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

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KEMPOMIG 3200

KEMPOMIG 4000W

KEMPOMIG 3200W

KEMPOMIG 4000

KEMPPI
The Joy of Welding

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1. PREFACE

1.1. INTRODUCTION

Congratulations on having purchased this product. Properly installed Kemppi products should prove to be productive machines requiring maintenance at only regular intervals. This manual is arranged to give you a good understanding of the equipment and its safe operation. It also contains maintenance information and technical specifications. Read this manual from front to back before installing, operating or maintaining the equipment for the first time. For further information on Kemppi products please contact us or your nearest Kemppi distributor.
The specifications and designs presented in this manual are subject to change without prior notice.

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

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

1.2. PRODUCT INTRODUCTION

Kempomig 3200, 3200W, 4000 and 4000W are DC power sources for demandin professional use in MIG/MAG and MMA welding.
They are inverter power sources for 400 V 3-phase electric mains. Kempomig 3200W and 4000W are equipped with inbuilt cooling unit for water-cooled MIG guns. Parameter adjustments for MIG/MAG and MMA welding are made from the FEED 400 wire feeder unit, which is connected to Kempomig power sources.
Kempomig power sources are delivered as standard with mounted wheeled/gas bottle transport carrier.

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.

2. INSTALLATION

2.1. TRANSPORT AND LIFTING OF THE EQUIPMENT

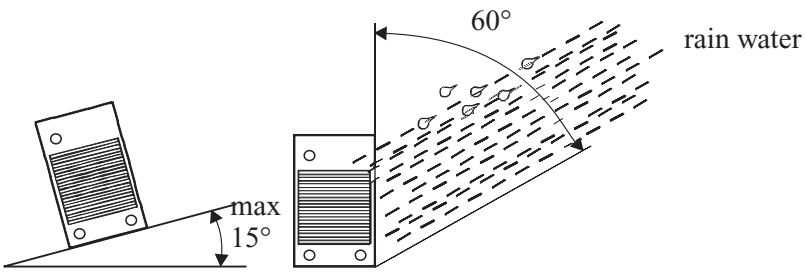
On the power source bottom there are four fixed lifting points for lifting devices.
On the power source´s front panel and above the wire feeder unit there are handles designed for moving the units on the floor.

⚠ **Lift the entire power source only from lifting points on the bottom!**
Ensure that the unit is kept during lifting between lifting linens. When necessary use additional binding round the lifting linens and the unit´s upper part. Use the protection between the lifting device and the unit in order to eliminate impacts and shocks.

2.2. SITING THE MACHINE

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

IEC 974-1
EN 60974-1



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

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

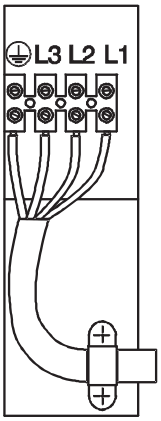
⚠ **Do not direct the line of the particle spray of grinding tools towards the machine.**

2.3. CONNECTION TO THE MAINS SUPPLY

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

⚠ **Connection and change of the mains cable and the plug must be carried out only by a competent electrician.**
Remove for the mounting time of the mains cable the right side plate of the machine, seen from the front of the power souce.

By mounting of the mains cable ensure the following: The cable is entered into the machine through the inlet ring on the rear wall of the machine and locked with a cable clamp. The phase conductors of the cable are coupled to connectors L1, L2 and L3.
Sizes of mains cables and fuse ratings for the machine at 100 % ED duty cycle are specified in the table below:



Kempomig	**3200**	**3200W**	**4000**	**4000W**
Rated voltage	400 V 3~			
Mains voltage range	380 V -10 % ... 415 V +6 %			
Fuses, delayed	16 A			
Connection cable *) mm^2	4 × 2,5 S			

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

2.4. WELDING AND RETURN CURRENT CABLES

Use only copper cables with cross-sectional area of at least 50 mm^2.
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.

