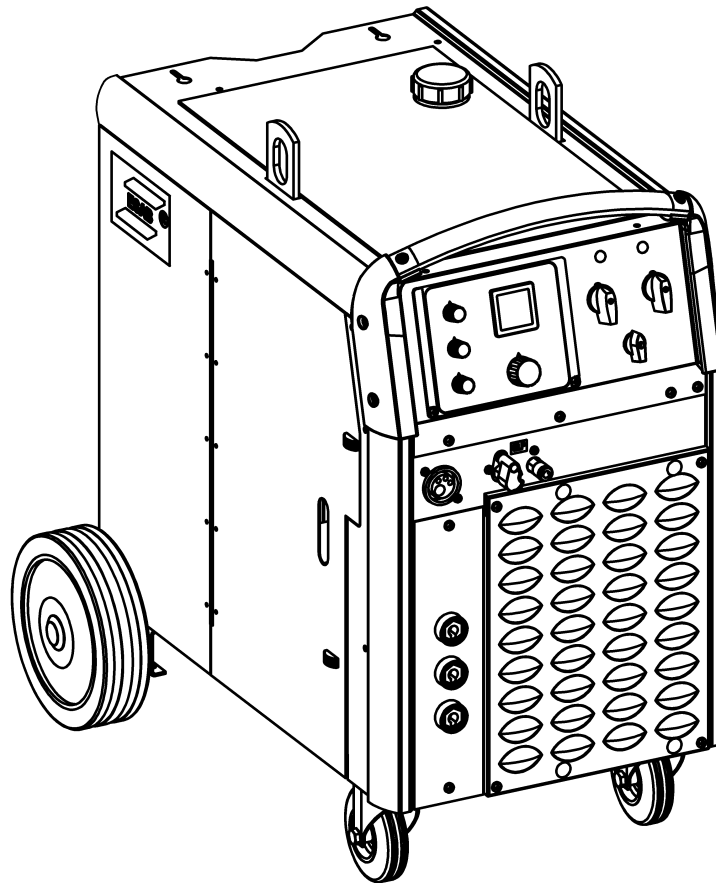


GB



*Origo*<sup>TM</sup>

# *Mig C420 PRO*



**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 C420 PRO      Valid from serial number 627-xxx-xxxx (2006 w.27), 120-xxx-xxxx (2011 w.20)

### 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 60974-5, Arc welding equipment – Part 5: Wire feeders

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.**

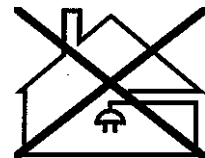
**Read and understand the instruction manual before installing or operating.**

**PROTECT YOURSELF AND OTHERS!**



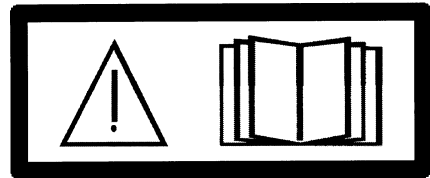
**CAUTION**

*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.*



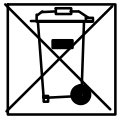
**CAUTION**

*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.**

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## **2 INTRODUCTION**

---

The **Mig C420 PRO** is a step-controlled compact welding power source incorporating wire feed mechanism intended for MIG/MAG welding with solid wires of steel, stainless steel or aluminium, and cored wires with or without shielding gas.

The Mig C420w PRO is equipped with a cooling liquid system for welding torches. The Mig C420 PRO is not equipped with a cooling system and can operate only with appropriate gas cooled torches.

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

The machines can be fitted with a flow guard (Mig C420w PRO).

The power source comes in different variants, see page 22.

**ESAB's accessories for the product can be found on page 26.**

### **2.1 Equipment**

The power source is supplied with:

- Welding gun PSF 405/410w - 4,5m
- Return cable 5m with return clamp
- Shelf for gas cylinder
- Instruction manual

### 3 TECHNICAL DATA

<b>Mig C420 PRO</b>	
<b>Voltage</b>	400-415V, 3~50Hz
<b>Permissible load</b> at 100 % duty cycle	315 A/30V
at 60 % duty cycle	400 A/34V
at 50 % duty cycle	420 A/35V
<b>Setting range (DC)</b>	50A/16,5V-420A/35V
<b>Open circuit voltage</b>	14-47V
<b>Open circuit power</b> with cooling unit	520W 730W
<b>Efficiency</b>	77%
<b>Power factor</b>	0,92
<b>Control voltage</b>	42V, 50/60Hz
<b>Wire feed speed</b>	1,9 - 25,0m/min
<b>Burnback time</b>	0 - 0,5s
<b>Creep start</b>	OFF / ON
<b>2/4 stroke</b>	2 / 4
<b>Welding gun connection</b>	EURO
<b>Max diameter of wire bobbin</b>	300mm
<b>Wire dimension range</b>	0,6 - 1,6mm
<b>Dimensions LxWxH</b>	935 x 640 x 800mm
<b>Weight</b> with cooling unit	215kg 230kg
<b>Operating temperature</b>	-10 to +40°C
<b>Transportation temperature</b>	-20 to +55°C
<b>Enclosure class</b>	IP 23
<b>Application classification</b>	<b>S</b>

<b>Cooling unit (100 % duty cycle)</b>	
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 0.268W 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.*

