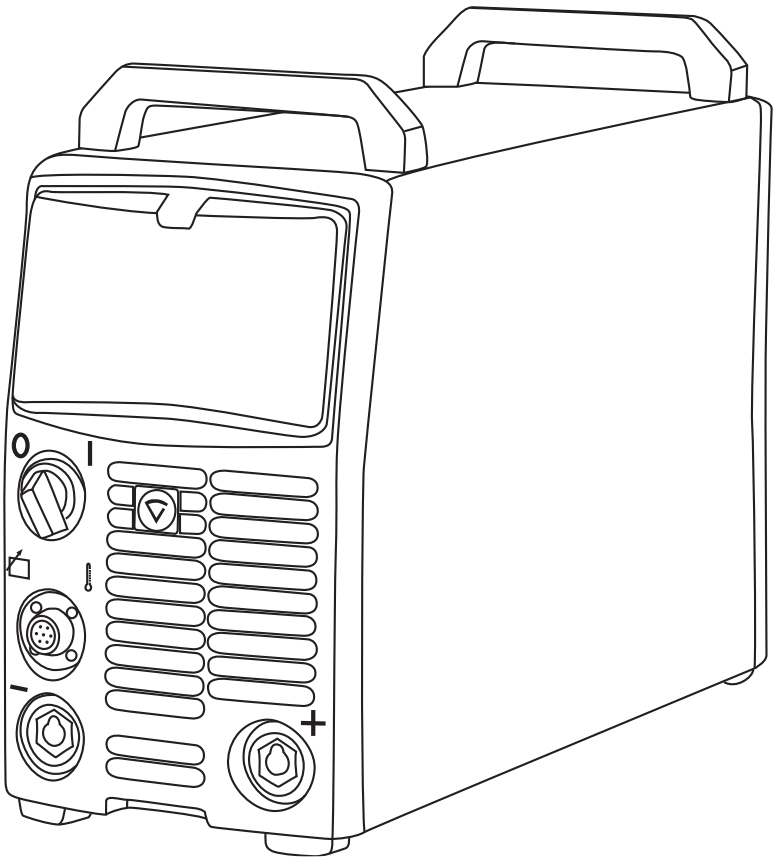
KEMPPI
The Joy of Welding

FastMig™ | KMS 300, 400, 500



Operating manual • English EN

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Manuale d'uso • Italiano IT

OPERATING MANUAL

English

CONTENTS

1. PREFACE

1.1 GENERAL

Congratulations on choosing the FastMig welding equipment. Used correctly, Kemppi products can significantly increase the productivity of your welding, and provide years of economical service.

This operating manual contains important information on the use, maintenance and safety of your Kemppi product. The technical specifications of the equipment can be found at the end of the manual.

Please read the manual carefully before using the equipment for the first time. For your own safety and that of your working environment, pay particular attention to the safety instructions in the manual.

For more information on Kemppi products, contact Kemppi Oy, consult an authorised Kemppi dealer, or visit the Kemppi web site at www.kemppi.com.

The specifications presented in this manual are subject to change without prior notice.

Important notes

Items in the manual that require particular attention in order to minimise damage and personal harm are indicated with the ***'NOTE!'*** notation. Read these sections carefully and follow their instructions.

