

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

1922430E

**KEMPOMIG**  
**4000R**

**KEMPOMIG**  
**4000WR**



## CONTENTS

<b>1.</b>	<b>PREFACE</b> .....	<b>3</b>
	1.1. Introduction .....	3
	1.2. Product introduction .....	3
	1.3. Operation safety.....	3
<b>2.</b>	<b>INSTALLATION</b> .....	<b>4</b>
	2.1. Transport and lifting of the equipment.....	4
	2.2. Siting the machine .....	4
	2.3. Connection to the mains supply.....	4
	2.4. Welding and return current cables .....	5
<b>3.</b>	<b>OPERATION AND USE CONTROLS</b> .....	<b>5</b>
	3.1. Main switch .....	7
	3.2. Signal lamps .....	7
	3.3. Adjustment for MMA dynamics .....	7
	3.4. Control fuse.....	7
	3.5. Operation of cooling fan.....	7
	3.6. Adjustment for MIG/MAG welding.....	7
<b>4.</b>	<b>ACCESSORIES</b> .....	<b>8</b>
	4.1. V/A meter unit MSD 1 .....	8
	4.2. Cooling unit functions in Kempomig 4000WR.....	8
	4.2.1. Installation of cooling.....	8
	4.2.2. Operation .....	9
	4.2.3. Operation disturbances of the cooling unit.....	9
<b>5.</b>	<b>MAINTENANCE</b> .....	<b>10</b>
	5.1. Cables.....	10
	5.2. Power source .....	10
	5.3. Regular maintenance.....	10
<b>6.</b>	<b>ORDERING NUMBERS</b> .....	<b>11</b>
<b>7.</b>	<b>TECHNICAL DATA</b> .....	<b>12</b>

---

# 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

Kempomig 4000R and 4000WR are DC power sources for demanding professional use in MIG/MAG welding.

They are inverter power sources for 400 V 3-phase electric mains. Kempomig 4000WR is equipped with inbuilt cooling unit for water-cooled MIG guns. Parameter adjustments for MIG/MAG welding are made from Feed 420R wire feeding control unit, which is connected to Kempomig power sources.

## 1.3. OPERATION SAFETY

Please study these Operation safety instructions and respect them when installing, operating and servicing the machine.

### **Welding arc and spatter**

Welding arc hurts unprotected eyes. Be careful also with reflecting arc flash. Welding arc and spatter burn unprotected skin. Use safety gloves and protective clothing.

### **Danger for fire or explosion**

Pay attention to fire safety regulations. Remove flammable or explosive materials from welding place. Always reserve sufficient fire-fighting equipment on welding place. Be prepared for hazards in special welding jobs, e.g. for the danger of fire or explosion when welding container type work pieces. Note! Fire can break out from sparks even several hours after the welding work has been finished!

### **Mains voltage**

Never take welding machine inside a work piece (e.g. container or truck). Do not place welding machine on a wet surface. Always check cables before operating the machine. Change defect cables without delay. Defect cables may cause an injury or set out a fire. Connection cable must not be compressed, it must not touch sharp edges or hot work pieces.

### **Welding power circuit**

Isolate yourself by using proper protective clothing, do not wear wet clothing. Never work on a wet surface or use defect cables. Do not put MIG gun or welding cables on welding machine or on other electric equipment. Do not press MIG gun's switch if the gun is not directed towards a work piece.

### **Welding fumes**

Take care that there is sufficient ventilation during welding. Take special safety precautions when welding metals which contain lead, cadmium, zinc, mercury or beryllium.

## 2. INSTALLATION

### 2.1. TRANSPORT AND LIFTING OF THE EQUIPMENT

On the power source's front panel and above the wire feeder unit there are handles for moving the units on the floor.

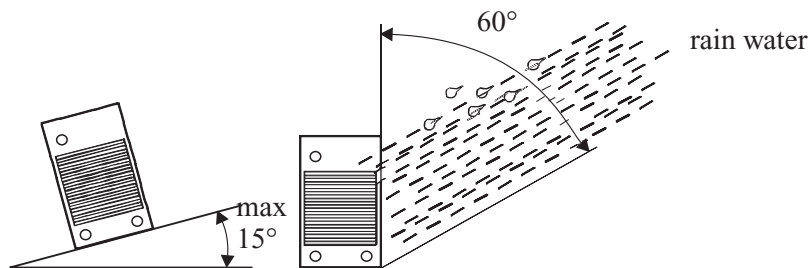


**Make sure that the unit is kept between lifting linens during lifting. When necessary, use additional binding round the lifting linens and the unit's upper part. Use protection between the lifting device and the unit in order to eliminate impacts and shocks.**

### 2.2. SITING THE MACHINE

Site the machine on a stationary, horizontal, dry and clean base from which there does not come any dust etc. into inlet air through the rear grate.