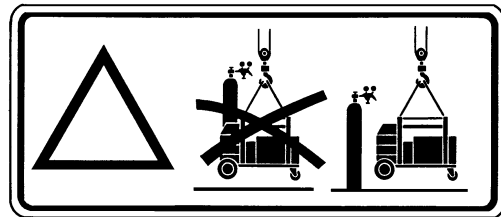
### 4.1 Location

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

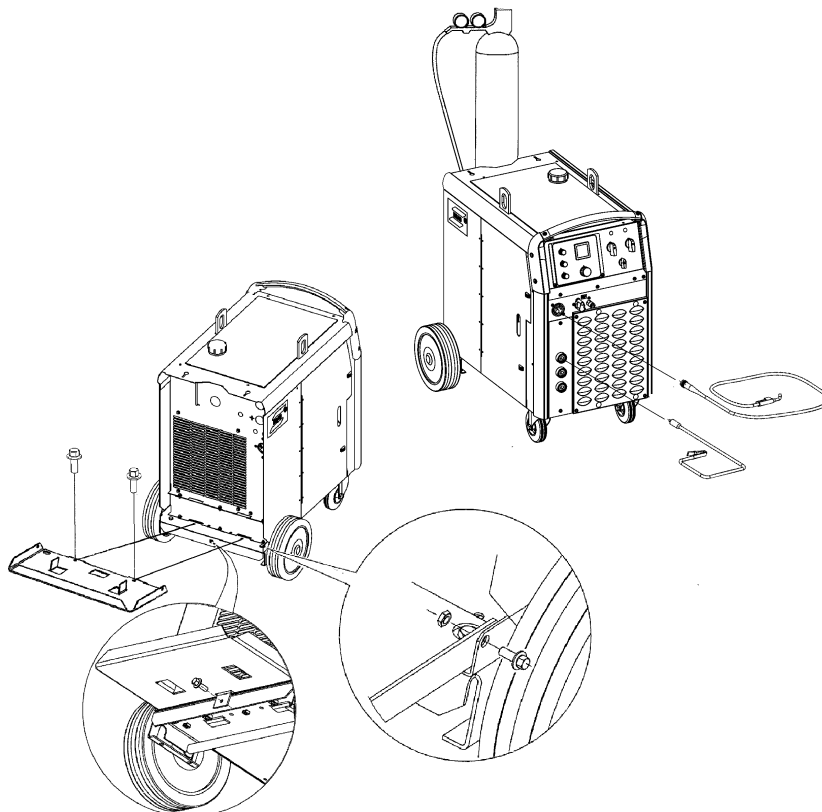


### WARNING

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



### 4.2 Assembly of components



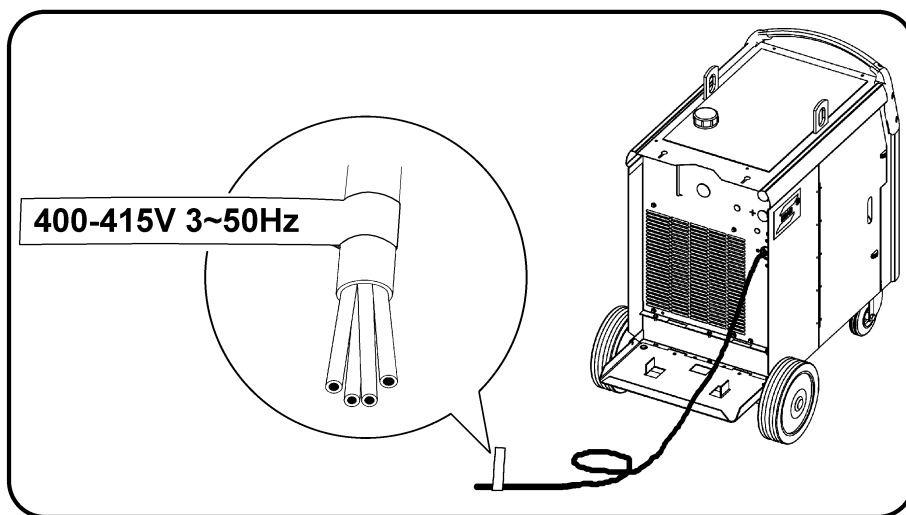




## WARNING

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

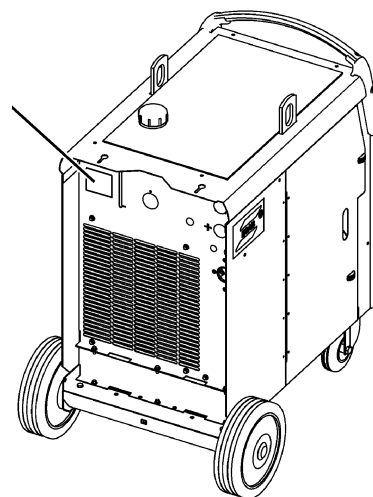
### 4.3 Electrical installation



### 4.4 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

	3~ 50 Hz
<b>Voltage V</b>	400-415
<b>Current A</b> at 100% duty cycle	19
at 60% duty cycle	27
at 50% duty cycle	30
<b>Cable area mm<sup>2</sup></b>	4 x 4
<b>Fuse, slow A</b>	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!**

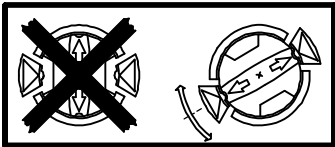



**WARNING**  
*Rotating parts can cause injury, take great care.*



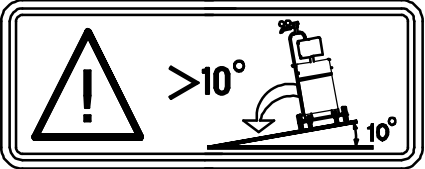


**WARNING**  
*To prevent the reel from sliding off the hub: Lock the reel in place by turning the red knob as shown on the warning label attached next to the hub.*





