

Kempoweld | 3200, 3200W



Operating manual • English *EN*

Käyttöohje • Suomi *FI*

Bruksanvisning • Svenska *SV*

Bruksanvisning • Norsk *NO*

Brugsanvisning • Dansk *DA*

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Manuel d'utilisation • Français *FR*

Instrukcja obsługi • Polski *PL*

Инструкции по эксплуатации • По-русски *RU*

OPERATING MANUAL

English

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1. PREFACE

1.1 GENERAL

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

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

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

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

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

Important notes

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

Disclaimer

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

1.2 PRODUCT INTRODUCTION

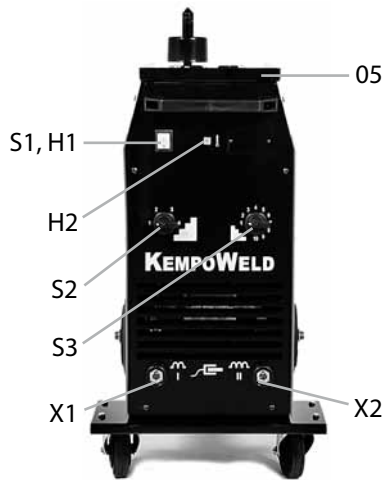
The power sources Kempoweld 3200 and 3200W with wire feeder unit WIRE 400 makes together 320 A MIG welding equipment, which is suitable for heavy industrial use. To the product range belong in addition also the power sources Kempoweld 4200, 4200W and 5500W. Kempoweld 3200W has inbuilt water cooling unit.

Power source: Supply voltage of the power source is 3~ 230 V / 400 V. Voltage of power source is adjusted with turn type switches; together 40 steps. The Volt/Ampere metering unit MSD-1 (accessory) which is included in the power source displays voltage or welding current.

Wire feeder unit: The wire feeder unit WIRE 400 is a 4-roll driven unit, which is suitable for air- or liquid-cooled guns. The unit may be turnable above the power source or it may be locked at its place. You can use the WIRE 400 wire feeder unit equipped also with interconnection cable and push-pull gun. KMW timer controls continuous, spot and cycle-arc welding. Accessory unit KMW sync is needed for connection and use of push-pull guns.

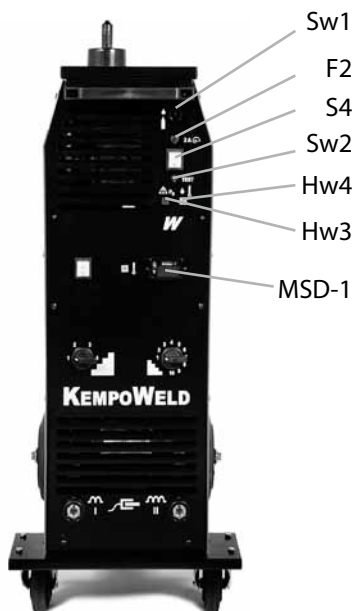
1.3 KEMPOWELD PANELS

1.3.1 Operation control and connectors



- S1 Main switch (pilot lamp H1)
- S2 Voltage selecting switch (coarse grading)
- S3 Voltage selecting switch (fine grading)
- H2 Pilot lamp for overheating (power source)
- X1 Return current connector (coarser arc)
- X2 Return current connector (softer arc)
- 05 Accessory drawer
- MSD-1 V/A metering unit (accessory)

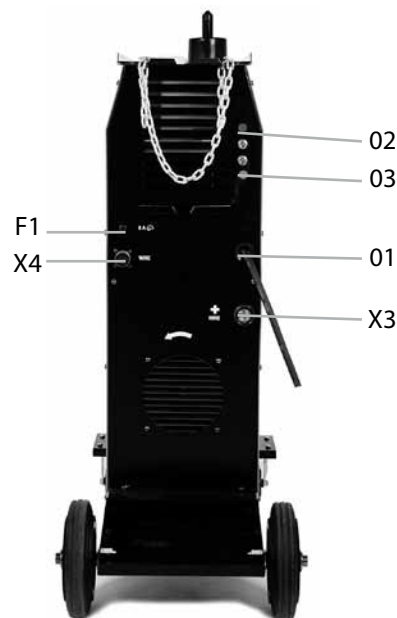
1.3.2 Parts of cooling unit Kempoweld 3200W



- S4 Main switch of cooling unit
- Sw1 Selecting switch for gun's cooling mode
- Sw2 Water cooling test switch
- Hw4 Pilot lamp for overheating
- Hw3 Pilot lamp for lacking water pressure

