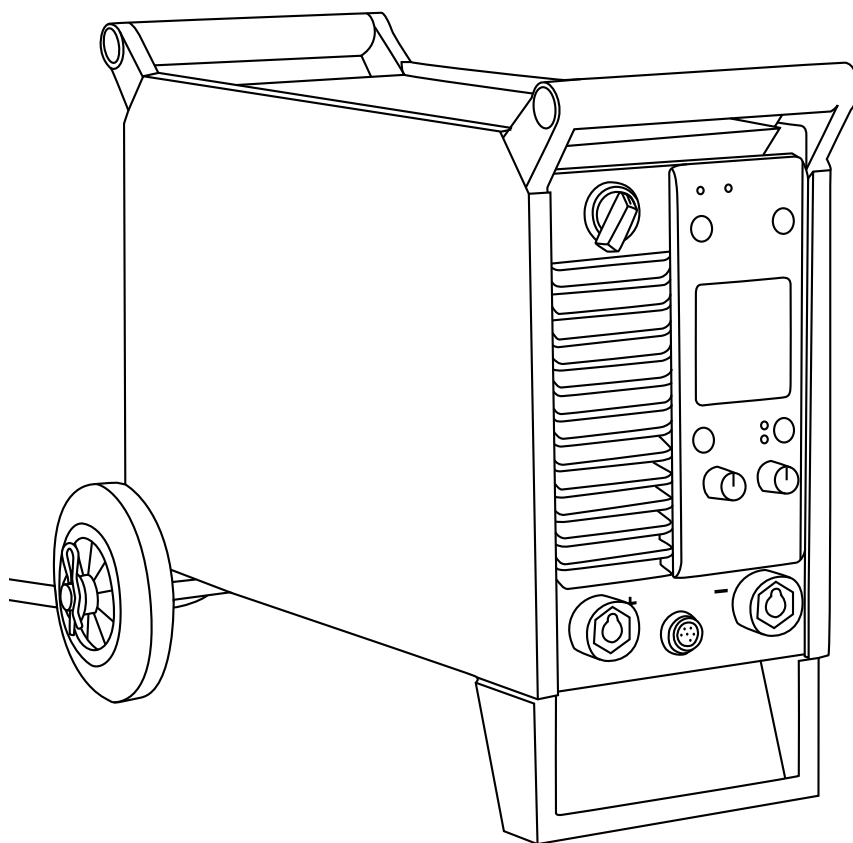


HiArc

M 400R, M 500R



Operating manual **EN**

Manual de instrucciones **ES**

Manuel d'utilisation **FR**

Manual de utilização **PT**

Инструкции по эксплуатации **RU**

OPERATING MANUAL

English

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1. INTRODUCTION

1.1 General

Congratulations on choosing the HiArc series 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 device 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.

NOTE! Items in the manual that require particular attention in order to minimise damage and personal harm are indicated with this symbol. 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.

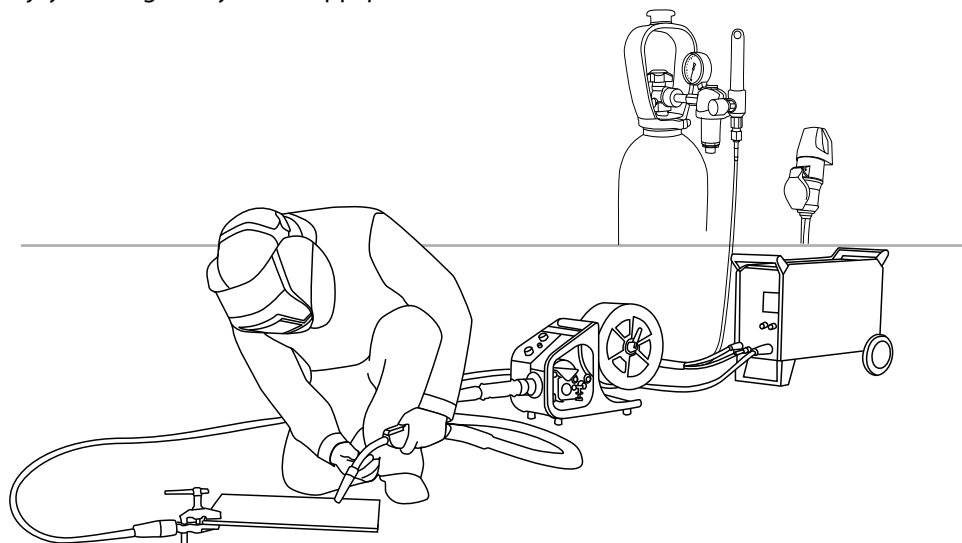
1.2 About HiArc M product series

Kemppi's HiArc M products are inverter MIG/MAG welding power sources to be used in a 3-phase mains power supply. HiArc welding machines are designed for industrial and professional use.