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



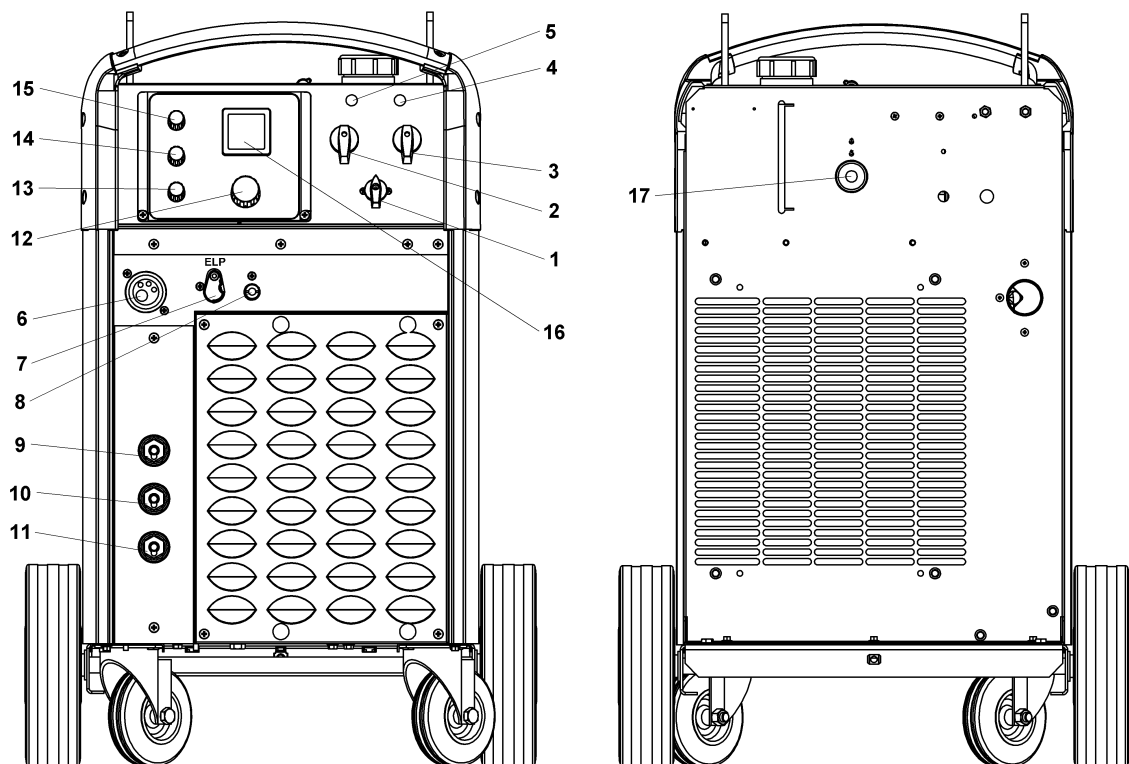
## 5.1 Connection and control devices

- |   |  |    |  |
|---|--|----|--|
| 1 | Mains supply switch  | 10 | Connection for return cable (-), medium inductance |
| 2 | Switch, coarse control   | 11 | Connection for return cable (-), low inductance    |
| 3 | Switch, precise control  | 12 | Knob for wire speed setting                        |
| 4 | Indicator lamp, power supply ON  | 13 | Knob for selecting 2/4-stroke control mode         |
| 5 | Orange indicating lamp, overheating and loss of coolant*                   | 14 | Knob for selecting - creep start - ON/OFF          |
| 6 | EURO - connector (for welding gun)   | 15 | Knob for burn-back time setting                    |
| 7 | Connection for cooling water to the welding gun (Blue - with ELP** switch) | 16 | Digital instrument - V / A ***                     |
| 8 | Connection for cooling water from the welding gun (Red)                    | 17 | Water flow guard (option, see page 26)             |
| 9 | Connection for return cable (-), high inductance                           |    |  |

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

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

\*\*\* NOTE! Digital instrument V/A only available on certain models.



## 5.2 Start

When switched on, indicator lamps [4,5] are on 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 at the first start of welding. The coolant pump starts at the same moment, if it is switched on with ELP switch on the water outlet [7].

### **5.3 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 run 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.

### **5.4 Water connection**

The Mig C420w PRO has a sensor ELP, ESAB Logic Pump, 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.

It is recommended to switch the power source off by means of the mains switch ON/OFF [1] for connecting the cooling water hoses to/from the Mig C420w PRO.

### **5.5 Water flow guard**

The machines with cooling unit (Mig C420w PRO) can be fitted with a water flow guard (option - see page 26).

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

### **5.6 Idle mode**

The machine has an idle mode. The fan is switched off 5 min after the end of 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 [4] on the front panel flashes.

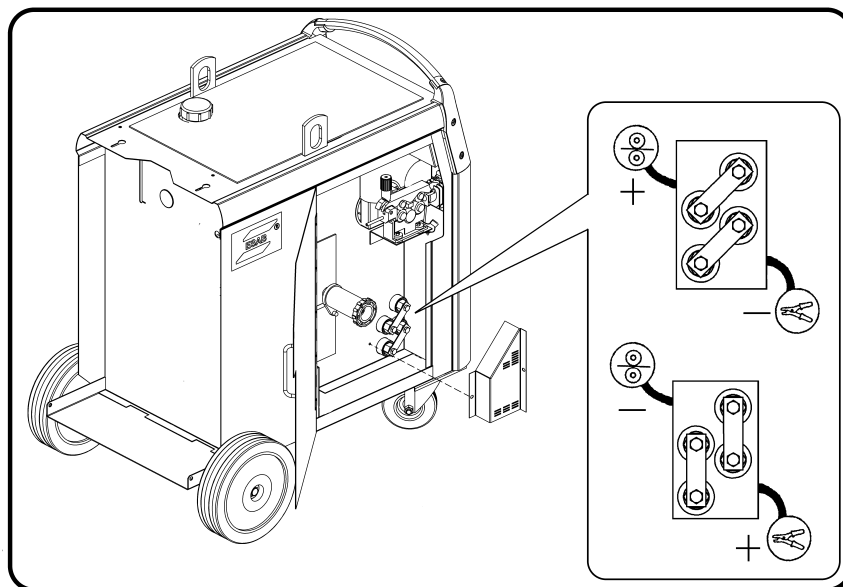
### **5.7 Mig C420w PRO / Mig C420 PRO**

The Mig C420w PRO / Mig C420 PRO is equipped with a standard control unit. The welder can manually select and adjust all welding parameters.