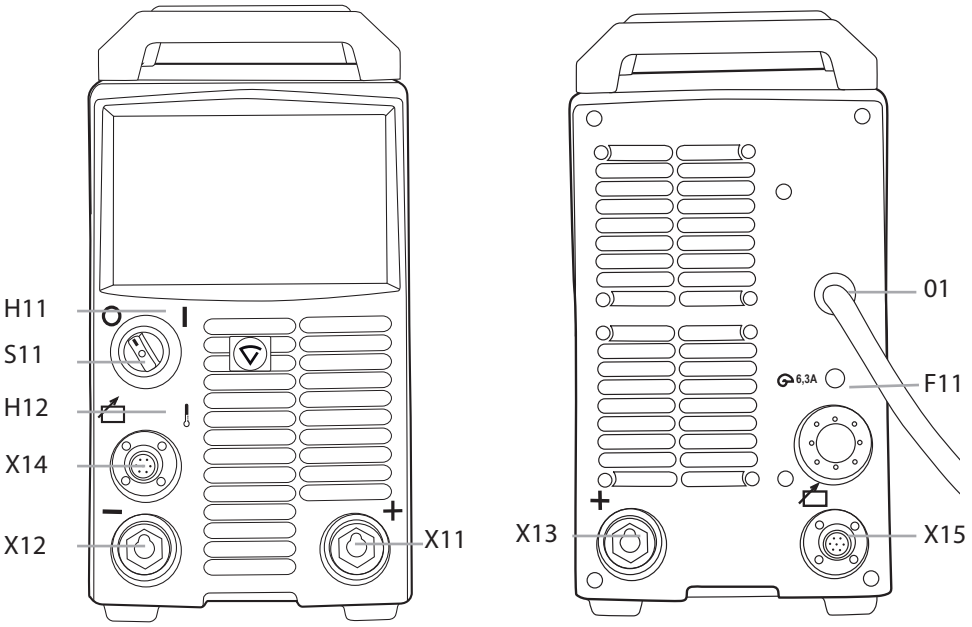
Disclaimer

While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions. Kemppi reserves the right to change the specification of the product described at any time without prior notice. Do not copy, record, reproduce or transmit the contents of this guide without prior permission from Kemppi.

1.2 PRODUCT INTRODUCTION

FastMig KMS 300, 400 and 500 are multi-operator power sources designed for demanding professional use. They are suitable for MMA and MIG welding in DC.

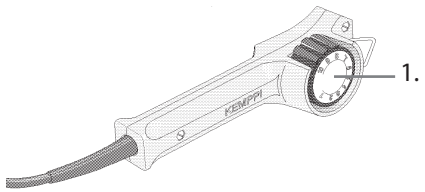
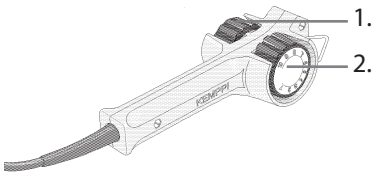
1.2.1 Operation control and connectors



F11	Fuse for connection for control table	6,3 A delayed	**X12**	Earth connection	
H11	Signal lamp	I/O	**X14 , X15**	Connection for control cable	parallel
H12	Warning lamp for thermal protection		**01**	Inlet of mains cable	
S11	Main switch	I/O			
X11, X13	Welding connection	parallel			

1.3 ACCESSORIES

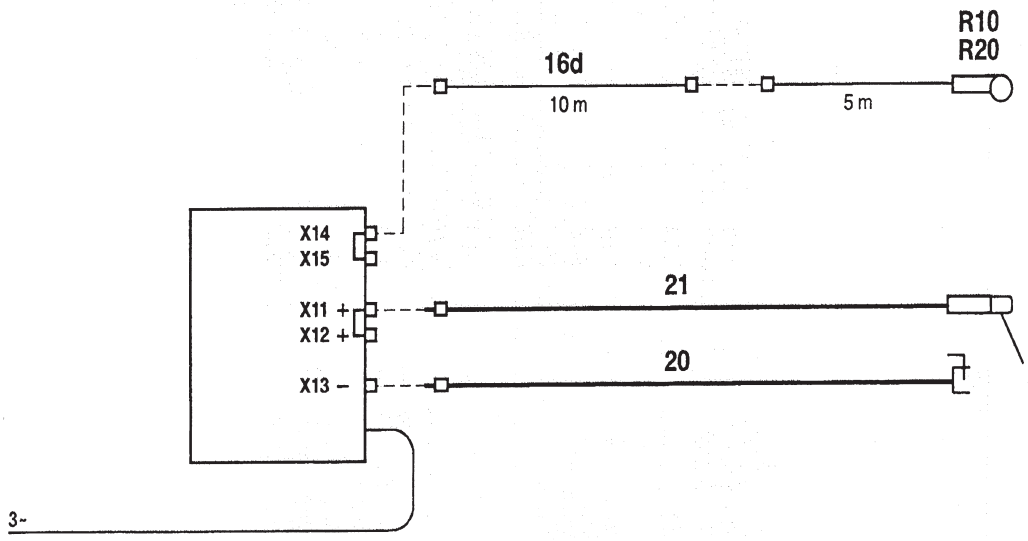
1.3.1 Remote control devices

R10		1. Control of MMA/TIG welding current, reference scale 1 – 5.
R20		1. Wire feed adjustment, electrode current adjustment. 2. Voltage adjustment.

MIG-MAG remote control device with controls for wire feed and voltage, memory scales 1 – 5. You can use control device also for control of MMA current.

