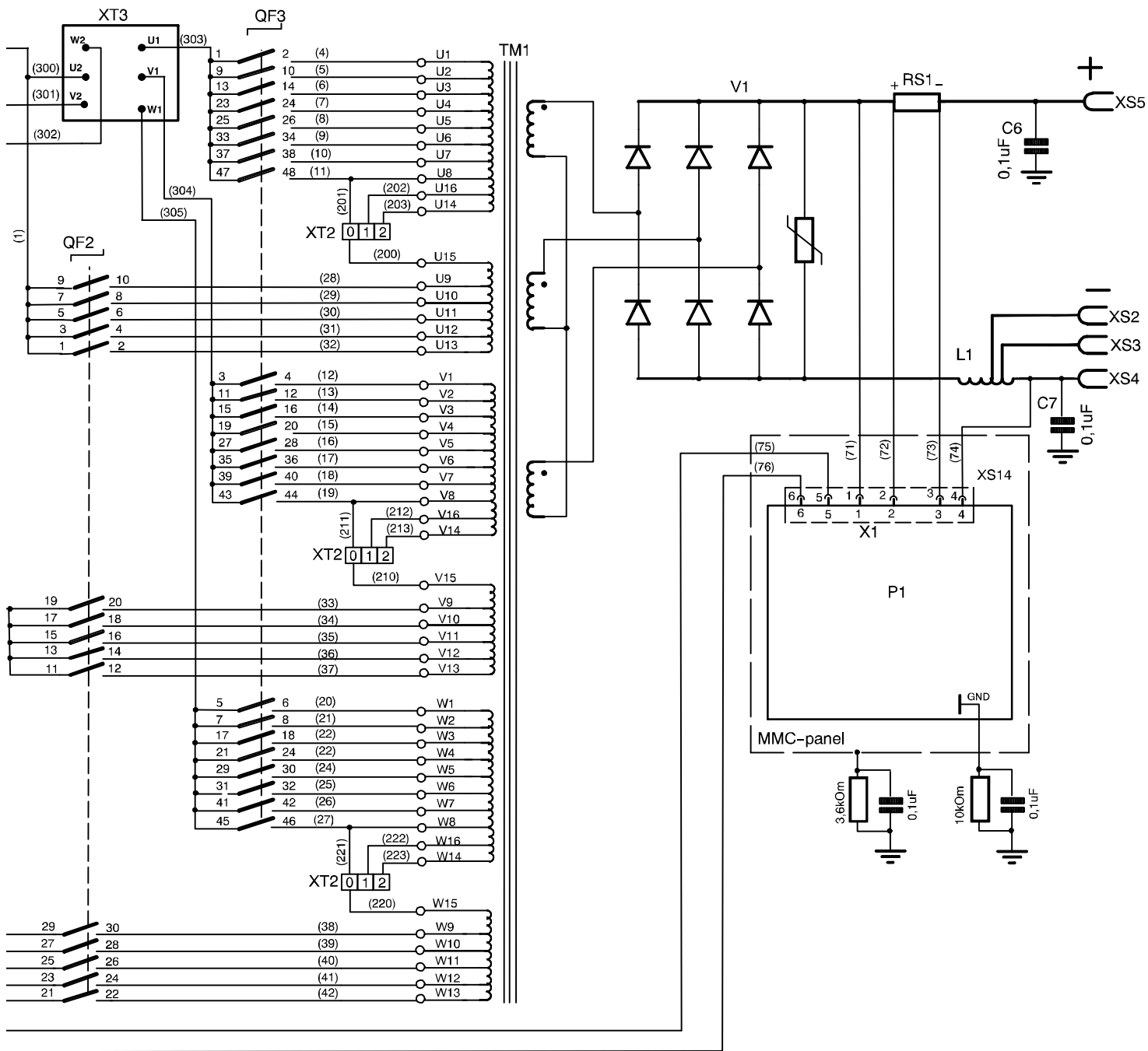
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1	●															
2		●														
3			●													
4				●												
5					●											
6						●										
7							●									
8								●								●

QF2	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	21-22	23-24	25-26	27-28	29-30
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2		●													
3			●												
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5					●										●

