

Operation instructions • english
Gebrauchsanweisung • deutsch
Gebruiksaanwijzing • nederlands
Manuel d'utilisation • français

1913250E
Master 5000

MASTER 5000



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1. PREFACE

1.1. INTRODUCTION

Congratulations on having purchased this product. Properly installed Kemppi products should prove to be productive machines requiring maintenance at only regular intervals. This manual is arranged to give you a good understanding of the equipment and its safe operation. It also contains maintenance information and technical specifications. Read this manual from front to back before installing, operating or maintaining the equipment for the first time. For further information on Kemppi products please contact us or your nearest Kemppi distributor.

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

In this document, for danger to life or injury the following symbol is used:



Read the warning texts carefully and follow the instructions. Please also study the Operation safety instructions and respect them when installing, operating and servicing the machine.

1.2. PRODUCT INTRODUCTION

Master 5000 is a 3-phase inverter power source for demanding professional use. Master 5000 is suitable for MMA welding and carbon arc gouging. Due to its high effect and excellent welding properties as well as due to its small size and light weight it is very suitable for site welding as well as for repair and production welding.

In order to enable a good following of welding current the machine is equipped with well-visible displays for welding current and welding voltage. Properties of Master 5000 can be improved with remote control units and transport carts which are delivered as accessory.

1.3. OPERATION SAFETY

Never watch the arc without a face shield designed for arc welding!

The arc damages unprotected eyes! The arc burns unprotected skin!

Protect yourself and the surroundings against the arc and hot spray!

Remember general fire safety!

Pay attention to the fire safety regulations. Welding is always classified as a fire risk operation. Welding where there is flammable or explosive material is strictly forbidden. If it is essential to weld in such an area remove inflammable material from the immediate vicinity of the welding site. Fire extinguishers must always be on site where welding is taking place.

Note! Sparks may cause ignition many hours after completion of welding.

Watch the mains voltage!

Take care of the cables - the connection cable must not be compressed, touch sharp edges or hot work pieces. Faulty cables are always a fire risk and highly dangerous. Do not locate the welding machine on wet surfaces. Do not take the welding machine inside the work piece (i.e. in containers, cars etc.)

Ensure that neither you nor gas bottles or electrical equipment are in contact with live wires or connections!

Do not use faulty welding cables. Isolate yourself by using dry and not worn out protective clothes. Do not weld on wet ground. Do not place the welding cables on the power source or other electrical equipment.

Watch the welding fumes!

Ensure that there is sufficient ventilation. Follow special safety measures when you weld metals which contain lead, cadmium, zinc, mercury and beryllium.

Note the danger caused by special welding jobs!

Watch the fire and explosion danger when welding container type work pieces.