- F2 Fuse for cooling unit (2 A delayed)
- O2 Water circulation return connector
- O3 Water circulation output connector
- O4 Filler hole for water tank

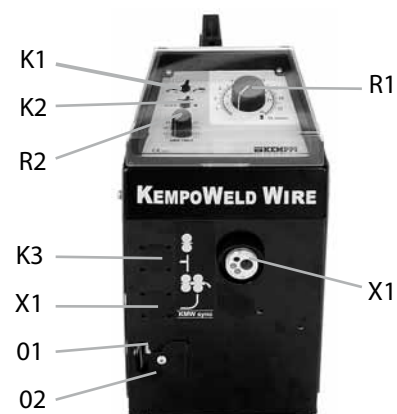
1.3.3 Rear plate of Kempoweld 3200, 3200W



- O1 Inlet of mains cable
- F1 Fuse of auxiliary transformer (8 A delayed)
- X3 Welding current connector for wire feeder unit (+ pole)
- X4 Control connector for wire feeder unit

1.4 WIRE FEEDER PANELS

1.4.1 Front panel



- R1 Adjustment for wire feed
- X1 Welding gun connector (EURO)
- K1 Trigger function mode (continuous/hold)
- K2 Welding mode selection (continuous/spot/cycle arc)
- R2 Adjustment for welding mode timing (spot or cycle time)

1.4.2 Accessories

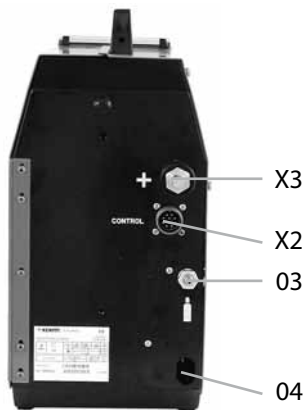
KMW sync

- K3 Wire feed adjustment selection (panel or push-pull gun)
- X1 Control connector for push-pull gun

1.4.3 Cooling unit connections

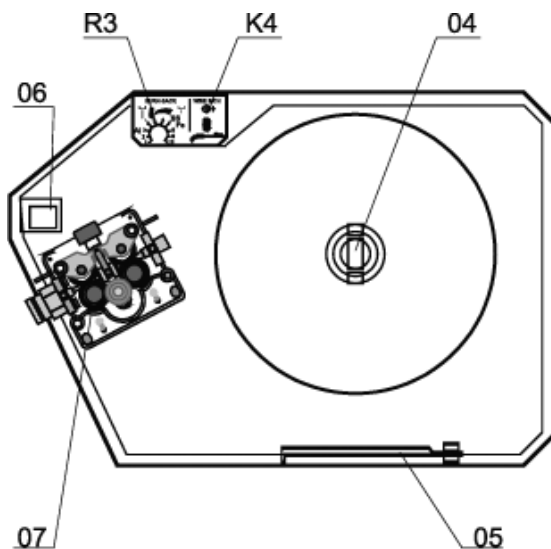
- 01 Return water connector for gun
- 02 Feed water connector for gun
- 04 Inlet of water hoses

1.4.4 Rear panel



- 03 Shielding gas connector
- X2 Control cable connector (Kempoweld or interconnection cable)
- X3 Welding current connection (Kempoweld or interconnection cable)

1.4.5 Inside wire feeder unit



- K4 Wire inch switch (wire feed into gun)
- R3 Burn back time adjustment (according to filler material and wire feed)
- 04 Locking device for wire reel
- 05 Box door latch
- 06 Box door lock
- 07 Wire feed mechanism

2. INSTALLATION

2.1 POSITIONING OF THE MACHINE

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

Notes for positioning the machine

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

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

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

2.2 DISTRIBUTION NETWORK

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

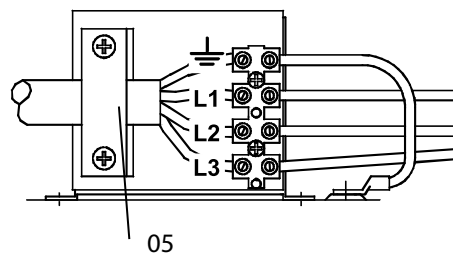
This equipment complies with IEC 61000-3-12 provided that the short-circuit power S_{sc} is greater than or equal to 0.9 MVA at the interface point between the user's supply and the public supply network. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{sc} greater than or equal to 0.9 MVA.

