

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

192200E

0533

KEMPOMAT

2500

3200

4200



CONTENTS

1. PREFACE	3
1.1. INTRODUCTION	3
1.2. PRODUCT INTRODUCTION	3
1.3. OPERATION SAFETY	3
2. INSTALLATION OF THE POWER SOURCE	4
2.1. SITING THE MACHINE	4
2.2. CONNECTION TO THE MAINS SUPPLY	4
2.3. MOUNTING OF THE MAINS CABLE	4
2.4. WELDING AND RETURN CURRENT CABLES	5
3. USE OF WIREFEEDER	6
3.1. PARTS OF WIRE FEED MECHANISM	6
3.2. INSTALLATION OF THE WIRE FEED SYSTEM	8
3.3. INSTALLATION OF WIRE FEED	8
3.4. MOUNTING OF MIG WELDING GUN	9
3.5. MOUNTING AND LOCKING OF WIRE REEL	9
3.6. AUTOMATIC WIRE FEED TO GUN	10
3.7. ADJUSTMENT OF TIGHTNESS OF WIRE REEL BRAKE	10
3.8. SHIELDING GAS	11
4. OPERATION AND USE OF POWER SOURCE	12
4.1. KEMPOMAT PANELS	12
4.2. WIRE FEED PANEL	13
4.3. WIRE FEEDER UNIT	13
4.4. MAIN SWITCHES AND PILOT LAMPS	14
4.5. ADJUSTMENT FOR ARC ROUGHNESS	15
4.6. OPERATION OF COOLING FAN	15
5. CONTROL PANELS AND ADJUSTMENTS	15
5.1. WIRE FEED SPEED POTENTIOMETER	15
5.2. BURN BACK TIME	15
5.3. KMW TIMER FUNCTIONS	16
6. ACCESSORIES	17
6.1. KMW SYNC	17
6.2. INSTALLATION AND MOUNTING OF KMW SYNC	17
7. OPERATION DISTURBANCES	18
8. REGULAR MAINTENANCE OF THE EQUIPMENT	19
8.1. CABLES	19
8.2. POWER SOURCE	19
8.3. DISPOSAL OF THE MACHINE	20
9. ORDERING NUMBERS	20
10. TECHNICAL DATA	21
11. TERMS OF GUARANTEE	24

1. PREFACE

1.1. INTRODUCTION

Congratulations on having purchased a KEMPPI product. Properly installed and used Kemppi products should prove to be productive machines requiring a small amount of seasonal maintenance. 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 completely 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, where ever there exists a danger to life or injury the following symbol is used:



Read the warnings 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

The power sources Kempomat 3200 and 4200 are compact MIG welding machines, designed for heavy industrial use. Kempomat 2500 is compact MIG welding machine, designed for repair shops and light and heavy industrial use.

Power source

Supply voltage of the Kempomat 2500 power source is 3~ 230 V/400 V. Supply voltage of the Kempomat 3200 power source is 3~ 230 V/400 V. Welding voltage adjustment is in 10-steps. Adjustment for voltage of power source is in 40-steps.

In Kempomat 4200 product range there are different units for mains voltages 3~ 230 and 400 V. The welding voltage adjustment for 230 V power source is made in 32 steps, 400V power source in 56-steps. The Volt/Ampere metering unit MSD 1 (available as accessory) displays voltage or welding current.

Wire feeder unit

The wire feeder unit is a fixed unit in the equipment for air-cooled guns. Kempomat 2500 is equipped with 2 wheel wire drive mechanism, Kempomat 3200 and 4200 are equipped with 4 wheel wire drive mechanism. Accessory unit KMW sync is needed for connection and use of push-pull guns.

1.3. 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.

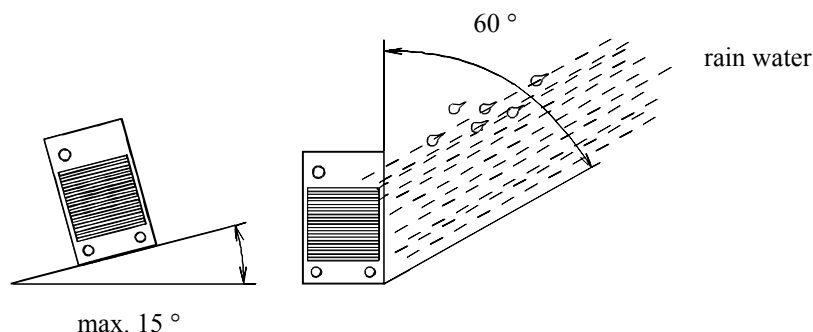
⚠ This equipment's electromagnetic compatibility (EMC) is designed for use in an industrial environment. Class A equipment is not intended for use in residential location where the electrical power is provided by the public low-voltage supply system.

2. INSTALLATION OF THE POWER SOURCE

2.1. SITING THE MACHINE

Site the machine on a stationary, horizontal, dry and clean base from which there doesn't come any dust etc. into inlet air through the rear grate. Ensure the free circulation of the cooling air.

- Degree of protection IP23C of the machine 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 the particle spray, created by grinding tools etc.
- There must be free space in front of the machine as well as at the rear of the machine to allow good circulation of the cooling air through the machine.
- Protect the machine against straight rain and in circumstances over 25°C against direct sunshine.



2.2. CONNECTION TO THE MAINS SUPPLY

Connection and change of the mains cable and the plug must be carried out only by a competent electrician. Remove for the mounting of the mains cable the left side plate, seen from the front of the power source.

The Kempomat power source is equipped with 5 m supply cable without plug. The mains cable is according to the marking H07RN-F of the norm CENELEC HD22. The mains cable must be changed if it doesn't meet local regulations.

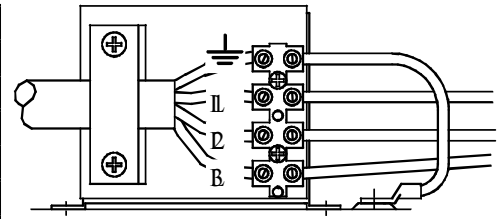
2.3. MOUNTING OF THE MAINS CABLE

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

The cable is entered into the machine through the inlet ring on the rear wall of the machine and locked with a cable clamp (05).