2. INSTALLATION

2.1. INSTALLATION

P21 Current meter

P22 Voltage meter

P23 Display for adjustment value of MMA welding dynamics -9..0...9

R21 Adjustment of welding current

R22 Adjustment of MMA welding dynamics

S21 Selection for local/remote control



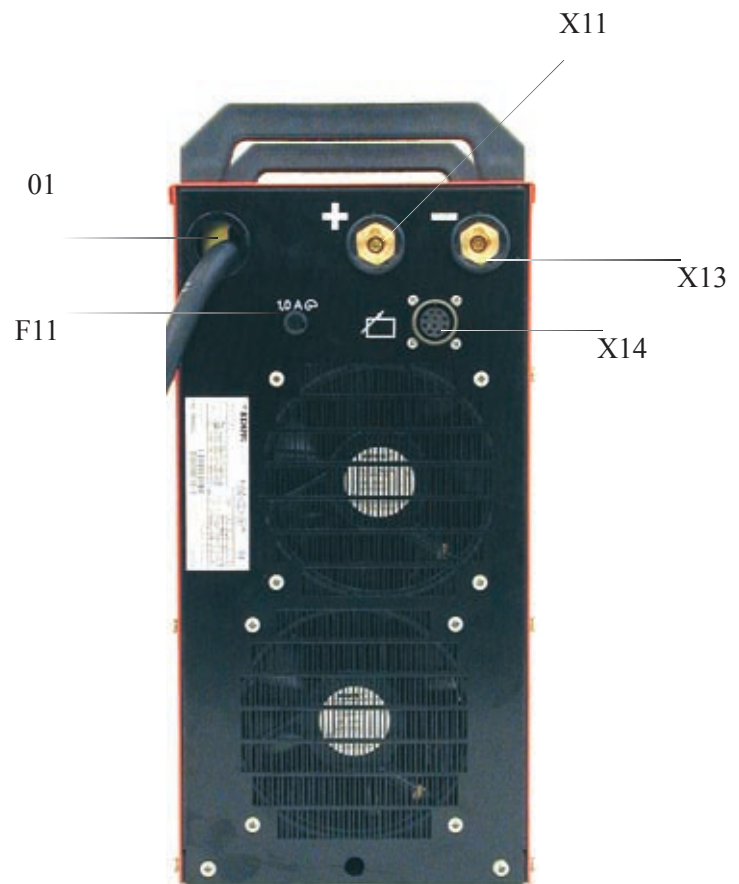


H12

H11

S11

- F11 Fuse for remote control connection 1,0 A delayed
- H11 Signal lamp I/O
- H12 Warning lamp for thermal shield
- S11 Main switch I/O
- X11 Welding and earth connection
- X 13 Welding and earth connection
- X14 remote control connection
- 01 Inlet of mains cable



X11

01

X13

F11

X14

2.2. SITING THE MACHINE

Site the machine on a stationary, horizontal, dry base from which there doesn't come any dust etc. into cooling air (front grate).

- Preferably site the machine somewhat higher above the floor level.
- See to that in front of the machine as well as at the rear of the machine there is at least 20 cm free distance to allow good circulation of the cooling air through the machine.
- Protect the machine against heavy rain and in hot circumstances against direct sunshine. Ensure free circulation of the cooling air.



Degree of protection of machine IP23 allows at its maximum the water jet coming in 60° angle to hit machine's outer covering.

See to that the machine is positioned away from the line of particle spray, created by grinding tools etc.

2.3. CONNECTION TO MAIN SUPPLY

Master 5000 power source is 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 them.



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

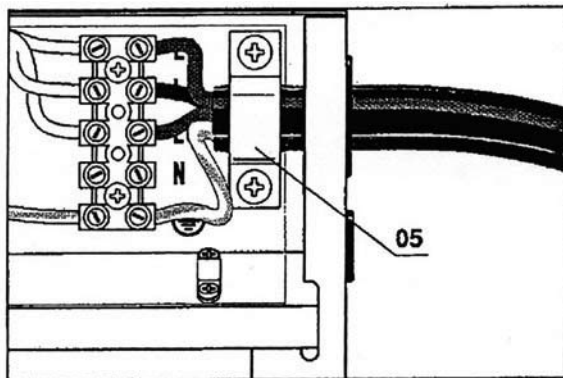
Remove machine's right side plate for the time you are mounting mains cable.

By change of the mains cable take into attention 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. The phase conductors of the cable are coupled to connectors L1, L2 and L3. The earth protection coloured green-yellow is coupled to connector.



If you are using 5-lead cable, you must connect neutral conductor with terminal N.



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

Master 5000	
Rated voltage	400 V 3~
Mains voltage range	380 V -10%...415 V + 6%
Fuses, slow-blow	35 A
Connection cable mm ²	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

Use only copper cables with cross-sectional area of at least 50 ...95mm².

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 cycled ed			Voltage loss /10 m
	100%	60%	30%	
50mm ²	285 A	370 A	520 A	0,35 V/ 100 A
70 mm ²	355 A	460 A	650 A	0,25 V/ 100 A
95 mm ²	430 A	560 A	790 A	0,18 V/ 100 A

Don't overload welding cables due to voltage losses and heating.

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

Clean the fastening surface from paint and rust.

2.5. MOUNTING OF POWER UNIT TO TRANSPORT CARRIAGE

Read mounting instructions for Master 5000 power source delivered with carriage T12. Fasten power source carefully of that the equipment should withstand lifting with lifting device.

3. OPERATION OF CONTROL SWITCHES AND POTENTIOMETERS AND THEIR USE

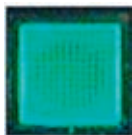
3.1. MAIN SWITCH I/O

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

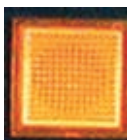
Always start and switch off the machine with the main switch, never use the mains plug as a switch.

3.2. PILOT LAMPS

The pilot lamps of the machine report about the electric operation:



The green pilot lamp H11 for readiness for use is always lighted, when the machine is connected to mains supply and the main switch is in I-position.