2.3 CONNECTION TO THE MAINS SUPPLY


NOTE! 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 Kempoweld 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 does not meet local regulations.

Mounting of the mains cable



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 . If you are using 5-conductor cable, you must cut the zero conductor to the level of the cable's protective shield.

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

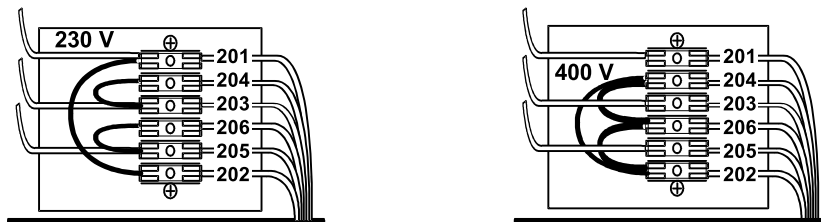
Kempoweld 3200, 3200W		
Connected voltage	230 V	400 V
Voltage range	220 – 240 V	380 – 415 V
Fuses, delayed	20 A	16 A
Connected cable	4 x 2.5 S mm ²	4 x 2.5 S mm ²

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

NOTE! 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.

Change of mains voltage

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



By delivery from the factory the machine has been connected for mains voltage 3~ 400 V. In order to change the mains voltage, 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.

2.4 WELDING AND RETURN CURRENT CABLES

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

cable cross-section	duty cycle ED			voltage loss / 10 m for 100 A
	100 %	60 %	40 %	
Cu 50 mm ²	285 A	370 A	450 A	0.35 V

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.

Do not overload welding cables over permissible values due to voltage losses and heating. Clean the contact surface from paint and rust.

2.5 OPERATION AND USE OF CONTROLS

See the page for Kempoweld PANELS and COOLING UNIT.

2.5.1 Main switch (S1)

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.

NOTE! 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!

2.5.2 Adjustment of welding voltage,

Table of adjustments, switch positions:

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

The welding voltage is adjusted with two turn switches. The S2 is the 4-step switch for coarse control, where voltage value of each step can be fine-adjusted with the 10-step switch S3.

2.5.3 Pilot lamps

Pilot lamps of the machine report about electric function:

The green pilot lamp H1 indicating that the machine is ready for operation is always lit, when the machine is connected to mains voltage and the main switch is on position I.

The yellow pilot lamp H2 is lit, 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.

2.5.4 Control fuse (F1)

On the rear plate of the power source the fuse (F1) 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.

2.5.5 Adjustment for arc roughness

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 shorter symbol 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 longer symbol 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.

2.5.6 Operation of cooling fan

The cooling fan on the rear plate of the Kempoweld 3200 equipment is started and stopped according to use. The cooling fan is controlled by the gun trigger and control circuits. 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! Do not 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.

2.5.7 Accessory drawer

In the accessory drawer in the cover part of the unit are by delivery the plastic guide tubes needed for welding of aluminium and stainless steels. In the drawer are also the screw and the insulation bushings needed for locking of rotation of the wire feeder Kempoweld WIRE 400.

2.5.8 Adjustment for wire feed



The wire feed is adjusted from the potentiometer on the control panel of the wire feeder unit Kempoweld WIRE 400. The adjustment has been described in the operation instructions of the wire feeder unit.

2.6 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 2 – 3 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 $\pm 4,0\%$, $\pm 0,2V$ by welding values according to the norm.

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

The metering unit does not show wire feed values.

The MSD-1 does not need any calibration in the Kempoweld power source.

The switch positions: V = voltage display, A = current display.

2.7 COOLING UNIT

Kempoweld 3200W power source has inbuilt cooling unit.

2.7.1 Installation of cooling

The cooling unit is connected to the gun by means of water hoses, which are mounted to the wire feeder unit. The interconnection cable contains also the water hoses, which are mounted to the gun through the wire feeder unit without any extension parts. See operation instruction for Kempoweld WIRE feeders.

Before connection check that in the hoses are no dirt, metal powder, rubber waste etc. The connectors for hoses and cooling unit are marked with red or blue identification rings or spots. Blue is colour for water supplied from cooling unit to gun and red is colour for water returning back from gun to cooling unit.

The cooling unit's tank is filled with 40 % antifreeze according to British Standard BS3151. If the circumstances do not require frost resistance, you can use a more dilute mixture, or some other mixture, of which you have good experiences.

