

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

1921440E

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KEMPOMAT

1701, 2100



CONTENTS


1. PREFACE.....	3
1.1. Introduction	3
1.2. Product introduction	3
1.3. Main components	3
1.4. Switches and controls	4
1.5. Mains connection	4
1.6. Locating the machine	4
1.7. Operation safety	4
2. INSTALLATION OF WELDING GUN AND WIRE	5
2.1. Welding gun main components	5
2.2. Wire feeding mechanism components	5
2.3. Installation of welding gun	6
2.4. To fit the wire reel	6
2.5. To install the welding wire	6
3. OPERATING WELDING EQUIPMENT	6
3.1. Places of use	6
3.2. Main switch	7
3.3. Polarity for welding	7
3.4. Adjustment of arc roughness/Kempomat 2100	7
3.5. Earthing	7
3.6. To select welding mode	7
3.7. To select welding parameters	8
3.8. Thermostat	8
3.9. Shield gas	8
3.10. Welding	9
3.11. Storage. □	9
4. MAINTENANCE OF WELDING UNIT	9
4.1. Daily maintenance	9
4.2. Regular maintenance	9
5. DISPOSAL OF THE MACHINE	10
6. ORDERING NUMBERS	10
7. TECHNICAL INFORMATION	11
8. TERMS OF GUARANTEE	13

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: 

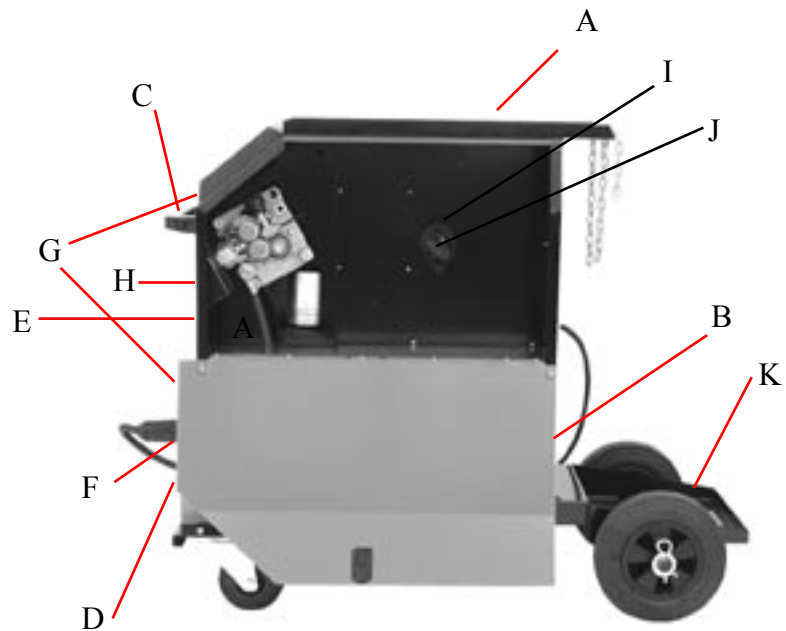
Read the warning texts carefully and follow the instructions. Please also study the Operation safety instructions and respect them when installing, operating and servicing the machine.

1.2. Product introduction

Kempomat is a welding machine with integrated welding current supply and wire feeder. The power supply converts the mains voltage suitable for welding. The wire feeding mechanism feeds wire from a roll through the welding gun nozzle into the arc. A weld is made by moving the welding gun.