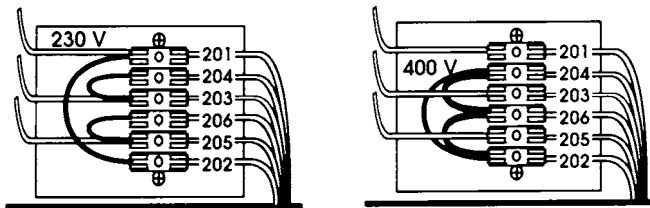
The phase conductors of the cable are coupled to connectors L1, L2 and L3. The earth protection coloured green-yellow is coupled to connector marked with earth protection symbol \oplus . If you are using 5-conductor cable, you must cut the zero conductor to the level of the cable's protective shield.

Kempomat 2500		
Rated voltage	230 V	400 V
Fuses, delayed	16 A	10 A
Connection cable	4 x 2,5 S mm ²	4 x 2,5 S mm ²
Kempomat 3200		
Rated voltage	230 V	400 V
Fuses, delayed	20 A	16 A
Connection cable	4 x 2,5 S mm ²	4 x 2,5 S mm ²
Kempomat 4200		
Rated voltage	230 V	400 V
Fuses, delayed	25 A	16 A
Connection cable	4 x 6,0 S mm ²	4 x 2,5 S mm ²



Change of mains voltage / Kempomat 2500, 3200

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



Connection 3~ 230 or 3~ 400 V of mains voltage

By delivery from the factory the Kempomat 3200 and 2500 machine has been connected for mains voltage 3~ 400 V. In order to change the mains voltage in the Kempomat 2500/3200 machine, remove the side plate of the machine. Change the connections according to the enclosed diagram. You find the corresponding wiring diagram on the instruction label, which is under terminal block.

⚠ Note! The Kempomat 4200 machine has the connection for only one mains voltage!

2.4. WELDING AND RETURN CURRENT CABLES

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

Kempomat 2500				
Cable cross-section	Duty cycle ED			Voltage loss / 10 m
	100 %	60 %	30 %	
Cu				for 100 A
25 mm ²	180 A	230 A	330 A	0.7 V
35 mm ²	225 A	290 A	410 A	0.5 V
Kempomat 3200, 4200				
Cable cross-section	Duty cycle ED			Voltage loss / 10 m
	100 %	60 %	40 %	
Cu				for 100 A
50 mm ²	285 A	370 A	450 A	0.35 V
70 mm ²	355 A	460 A	560 A	0.25 V

⚠ Don't overload welding cables over permissible values 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 area of the press should always be as large and steady as possible. Clean the contact surface from paint and rust.

3. USE OF WIREFEEDER

3.1. PARTS OF WIRE FEED MECHANISM

Kempomat 2500

2 - roll wire feed mechanism



Wire guide tubes

Fe	∅ 0,6...0,8 mm	∅ 1,0 mm	3134140	brass	∅ 1,8 mm	4102283
Mc		white				
Fc	∅ 0,9...1,6 mm	∅ 2,0 mm	3133700	plastic		
		orange				
Ss	∅ 0,8...1,6 mm	∅ 2,5 mm	3134290			
Al		silver				

pressure adjustment

Syöttöpyörän uran valinta, val av matarhjulspår, valg av matehjul spor, valg af spor i tråd hjul, selection of feed wheel groove, Auswahl der Transportrollennut, selectie van de draaddiameter groef, sélection de la gorge du galet

4292030

Vetoratas, drivhjul, trekktannhjul, drivhjul, gearwheel, Aufziehrad, aandrijfrol, galet d'entraînement
 ∅ 28 mm (0 - 18 m/min) 4265240
 Muovi, plast, plast, plastic, plastic, Kunststoff, plastic, plastique
 ∅ 28 mm (0 - 18 m/min) 4287860
 Teräs, stål, stål, steel, Stahl, staal, acier

Vetorataan valintalevyn siirto, flytning av distansbricka, flytning av avståndsskive for matehjul, hvordan flytter man justerskiven, relocation of selection plate, Versetzen der Wahlschalterplatte, verplaatsing van selectie plaat, remise en place de la rondelle de sélection

Feed rolls

Fe	Plain	∅ 0,6/0,8 ∅ 0,8/0,8 (L) white	∅ 1,0/1,2	3133210	∅ 1,4-1,6	3133820
Ss			∅ 1,0/1,0 (L)	3138650	∅ 1,6/1,6 (L)	3141120
Al			∅ 1,2/1,2 (L)	3137390	orange	yellow
Fe	Knurled		∅ 1,0/1,2	3133940	∅ 1,4-1,6	3133990
Fc			red	∅ 1,6/1,6 (L)	3141130	
Mc			∅ 1,2/1,2 (L)	3137380	orange	yellow
Fe	Trapezoid		∅ 1,2/1,2 (L)	3142210	∅ 1,4/1,4 (L)	3142220
Fc			orange	brown	∅ 1,6/1,6 (L)	3142200
Mc				yellow		