EN 60974-1



- Preferably site the machine above 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 space 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 IP23 of the machine allows a water jet coming in 60 ° angle at its maximum to hit machine's outer covering.



**Do not direct particle spray of grinding tools towards the machine.**

### 2.3. CONNECTION TO THE MAINS SUPPLY

As standard, Kempomig power sources are delivered with 5 m mains cable without plug. If the mains cable does not meet local electric regulations, you must change the cable to meet them.

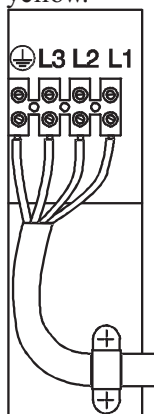


**Connection and change of the mains cable and plug must be carried out only by a competent electrician.**

**During mounting of mains cable, remove the right side plate of the machine, seen from the front.**

When mounting the mains cable ensure the following: The cable is entered into the machine through the inlet ring on the rear wall of the machine and locked with a cable clamp. The phase conductors of the cable are coupled to connectors L1, L2 and L3.

Sizes of mains cables and fuse ratings for the machine at 100 % ED duty cycle are specified in the table Technical data. In cables of S type there is protective grounding conductor coloured green-yellow.



## 2.4. WELDING AND RETURN CURRENT CABLES

Use only copper cables with cross-sectional area of at least 50 mm<sup>2</sup>.

Table below shows typical loading capacities of rubber insulated copper cables, when ambient temperature is 25°C and conductor temperature is 85°C.

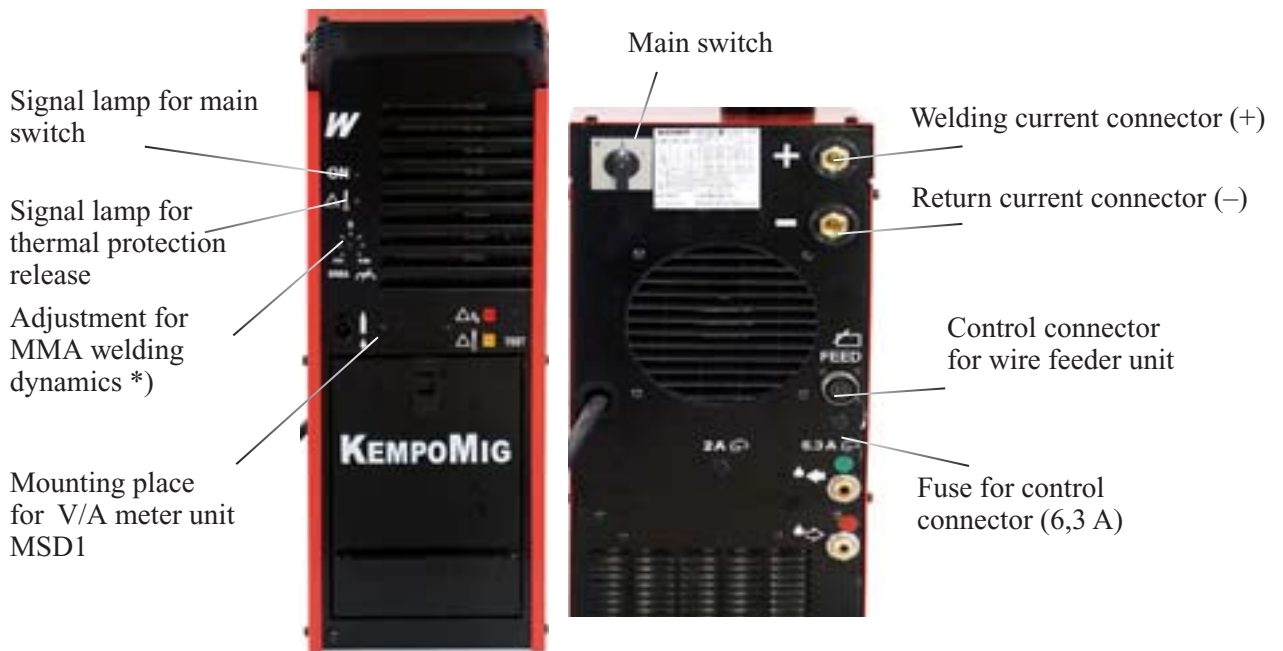
Cable	Duty cycle ED			Voltage loss / 10 m
	100 %	60 %	30 %	
50 mm <sup>2</sup>	285 A	370 A	520 A	0,35 V / 100 A
70 mm <sup>2</sup>	355 A	460 A	650 A	0,25 V / 100 A
95 mm <sup>2</sup>	430 A	560 A	790 A	0,18 V / 100 A