- Wire speed (1,9 - 25m/min) is set with knob [12].
- The stroke control (2/4 stroke) is selected with switch [13].
- Creep start i.e. start with 50% wire speed is toggled ON/OFF with switch [14].
- Burn back time is set with knob [15].

Mig C420w PRO / Mig C420 PRO can be fitted with a digital instrument that displays current and voltage. It incorporates a hold function (see page 26).

## 5.8 Polarity change

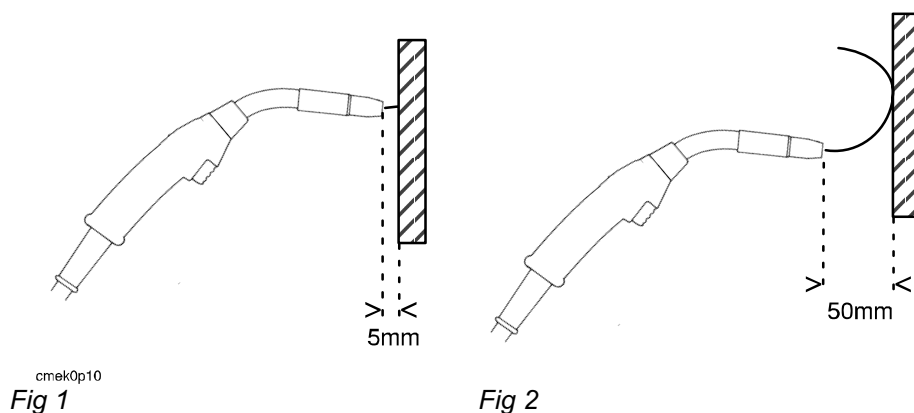


The power source is delivered with the welding wire connected to the plus pole. Some wires, e.g. self shielded cored wires, are recommended for welding with negative polarity. Negative polarity means that the wire is connected to the minus pole and the return cable to the plus pole.

Check the recommended polarity for the welding wire you want to use.

## 5.9 Wire feed pressure

Start by making sure that the wire moves smoothly through the wire guide. Then set the pressure of the wire feeder's pressure rollers. It is important that the pressure is not too great.



To check that the feed pressure is set correctly, you can feed out the wire against an insulated object, e.g. a piece of wood.

When you hold the gun approx. 5 mm from the piece of wood (fig. 1) the feed rollers should slip.

If you hold the gun approx. 50 mm from the piece of wood, the wire should be fed out and bend (fig. 2).

## 5.10 Replacing and inserting wire

- Open the side panel.
- Disconnect the pressure sensor by folding it backwards, the pressure rollers slide up.
- Straighten out 10-20 cm of new wire. File off any burrs and sharp edges from the end of the wire before inserting it into the wire feed unit.
- Make sure that the wire goes properly into the feed roller track and into the outlet nozzle and the wire guide.
- Secure the pressure sensor.
- Close the side panel.

---

## 6 MAINTENANCE

---

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

*Only those persons who have appropriate electrical knowledge (authorized personnel) may remove the safety plates.*



### **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 19. 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 airfilter.

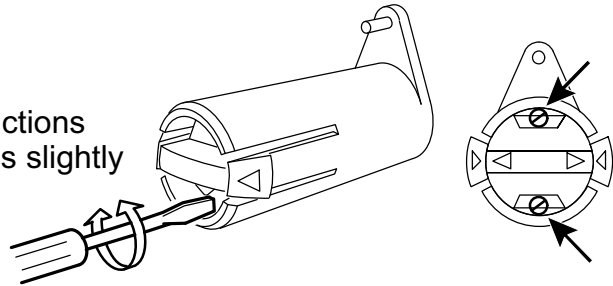
The airfilter is an accessory. Order number can be found on page 26.

## 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.

## The brake hub

The hub is adjusted when delivered, if readjustment is required, follow the instructions below. Adjust the brake hub so that wire is slightly slack when wire feed stops.



- Adjusting the braking torque:**
  - Turn the red handle to the locked position.
  - Insert a screwdriver into the springs in the hub.

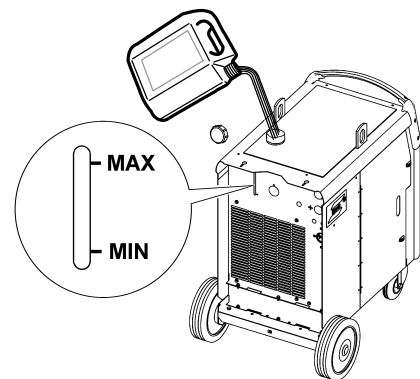
Turn the springs clockwise to reduce the braking torque

Turn the springs counter-clockwise to increase the braking torque. **NB:** Turn both springs the same amount.

## 6.2 Topping up the coolant

ESAB's ready mixed coolant is recommended for use. See accessories on page 26.

**Note!** Coolant must be topped up if connecting a Push-Pull welding gun that is 6 meters 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.

<b>Type of fault</b>	<b>Actions</b>
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> </ul>
Welding current is interrupted during welding	<ul style="list-style-type: none"> <li>• Check whether the thermal overload trip has operated (indicated by the orange lamp on the front).</li> <li>• Check the main power supply fuses.</li> </ul>
Thermal overload trips operate 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> <li>• Check the wire feed unit - that proper rolls are applied and properly set the pressure of the wire feeder's pressure rollers</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 C420 PRO is designed and tested in accordance with the international and European standards EN 60974-1, EN 60974-5 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.**