# Mig 510 (230-500V)





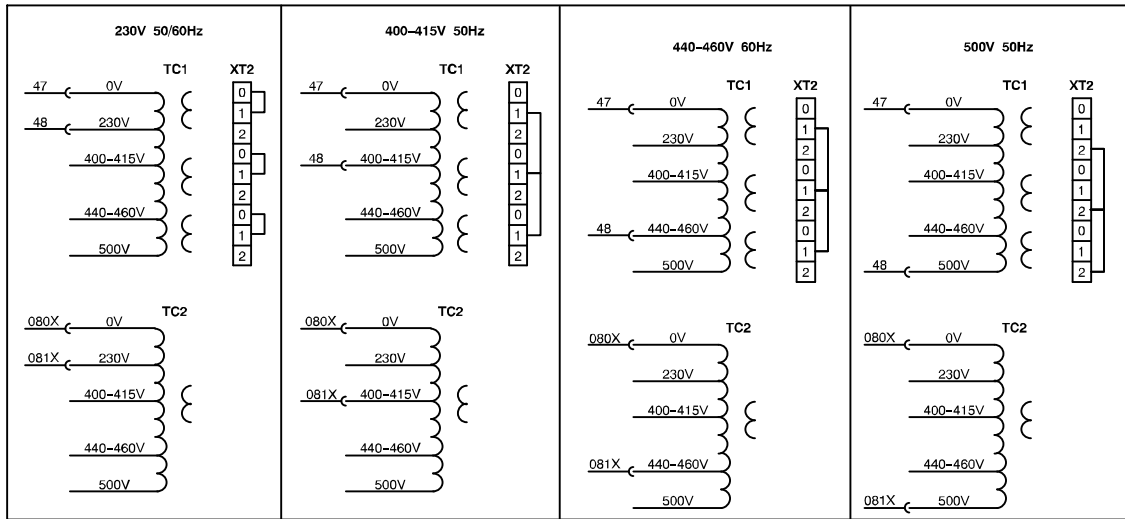


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1	●	●																						
2			●	●																				
3					●	●	●																	
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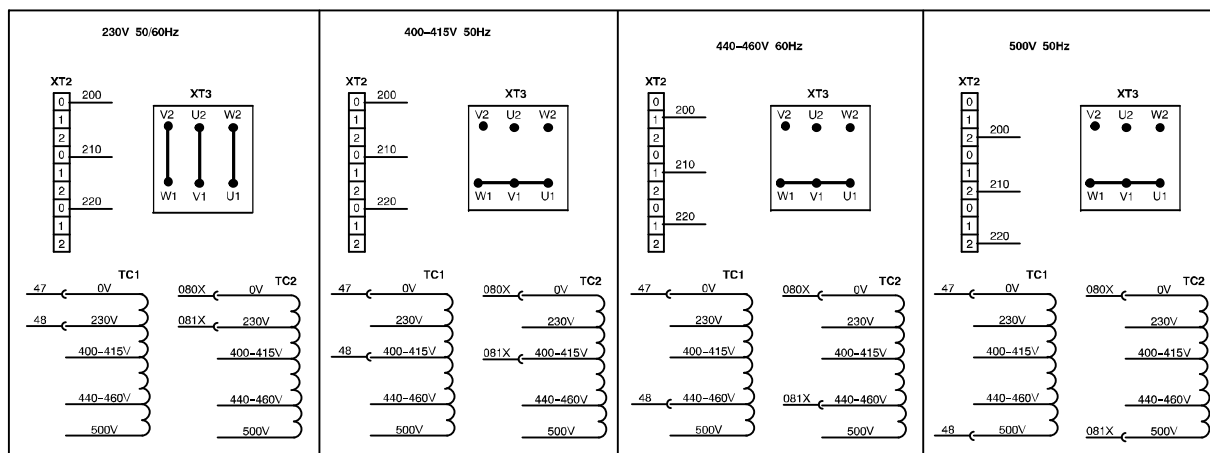
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1	●					●					●				
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5					●					●					●

# Connection instruction

## Mig 410

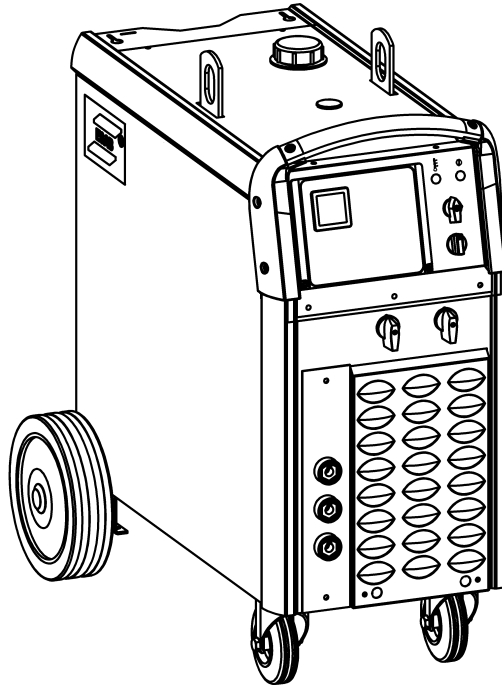


## Mig 510



## Mig 410, Mig 510

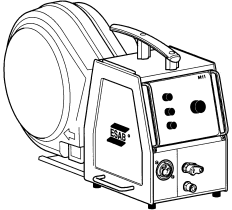
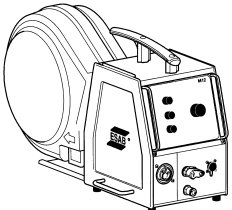
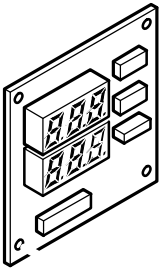
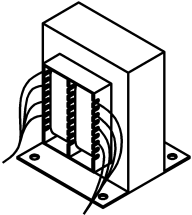
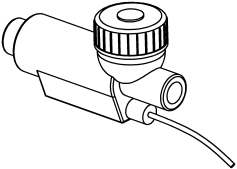
### Order number