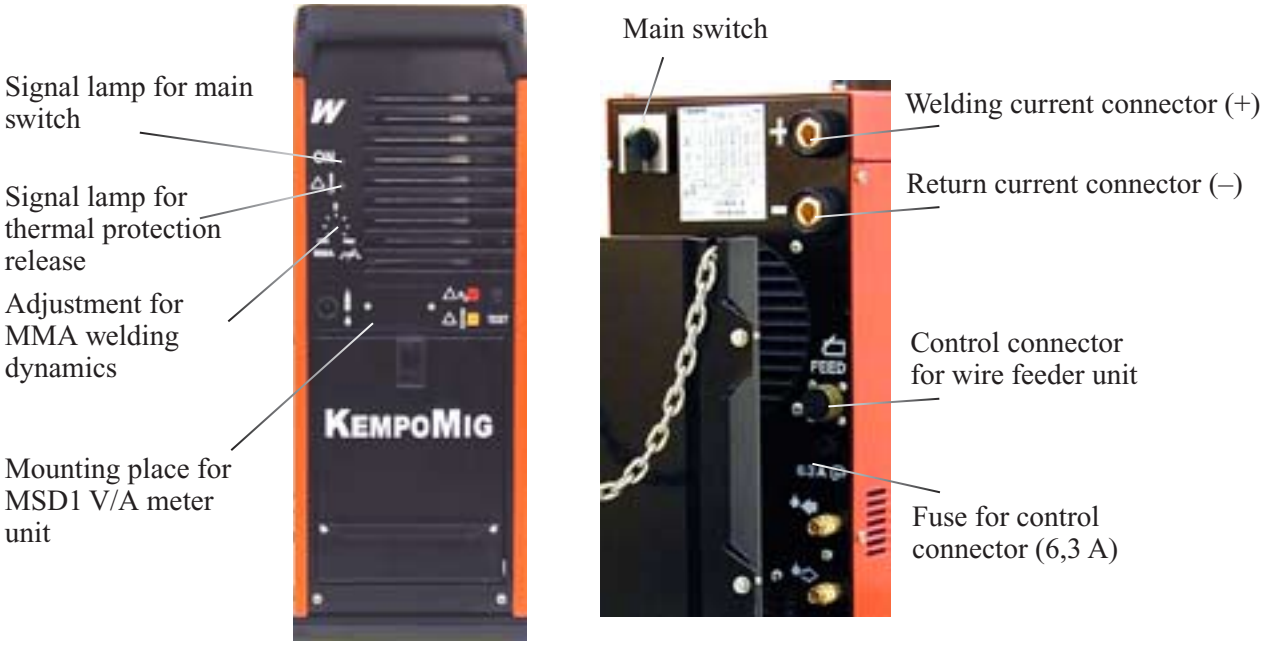
Cable	Duty cycle ED			Voltage loss / 10 m
	100 %	60 %	30 %	
50 mm^2	285 A	370 A	520 A	0,35 V / 100 A
70 mm^2	355 A	460 A	650 A	0,25 V / 100 A
95 mm^2	430 A	560 A	790 A	0,18 V / 100 A

Do not overload welding cables over permissible values to avoid 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.

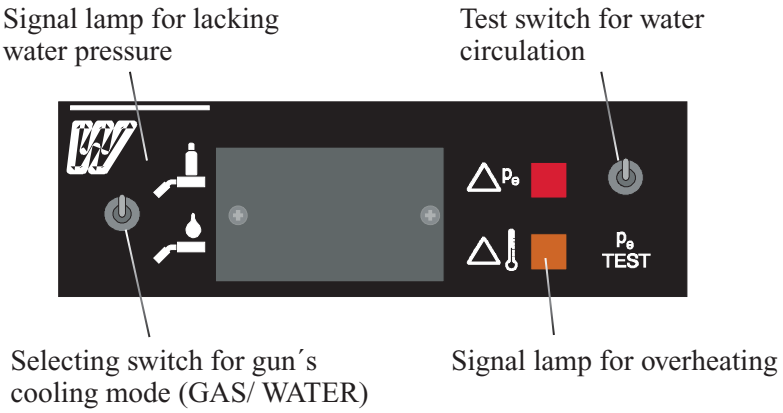
3. OPERATION AND USE CONTROLS

Kempomig 3200, 4000



Operation control and connectors Kempomig 3200 W, 4000 W

Water tank



3.1. MAIN SWITCH

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

3.2. SIGNAL LAMPS

Signal lamps of the machine report about electric function:

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

Signal lamp for thermal protection is lit, when the thermostat has 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 signal lamp has switched off, the machine is again ready for welding.

3.3. ADJUSTMENT FOR MMA DYNAMICS

By adjustment for MMA dynamics you influence on arc behaviour in drop short circuit. In max. setting the arc is at its roughest position and in min. setting at its softest position. Zero setting is recommendable factory setting for welding of all electrodes. By increasement of roughness of arc, blowing is increased and amount of spatters will grow.
Soft arc. Purpose: reduction of spatters in welding at upper end of recommended currents for electrode.
Rough arc. Purpose: e.g. thin stainless electrodes in welding at lower end of recommended currents for electrode.

3.4. CONTROL FUSE

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

3.5. OPERATION OF COOLING FAN

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

3.6. ADJUSTMENT FOR MIG/MAG WELDING

Adjustments for MIG/MAG welding parameters are made from FEED 400 wire feeder unit, which is connected to the Kempomig power source, see operation instructions for FEED 400.