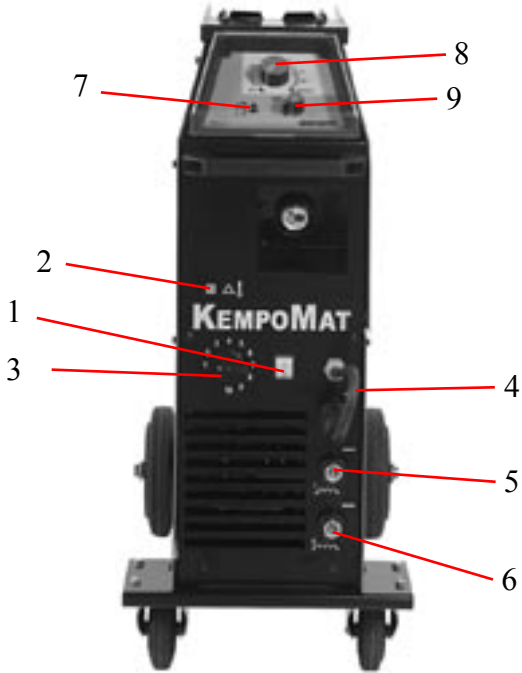
1.3. Main components

- A Housing
- B Door plate
- C Handle
- D Earth cable socket
- E Gun connector
- F Polarity selector
- G Switches and controls
- H Wire feed mechanism
- I Feed roll latch
- J Roll brake control
- K Gas bottle holder



This equipment's electromagnetic compatibility (EMC) is designed for use in an industrial environment. Class A equipment is not intended for use in residential location where the electrical power is provided by the public low-voltage supply system.

1.4. Switches and controls



- 1 Main switch and pilot light
- 2 Overheat control lamp
- 3 Voltage selector
- 4 Polarity selector
- 5 **I** Return current connector (coarser arc), only Kempomat 2100
- 6 **II** Return current connector (softer arc)
- 7 Welding method selector (2-way/spot or 4-sequence)
- 8 Wire feed rate adjustment potentiometer
- 9 Timer potentiometer

1.5. Mains connection

The machine is supplied with the mains cable installed. The cable may be disconnected and the plug installed only by an authorised electrician! See under “Maintenance”. The fuse rating and the cable diameter are given in the chapter Technical data in the end of this document.

1.6. Locating the machine

Use the front panel handles to move the machine. Use ropes for lifting. Do not use a hook or a chain! Place the machine on a horizontal, stable and clean base. Protect from hard rain and intensive sunshine. Ensure unhindered circulation of cooling air.

1.7. Operation safety

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

Welding arc and spatters

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, eg. 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 (eg. 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 switch, if the gun is not directed towards a work piece.

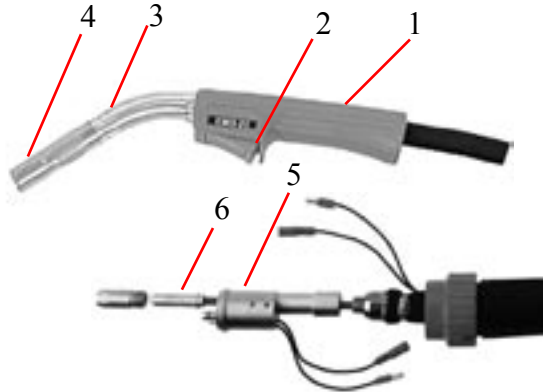
Welding fumes

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 OF WELDING GUN AND WIRE

Select the flow nozzle, the wire conduit and the feed roll to match the wire. The machine is supplied with 0.6 and 0.8 mm dia. wires.