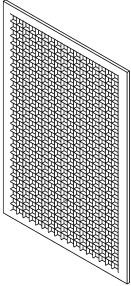
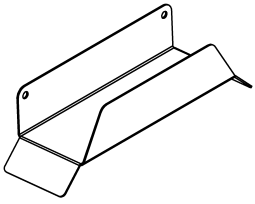
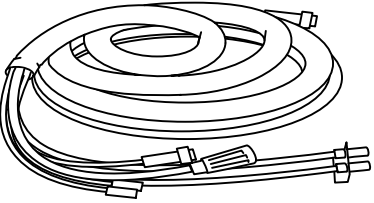


Order no.	Type	Notes
0349 303 563	Origo™ Mig 410	400-415 V 3~50Hz with digital instrument
0349 312 610	Origo™ Mig 410	230/400-415/500V 3~50Hz; 230/440-460V 3~60Hz with digital instrument
0349 303 564	Origo™ Mig 410w	400-415 V 3~50Hz with water cooling and digital instrument
0349 312 620	Origo™ Mig 410w	230/400-415/500V 3~50Hz; 230/440-460V 3~60Hz with water cooling and digital instrument
0349 303 565	Origo™ Mig 510	400-415 V 3~50Hz with digital instrument
0349 303 566	Origo™ Mig 510w	400-415 V 3~50Hz with water cooling and digital instrument
0349 300 066	Origo™ Mig 410, Origo™ Mig 510	Spare parts list


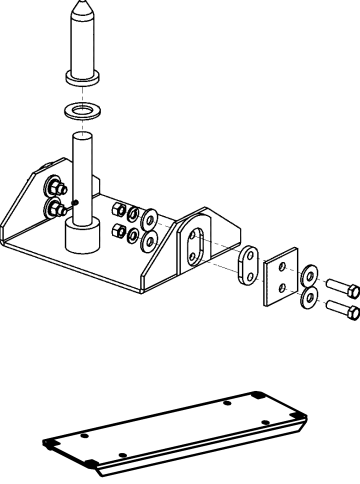
Technical documentation is available on the Internet at [www.esab.com](http://www.esab.com)

Accessories

	<p><b>Feeder with capsulated bobbin, M11 panel</b></p> <p>Feed 302 ..... 0459 116 781</p> <p>Feed 302 with water ..... 0459 116 791</p>
	<p><b>Feeder with capsulated bobbin, M12 panel</b></p> <p>Feed 304 ..... 0459 116 882</p> <p>Feed 304 with water ..... 0459 116 892</p> <p>Feed 484 ..... 0459 116 982</p> <p>Feed 484 with water ..... 0459 116 992</p>
	<p><b>Digital meter</b></p> <p>for Mig 410 ..... 0349 302 451</p> <p>for Mig 510 ..... 0349 302 424</p>
	<p><b>Transformer kit for CO<sub>2</sub> heater</b> ..... 0349 302 250</p>
	<p><b>Water flow guard</b> ..... 0349 302 251</p>

	<p><b>Coolant ready mixed (5 l) .....</b> 0349 483 296</p>
	<p><b>Filter .....</b> 0349 302 423</p>
	<p><b>Cable holder .....</b> 0349 303 362</p>
	<p><b>Connection sets for 400A machines</b></p> <p>Connection set 1.7m ..... 0469 836 880</p> <p>Connection set 10m ..... 0469 836 881</p> <p>Connection set 15m ..... 0469 836 882</p> <p>Connection set 25m ..... 0469 836 883</p> <p>Connection set 35m ..... 0469 836 884</p> <p>Connection set 1.7m, water ..... 0469 836 885</p> <p>Connection set 10m, water ..... 0469 836 886</p> <p>Connection set 15m, water ..... 0469 836 887</p> <p>Connection set 25m, water ..... 0469 836 888</p> <p>Connection set 35m, water ..... 0469 836 889</p> <p><b>Connection sets for 500A machines</b></p> <p>Connection set 1.7m ..... 0469 836 890</p> <p>Connection set 10m ..... 0469 836 891</p> <p>Connection set 15m ..... 0469 836 892</p> <p>Connection set 25m ..... 0469 836 893</p> <p>Connection set 35m ..... 0469 836 894</p> <p>Connection set 1.7m, water ..... 0469 836 895</p> <p>Connection set 10m, water ..... 0469 836 896</p> <p>Connection set 15m, water ..... 0469 836 897</p> <p>Connection set 25m, water ..... 0469 836 898</p> <p>Connection set 35m, water ..... 0469 836 899</p>

**Mig 410, Mig 510**

	<p><b>Stabiliser</b> ..... 0349 303 474</p>
	<p><b>CB KIT (cpl.)</b> ..... 0349 305 812 CONTAINS: - KIT for Counter Balance (0349 309 748) - Stabiliser (0349 303 474)</p>



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