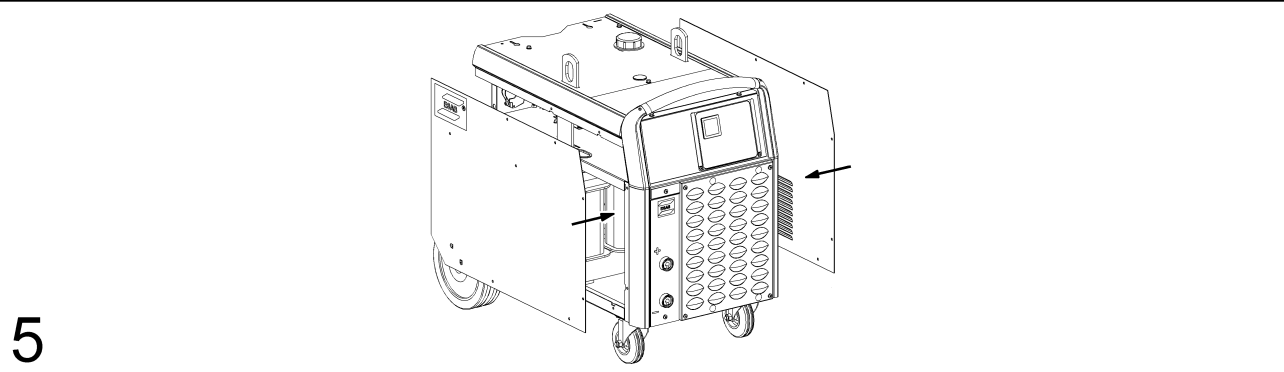
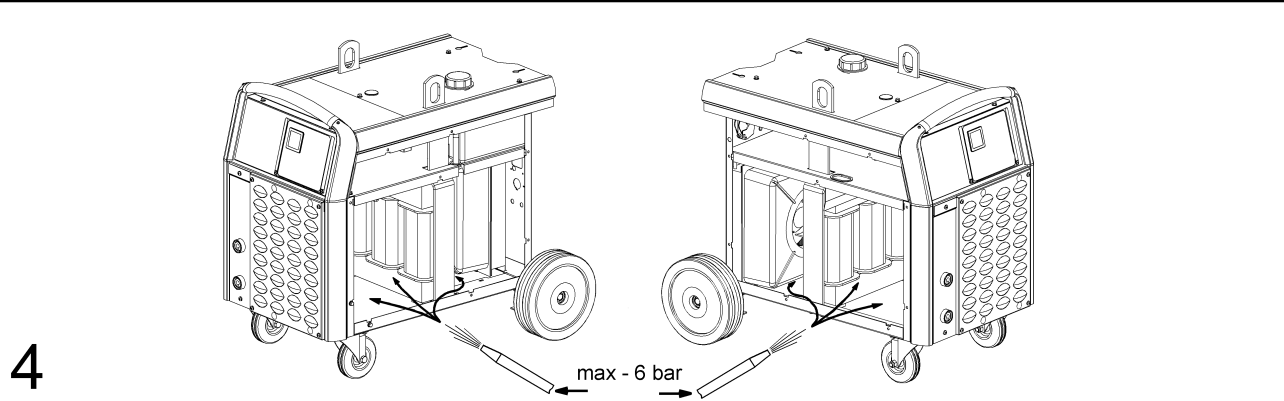
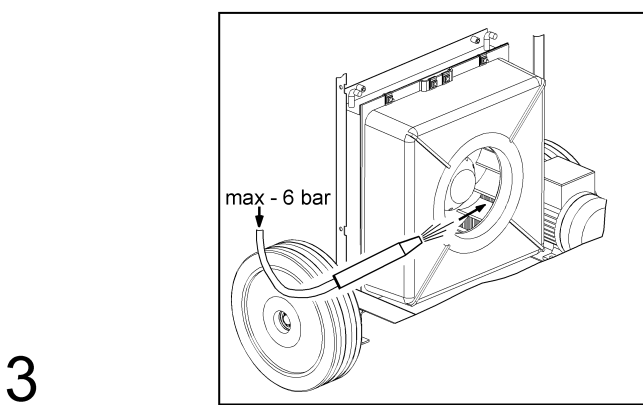
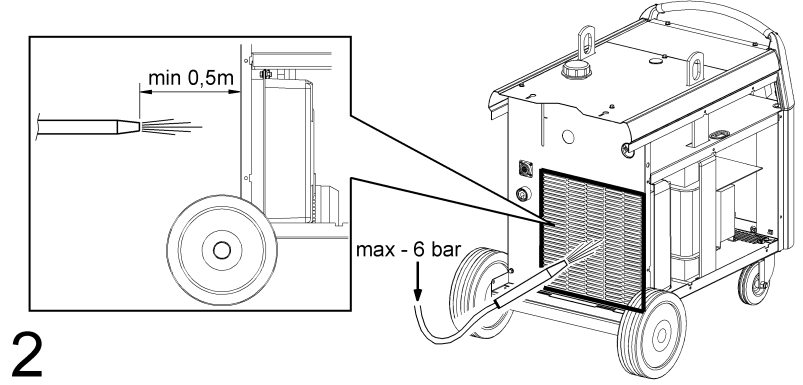
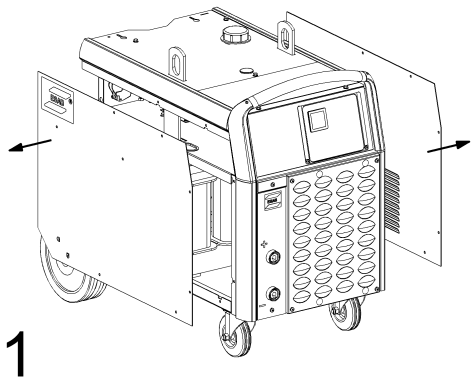
Spare parts may be ordered through your nearest ESAB dealer, see the last page of this publication.