(L) = Ball race

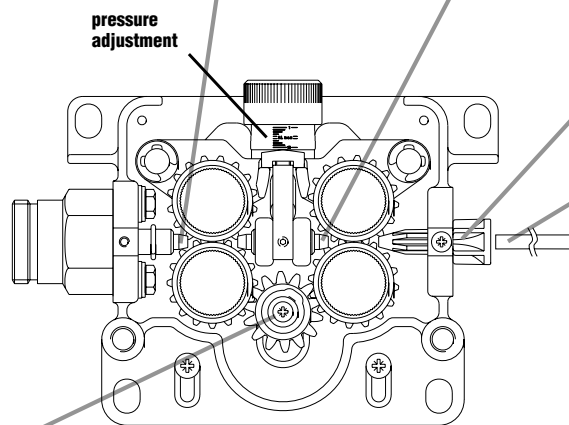
W000575

Kempomat 3200, 4200

4 - roll wire feed mechanism

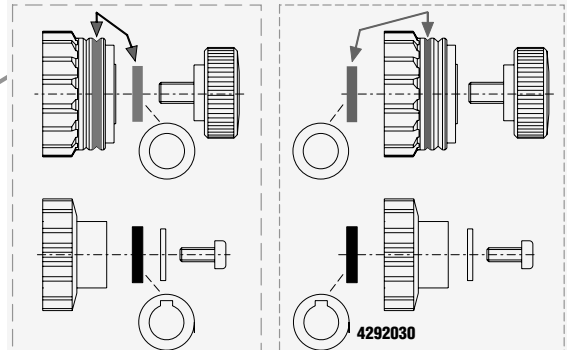


Wire guide tubes									
Fe	Ø 0,6...0,8 mm	Ø 1,0 mm white	3134140	Ø 2,0 mm orange	3134120	Ø 2,0 mm plastic	4267220	Ø 2,4 mm yellow	4268210
		Ø 2,0 mm plastic	4266970						
Mc	Ø 0,9...1,6 mm	Ø 2,0 mm orange	3133700	Ø 4,0 mm blue	3134110	Ø 4,0 mm plastic	4270180	Promig 511	
		Ø 4,0 mm blue	3134130	Ø 4,0 mm brass	4267030				
Fc	Ø 1,6...2,4 mm	Ø 2,5 mm silver	3134290	Ø 2,5 mm silver	3134300	Ø 2,0 mm plastic	4267220	Ø 3,0 mm yellow	4268560
		Ø 3,0 mm yellow	3134710	Ø 3,0 mm yellow	3134720	Ø 4,0 mm plastic	4270180		
Ss	Ø 0,8...1,6 mm	Ø 2,5 mm silver	3134290	Ø 2,5 mm silver	3134300	Ø 2,0 mm plastic	4267220		
Al	Ø 1,6...2,4 mm	Ø 3,0 mm yellow	3134710	Ø 3,0 mm yellow	3134720	Ø 4,0 mm plastic	4270180		



pressure adjustment

Syöttöpöyrän uran valinta, val av matarhjulspår, valg av matehjul spor, valg af spor i tråd hjul, selection of feed wheel groove, Auswahl der Transportrollennut, selectie van de draaddiameter groef, sélection de la gorge du galet



Vetoratas, drivhjul, trekkattanhjul, drivhjul, gearwheel, Aufziehrad, aandrijfrol, galet d'entraînement

Ø 28 mm (0 - 18 m/min) 4265240, Ø 40 mm (0 - 25 m/min) 4265250
Muovi, plast, plastic, plastic, Kunststoff, plastic, plastique

Ø 28 mm (0 - 18 m/min) 4287860, Ø 40 mm (0 - 25 m/min) 4297270
Teräs, stål, stål, stål, steel, Stahl, staal, acier

Vetorataan valintalevyn siirto, flytning av distansbricka, flytting av avstandsskive for matehjul, hvordan flytter man justerskiven, relocation of selection plate, Versetzen der Wahlschalterplatte, verplaatsing van selectie plaat, remise en place de la rondelle de sélection

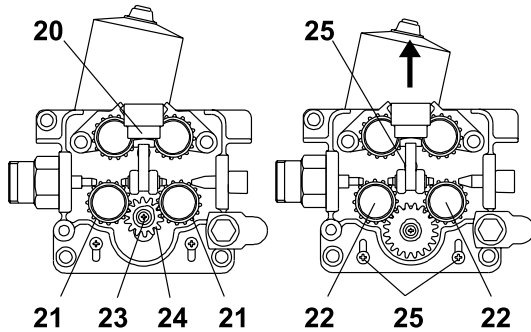
Feed rolls										
Fe Ss Al	Plain	Ø 0,6/0,8 Ø 0,8/0,8 (L) white	Ø 1,0/1,2	3133810	Ø 1,0/1,0 (L)	3133210	Ø 1,4-1,6/2,0	3133820	Ø 2,4	3133880
			Ø 1,2/1,2 (L)	3134310	red	3138650	Ø 1,6/1,6 (L)	3141120	black	3133910
			orange	3137390	yellow		blue			
Fe Fc Mc	Knurled		Ø 1,0/1,2	3133940	Ø 1,4-1,6/2,0	3133990	Ø 2,4	3134030		
			Ø 1,2/1,2 (L)	3137380	red	3141130	black	3134060		
Fe Fc Mc Ss Al	Trapezoid		Ø 1,2/1,2 (L)	3142210	Ø 1,4/1,4 (L)	3142220	Ø 2,0/2,0 (L)	3142230		
			orange		brown	3142200	grey	3142240		
					yellow		black			

(L) = Ball race

W000574

eng

3.2. INSTALLATION OF THE WIRE FEED SYSTEM



Wire feeder unit:

1. Mount the return current cable to connector on the Kempomat's front panel.
2. The MIG gun is mounted to the EURO connector of the wire feeder unit.
Use guide tubes and contact tips according to manufacturer's operation instructions. Accessories which are too tight or otherwise unsuitable for the wire type used by you, will cause wire feed disturbances.
3. (Kempomat 3200 and 4200)
Max. wire feed speed
When the unit is delivered the max. wire feed speed is 18 m/min, which is enough for the most welding works. If you need a higher speed, you can increase the max. wire feed speed to 25 m/min by replacing the gear wheel on motor shaft to a bigger one. The big gear wheel (D40) is delivered on order.