**⚠ To avoid voltage losses and heating, do not overload welding cables over permissible values.**

Fasten the earth clamp of the return current cable carefully, preferably directly onto the work piece. The contact surface area of the clamp should always be as large and steady as possible. Clean the contact surface from paint and rust.

## 3. OPERATION AND USE CONTROLS

### Kempomig 4000R



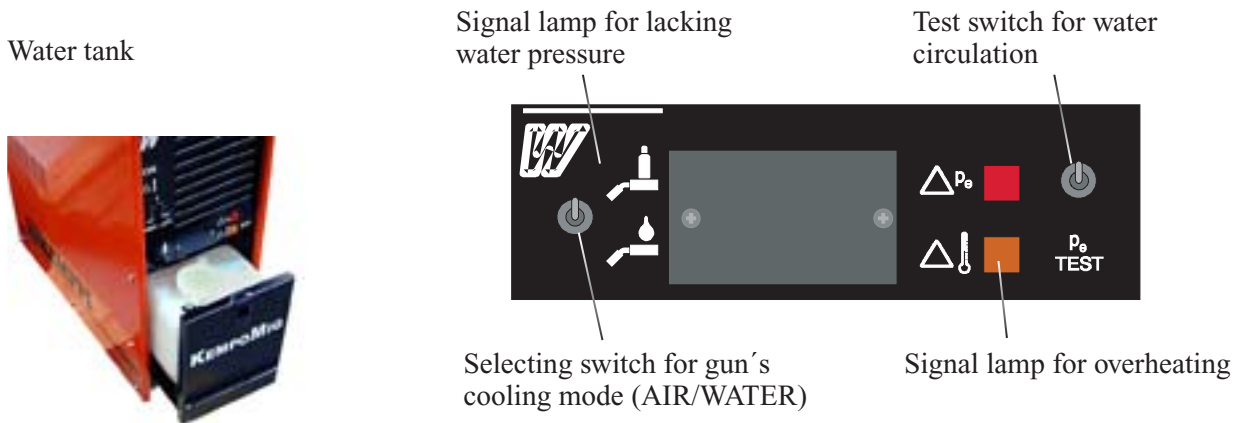
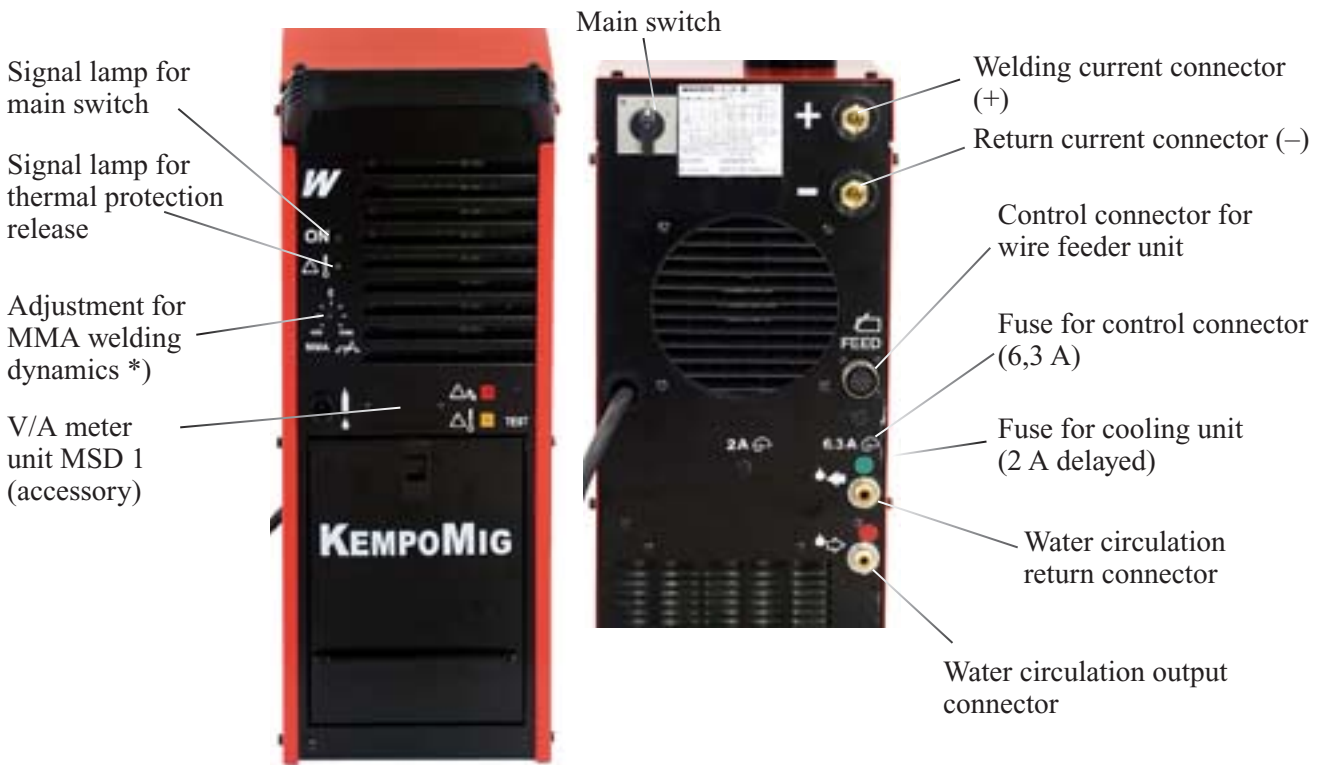
Accessory drawer