1.3.2 Cables

FastMig KMS 300, FastMig KMS 400, FastMig KMS 500



16d	Extension cable for remote control
20	Earth cable
21	MMA welding cable
R10, R20	Remote control devices

2. INSTALLATION

2.1 POSITIONING OF THE MACHINE

Place the machine on a firm, dry and level surface. Where possible, do not allow dust or other impurities to enter the machines cooling air flow. Preferably site the machine above floor level; for example on a suitable carriage unit.

Notes for positioning the machine

- The surface inclination should not exceed 15 degrees.
- Ensure the free circulation of the cooling air. There must be at least 20 cm of free space in front of and behind the machine for cooling air to circulate.
- Protect the machine against heavy rain and direct sunshine.

NOTE! *The machine should not be operated in the rain as the protection class of the machine, IP23S, allows for outside preserving and storage only.*

NOTE! *Never aim metallic grinding spray/sparks towards the equipment.*

2.2 DISTRIBUTION NETWORK

All regular electrical devices without special circuits generate harmonic currents into distribution network. High rates of harmonic current may cause losses and disturbance to some equipment.

FastMig KM 500:

This equipment complies with IEC 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to 4.6 MVA at the interface point between the user's supply and the public supply network. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{sc} greater than or equal to 4.6 MVA.

FastMig KM 400:

This equipment complies with IEC 61000-3-12 provided that the short-circuit power S_{SC} is greater than or equal to 4.7 MVA at the interface point between the user's supply and the public supply network. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{SC} greater than or equal to 4.7 MVA.

FastMig KM 300:

WARNING: This equipment does not comply with IEC 61000-3-12. If it is connected to a public low voltage system, it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment may be connected.

2.3 CONNECTION TO THE MAINS SUPPLY

FastMig power sources are delivered equipped with 5 m mains cable without plug.

If local electricity regulations of operating country are stating otherwise, the mains cable should be replaced in conformity with the local regulations.

Connection of the mains cable, mounting and change of the plug should only be carried out by a competent electrician.

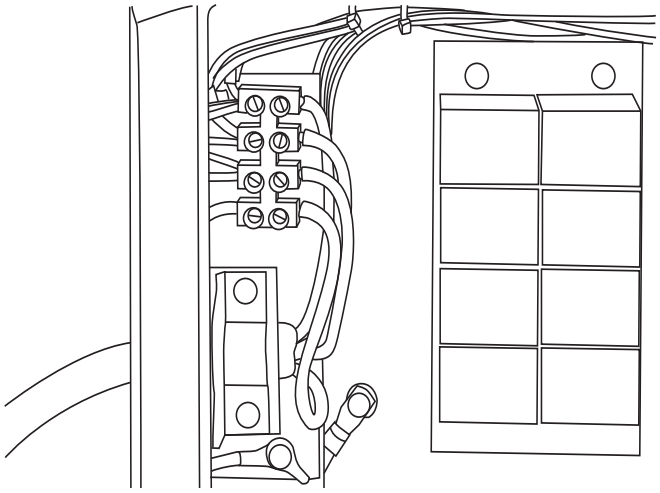
Remove the machine's right side plate to enable the mounting of a mains cable.

KMS power sources can be connected to the mains supply of 400 V 3~ .

If changing the mains cable take into consideration the following:

The cable is entered into the machine through the inlet ring on the rear panel of the machine and fastened with a cable clamp (05). The phase conductors of the cable are coupled to connectors L1, L2 and L3. The earth protection coloured green-yellow is coupled to connector. ⏚

NOTE! If you are using 5-lead cable, do not connect neutral conductor.



Sizes of the mains cables and fuse ratings for the machine at 100 % duty cycle are specified in the table below:

	Rated voltage	Mains voltage range	Fuses, slow-blow	Connection cable *) mm^2
KMS 300	400 V 3~	360 V – 440 V	20 A	4 x 6.0 S
KMS 400	400 V 3~	360 V – 440 V	25 A	4 x 6.0 S
KMS 500	400 V 3~	360 V – 440 V	35 A	4 x 6.0 S

*) In cables of S type there is a protective grounding conductor coloured green-yellow.

2.4 WELDING AND EARTH CABLES

Recommended copper cables with cross-sectional area are as follows:

FastMig KMS 300 50 – 70 mm²

FastMig KMS 400 70 – 90 mm²

FastMig KMS 500 70 – 90 mm²

In enclosed table are shown typical load capacities of rubber insulated copper cables, when ambient temperature is 25 °C and lead temperature is 85 °C.