When necessary speed is changed according to following:

- Open tightening lever (20). Remove lower feed rolls (21). Release screw (23) and its washer. Remove gear wheel D28 (24) from motor shaft.
 - Loosen screws (25) (3 pc) 1 twist. Mount the D40 gear wheel onto motor shaft. Screw the screw (23) with its washer back.
 - Put feed rolls (21) back to their axles, however don't fasten yet fastening screws of the feed rolls (22).
 - Lift the motor so that the tooth gap between gear wheel and both lower feed rolls is approx. 0,2 mm.
 - Tighten screws (25). Check gear teeth gaps, when necessary put the motor into a better position. Screw on the mounting rolls of feed rolls (22).
Too small gap between gear wheel and feed rolls will overload motor.
Too big gap for its part might cause too rapid wearing for teeth of feed rolls and gear wheel.
4. The shielding gas hose is mounted to the snap connector on the rear wall of the unit. Mounting to the gas bottle and shielding gas flow regulation, see paragraph for SHIELDING GAS.

3.3. INSTALLATION OF WIRE FEED

Accessories according to wire feed

Wire feed rolls are available with plain groove, knurled groove and with trapezoidal groove for different purposes.

Kempomat 2500		
Colour	Filler wire \varnothing , mm	inch
Feed rolls		
white	0.6 and 0.8	0.030
red	0.9/1.0 and 1.2	0.035, 0.045 and 0.052
Guide tubes		
orange	0.6-1.6	0.024-1/16

Kempomat 3200, 4200		
Colour	Filler wire ø, mm	inch
	Feed rolls	
white	0.6 and 0.8	0.030
red	0.9/1.0 and 1.2	0.035, 0.045 and 0.052
yellow	1.4, 1.6 and 2.0	1/16 and 5/64
	Guide tubes	
orange	0.6-1.6	0.024-1/16

Feed roll with plain groove:

Universal feed roll for welding of all kinds of wires

Feed rolls with knurled groove:

Special feed roll for cored wires and steel wires

Feed rolls with trapezoidal groove:

Special feed roll for aluminium wires

Wire feed rolls have two grooves for different filler wire diameters. Correct wire groove is selected by moving selecting washer from one side to another in feed roll.

Feed rolls and wire guide tubes have colour codes in order to make identification easier.

By delivery Kempomat is equipped with red feed rolls with plain groove and with orange wire guide tubes for welding filler wires 0.9 - 1.2 mm (0.035", 0.045" and 0.052").

3.4. MOUNTING OF MIG WELDING GUN

In order to ensure trouble-free welding check in operation instructions of gun used by you that wire guide tube and contact tip of gun are according to manufacturer's recommendation suitable to be used for wire feed diameter and type in question. Too tight a wire guide tube might cause for wire feeder unit a bigger stress than normally as well as disturbances in wire feed.

Screw snap connector of gun tight that there won't come any voltage losses on connecting surface.

A loose connection will heat gun and wire feeder unit.



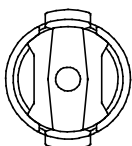
Make sure that the welding gun in your use is designed for max. welding current needed by you! Never use a damaged welding gun!

3.5. MOUNTING AND LOCKING OF WIRE REEL

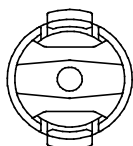
- Release locking nails of wire reel hub by turning locking knob to the position OPEN.
- Mount the reel at its place. Note rotating direction of reel!
- Turn the locking knob to the position LOCKED.



Check in filler wire reel that there are no parts sticking out, which could e.g. chafe against chassis or door of wire feeder unit. Dragging parts might expose chassis of wire feeder unit under voltage.



LOCKED

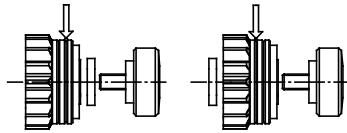


OPEN

3.6. AUTOMATIC WIRE FEED TO GUN

Automatic wire feed makes change of wire reel more rapid. In reel change the pressure of feed rolls need not to be released and filler wire goes automatically to correct wire line.

- Make sure that groove of feed roll matches the diameter of welding wire used. Feed roll groove is selected by moving the groove selecting washer. Also the selector plate for changing the feed roll groove has to be moved similarly. (see tables on pages 6 and 7).



groove selecting washer

- Release the wire end from reel and cut off the bent length. Be careful that the wire does not spill from the reel to sides!
- Straighten about 20 cm of the wire and see that the end of it has no sharp edges (file off if necessary). A sharp edge may damage the wire guide tube and contact tip of the welding gun.
- Draw a bit of loose wire from wire reel. Feed wire through back liner to feed rolls. Don't release pressure of feed rolls!
- Press the gun switch and feed a bit wire until wire goes through feed rolls to gun. See that wire is in grooves of both feed roll pairs!
- Press still the gun switch until wire has come through contact tip.

Automatic feed may sometimes fail with thin wires (Fe, Ss: 0.6...0.8 mm, Al, Fc: 0.8...1.0 mm). Then it might be possible that you must open feed rolls and feed wire manually through feed rolls.

Adjustment of pressure

Adjust the pressure of feed rolls with the control screw (20) so that the wire is fed into the wire guide tube evenly and allows a little braking when coming out from the contact tip without slipping at the feed rolls.



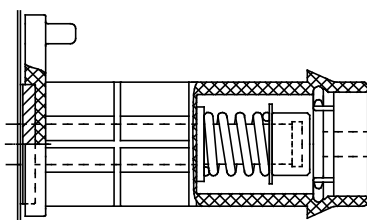
Excessive pressure causes flattening of the filler wire and damage to the coating. It also causes undue wear of the feed rolls as well as friction.

3.7. ADJUSTMENT OF TIGHTNESS OF WIRE REEL BRAKE

Brake force is adjusted through hole in locking device of reel hub by screwing the control screw with screwdriver.

Adjust brake force as so big that the wire cannot spill from the reel when the rotation of the reel stops. Need for brake force is increased with increase of the wire feed speed.

Since the brake loads for its part the motor, you shouldn't keep it unnecessarily tight.



Adjustment screw

3.8. SHIELDING GAS

As MIG shielding gas is used carbon dioxide, mixed gases and argon. Shielding gas flow rate is defined by welding current size. Typical rate of gas in welding of steel is 8-15 l / min.