NOTES

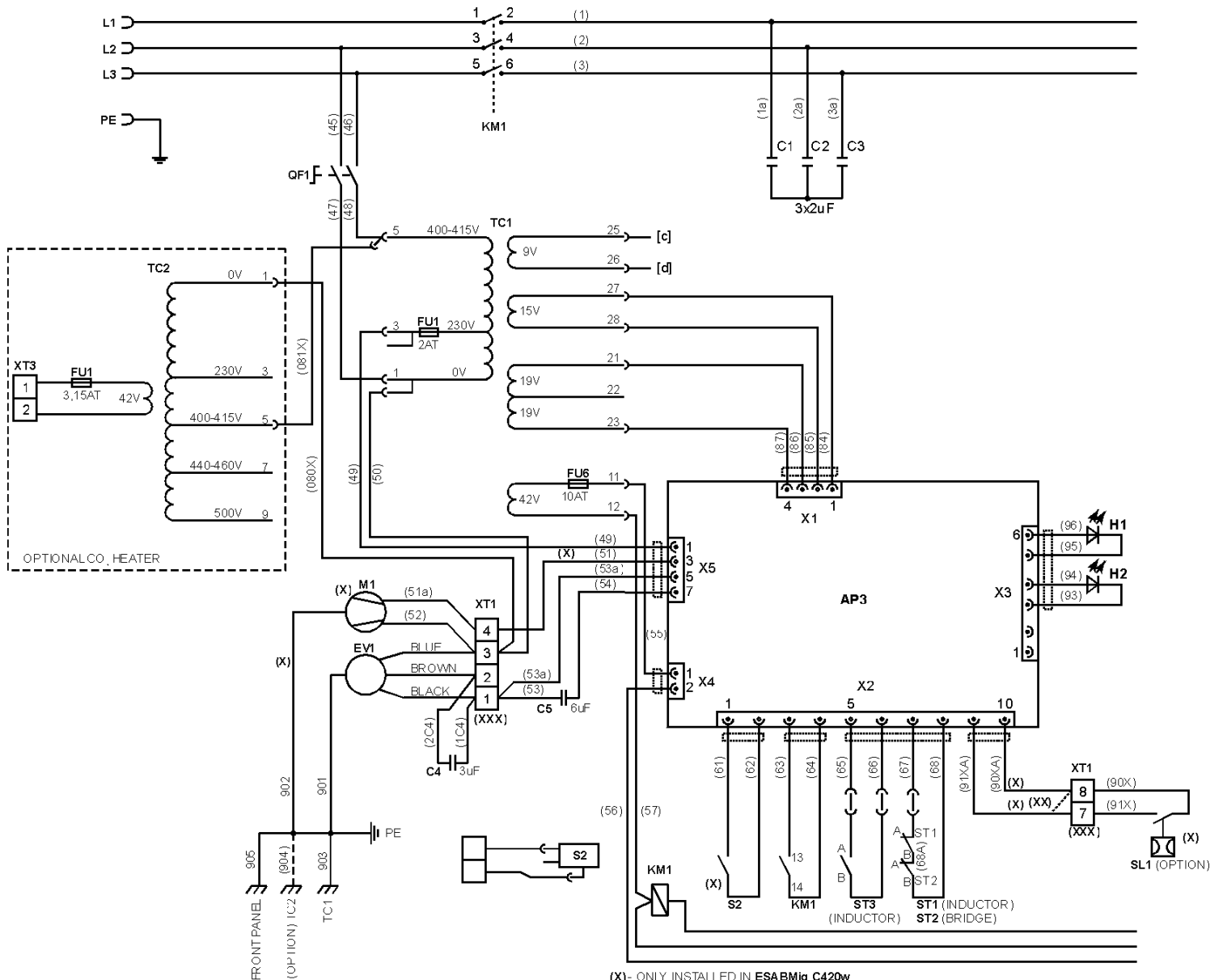
Dotted lines for writing notes.