Cable	Duty cycle ED			Voltage loss / 10 m
	100 %	60 %	30 %	
50 mm²	285 A	370 A	520 A	0.35 V / 100 A
70 mm²	355 A	460 A	650 A	0.25 V / 100 A
95 mm²	430 A	560 A	790 A	0.18 V / 100 A

Do not overload welding cables due to voltage losses and heating.

Fasten the earth clamp of the return current cable carefully, preferably direct onto the piece to be welded. The contact surface of the earth clamp should always be as large as possible.

Clean the fastening surface from paint and rust.

3. OPERATION CONTROL SWITCHES AND POTENTIOMETERS

3.1 MAIN SWITCH I/O

When you turn the switch into I-position, pilot lamp H11 on the front face is illuminated and the machine is ready for use.

NOTE! Always turn the machine on and off with the mains switch, never use the mains plugs as a switch.

3.2 PILOT LAMPS

The pilot lamps of the machine report the electric operation:

The green pilot lamp H11 when lit indicates that the machine is on and ready for use and it is connected to the mains supply with the main switch in the I-position.

H12 indicates when lit that the thermal protection of the machine has been activated due to over heating. The cooling fan will continue to run and cool the machine down and when the lamp is off the machine is ready to weld.

3.3 OPERATION OF COOLING FAN

In FastMig power sources there are two simultaneously operating fans.

- The fan is started for a moment when main switch is placed into position I.
- The fan will start during welding as the machine heats up and it will run for 1 to 10 minutes after the welding has stopped.

4. MANUAL METAL ARC WELDING

The FastMig power source can be used in electrode welding by connecting a FastMig MFS 53, MFS 55 or MSF 57 wire feeder to it. The power source can be made suitable for electrode welding without a wire feeder by connecting an R10 or R20 remote control to the X14 or X15 terminal at the back of the power source for welding current adjustment, and the welding power cable connected to the power source's (+) connector X11 or X12.

5. MAINTENANCE

The amount of use and the working environment should be taken into consideration when planning the frequency of maintenance of the machine. Careful use and preventive maintenance will help to ensure trouble-free operation.

5.1 CABLES

Check the condition of welding and connection cables daily. Do not use damaged cables.

Make sure that the mains cables in use are safe and according to laid down regulations.

The repair and mounting of a mains connection cable should be carried out only by an authorised electrician.

5.2 POWER SOURCE

NOTE! *Disconnect the plug of the machine from the mains socket and wait approx. 2 minutes (capacitor charge) before removing the cover plate.*

Check at least every half year:

- Electric connectors of the machine – clean the oxidised parts and tighten the loosened ones.

NOTE! *You must know correction tension torques before starting the reparation of the joints.*

- Clean the inner parts of the machine from dust and dirt e.g. with a soft brush and vacuum cleaner. Also clean the ventilation net behind the front grate.
- Do not use compressed air, there is a risk that dirt is packed even more tightly into gaps of cooling profiles.
- Do not use pressure washing device.
- Only authorised electrician shall carry out repairs to the machines.

5.3 REGULAR MAINTENANCE

Kemppi Service Workshops make regular maintenance according to agreement.

The major points in the maintenance procedure are listed as follows:

- Cleaning of the machine
- Checking and maintenance of the welding tools
- Checking of connectors, switches and potentiometers
- Checking of electric connections
- Checking of mains cable and plug
- Damaged parts or parts in bad connection are replaced by new ones
- Maintenance testing. Operation and performance values of the machine are checked, and adjusted when necessary by means of test equipment.

6. OPERATION DISTURBANCES

In the event of a failure of the machine, contact an authorised Kemppi service agent or your local Kemppi dealer.

Check the maintenance objects before the machine is sent to the Service Workshop.

6.1 OPERATION OF THE OVERLOAD PROTECTION

Yellow pilot lamp H12 of thermal protection is lit when thermostat has operated due to overheating of machine.

The thermostat of machine will operate, if machine is continuously loaded over rated values or cooling air circulation is blocked.

Cooling fan cools down the machine and when the pilot lamp is not lit the machine is automatically ready for welding.

6.2 CONTROL FUSES

Fuse F11, 6.3 A delayed, on the rear wall of machine is as protection for connection of auxiliary devices X14-15.