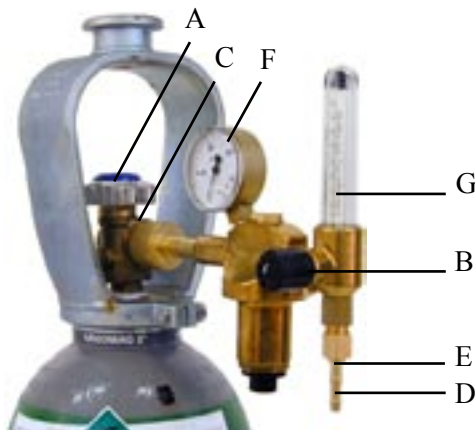
Gas flow regulator

Gas flow regulator should be suitable for shielding gas used by you. The regulator being in your use might be different from the one in picture, however, following general instructions are valid for all pressure regulators.

Before mounting of flow regulator

1. Step aside and open the bottle valve (A) for a while to blow out possible impurities from the bottle valve.
2. Turn the pressure regulation screw (B) of the regulator until no spring pressure can be felt.
3. Close needle valve, if there is one in the regulator.
4. Install the regulator on bottle valve and tighten connecting nut (C) with a wrench.
5. Install hose spindle (D) and jacket nut (E) into gas hose and tighten with hose clamp.
6. Connect the hose with the regulator and the other end with the power source. Tighten the jacket nut.
7. Open bottle valve slowly. Gas bottle pressure meter (F) shows the bottle pressure. Note! Do not use the whole contents of the bottle. The bottle should be filled when the bottle pressure is 2 bar.
8. Open needle valve if there is one in the regulator.
9. Turn regulation screw (B) until hose pressure meter (G) shows the required flow (or pressure).
When regulating flow amount, the power source should be switched on and gas test button on the panel pressed simultaneously.

Close bottle valve after having finished welding. If the machine will be out of use for a long time, unscrew the pressure regulation screw.



- A Gas bottle valve
- B Pressure regulation screw
- C Connecting nut
- D Hose spindle
- E Jacket nut
- F Gas bottle pressure meter
- G Gas hose pressure meter



The gas bottle may explode if it falls!

Always fasten gas bottle tightly in vertical position, to wall stand or bottle cart, specially designed for it! For safety reasons always remove gas bottle from transport stand of the machine before lifting or car transport of machine!

4. OPERATION AND USE OF POWER SOURCE

4.1. KEMPOMAT PANELS



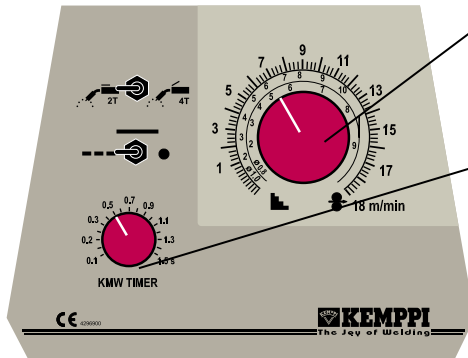
- Wire feed panel
- Push-pull gun connector and switch (accessory)
- Welding gun connector (EURO)
- Mounting place for MSD 1 V/A metering unit (accessory)
- Signal lamp for Kempomat 4200 main switch
- Signal lamp for overheating (power source)
- Kempomat 3200 main switch
- Kempomat 4200 main switch and voltage selecting range
- Voltage selecting switch (fine grading)
- Voltage selecting switch (coarse grading)
- I Return current dix-connector (coarser arc)
- II Return current dix-connector (softer arc)



- Control fuse (8 A delayed)
- Shielding gas connector
- Inlet of mains cable
- Fan and inlet opening

4.2. WIRE FEED PANEL

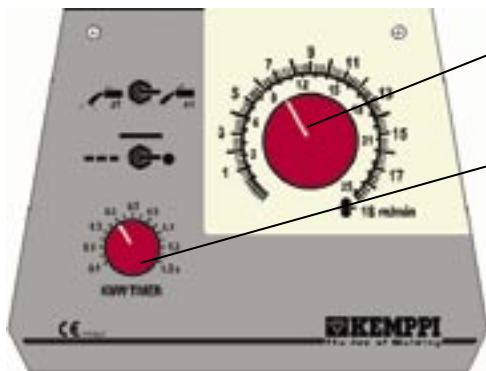
Kempomat 2500



Adjustment potentiometer for wire feed

KMW timer
continuous/hold
continuous/spot/cycle arc welding
spot or cycle time

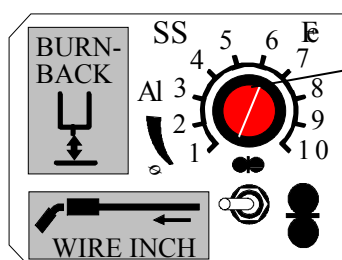
Kempomat 3200, 4200



Adjustment potentiometer for wire feed

KMW timer
continuous/hold
continuous/spot/cycle arc welding
spot or cycle time

4.3. WIRE FEEDER UNIT



Burn back time (according to filler material and wire feed)

Wire inch switch (wire feed into gun)

4.4. MAIN SWITCHES AND PILOT LAMPS

Main switch (Kempomat 2500 and 3200)

In zero position all control and welding current circuits of the equipment are dead (without voltage). In position I the control circuits of the machine become live (get voltage). The primary and welding circuits are dead, if the welding mode has not been started with the gun trigger.



Main switch (Kempomat 4200)

In zero position all control and welding current circuits of the equipment are dead (without voltage). In positions 15 - 28 V and 28 - 48 V the control circuits and cooling fan of the equipment get voltage. The primary and welding circuits are dead, if the welding mode has not been started with the gun trigger.

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

Adjustment of welding voltage

Table of adjustments, switch positions:

In Kempomat 2500 the welding voltage is adjusted with one 10-step turn switch. In Kempomat 3200 and 4200 the welding voltage is adjusted with two turn switches. In Kempomat 4200 first select the other welding voltage area from the main switch . There is 4-step switch for coarse control, where voltage value of each step can be fine-adjusted with the switch . The switch for fine-adjustment in Kempomat 3200 is with 10-steps, in Kempomat 4200 230V with 4-steps, and in Kempomat 4200 400V with 7-steps.