Accessory drawer



# Kempomig 4000 WR



---

### 3.1. MAIN SWITCH

When you turn the main switch at the rear wall of the machine into position **I**, signal lamp for readiness of use on the front wall is lit and the machine is ready for use.

**Always switch the machine on and off from the main switch. Never use the mains plug for switching the units and equipment on or off.**

### 3.2. SIGNAL LAMPS

Signal lamps of the machine report on electric function:

**Green signal lamp** for readiness of use is always lit when the machine is connected to mains and the main switch is in position **I**.

**Signal lamp for thermal protection** is lit, when the thermostat has been released due to overheating. The protection is released if the power source is continuously loaded over rated values or cooling air circulation has been obstructed. The cooling fan is cooling down the machine, and after the signal lamp has switched off, the machine is again ready for welding.

### 3.3. ADJUSTMENT FOR MMA DYNAMICS \*)

On adjusting MMA dynamics, you influence the arc behaviour in drop short circuit. In max. setting the arc is at its roughest position and in min. setting at its softest position. Zero setting is recommendable factory setting for welding of all electrodes. When roughness of arc is increased, blowing is also increased and amount of spatter will grow.

Soft arc. Purpose: reduction of spatter in welding at upper end of recommended currents for electrode.

Rough arc. Purpose: e.g. thin stainless electrodes in welding at lower end of recommended currents for electrode.

### 3.4. CONTROL FUSE

On the rear wall of the power source the fuse 6.3 A, delayed, protects the control voltage supply of the power source against the control cable's short-circuit, or against overload caused by the wire feeder unit. Use a fuse size and type according to markings. Damage caused by a wrong type fuse is not covered by the guarantee.

### 3.5. OPERATION OF COOLING FAN

Cooling fan is started and stopped according to use. The cooling fan is started after ca. 30 s after weld start and stopped after ca. 5 - 7 min after weld end.

### 3.6. ADJUSTMENT FOR MIG/MAG WELDING

Adjustments for MIG/MAG welding parameters are made from Feed 420R wire feeder unit which is connected to Kempomig power source. See operation instructions for Feed 420R.

**\*) Feed 420R wire feeding control unit does not support the MMA welding method.**

## 4. ACCESSORIES

### 4.1. V/A METER UNIT MSD 1



The V/A meter unit MSD 1 displays during welding true value of welding current or welding voltage. The current / voltage display is selected with selecting switch of the MSD 1.