# Cleaning





# Diagram



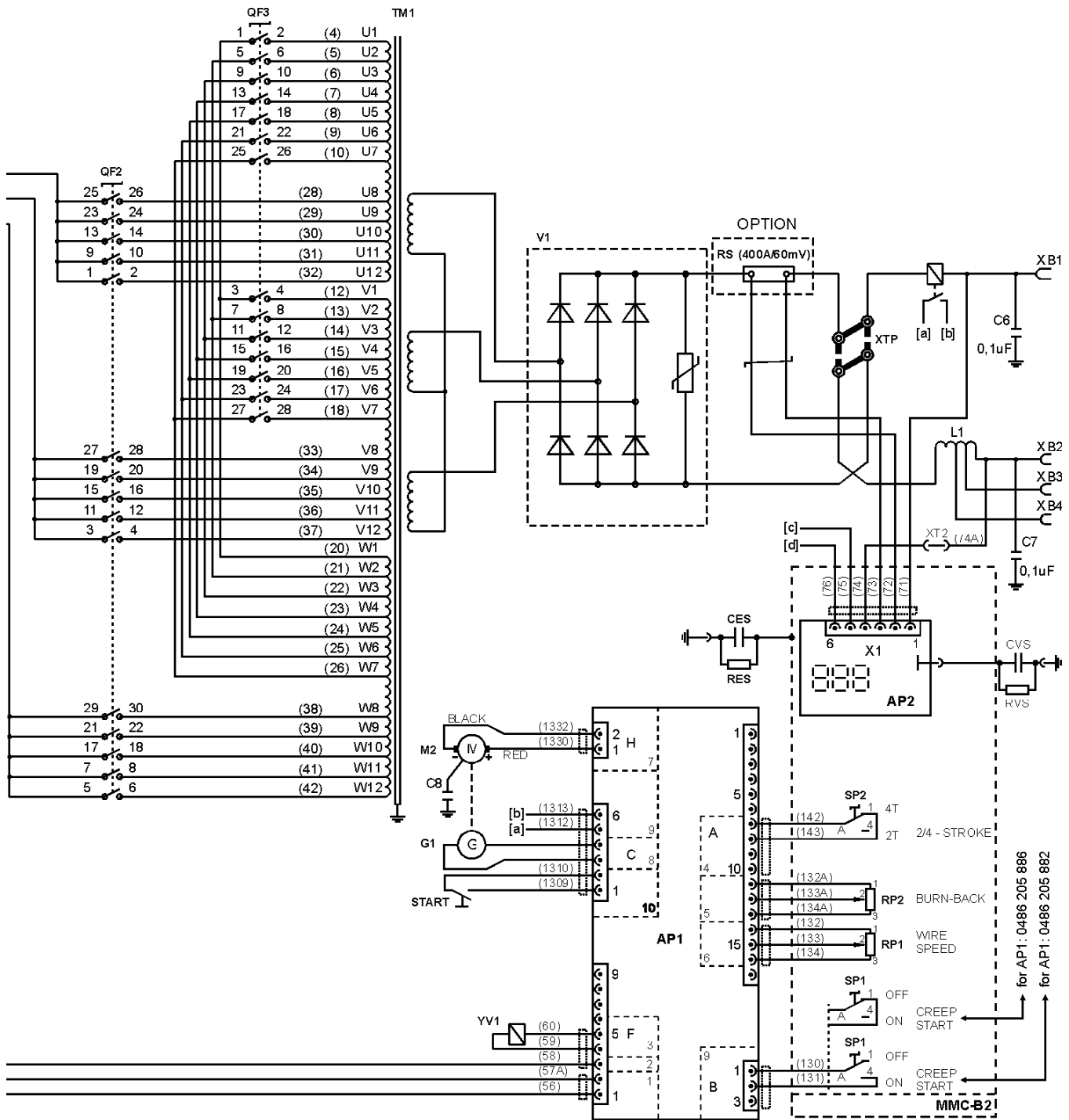
(X) - ONLY INSTALLED IN ESABMig C420w

(XX) - (91XA) TO BE CONNECTED TO XT1:8 WHEN SL1 NOT INSTALLED

(XXX) - XT 1 = 3pol for ESABMig C420

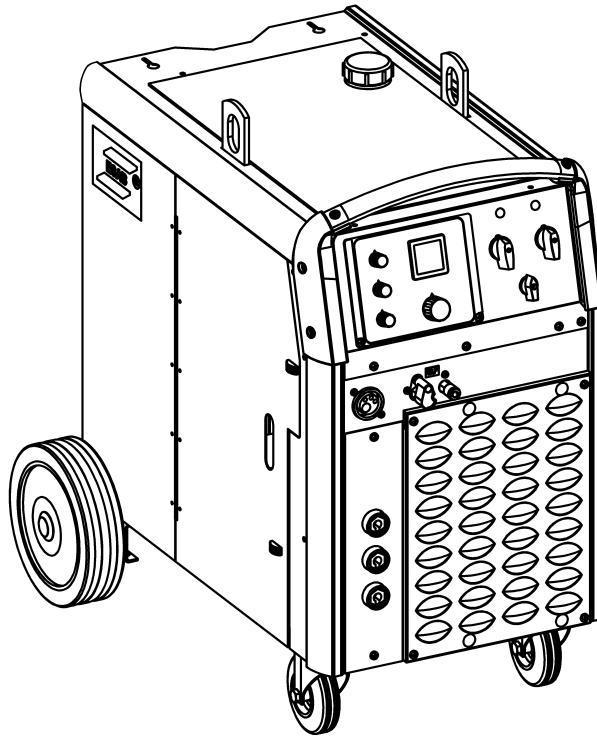
QF3	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	21-22	23-24	25-26	27-28
1	●	●												
2			●	●										
3					●	●								
4						●	●							
5								●	●					
6										●	●			
7												●	●	●

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
1	●	●	●												
2				●	●	●									
3						●	●	●							
4								●	●	●					
5											●	●	●	●	●



## Mig C420 PRO

### Order number



Ordering no.	Type	Notes
0349 302 655	Origo™ Mig C420 PRO	400–415V 3~50Hz
0349 303 079	Origo™ Mig C420w PRO	400–415V 3~50Hz; with water cooler
0349 312 580	Origo™ Mig C420 PRO	400–415V 3~50Hz, with digital instrument
0349 312 590	Origo™ Mig C420w PRO	400–415V 3~50Hz; with water cooler and digital instrument
0349 300 538	Origo™ Mig C420 PRO	Spare parts list

The spare parts list is available on the Internet at [www.esab.com](http://www.esab.com)



## Mig C420 PRO

### Wear parts

Item	Denomination	Ordering no.	Notes
A	Feed / pressure roller	0459 052 001	Ø 0.6 & 0.8 mm; Fe, Ss & cored wire; V-groove
		0459 052 002	Ø 0.8 & 1.0 mm; Fe, Ss & cored wire; V-groove
		0459 052 003	Ø 0.9/1.0 & 1.2 mm; Fe, Ss & cored wire; V-groove
		0459 052 013	Ø 1.4 & 1.6 mm; Fe, Ss & cored wire; V-groove
		0458 825 001	Ø 0.9/1.0 & 1.2 mm; Cored wire; V-groove; knurled
		0458 825 002	Ø 1.2 & 1.4 mm; Cored wire; V-groove; knurled
		0458 825 003	Ø 1.6 & 2.0 mm; Cored wire; V-groove; knurled
		0458 824 001	Ø 0.8 & 0.9/1.0 mm; Al wire; U-groove
		0458 824 003	Ø 1.2 & 1.6 mm; Al wire; U-groove
B	Gear adapter	0459 441 880	Replacing 0455 053 880
C	Inlet nozzle	0455 049 001	
D	Drive gear	0459 440 001	Replacing 0455 052 001
E	Intermediate nozzle	0455 072 002	Fe, Ss & cored wire
		0456 615 001	Al wire
F	Outlet nozzle	0469 837 880	Ø 2.0 mm steel for 0.6-1.6 mm Fe, Ss & cored wire
		0469 837 881	Ø 2.0 mm plastic for 0.8-1.6 mm Al wire
G	Liner	0349 303 018	Fe, Ss & cored wire
		0455 894 001	Al wire