Kempomat 2500	
Voltage step	Open circuit voltage
1	13,7 V
2	15,2 V
3	16,9 V
4	18,8 V
5	20,8 V
6	23,0 V
7	25,5 V
8	28,3 V
9	31,4 V
10	34,9 V

Kempomat 3200		
Coarse control	Fine control	Open circuit voltage
1 / 4	1 / 10 - 10 / 10	15,5 - 18,2 V
2 / 4	1 / 10 - 10 / 10	18,6 - 22,5 V
3 / 4	1 / 10 - 10 / 10	23,1 - 29,3 V
4 / 4	1 / 10 - 10 / 10	30,4 - 41,6 V

Kempomat 4200				
Main switch.	Coarse control	Fine control (400V)	Fine control (230V)	Open circuit voltage
15 - 28 V	1 / 4	1 / 7 - 7 / 7	1 / 4 - 4 / 4	14,6 - 16,3 V
15 - 28 V	2 / 4	1 / 7 - 7 / 7	1 / 4 - 4 / 4	16,6 - 18,8 V
15 - 28 V	3 / 4	1 / 7 - 7 / 7	1 / 4 - 4 / 4	19,2 - 22,0 V
15 - 28 V	4 / 4	1 / 7 - 7 / 7	1 / 4 - 4 / 4	22,5 - 26,1 V
28 - 48 V	1 / 4	1 / 7 - 7 / 7	1 / 4 - 4 / 4	27,1 - 30,0 V
28 - 48 V	2 / 4	1 / 7 - 7 / 7	1 / 4 - 4 / 4	30,5 - 34,2 V
28 - 48 V	3 / 4	1 / 7 - 7 / 7	1 / 4 - 4 / 4	34,9 - 39,7 V
28 - 48 V	4 / 4	1 / 7 - 7 / 7	1 / 4 - 4 / 4	40,5 - 47,1 V

Pilot lamps of the machine report about electric function:

The green pilot lamp indicating that the machine is ready for operation is always illuminated, when the machine is connected to mains voltage and you have selected welding voltage range from the main switch.

The yellow pilot lamp for thermal protection is illuminated, when thermal protection of the welding circuit has released due to overheating. The protection releases if the power source is continuously loaded over rated values or the cooling air circulation has been obstructed.

The cooling fan is cooling down the machine and after the pilot lamp has switched off, the machine is again ready for welding from the gun trigger.

Control fuse

On the rear plate of the power source the fuse 8 A delayed is the short-circuit protection. Use the fuse size and type according to markings. Damage caused by a wrong type fuse is not covered by the guarantee. If the fuse is blowing again, send the unit to service.

4.5. ADJUSTMENT FOR ARC ROUGHNESS I , II

Arc roughness is adjusted by connecting the return current cable to the applicable 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 0.6 - 1.0 mm wires and especially with CO₂ shielding gas. The connector marked with symbol II is suitable for thicker wires 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 the different positions.

4.6. OPERATION OF COOLING FAN

The cooling fan on the rear plate of the Kempomat machine is started and stopped according to use. The cooling fan is started after ca. 15 s after weld start and stopped after ca. 10 min after weld end or release of the overheat protection.



Note! The fan is intaking air from rear plate side! Don't switch off the unit with the main switch before the cooling fan has automatically stopped. By open circuit the cooling fan does not get started.

5. CONTROL PANELS AND ADJUSTMENTS

5.1. WIRE FEED SPEED POTENTIOMETER

The wire feed speed is adjusted steplessly with the potentiometer on the front panel, see the paragraph Panels. The potentiometer has the memory scale for max. speeds of 18 m/min and 25 m/min. See the section Installation of wire feed equipment, paragraph 3. Max. wire feed speed.

5.2. BURN BACK TIME

Different filler materials and shielding gases behave in different ways in the welding end, so that you should switch off the welding current with a delay, which is suitable for wire feed stopping according to the welding case.

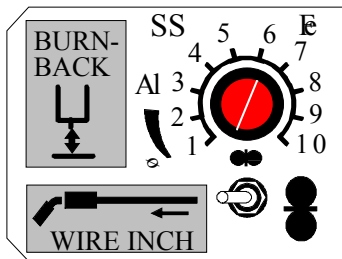
If you try to end welding with an unsuitable burn back time, the wire will burn in the contact tip, there will be too big "balloon" at the wire end, or the wire will stick at the ending point.

Factors influencing on the delay:

The wire feed speed has a significant influence on required burn back time. By low wire feed speeds always select the short burn back time.

- Melting of aluminium is much quicker than by steel-base materials, so that the burn back time is clearly shorter.
- Steel and especially filler wires require longer time than the stainless materials.
- Thicker filler wires require longer time. Also by increase of wire feed speed the required time should be longer. In the instruction label are given starting points for adjustment. The fine-adjustment should be carried out according to each case in question.
- Memory scale for adjustment potentiometer
- The wire inch switch starts the wire feed motor and mechanism, but not the power source.

The filler wire can be driven to the wire feeder unit, gun and interconnection cable also with the welding gun's switch, but then also the power source will get started and the wire becomes live (gets voltage), and this can cause a danger situation by accidental contact to surrounding objects.



5.3. KMW TIMER FUNCTIONS

The control includes the welding with the closed-open operation of the gun trigger, this is called the 2-sequence procedure. The KMW timer also has the 4-sequence procedure, with which you can release the trigger for the time of welding, as well as the wire feed timer, which helps you to control the spot or cycle arc welding.

2 / 4-sequence procedure

2-sequence procedure

1. Switch pressed: welding starts
2. Switch open: welding stops

The welding with the 2-sequence trigger procedure of the gun.

4-sequence procedure

1. Switch pressed: shielding gas is flowing
2. Switch open: welding starts
3. Switch pressed: welding stops
4. Switch open: gas flow stops after the post gas time

The welding with the 4-sequence trigger procedure of the gun.