For the mounting of the MSD 1, remove the cover plate on the front panel of the unit. The connector of flat cable fastened to the cover plate is connected to the corresponding connector of MSD 1.

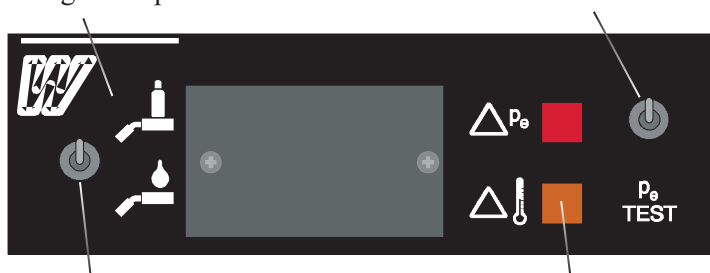
**Note!** MSD 1 does not display arc voltage but the machine's pole voltage. Note that due to cable losses, the arc voltage can be many volts lower than the machine's pole voltage.

### 4.2. COOLING UNIT FUNCTIONS IN KEMPOMIG 4000WR

Kempomig 4000WR has an inbuilt cooling unit inside the power source. Operation control switches of the cooling unit are on the front panel of the power source and the water tank of the cooling system is in front wall drawer.

Signal lamp for lacking water pressure

Test for water circulation



Selecting switch for gun's cooling mode

Signal lamp for overheating

#### 4.2.1. Installation of cooling

1. Connect water hoses of the interconnection cable coming from the wire feeder to snap connectors on the power source's rear wall. The interconnection cable's hose marked with blue colour is for water supplied from the cooling unit to gun. The hose marked with red is for water returning back from gun to cooling unit. Before connecting the interconnection cable, check that in hoses there is no dirt, metal powder, rubber waste etc.
2. The cooling unit's tank is filled with 20 - 40 % glycol / water mixture according to antifreeze requirements. Instead of glycol / water mixture you can also use another suitable liquid according to your experience.
3. Set the selecting switch for gun's cooling mode on the front wall to water cooling mode and start the power source from the main switch.
4. Press the test switch for water circulation until the signal lamp for water pressure is switched off. Fill the water hoses for interconnection cable and gun with the test switch in question. Check the return flow and the tank's water line. The tank volume is ca. 3 litres, the volume for gun and interconnection cable is 0.3 – 1.5 litres. Filling of hoses takes 5 s - 3 min.
5. Start welding in a normal way and the pump starts automatically. After the weld end the pump is still operating for ca. 5-7 min.

**If the water does not start circulating, see paragraph for Operation disturbances.**

**Do not let any waste or dirt get into the water circulation! Check the filling volume before you start welding!**

**Use a cooling liquid according to recommendations or one you know to be good. Keep an eye on liquid material's quality and possible sediments in hoses and in gun.**



## 4.2.2. Operation

### Operating control

The pump starts up automatically when you pull the gun trigger. The water post-circulation continues ca. 5 - 7 min after weld end.

When the power source's main switch is in **O** position all cooling unit functions are stopped!

### Cooling unit's fuse

The fuse 2 A, delayed, on the rear wall of the power source is the short-circuit protection of the cooling unit's auxiliary transformer. Use a fuse size and type according to markings. If the fuse is blown again, send the unit to service.

### Selecting switch for gun's cooling mode




- position: for air-cooled MIG gun.



- position: for water-cooled MIG gun. The pump starts up, when you pull the gun trigger.



**Note!** If you have selected  - position but you are using a water-cooled gun, welding is started by pulling the gun trigger. However, the pump will not get started. This kind of wrong selection will destroy the gun in short time!

### Test switch

With the TEST switch on the cooling unit panel you can circulate water without starting welding. This is used for filling the gun and interconnection cable with cooling water before starting welding. In disturbance situations you can always test the water circulation. **Always check entry of return water into the tank before welding.**

### Signal lamp for overheating

If the cooling water in the tank is overheating, the thermal protection will stop the power source. Cooling unit operation continues automatically ca. 5 - 7 min. After the cooling water has cooled down sufficiently, the signal lamp will switch off, and you can start welding as usual.

### Signal lamp for lacking water pressure

If the pump does not step up sufficient supply pressure, e.g. when the water is running out or in disturbances in the pump the whole equipment will stop after ca. 5 s and the red signal lamp is lit. Check the equipment as upon installation. See chapter for Operation disturbances.