Tank volume is ca. 3 litres, volume of gun and interconnection cable is 0.3 – 1.5 litres. Filling of hoses takes 5 s – 3min time. Check the return flow to the tank. Before filling check that tank, cooling water, pouring tank etc. are clean, and that there is no metal powder, waste etc.

NOTE! If the water does not start circulating, see paragraph Operation disturbances: "The water does not circulate ... etc.

Do not let any waste and dirt into the water circulation! Check filling volume before starting to weld! Use the cooling liquid according to recommendations, or the one you know as good beforehand. Watch over liquid material's quality and possible sediments in hoses of the gun.

Do not swallow cooling liquid. If somebody has swallowed the liquid, take him immediately to medical care. Avoid contact with skin and eyes, wash the liquid from your skin with clean water.

2.7.2 Operation switches

In zero (O) position of the power source's main switch also all operations of the cooling unit are stopped.

Cooling unit's main switch O / I

The electric supply for the pump motor is switched on by main switch key O / I, where the pilot lamp indicates the standby state I. In zero (O) position of the main switch the pump motor cannot get started, but the switches and pilot lamps are operating.

Fuse (F2)


The fuse on the front wall of the cooling unit is short-circuit protection. Use the fuse size and type according to markings. If the fuse is blowing again, send the unit to service.

Selecting switch for gun's cooling mode (Sw1)

The Kempoweld equipment are suitable to be used with both air- and water-cooled guns. Select cooling mode and correct use and protection functions with switch on the cooling unit's panel.

If your choice is **GAS**, but you are using water-cooled gun, no protection is operating. The pilot lamp is illuminated in position I of the cooling unit's main switch. However, the control does not start the pump.

The wrong choice will destroy the gun in short time!

If your choice is  (water), but you are using air-cooled gun, the pump gets started by pressing on the trigger, if the cooling unit's main switch is in position I.

Test switch (Sw5)

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

Pilot lamps

Pilot lamp for overheating (Hw4)

If the cooling water in the tank is overheating, the thermal protection will stop the power source. Operation of the cooling unit is continued for ca. 5 – 7 min automatically. The pilot lamp will switch off after the water in the tank has cooled down, after which the welding will start from the gun triggering.

Pilot lamp for lacking liquid pressure (Hw3)

If the pump does not step up sufficient supply pressure, e.g. when the water is running out or by disturbances in the pump, the whole equipment will stop after ca. 5 s and the red pilot lamp illuminates. Check the equipment like by the installation. See paragraph for OPERATION DISTURBANCES.

Operating control

The water circulation gets automatically started, when you are pressing on the gun trigger. The post-circulation of water will continue for ca. 5 – 7 min. after the weld end. The time is always counted from the latest trigger release.

3. OPERATION DISTURBANCES

By the operation or functional disturbances take the measures according to the following list. If the disturbance cannot be eliminated, check the equipment according to the paragraphs Installation and Maintenance, and take contact with Authorized Kemppe repair workshop.

The pump does not get started by test switch:

- check the fuse on the front plate of the cooling unit
- check the fuse on the rear plate of the power source
- check position for cooling mode selecting switch
- check positions for main switches

The water does not circulate by lever switch:

- check the tank filling volume
- disconnect the connector for the return water hose of the gun from the rear wall of the cooling unit and use that test switch

If the water is pumped, close the connector and run again by the test switch

A good tip: Blow compressed air into the tank; closing the filling opening by hand is enough.

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 many meters higher than the power source, the filling will happen considerably slower. Fill the hoses on the floor position.
- check the whole flowing line connector by connector

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

- check the cooling water volume and return flow to the tank
 - in the system are air bubbles or leakages, especially check the connections of the cooling unit.
 - the pressure switch set value (ca. 1 bar) is unsuitable for the gun you are using:
1. Open the side plate. In the middle at the upper end of the pressure guard connected to the pump is the adjusting screw for limit value.
 2. Use the pump during the adjustment by the test switch.
 3. After ca. 5 s use twist the screw carefully until the pilot lamp is switched off.
 4. Check the result by welding.
 5. If the adjustment and checkings do not eliminate the disturbance, take contact with the Authorized Kemppe repair workshop.

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

- release the trigger. When the lamp is switched off, the operation has been reset automatically
- check if the gun is suitable for power you are using
- check condition of connectors and connections in the welding current circuit

4. MAINTENANCE

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

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.

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, there is a risk that dirt is packed even more tightly into gaps of components!

Do not use pressure washing device!