Spot, cycle arc and continuous welding (is operating only in the 2-sequence procedure position)

Spot welding ●

1. Set the spot time with the potentiometer.
2. The gun switch pressed: welding starts
3. Welding ends automatically after the set time

Cycle arc welding — — —

1. Set the welding cycle time with the potentiometer. The pause time is adjusted automatically.
2. The gun switch pressed: welding is started and continued for so long as the switch is pressed.

6. ACCESSORIES

Volt / Ampere metering unit 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 the MSD 1. From the



metering unit you can with lever switch select momentary display for either voltage or current. By open circuit only voltage value is displayed, because there is no welding current present.

The voltage value is the voltage between the unit's welding connectors or terminal voltage. The value of the open circuit voltage has not very much importance for the welding, so that the display of the metering unit is adjusted according to the welding situation. The display of the open circuit voltage differs 1 - 2 V from the true voltage. During welding the terminal voltage is varying and the arc voltage differs from the terminal voltage due to cable etc. losses. Accuracy of voltage true value in respect to real value is $\pm 4.0\% \pm 0.2\text{ V}$ by welding values according to the norm.

Accuracy of current true value in respect to real value is $\pm 2.5\% \pm 2\text{ A}$.

The metering unit doesn't show wire feed values. The MSD 1 doesn't need any calibration in the Kempomat units. The switch positions: V = voltage display, A = current display.

6.1. KMW SYNC

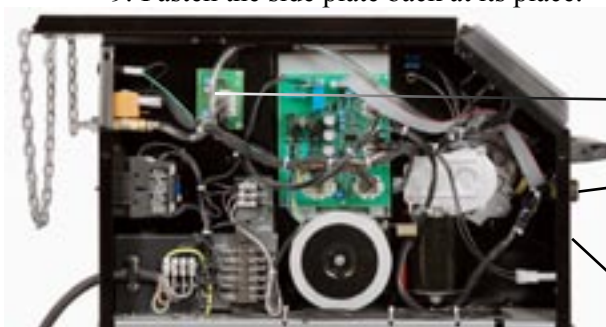
The push-pull gun is most often used for feed of thin aluminium wires, when over 5 m reach is required. You can connect the gun equipped with the EURO adaptor to the KMW sync unit. The push-pull gun's potentiometer is connected to amphenol connector, mounted onto front wall of the Kempomat. You can connect to this connector also some other potentiometer, which has suitable values for it. With the unit's switch you can select the Kempomat operation or the push-pull gun operation.

Concerning the right connections in the gun, contact your KEMPPI dealer.

6.2. INSTALLATION AND MOUNTING OF KMW SYNC

In the accessories of the KMW timer are included electronics card, potentiometer knob, switch protections, flat cable and fastening screws.

1. Remove the side plate as well as frame and panel cover plate of the wire feed panel.
2. Remove protective knobs of the holes on the panel plate.
3. Mount the KMW timer electronics card in such a way that the switch levers and potentiometer axle penetrate through the holes.
4. Mount the protective caps of the switches above the levers.
5. Fasten the card to back edge of the base with two screws. Don't tighten unnecessarily much. Mount the panel cover plate with its frame back at its place.
6. Turn the potentiometer axle into clockwise direction to extreme position. Mount the potentiometer knob onto axle in such a way that the dial line shows the reading more than 1.5 s. Check that the knob can be turned freely and that in the other extreme position the dial line shows the value less than 0.1 s. Correct if necessary. Mount the knob cap.
7. Connect one connector of the flat cable to the KMW timer card connector.
8. Connect the other connector of the flat cable to connector for KMW timer on the control card A001.
9. Fasten the side plate back at its place.



KMW sync control card

KMW sync
Mode selecting switch
Control connector for push-pull gun

MSD 1 V/A metering unit

7. OPERATION DISTURBANCES

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

The following maintenance operations should be carried out at least every six months.

Wire feed:

- The wear of the grooves of the feed rolls. Excessive wear of grooves causes problems in wire feed.
- The wear of the wire guide tubes of the wire feeder unit. Badly worn feed rolls and wire guide tubes should be discarded.
- The wire guide tube should be set as near the feed rolls as possible, but not touching them and the wire must follow a straight line from the end of the tube to the groove of the feed roll.
- Reel brake adjustment.
- Electric connections
 - * Oxidized couplings must be cleaned.
 - * Loose couplings must be tightened.

Clean dust and dirt from the equipment.

When using compressed air, always protect your eyes with proper eye protection.

8. REGULAR MAINTENANCE OF THE EQUIPMENT

Kemppi service repair shops make regular maintenance according to the 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
- Metering units checking
- 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 equipment are checked, and adjusted when necessary by means of test equipment.

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.

8.1. 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 regulations!

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

8.2. POWER SOURCE

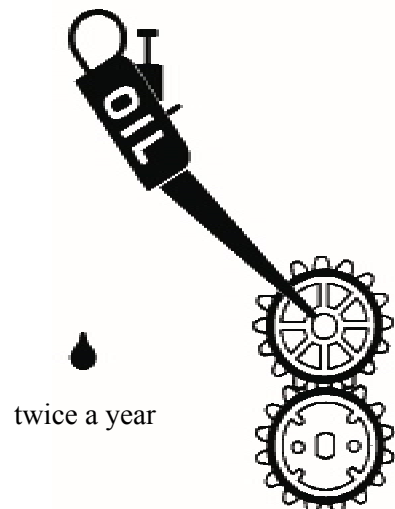
NOTE! Disconnect the plug of the power source from the mains socket before removing the cover plate.

Check at least every 6 months (twice a year):

- Electric connections of the unit - clean the oxidized 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 soft brush and vacuum cleaner.

Do not use compressed air. Do not use pressure washing device!

- There is a risk that dirt is packed even more tightly into gaps of components!
Only authorized electrician shall carry out repairs to the machines.



8.3. 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!