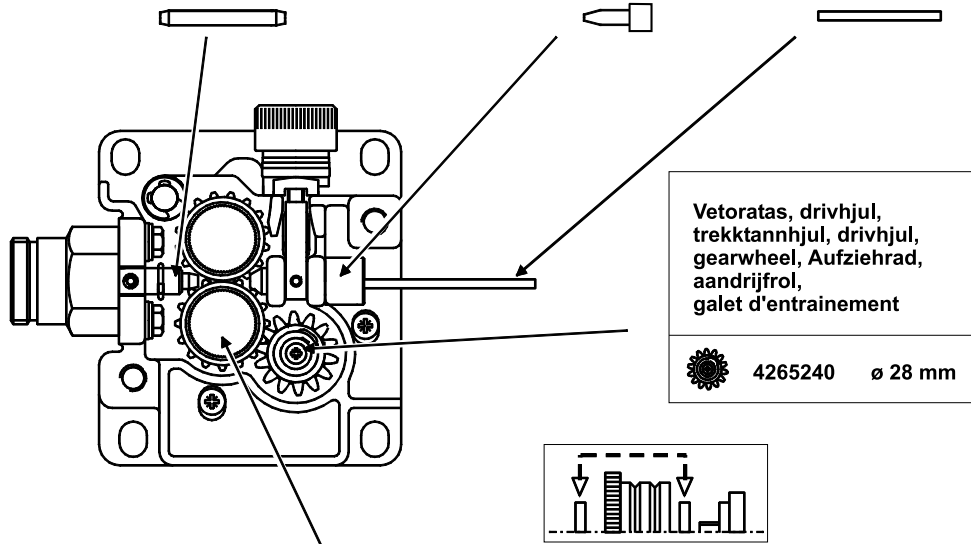
2.1. Welding gun main components



- 1 Handle
- 2 Trigger
- 3 Neck
- 4 Gas nozzle
- 5 Gun connector
- 6 Wire conduit

2.2. Wire feeding mechanism components

FE FEMC FEFC SSFC	0.6 - 0.8 mm	3134140 \varnothing 1 mm Valkoinen, vit, hvit, hvid, white, weiss, wit, blanc	4285900 Messinki, Messing, Messing, Mässing, Brass, Messing, Messing, Laiton	4102283 \varnothing 1,8 mm Muovi, plast, plast, plastic, plastic, Kunststoff, plastic, plastique
	0.9 - 1.6 mm	3133700 \varnothing 2 mm Oranssi, orange, oransje, orange, orange, orange, oranje, orange		
SS AL	0.8 - 1.6 mm	3134290 \varnothing 2 mm Hopea, silver, sølv, sølv, silver, Silber, zilveren, argent		



			0.6 mm	0.8 mm 0.030"	0.9 - 1.0 mm 0.035"	1.2 mm 0.045-52"	1.4 - 1.6 mm 1 / 16"
FE SS AL	Sileä, slät, slett, glatt, plain, glatt, glad, lisse		3133810 Valkoinen, vit, hvit, hvid, white, weiss, wit, blanc		3133210 Punainen, rød, rød, rød, red, rot, rood, rouge		3133820 Keltainen, gul, gul, gul, yellow, gelb, geel, jaune
FE FC	Pyälletty, räfflat, riflet, riflet, knurled, gerillt gekarteld, cranté			—	3133940 Punainen, rød, rød, rød, red, rot, rood, rouge		3133990 Keltainen, gul, gul, gul, yellow, gelb, geel, jaune
AL	U - ura, U - spår, U - spor, U - spor, U - groove, U - Nut, U - groef, gorge U			—	3133960 Punainen, rød, rød, rød, red, rot, rood, rouge		—

2.3. Installation of welding gun

To ensure trouble-free welding use only original Kemppi welding guns. Do not use a damaged gun.

Make sure the gun wire conduit and the flow nozzle match the manufacturer's recommendations for the type and diameter of the wire you use. Too small a conduit may overload the wire feed device and disturb wire feeding.

Tighten the gun quick connector to eliminate voltage losses. A loose joint will make the gun and the wire feeder warm. After this check that the conduit inside the wire liner does not touch the feed rolls.

2.4. To fit the wire reel

1. Release the reel latch claws by turning them 1/4 of a turn.
2. Insert the reel so that the hole in the reel will be at the pin of the device. Use reel supports, when required.
3. Insert the reel. N.B.!The wire travels from the top of the roll to the wire feed unit.
4. Secure the reel by turning the latch.



2.5. To install the welding wire

Before installing the welding wire check that the feed roll, the wire conduit and the flow nozzle match the wire.

1. Fit in the feed roll and check once more that the correct groove is in line with the wire.
2. Round the end of the wire and push it through wire guide into burner's wire tube
3. Check, that the wire is in the groove and set clamping lever on its place. Tighten only a little.
4. Feed the wire into the gun by pressing the gun switch. Wire clamping force to the feed roll is correct, when wire coming out of flow nozzle can be lightly slowed down with fingers.
5. Regulate braking power of wire roll by turning the adjustment screw in the centre of latch with a screw driver. Do not tighten too much, as the brake puts an additional load on motor.