## 4.2.3. Operation disturbances of the cooling unit

**If operation or functional disturbances occur, take measures according to the following list. If the disturbance cannot be eliminated, take contact with an authorised Kemppi repair workshop.**

### The pump does not get started when pressing the TEST switch:

- check the fuse 2 A, DELAYED, on the rear of the cooling unit
- check position for cooling mode selecting switch
- check position for main switch

### The water is pumping but does not return back to the tank or the return flow is weak:

- filling of interconnection cable can take several minutes
- if you have lifted the gun or interconnection cable for the filling time several meters higher than the power source, filling will take place considerably slower. Fill the hoses on the floor position.
- if there is a leakage in the interconnection cable, check the whole flowing line

### The water is pumping, but during welding the red signal lamp for water pressure is lit and the equipment is stopped:

- check the cooling water volume and return flow to the tank
- there are air bubbles or leakages in the system
- pressure switch set value (ca. 1 bar) is unsuitable for the gun being used

### During welding the yellow signal lamp for overheating is lit and the equipment is stopped:

- release the trigger and let the water cool down. When the lamp is switched off, the operation has been reset automatically
- check if the gun is suitable for power being used

## 5. MAINTENANCE

The amount of use and working environment should be taken into account when planning frequency of maintenance of 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 faulty cables!  
Make sure that the mains connection cables used are safe and according to regulations!  
Repair and mounting of mains connection cables should be carried out only by an authorised electrician.

### 5.2. POWER SOURCE

NOTE! Disconnect the plug of the power source from the mains socket before removing the cover plate.

**Check at least every 6 months:**

- Electric connections of the unit - clean the oxidised parts and tighten the loosened ones. NOTE! You must know correct tension torques before starting the repair of the joints.
- Clean the inner parts of the machine from dust and dirt e.g. with a soft brush and vacuum cleaner.

Do not use compressed air, there is a risk that dirt is packed even more tightly into gaps of components!

Do not use a pressure washing device!

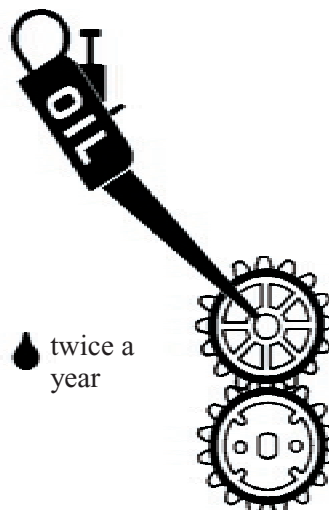
 **Only an authorised electrician may carry out repairs to the machine.**

### 5.3. REGULAR MAINTENANCE

Kemppi service repair workshops perform regular maintenance according to agreement.

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

- Cleaning of equipment
- Checking and maintenance of the welding tools
- Checking of connectors, switches and potentiometers
- Checking of electric connections
- Metering units checking
- Checking of mains cable and plug
- Replacing damaged parts or parts in bad connection with new ones
- Maintenance testing. Operation and performance values of the equipment are checked and adjusted when necessary with test equipment.



---

## 6. ORDERING NUMBERS

### Power sources

Kempomig 4000R.....	6227400R
Kempomig 4000WR.....	6227400WR

### Accessories:

V/A metering unit MSD 1.....	6185666
------------------------------	---------

### Wire feeder units

Feed 420R.....	6236420
Feed 120R.....	6236120

### Accessories:

SYNC 400.....	6263120
GG 400 gas guard.....	6237405
GH 10 gun holder.....	6256010
KV400 swing arm.....	6185247
KV400 50-1.5-GH (cable).....	6260351
KV400 50-1.7-WH (cable).....	6260353
Hub for wheel reel.....	4289880

### MIG guns for robotic use

#### Air-cooled:

MT 38M.....3 m.....	6253038
---------------------	---------

#### Liquid-cooled:

MT 51MW.....1,5 m / SK.....	6255156
MT 51MW.....1,5 m / K30.....	6255157
MT 51MW.....3 m / SK.....	6255158
MT 51MW.....3 m / K30.....	6255159

### Interconnection cables

#### Interconnection cables Kempomig 4000R, 4000WR / Feed 420R

KW 50-1.3-GH.....	6260350
Multimig 70-11-GH.....	6260182

### Return current cable

5 m - 50 mm <sup>2</sup> .....	6184511
--------------------------------	---------