Only authorized electrician shall carry out repairs to the machines.

Regular maintenance

Kemppe service repair workshops make regular maintenance according to agreement.

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

- Cleaning of the machine
- Checking and maintenance of the welding tools
- Checking of connectors, switches and potentiometers
- Checking of electric connections
- 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.

4.1 DISPOSAL OF THE MACHINE



Do not dispose of electrical equipment with normal waste!

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

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

5. ORDERING NUMBERS

Units		
Kempoweld 3200	230 V / 400 V	621532002
Kempoweld 3200W	230 V / 400 V	621632002
Wire feeder unit		
Kempoweld WIRE 400		621740001
Accessories		
KMW sync 2		6219150
MSD-1		6185666
P500 transport unit (feeder)		6185265
KV400 swing arm		6185247
KV400 50-1.5-GH		6260351
KV400 50-1.7-WH		6260353
Hub for wire reel		4289880
Branch cable KMP/Kempoweld		3151360
MIG guns		
Air-cooled:		
KMG 32	3 m	6253033
KMG 32	4,5 m	6253034
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
KMP 300	6 m	6257306
KMP 300	10 m	6257310
Liquid-cooled:		
MT 51W	3 m	6255046
MT 51W	4.5 m	6255047
MMT 30W	3 m	6253043MMT
MMT 30W	4.5 m	6253044MMT
KMP 400W	6 m	6257406
KMP 400W	10 m	6257410
WS 30W (Al 1.2-1.6)	6 m	6253046A12
WS 30W (SS 1.0)	6 m	6253046S10
WS 30W (SS 1.2)	6 m	6253046S12
WS 30W (Al 1.2-1.6)	8 m	6253048A12
WS 30W (SS 1.0)	8 m	6253048S10
WS 30W (SS 1.2)	8 m	6253048S12

Air-cooled interconnection cables		
Mounting cables for short distance:		
KW 50-1.3-GH		6260350
Interconnection cables for long distance:		
Multimig 50-5-GH		626010401
Multimig 50-10-GH		626010601
Liquid-cooled interconnection cables		
Mounting cables for short distance:		
KW 50-1.5-WH		6260352
Interconnection cables for long distance:		
KW 50-5-WH		626035401
KW 50-10-WH		626035601
Return current cable		
5 m - 50 mm ²		6184511

6. TECHNICAL DATA

Kempoweld	3200	3200W	
Connection voltage			
	3 ~ 400 V	380 V -10 % ... 415 V +6 %	380 V -10 % ... 415 V +6 %
	3 ~ 230 V	220 V -10 % ... 240 V +6 %	220 V -10 % ... 240 V +6 %
Connection capacity 230 V / 400 V			
	40 % ED	13,6 kVA	13,6 kVA
	60 % ED	10,0 kVA	10,0 kVA
	100 % ED	6,6 kVA	6,6 kVA
Main cable / fuses			
	220 - 240 V	4 x 2,5 mm ² / 20 A delayed	4 x 2,5 mm ² / 20 A delayed
	380 - 415 V	4 x 2,5 mm ² / 16 A delayed	4 x 2,5 mm ² / 16 A delayed
Connection to wire feeder unit			
		30 V / 250 VA	30 V / 250 VA
- Fuse delayed		8 A	8 A
Loading capacity (nominal values)			
	40 % ED	320 A / 32 V	320 A / 32 V
	60 % ED	265 A / 27 V	265 A / 27 V
	100 % ED	205 A / 24 V	205 A / 24 V
Control range 40 steps		40 – 320 A / 15 – 32 V	40 – 320 A / 15 – 32 V
Open circuit voltage 40 steps		15 – 40 V	15 – 40 V
Open circuit power		< 50 W	< 50 W
Efficiency	320 A / 32 V	75 %	75 %
Power factor	320 A / 32 V	0,95	0,95
Temperature class		H (180 °C)	H (180 °C)
Operation temperature range		-20 ... +60 °C	-20 ... +60 °C
Storage temperature range		-40 ... +60 °C	-40 ... +60 °C
Degree of protection		IP23S	IP23S
EMC class		A	A
Minimum short circuit power S_{sc} of supply network *		0.9 MVA	0.9 MVA
Cooling unit power		---	230 V / 250 VA
- Fuse delayed		---	2 A
External dimensions			
	length	990 mm	990 mm
	width	530 mm	530 mm
	height	880 mm	1090 mm
Weight		106 kg	118 kg

* See paragraph 2.2

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