9. ORDERING NUMBERS

Kempomat 2500 230 / 400		621425002
Kempomat 3200 230 / 400 V		621432002
Kempomat 4200 230 V		6214422
Kempomat 4200 400 V		6214424
KMW sync 2 (Synchronization unit)		6219150
MSD 1 (Volt / Ampere metering unit)		6185666
GH 20 (Gun holder)		6256020
Hub for wire reel		4289880
MT 25	3 m	6252023
MT 25	4,5 m	6252024
KMG 25	3 m	6252123
KMG 25	4,5 m	6252124
KMG 32	3 m	6253033
KMG 32	4,5 m	6253034
MMT 25	3 m	6252513MMT
MMT 25	4,5 m	6252514MMT
MMT 27	3 m	6252713MMT
MMT 27	4,5 m	6252714MMT
MMT 32	3 m	6253213MMT
MMT 32	4,5 m	6253214MMT
MMT 35	3 m	6253513MMT
MMT 35	4,5 m	6253514MMT
WS 35 (Al 1.2)	6 m	6253516A12
WS 35 (SS 1.0)	6 m	6253516S10
MMT 42	3 m	6254213MMT
MMT 42	4,5 m	6254214MMT
KMP 300	6 m	6257306
KMP 300	8 m	6257310
Branch cable KMP/Kempomat		3151360
Earth cable 25 mm ²	5 m	6184211
Earth cable 35 mm ²	5 m	6184311
Earth cable 50 mm ²	5 m	6184511
Earth cable 70 mm ²	5 m	6184711

10. TECHNICAL DATA

Kempomat 2500

Rated voltage		230 V / 400 V
Connection voltage		
	3~ 400 V	380 V -10 %...415 V +6 %
	3~ 230 V	220 V -10 %...240 V +6 %
Connection capacity		
230 V / 400 V		
	30 % ED	9.2 kVA
	60 % ED	5.9 kVA
	100 % ED	4.0 kVA
Loading capacity		
(nominal values)		
	30 % ED	250 A / 26 V
	60 % ED	180 A / 23 V
	100 % ED	140 A / 21 V
Control range		40 - 250 A / 14 - 26 V
Voltage steps		10 steps
Open circuit voltage max.		35 V
Efficiency	250 A / 26 V	75 %
Power facto	250 A / 26 V	0.95
Fuse		8 A delayed
Wire feeder unit		2-roll drive
Diameter of feed roll		32 mm
Wire feed speed	I	0...18 m / min
	II	0...25 m / min
Filler wires		
	∅ Fe, Ss	0,6...1,2 mm
	∅ Cored wire	0,8...1,2 mm
	∅ Al	1,0...1,2 mm
Wire reel		
	max. weight	20 kg
	max. size	∅ 300 mm
Gun connector		Euro
Temperature class		H (180 °C)
Operation temperature range		-20...+40 °C
Storage temperature range		-40...+60 °C
Degree of protection		IP 23C
External dimensions		
	length	930 mm
	width	440 mm
	height	860 mm
Weight		80 kg

Kempomat 3200

Rated voltage		230 V / 400 V
Connection voltage		
	3~ 400 V	380 V -10%...415 V +6%
	3~ 230 V	220 V -10%...240 V +6%
Connection capacity		
230 V / 400 V		
	40 % ED	13.6 kVA
	60 % ED	10.0 kVA
	100 % ED	6.6 kVA
Loading capacity		
(nominal values)		
	40 % ED	320 A / 32 V
	60 % ED	265 A / 27 V
	100 % ED	205 A / 24 V
Control range		40 - 320 A / 15 - 32 V
Voltage steps		40 steps
Open circuit voltage max.		42 V
Efficiency	320 A / 32 V	75 %
Power factor	320 A / 32 V	0.95
Fuse		8 A delayed
Wire feeder unit		4-roll drive
Diameter of feed roll		32 mm
Wire feed speed	I	0...18 m / min
	II	0...25 m / min
Filler wires		
	ø Fe, Ss	0.6...1.2 mm
	ø Cored wire	0.8...1.6 mm
	ø Al	1.0...1.6 mm
Wire reel		
	max. weight	20 kg
	max. size	ø 300 mm
Gun connector		Euro
Temperature class		H (180 °C)
Operation temperature range		-20...+40 °C
Storage temperature range		-40...+60 °C
Degree of protection		IP 23C
External dimensions		
	length	970 mm
	width	480 mm
	height	970 mm
Weight		118 kg

Kempomat 4200

Rated voltage		230 V, 400 V
Connection voltage		
	3~ 400 V	380 V -10%...415 V +6%
	3~ 230 V	220 V -10%...240 V +6%
Connection capacity		
230 V / 400 V		
	40 % ED	18.5 kVA
	60 % ED	13.5 kVA
	100 % ED	9.0 kVA
Loading capacity (nominal values)		
	40 % ED	420 A / 37,5 V
	60 % ED	325 A / 31 V
	100 % ED	265 A / 27 V
Control range		40 - 420 A / 15 - 37,5 V
Voltage steps		32 steps / 230 V power source 56 steps / 400 V power source
Open circuit voltage max.		48 V
Efficiency	420 A / 37,5 V	80 %
Power factor	420 A / 37,5 V	0.95
Fuse		8 A delayed
Wire feeder unit		4-roll drive
Diameter of feed roll		32 mm
Wire feed speed	I	0...18 m / min
	II	0...25 m / min
Filler wires		
	∅ Fe, Ss	0.6...1.2 mm
	∅ Cored wire	0.8...1.6 mm
	∅ Al	1.0...1.6 mm
Wire reel		
	max. weight	20 kg
	max. size	∅ 300 mm
Gun connector		Euro
Temperature class		H (180 °C)
Operation temperature range		-20...+40 °C
Storage temperature range		-40...+60 °C
Degree of protection		IP 23C
External dimensions		
	length	970 mm
	width	480 mm
	height	970 mm
Weight		130 kg

The products meet conformity requirements for CE marking.

11. 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-authorised 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.

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 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