Note! Not wire nor wire reel must touch the unit body, as it creates a danger of short circuit!
When using aluminium wire it might be advisable to totally remove the spiral part of the back guide. If you use cored wire, check the wire manufacturer's instructions on use and safety first.

3. OPERATING WELDING EQUIPMENT

Also see section 1. Before you start using the welding machine.



Welding in fire or explosion hazard sites is absolutely forbidden!

Note! When welding in other than industrial surroundings, the unit might cause disturbance in radio equipment. Taking necessary precautions is the responsibility of the user.

3.1. Places of use

Kempomat is a basic welding machine for MIG/MAG welding in maintenance, servicing and repair works. It is suitable for both normal MIG/MAG welding as well as for welding without shield gas.

3.2. Main switch

In position I control circuit of the unit is live and indicator light of main switch is on. Power source and welding circuit become active, when gun trigger is pressed.

Note. If mains power is shut off or triggered, you must wait 10 to 15 sec, before switching power back on.

Always switch the unit on and off from the main switch. Do not use the mains plug as a switch!



Beware that neither you yourself, gas bottles nor electric equipment become a part of the welding electric circuit!

3.3. To select polarity for welding

Solid wire is usually welded in + pole and cored wire in - pole gun. Check for the recommended polarity on package or product seller. When welding very thin plates (0.5 to 0.7 mm) - polarity might also work best for solid wire.

3.4. Adjustment for arc roughness I II /Kempomat 2100

Arc roughness is set by connecting the return current cable or polarity selector cable to the one of the two dix connectors on the front plate.

The connector marked with symbol **I** gives a rougher arc, which is used for welding of thin sheets and ferrous metals by lower currents. Consider especially with CO₂ shielding gas.

The connector marked with symbol **II** is suitable for greater currents and especially for aluminium and stainless materials. The most suitable roughness is, however, most dependent on the welding case. You will find the best position by testing.

3.5. Earthing

If possible, always fix the earth clamp of return current cable directly on the welding target. Clean earth clamp touch surface of paint and rust. Secure clamp so, that the surface it is touching is as large as possible. Finally check that clamp sits tightly.

3.6. To select welding mode

Also see section 1.4. Switches and controls.

Use the welding mode selecting switch to select how to regulate shield gas flow and wire feed in welding gun switch. You have three welding modes to select from:



2T –sequence procedure

Gas flow and wire inch start when gun switch is pressed and end when the switch is released. Wire feed is in cycles, if timer potentiometer is set on time scale range.



4 T -sequence procedure

Gas flow starts when gun switch is pressed all the way. When the switch is released, wire inch starts and welding begins. When the gun switch is pressed again, wire inch is interrupted and when the switch is released, shield gas flow ends. Wire inch will be in cycles, if timer potentiometer is set on time scale range.

● Spot welding procedure

Shield gas flow and wire inch start, when gun switch is pressed all the way and end when time set by the timer potentiometer ends or when the gun switch is released. If the timer potentiometer is in 0 range this procedure will not start.

TIMER potentiometer

Welding can be spaced by selecting a time for welding period on timer potentiometer. Wire feed and gas flow will be automatically interrupted after set time and automatically restarted.

3.7. To select welding parameters

1. Select adjustment step of voltage switch.
2. Set adjustment potentiometer of wire inch speed on the same number.



3. Test the weld and make necessary adjustments in wire inch.
4. If fusion power is not suitable for the target, set the voltage anew. Also adjust wire feed, if necessary. Repeat until the values suit the target.

Kempomat 1700

Voltage step	Open circuit voltage
1	16,1 V
2	17,5 V
3	19,2 V
4	21,1 V
5	23,6 V
6	26,4 V
7	30,1 V
8	34,7 V

Kempomat 2100

Voltage step	Open circuit voltage
1	16,9 V
2	18,2 V
3	19,6 V
4	21,1 V
5	22,8 V
6	24,6 V
7	26,4 V
8	28,5 V
9	30,8 V
10	33,1 V

3.8. Thermostat

Thermal protection of the unit prevents the power source from overheating. Thus the unit will not be damaged, even if load during welding exceeds load factor. When overheating pilot lamp lights, welding is not possible. There is an appr. 3 min delay before the light goes out, and welding can be normally continued by starting from the trigger. The light can also signify low supply voltage or an overtly long welding period.