Yellow pilot lamp H12 of thermal protection is lighted when thermostat has released due to overheating of machine. The cooling fan is cooling down the machine and when the pilot lamp is switched off, the machine is again ready for welding.

3.3. LOCAL OR REMOTE CONTROL OF WELDING CURRENT

You can control welding current either from local control unit R21 of the machine or from remote control unit which is connected to remote control connector X14. When you are using the remote control unit, the switch S21 must be in remote control position:

During the control, the set value of welding current can be seen on current meter display P21 and at the same time the no-load voltage of the machine can be seen on voltage display. During welding the current meter P21 and the voltage meter P22 show welding current respectively welding voltage.

Note! Voltage which can be seen during welding on display P22, is terminal voltage of machine, which is voltage between terminals X11 and X13.

Accuracy of digital meter is as follows:

Accuracy of current true value in respect to real value is $\pm 2,5\%$, $\pm 2A$.

Accuracy of voltage true value in respect to real value is $\pm 2,5\%$, $\pm 0,2 V$.

Depending on welding cable length and copper cross-section, real arc voltage and meter display might differ many volts from each other. Error will increase when current is growing. See table in paragraph "welding and earthing cables". In current measurement the same error won't appear.

3.4. OPERATION OF COOLING FAN

In Master 5000 there are two simultaneously operating fans.

- Fan is started for a moment, when main switch is placed into position I.
- Fan is started after welding start after machine has been heated and runs still for 1...10 min time after welding stop.
- On no-load fan, is started in intervals of ca. half an hour for a minute's time.

3.5. CONTROL FOR MMA WELDING DYNAMICS

MMA welding dynamics is controlled with potentiometer R22. The potentiometer R22 has the reference scale -9...0...9 can be seen also on the V display P22, which otherwise is showing no-load/welding voltage. Setups for dynamics remain on the display still for approx. 3 s after you have finished the control.

With control of MMA dynamics you can influence on arc in different situations. When you make the arc harder, blow and at the same time spatter is increased.

-9...-1 Softer arc. Object: minimizing spatter in welding at upper end of recommended currents for electrode.

0 Factory setup. Normal setting for all electrode types.

1...9 Harder arc. Object: eg cellulose covered electrodes (9) and thin stainless electrodes in welding at lower end of recommended currents for electrode.

P21 Current meter

P22 Voltage meter

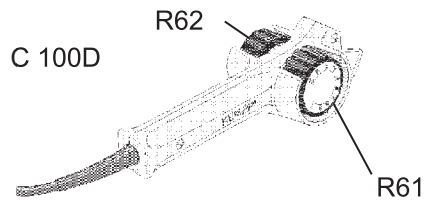
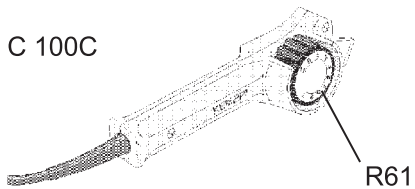
P23 Display for adjustment value of MMA welding dynamics -9...0...9.