## 7. TECHNICAL DATA

<b>Kempomig</b>		<b>4000R</b>	<b>4000WR</b>
Rated voltage		400 V +10 % ... -15 %	
		3~ 50/60 Hz	
Rated power (MIG)		17.5 kVA / 400 A 50 % ED	
	100 % ED	11 kVA / 300 A	
Mains cable / fuses		4×2.5 S / 16 A delayed	
Loading capacity	50 % ED	400 A / 36 V	
	100 % ED	300 A / 29 V	
Welding voltage control range (stepless)		10 V – 40 V / MIG	
Max welding voltage		40 V / 400 A	
Open circuit voltage		75 V	
Open circuit power		< 55 W	
Efficiency		0.84 (400 A / 36 V)	
Power factor		0.95 (400 A / 36 V)	
Operation temperature range		- 20°C ... + 40 °C	
Storage temperature range		- 40°C ... + 60 °C	
Temperature class		H (180°C) / B (130 °C)	
Degree of protection		IP 23	
Water tank volume		-----	3 l
Cooling capacity (dt = 30 °)		-----	620 W
Max pressure		-----	400 kPa
Max flow		-----	4 l / min
Cooling liquid		-----	20 - 40 % glycol-water mixture
External dimensions	length	640 mm	
	width	240 mm	
	height	720 mm	
Weight		46 kg	57 kg

The products meet conformity requirements for CE marking.

KEMPPI OY  
PL 13  
FIN – 15801 LAHTI  
FINLAND  
Tel (03) 899 11  
Telefax (03) 899 428  
www.kemppi.com

KEMPPIKONEET OY  
PL 13  
FIN – 15801 LAHTI  
FINLAND  
Tel (03) 899 11  
Telefax (03) 7348 398  
e-mail: myynti.fi@kemppi.com

KEMPPI SVERIGE AB  
Box 717  
S – 194 27 UPPLANDS VÄSBY  
SVERIGE  
Tel (08) 59 078 300  
Telefax (08) 59 082 394  
e-mail: sales.se@kemppi.com

KEMPPI NORGE A/S  
Postboks 2151, Postterminalen  
N – 3103 TØNSBERG  
NORGE  
Tel 33 34 60 00  
Telefax 33 34 60 10  
e-mail: sales.no@kemppi.com

KEMPPI DANMARK A/S  
Literbuen 11  
DK – 2740 SKOVLUNDE  
DANMARK  
Tel 44 941 677  
Telefax 44 941 536  
e-mail:sales.dk@kemppi.com

KEMPPI BENELUX B.V.  
Postbus 5603  
NL – 4801 EA BREDA  
NEDERLAND  
Tel (076) 5717 750  
Telefax (076) 5716 345  
e-mail: sales.nl@kemppi.com

KEMPPI (UK) Ltd  
Martti Kemppi Building  
Fraser Road  
Priory Business Park  
BEDFORD, MK443WH  
ENGLAND  
Tel 0845 6444201  
Fax 0845 6444202  
e-mail: sales.uk@kemppi.com

KEMPPI FRANCE S.A.  
S.A. au capital de 5 000 000 F.  
65 Avenue de la Couronne des Prés  
78681 EPONE CEDEX  
FRANCE  
Tel (01) 30 90 04 40  
Telefax (01) 30 90 04 45  
e-mail: sales.fr@kemppi.com

KEMPPI GmbH  
Otto – Hahn – Straße 14  
D – 35510 BUTZBACH  
DEUTSCHLAND  
Tel (06033) 88 020  
Telefax (06033) 72 528  
e-mail:sales.de@kemppi.com

KEMPPI SP. z o.o.  
Ul. Piłsudskiego 2  
05-091 ZĄBKI  
Poland  
Tel +48 22 781 6162  
Telefax +48 22 781 6505  
e-mail: info.pl@kemppi.com

KEMPPI SWITZERLAND AG  
Chemin de la Colice 4  
CH-1023 Crissier/ Lausanne  
SUISSE  
Tel. +41 21 6373020  
Telefax +41 21 6373025  
e-mail: sales.ch@kemppi.com

KEMPPI WELDING  
MACHINES AUSTRALIA PTY LTD  
P.O. Box 404 (2/58 Lancaster Street)  
Ingleburn NSW 2565, Australia  
Tel. +61-2-9605 9500  
Telefax +61-2-9605 5999  
e-mail: info@kemppi.com.au