3.9. Shield gas



Handle gas bottle with care, it might explode if it falls down!

Because the danger of falling, the gas bottle must not be higher than 1600 mm.

Shield gas shields the arc and in MAG welding it is also used for reinforcing the weld seam. Shield gas for steel wire is carbon dioxide (CO₂) or mixed gas, where main component is argon (Ar) and the rest is carbon dioxide. When welding aluminium wire, pure argon is used as shield gas.

Flow meter must be suitable for gas type. Usually suitable flow is 8 to 10 l/min. If flow is too slow or too big, the weld seam becomes porous.

Your dealer will give you advice on choosing gas and equipment.



Note! Always mount the gas bottle in upright position in a specially made rack on the wall or in a bottle trolley. Always close the bottle valve after finishing welding.

3.10. Welding



Never look at the flame arc without a face shield for arc welding! Protect yourself and your surroundings from the flame arc and hot spatter!

You can start welding, when selections and adjustments demanded by the work have been done. Welding begins when wire is pressed to the work piece by pressing the gun switch. Arc forms, shield gas starts to flow and wire feed inches welding wire out of the gun nozzle.

Note! It is advisable to test welding first on something else than the work piece.



Welding fumes are a possible health hazard, make certain there is sufficient ventilation during welding!

3.11. Storage

Store the unit in a clean and dry place. Shield it from rain and at temperatures exceeding 25 °C from direct exposure to sun. There must be sufficient free space in front and back of the unit for air circulation.

4. MAINTENANCE OF WELDING UNIT

4.1. Daily maintenance



Be careful of mains voltage when handling electric cables!

Clean wire passage in gun and check contact tip regularly.

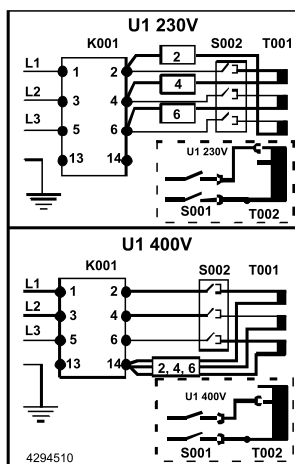
Always check condition of mains and welding cables before use, change damaged ones.

Note! Mains cable can be changed only by a qualified electrician!

Mains cable is changed as follows:

Kempomat 1701

1. Detach back plate of wire reel.
2. Connect mains cable to main switch pins with flat clamps.
3. Connect green and yellow earth to the body plug marked as earth.



Kempomat 2100

By delivery from the factory the Kempomat machine has been connected for mains voltage 3~400V.

In order to change the mains voltage loosen the right side plate of the machine, change the connections according to the enclosed diagram.

4.2. Regular maintenance

KEMPPI service workshops make service contracts with customers about regular maintenance. All parts are cleaned, checked, and if necessary, repaired. Also the operation of welding machine is tested.

5. DISPOSAL OF THE MACHINE



Do not dispose of electrical equipment together 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 returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative.

By applying this European Directive you will improve the environment and human health!

6. ORDERING NUMBERS

Part	Ordering number
Kempomat 1701 1~ 230 V welding machine	6214171
Kempomat 2100 3~ 230/400 V welding machine	621421001
Earth cable 16mm ² , 3 m	4260000
MIG welding gun, 3 m KMG 20	6251113
MIG welding gun, 3 m MT 18	6251013
Hub for wire reel	4289880