4. ACCESSORIES

4.1. V/A METER UNIT MSD 1

The V/A meter unit MSD 1 displays during welding true value of welding current or welding voltage. The current / voltage display is selected with selecting switch of the MSD 1.
For the mounting of the MSD 1 remove the cover plate on the front panel of the unit. The connector of flat cable fastened to the cover plate is connected to the corresponding connector of the MSD 1.
Note! The MSD 1 does not display arc voltage, but the machine´s pole voltage. Take into attention that due to cable losses the arc voltage can be many volts lower than the machine´s pole voltage.

4.2. COOLING UNIT FUNCTIONS IN KEMPOMIG 3200W, 4000W

Kempomig 3200W and 4000W units have an inbuilt cooling unit inside the power source. Operation control switches of the cooling unit are on the front panel of the power source and the water tank of the cooling system is in front wall drawer (see picture).

Signal lamp for lacking water pressure

Test for water circulation

Selecting switch for gun´s cooling mode

Signal lamp for overheating

4.2.1. Installation of cooling

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

If the water does not start circulating, see paragraph for Operation disturbances.
Do not let any waste and dirt into the water circulation! Check the 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 and in gun.

4.2.2. Operation

Operating control

The pump is started automatically, when you pull the gun trigger. The water post-circulation is continued after the weld end for ca. 5 - 7 min.
In **O** position of the power source´s main switch all cooling unit functions are stopped!

Cooling unit´s fuse

The fuse 2 A, delayed, on the rear wall of the power source is the short-circuit protection of the cooling unit's auxiliary transformer. Use 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


- position: Gas-cooled MIG gun in use.


- position: Water-cooled MIG gun in use and the pump is started, when you pull the gun trigger.


N**ote!** If your choice is  - position, but you are using water-cooled gun, the welding is started by pulling the gun trigger, but the pump will not get started. This kind of wrong choice will destroy the gun in short time!

Test switch

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

Signal lamp for overheating

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

Signal lamp for lacking water pressure

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

4.2.3. Operation disturbances of the cooling unit

If operation or functional disturbances occur, take measures according to the following list. If the disturbance cannot be eliminated, take contact with Authorized Kemppi repair shop.

The pump does not get started by TEST switch:

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

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

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

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

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

During welding the yellow signal lamp for overheating lights up and the equipment is stopped:

– release the trigger and let the water cool down. When the lamp is switched off, the operation has been reset automatically
– check if the gun is suitable for power you are using

5. MAINTENANCE

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

5.1. CABLES

Check the condition of welding and connection cables daily. Do not use faulty cables!
Make sure that the mains connection cables 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.

5.2. POWER SOURCE

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

Check at least every 6 months (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!

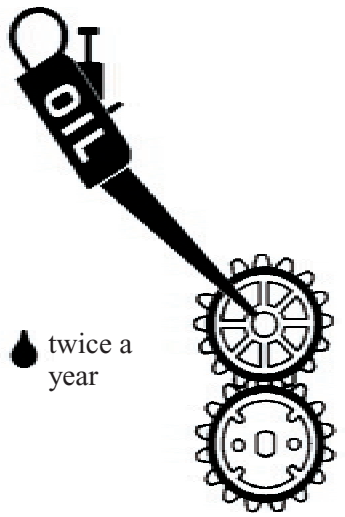
⚠ **Only authorized electrician shall carry out repairs to the machine.**

5.3. REGULAR MAINTENANCE

Kemppi service repair shops make regular maintenance according to agreement.

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

– Cleaning of equipment
– Checking and maintenance of the welding tools
– Checking of connectors, switches and potentiometers
– Checking of electric connections
– Metering units checking
– Checking of mains cable and plug
– 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.



6. ORDERING NUMBERS

Power sources

Kempomig 3200 6227320
Kempomig 3200W 6227325
Kempomig 4000 6227400
Kempomig 4000W 6227405

Accessories:

MSD 1 V/A metering unit 6185666

Wire feeder units

FEED 400 6237400

Accessories:

C 110D remote control unit 6185421
SYNC 400 6263120
GG 400 gas guard 6237405
GH 10 gun holder 6256010
P500 transport unit 6185265
KV400 swing arm 6185247
KV400 50-1.5-GH (cable) 6260351
KV400 50-1.7-WH (cable) 6260353
Hub for wheel reel 4289880
Branche cabel KMP/Kempomig 3151370

MIG guns

Air-cooled:

MMT 32 .....3 m 6253213MMT
MMT 32 .....4,5 m 6253214MMT
MMT 35 .....3 m 6253513MMT
MMT 35 .....4,5 m 6253514MMT
MMT 42 .....3 m 6254213MMT
MMT 42 .....4,5 m 6254214MMT
PMT 32 .....3 m 6253213
PMT 32 .....4,5 m 6253214
PMT 35 .....3 m 6253513
PMT 35 .....4,5 m 6253514
PMT 42 .....3 m 6254213
PMT 42 .....4,5 m 6254214
KMP 300.....6 m 6257306
KMP 300.....10 m 6257310