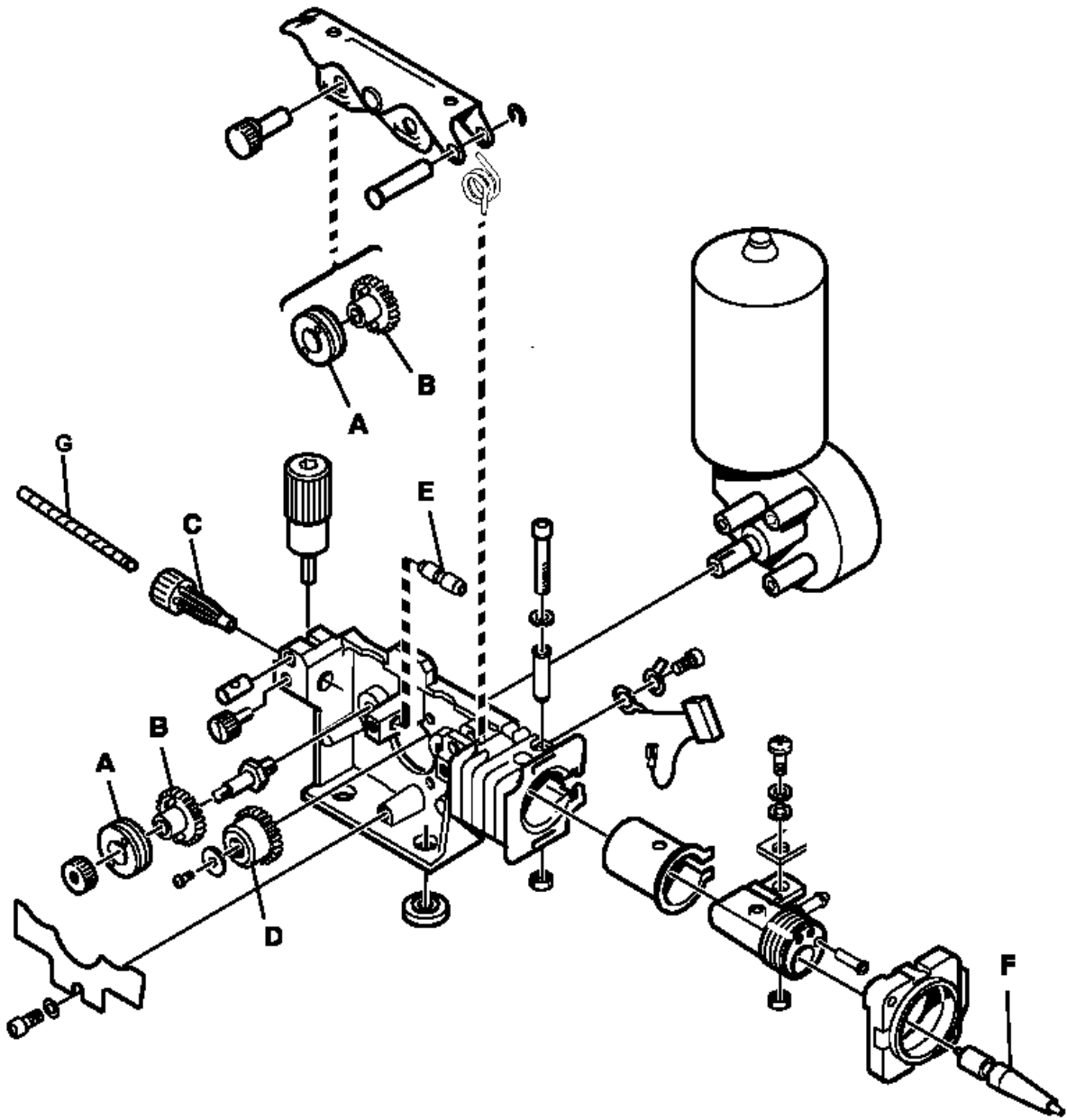
The rollers are marked with wire dimension in mm, some are also marked with inch.

#### **Welding with aluminium wires.**

*In order to weld with aluminium wires, proper rollers, nozzles and liners for aluminium wires MUST be used. It is recommended to use 3m long welding gun for aluminium wires, equipped with appropriate wear parts.*

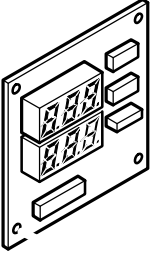
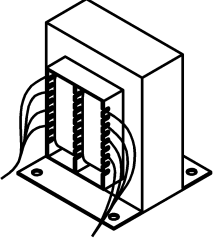
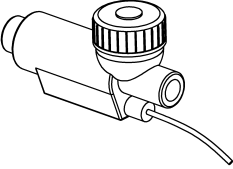

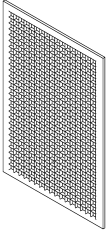


Mig C420 PRO

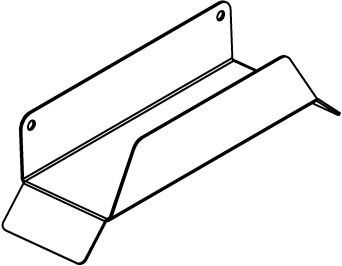



# Mig C420 PRO

## Accessories

	<b>Digital meter</b> .....	0349 302 451
	<b>Transformer kit for CO<sub>2</sub> heater</b> .....	0349 302 250
	<b>Water flow guard</b> .....	0349 302 251
	<b>Coolant ready mixed (5 l)</b> .....	0349 483 296
	<b>Filter</b> .....	0349 302 252

## Mig C420 PRO

	<b>Cable holder</b> .....	0349 303 362
	<b>Push-Pull connection kit</b> .....	0349 308 337
	<b>Push-Pull welding guns:</b> MXH 400w PP - 6,0m .....	0700 200 015 MXH 400w PP - 10,0m ..... 0700 200 016

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