7. TECHNICAL INFORMATION

Kempomat 1701 1~ 230 V Welding machine

Rated voltage		1~ 230 V 50/60 Hz
Mains cable/fuse		3x1,5 mm ² /16 A delayed
Mains connection		220 V -10 %...240 V+ 6%
Connected load	15 % ED	6.5 kVA
	60 % ED	3.0 kVA
	100 % ED	2.3 kVA
Load capacity		
	15 % ED	170 A/21 V
	60 % ED	85 A / 18.5 V
	100 % ED	76 A / 17.5 V
Adjustment range		30 A / 14 V ... 170 A / 22.5 V
Voltage adjustment		8 steps
open circuit voltage, max.		40 V
Efficiency		70 % / 170 A / 21 V
Power ratio		0,85 / 170 A / 21 V
Wire feed speed		0 – 16 m/min, stepless
Wires with filler		
	Ø Fe, SS	0.6 - 1.0 mm
	Ø Cored wire	0.9 - 1.2 mm
	Ø Al	1.0 mm
Wire reel:		
	maximum weight	20 kg
	maximum diameter	300 mm
Gun connection		Euro
Thermal class		H (180 °C)
Range of temperature for use		-20 ... +40 °C
Storage temperature range		-40 ... +60 °C
Degree of protection		IP 23 C
Measurements:	length	850 mm
	width	392 mm
	height	750 mm
Weight		47 kg

The unit fulfils the CE marking demands.

Kempomat 2100 3~ 230/400 Welding machine

Rated voltage	3~ 230 V 50/60 Hz / 3~ 400 V 50/60 Hz
Mains cable/fuse	3x1,5 mm ² /10 A delayed
Mains connection	220 V -10 %...240 V+6% / 380 V -10 %...415 V +6 %
Connected load	25 % ED 7.5 kVA
	60 % ED 4.0 kVA
	100 % ED 2.8 kVA
Load capacity	
	25 % ED 200 A / 23 V
	60 % ED 130 A / 20.5 V
	100 % ED 100 A / 19 V
Adjustment range	30 A / 14 V ... 200 A / 24 V
Voltage adjustment	10 steps
Idle voltage, max.	40 V
Efficiency	85 % / 200 A / 24 V
Power ratio	0,90 / 200 A / 24 V
Wire feed speed	0 – 18 m/min, stepless
Wires with filler	
	Ø Fe, SS 0.6 - 1.0 mm
	Ø Cored wire 0.9 - 1.2 mm
	Ø Al 1.0 mm
Wire reel:	
	maximum weight 20 kg
	maximum diameter 300 mm
Gun connection	Euro
Thermal class	H (180 °C)
Range of temperature for use	-20 ... +40 °C
Storage temperature range	-40 ... +60 °C
Degree of protection	IP 23 C
Measurements:	length 910 mm
	width 410 mm
	height 820 mm
Weight	54 kg

The unit fulfils the CE marking demands.

8. TERMS OF GUARANTEE

Kemppi Oy provides a guarantee for products manufactured and sold by them if defects in manufacture and materials occur. Guarantee repairs must be carried out only by an Authorised Kemppi Service Agent. Packing, freight and insurance costs to be paid by orderer. The guarantee is effected on the date of purchase. Verbal promises which do not comply with the terms of guarantee are not binding on guarantor.

Limitations on guarantee

The following conditions are not covered under the terms of guarantee: defects due to natural wear and tear, non-compliance with operating and maintenance instructions, connection to incorrect or faulty supply voltage (including voltage surges outside equipment spec.), incorrect gas pressure, overloading, transport or storage damage, fire or damage due to natural causes i.e. lightning or flooding.

This guarantee does not cover direct or indirect travelling costs, daily allowances or accommodation. Note: Under the terms of guarantee, welding torches and their consumables, feeder drive rolls and feeder guide tubes are not covered. Direct or indirect damage due to a defective product is not covered under the guarantee. The guarantee is void if changes are made to the product without approval of the manufacturer, or if repairs are carried out using non-approved spare parts.

The guarantee is also void if repairs are carried out by non-authorized agents.

Undertaking guarantee repairs

Guarantee defects must be informed to Kemppi or authorised Kemppi Service Agents within the guarantee period. Before any guarantee work is undertaken, the customer must provide proof of guarantee or proof of purchase, and serial number of the equipment in order to validate the guarantee. The parts replaced under the terms of guarantee remain the property of Kemppi.

Following the guarantee repair, the guarantee of the machine or equipment, repaired or replaced, will be continued to the end of the original guarantee period.

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