Liquid-cooled:

MMT 30W .....3 m 6253043MMT
MMT 30W .....4,5 m 6253044MMT
MMT 42W .....3 m 6254203MMT
MMT 42W .....4,5 m 6254204MMT
PMT 30W.....3 m 6253043
PMT 30W.....4,5 m 6253044
PMT 42W.....3 m 6254203
PMT 42W.....4,5 m 6254204
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
WS 42W (Al 1.2-1.6) 6 m 6254206A12
WS 42W (SS 1.0).....6 m 6254206S10

WS 42W (SS 1.2).....6 m 6254206S12
WS 42W (Al 1.2-1.6) 8 m..... 6254208A12
WS 42W (SS 1.0).....8 m 6254208S10
WS 42W (SS 1.2).....8 m 6254208S12

Accessories (PMT and WS):

RMT 10..... 6185475

Interconnection cables

Interconnection cables Kempomig 3200, 4000 / FEED 400

KW 50-1.3-GH 6260350
Multimig 50-5-GH..... 626010401
Multimig 50-10-GH..... 626010601

Interconnection cables Kempomig 3200W, 4000W / FEED 400

KW 50-1.5-WH..... 6260352
KW 50-5-WH..... 626035401
KW 50-10-WH..... 626035601

MMA cable

MMA cable .....5 m 6184501

Return current cable

5 m - 50 mm² 6184511

7. TECHNICAL DATA

Kempomig		**3200**	**3200W**
Rated voltage		400 V +10 % ... -15 %	
		3~ 50/60 Hz	
Rated power		13.4 kVA / 320 A 50 % ED	
	100 % ED	8.0 kVA / 220 A	
Mains cable / fuses		4×2.5 S / 16 A delayed	
Loading capacity	40 % ED	– – – –	
	50 % ED	320 A / 32.8 V	
	100 % ED	250 A / 30 V	
Welding current and		10 A – 320 A / MMA	
voltage control range (stepless)		10 V – 35 V / MIG	
Max welding voltage (MMA)		40 V / 320 A	
Open circuit voltage		75 V	
Open circuit power		< 55 W	
Efficiency		0.85 (320 A / 32.8 V)	
Power factor		0.94 (320 A / 32.8 V)	
Operation temperature range		- 20 °C ... + 40 °C	
Storage temperature range		- 40 °C ... + 60 °C	
Temperature class		H (180 °C) / B (130 °C)	
Degree of protection		IP 23	
Water tank volume		– – – –	3 l
Cooling capacity (dt = 30 °)		– – – –	620 W
Max pressure		– – – –	400 kPa
Max flow		– – – –	4 l / min
Cooling liquid		– – – –	20- 40 % glycol / water mixture
External dimensions	length	940 mm	
	width	515 mm	
	height	880 mm	
Weights	machine	46 kg	57 kg
	transport unit	25 kg	25 kg
	total	71 kg	82 kg

The products meet conformity requirements for CE marking.

Kempomig		**4000**	**4000W**
Rated voltage		400 V +10 % ... -15 %	
		3~ 50/60 Hz	
Rated power		18.4 kVA / 400 A 40 % ED	
	100 % ED	9.5 kVA / 250 A	
Mains cable / fuses		4×2.5 S / 16 A delayed	
Loading capacity	40 % ED	400 A / 36 V	
	50 % ED	– – – –	
	100 % ED	250 A / 30 V	
Welding current and		10 A – 400 A / MMA	
voltage control range (stepless)		10 V – 40 V / MIG	
Max welding voltage (MMA)		40 V / 400 A	
Open circuit voltage		75 V	
Open circuit power		< 55 W	
Efficiency		0.84 (400 A / 36 V)	
Power factor		0.95 (400 A / 36 V)	
Operation temperature range		- 20°C ... + 40 °C	
Storage temperature range		- 40°C ... + 60 °C	
Temperature class		H (180°C) / B (130 °C)	
Degree of protection		IP 23	
Water tank volume		– – – –	3 l
Cooling capacity (dt = 30 °)		– – – –	620 W
Max pressure		– – – –	400 kPa
Max flow		– – – –	4 l / min
Cooling liquid		– – – –	20- 40 % glycol/ water mixture
External dimensions	length	940 mm	
	width	515 mm	
	height	880 mm	
Weights	machine	46 kg	57 kg
	transport unit	25 kg	25 kg
	total	71 kg	82 kg

The products meet conformity requirements for CE marking.

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