NOTE! Use same type and rating of fuse which is marked beside the fuse adapter. Damage caused by a wrong type fuse is not covered by the guarantee.

6.3 UNDER- AND OVERVOLTAGES IN THE MAINS SUPPLY

Primary circuits of machine are protected against sudden, transient overvoltages.

Machine is designed to withstand 3 x 440 V voltage continuously (see technical data). See to it that voltage is kept within admissible limits especially when mains supply is taken e.g. from combustion engine generator.

If the mains has undervoltage (under approx. 300 V) or overvoltage (over approx. 480 V) machine control stops to operate automatically.

6.4 LOSS OF A PHASE IN THE MAINS SUPPLY

Loss of a phase causes noticeable poorer welding properties than normally or the machine doesn't get started at all. Loss of a phase can be due to following:

- blowing of mains supply fuse
- defective mains cable
- bad connection of mains connection cable on terminal block or plug of machine

7. DISPOSAL OF THE MACHINE

Do not dispose of electrical equipment with normal waste!

In observance of European Directive 2002/96/EC on waste electrical and electronic equipment, and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and taken to an appropriate environmentally responsible recycling facility.

The owner of the equipment is obliged to deliver a decommissioned unit to a regional collection centre, per the instructions of local authorities or a Kemppi representative. By applying this European Directive you will improve the environment and human health.

8. ORDERING NUMBERS

FastMig KMS 300		6053000
FastMig KMS 400		6054000
FastMig KMS 500		6055000
Wire feeders		
MXF 65		6152100EL
MXF 67		6152200EL
MXF 63		6152300EL
MXF 65		6152100
MXF 67		6152200
MXF 63		6152300
Panels for wire feeders		
SF 51		6085100
SF 52W		6085200W
SF 53W		6085300W
SF 54		6085400
Accessories		
Return current cable	5 m, 50 mm^2	6184511
Return current cable	5 m, 70 mm^2	6184711
Cable for MMA welding	5 m, 50 mm^2	6184501
Cable for MMA welding	5 m, 70 mm^2	6184701
R10		6185409
Remote controlled interconnecting cable	10 m	6185481
Cooling unit FastCool 10		6068100
Transport unit PM 500		6185291
Gun holder GH 30		6256030

9. TECHNICAL DATA

	FastMig KMS 300	FastMig KMS 400	FastMig KMS 500
Connection voltage			
3~, 50/60 Hz	400 V -15 %...+20 %	400 V -15 %...+20 %	400 V -15 %...+20 %
Rated power			
60 ED	-	-	26.1 kVA
80 % ED	-	19.5 kVA	-
100 % ED	13.9 kVA	18.5 kVA	20.3 kVA
Connection cable	H07RN-F 4G6 (5 m)	H07RN-F 4G6 (5 m)	H07RN-F 4G6 (5 m)
Fuse (delayed)	25 A	35 A	35 A
Output 40 °C			
60 % ED	-	-	500 A
80 % ED	-	400 A	-
100 % ED	300 A	380 A	430 A
Welding current and voltage range			
MMA	10 A – 300 A	10 A – 400 A	10 A – 500 A
MIG	10 V – 37 V	10 V – 39 V	10 V – 42 V
Max. welding voltage	46 V	46 V	46 V
Open circuit voltage	50 V	50 V	50 V
Idle power	25 W	25 W	25 W
Efficiency at max. current	87 %	87 %	87 %
Power factor at max. current	0.9	0.9	0.9
Operating temperature range	-20 ... +40 °C	-20 ... +40 °C	-20 ... +40 °C
Storage temperature range	-40 ... +60 °C	-40 ... +60 °C	-40 ... +60 °C
Degree of protection	IP23S	IP23S	IP23S
EMC class	A	A	A
Minimun short circuit power S_{sc} of supply network*	-	4.7 MVA	4.6 MVA
External dimensions			
length	590 mm	590 mm	590 mm
width	230 mm	230 mm	230 mm
height	430 mm	430 mm	430 mm
weight	34 kg	35 kg	36 kg
Voltage supply for auxiliary devices	50 V DC	50 V DC	50 V DC
X14, X15	fuse 6.3 A delayed	fuse 6.3 A delayed	fuse 6.3 A delayed
Operating voltage (for cooling unit)	400 V -15 %...+20 %	400 V -15 %...+20 %	400 V -15 %...+20 %

* See paragraph 2.2.

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