R21 Adjustment of welding current

R22 Adjustment of MMA welding dynamics

S21 Selection for local/remote control





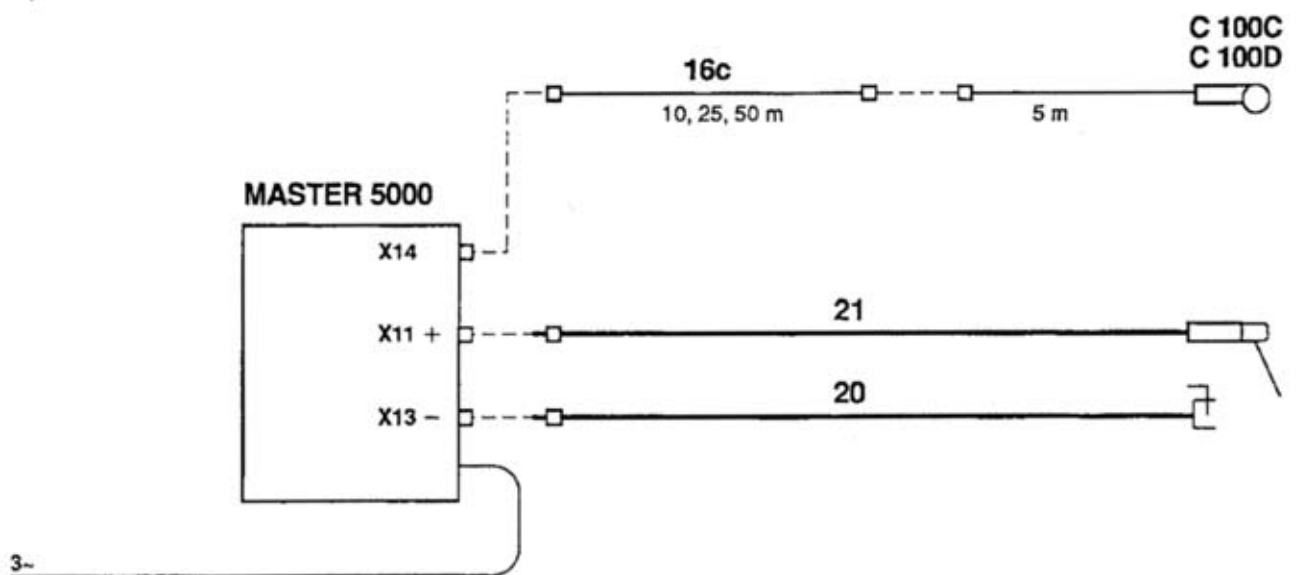
Accessories and cables

C100C

Control of MMA welding current (R61), reference scale 1...10

C100D

Rough control (R61), reference scale 1...10, and fine control +/- (R62) for MMA welding current.



16c Extension cable for remote control

20 Earth cable

21 MMA welding cable

C100C

D100D Remote control devices

4. 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 of the machine. Careful use and preventive maintenance will help to ensure trouble-free operation.

4.1. CABLES

Check the condition of welding and connection cables daily. Do not use faulty cables. Make sure that the mains connection cables in use are safe and according to laid down regulations.

The repairs and mounting of mains connection cables should be carried out only by an authorised electrician.

4.2. 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 connections of the machine - clean the oxidized parts and tighten the loosened ones. Note! You must know correct tension torques before starting the reparation of the joints.
- Clean the inner parts of the machine from dust and dirt eg 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.

4.3. REGULAR MAINTENANCE

Kemppi-service repair shops 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
- meter checking
- checking of mains cable and plug
- damaged parts of 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

5. OPERATION DISTURBANCES

In case of problems contact the Kemppi works in Finland or your Kemppi dealer.

Check the maintenance objects before the machine is sent to the service repair shop.

Operation of the overload protection

Yellow pilot lamp H12 of thermal protection is lighted 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 lighted the machine is automatically ready for welding.

Control fuses

Fuse F11, 1,0 A delayed, on the rear wall of machine is as protection for connection of auxiliary devices X14.

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.

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: 415 V +6%). See to it that voltage is kept within admissible limits especially when mains supply is taken eg from combustion engine generator. If the mains has undervoltage (under ca 300 V), machine control stops to operate automatically.

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.

6. ORDER NUMBERS

Master 5000	6130511
20/5 m 50mm ²	6184511
20/5 m 70mm ²	6184711
21/5 m 50mm ²	6184501
21/5 m 70 mm ²	6184701
C100C	6185410
C100D	6185413
16c /10 m	6185451
/25 m	6185452
/50 m	6185453
T12	6185228

7. TECHNICAL DATA

Master 5000

Mains voltage	3~, 50/60 Hz	380 V - 10 %...415 V + 6 %
Rated power	60 % ED	500 A / 28,2 kVA
	100 % ED	390 A / 20,2 kVA
Connection cable/fuses		4 x 6S - 5 m / 35 A delayed
Loading capacity (nominal values)	60 % ED	500 A / 40,0 V
	100 % ED	390 A / 35,6 V
Control range for welding current MMA		10 A ... 500 A
Max. welding voltage		50 V / 500 A
Open circuit voltage		ca. 65 V
Open circuit power		< 75 W
Operation frequency		ca. 20 kHz
Efficiency at nominal values		ca. 85 %
Power factor		ca 0,90
Storage temperature range		- 40 ... + 60 °C
Operation temperature range		- 20 ... + 40 °C
Temperature class		H (180 °C) / B (130 °C)
Degree of protection		IP 23
External dimensions (without handles)	length	530 mm
	width	230 mm
	height	520 mm
Weight		48 kg
Voltage supply for auxiliary devices		50 V DC
X14		fuse 1,0 A / delayed

The product meets conformity requirements for CE marking.

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