These MIG/MAG power sources can be used with various wire feeders. However, it is recommended to use the Kemppi wire feeder unit, which has been designed especially for use with your HiArc power source.

The HiArc power sources are equipped with gas type selection buttons. HiArc automatically presets the welding dynamic characteristic according to your gas selection choice.

Enjoy welding with your Kemppi product!



2. INSTALLATION

2.1 Before use

The product is packed in cartons designed specifically for them. However, always make sure before use that the products have not been damaged during transportation.

Check also that you have received the components you ordered and the instruction manuals needed. Product packaging material is recyclable.

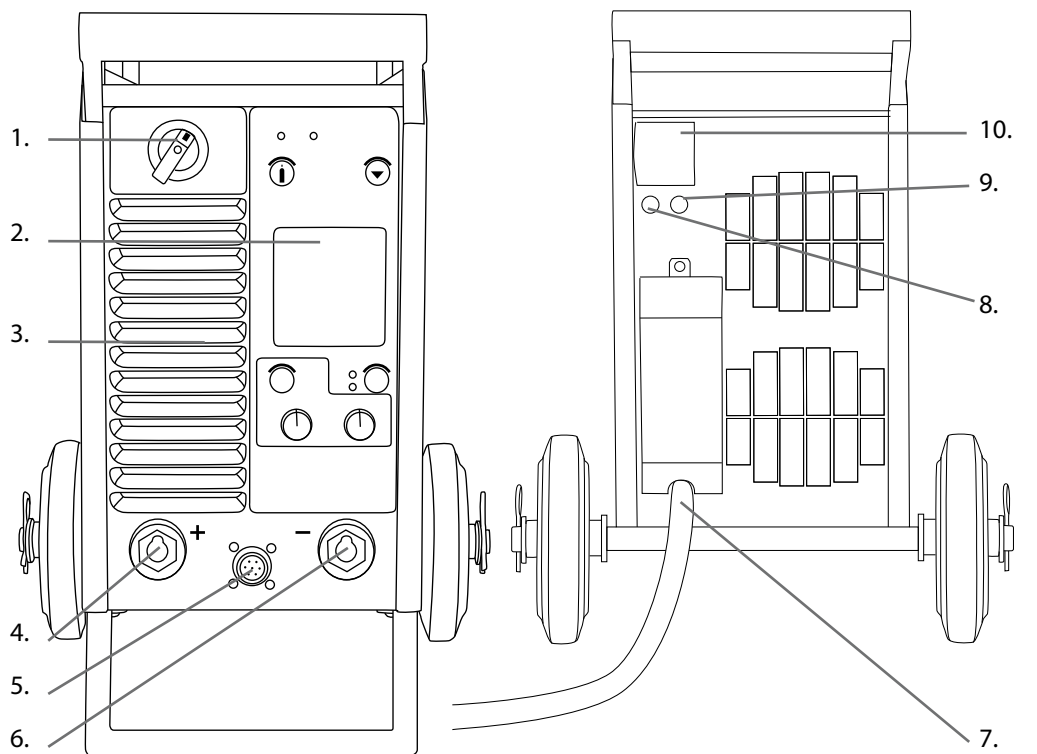
NOTE! When moving the welding machine, always lift it from the handle, never pull it from the welding gun or other cables.

Operating environment

This machine is suitable for both indoor and outdoor use. Always make sure that the air flow in the machine is unrestricted. The recommended operating temperature range is $-20...+40\text{ }^{\circ}\text{C}$.

Please read also the Safety Instructions concerning the operating environment.

2.2 Machine introduction



FRONT

1. ON/OFF switch
2. LCD display
3. Fan grill
4. Wire feeder cable connector (+)
5. Control cable connection
6. Earth return cable connector (-)

BACK

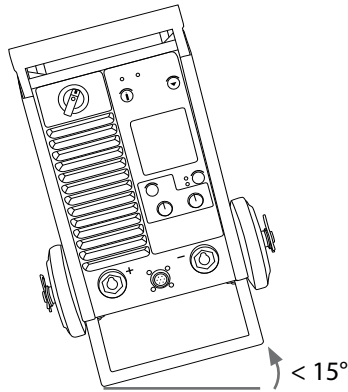
7. Mains lead connector
8. Power source fuse, 8A
9. Shielding gas heater fuse, 2 A
10. Connector for shielding gas heater

2.3 Positioning of the machine

Place the machine on a sturdy, level surface that is dry and does not allow dust or other impurities to enter the machines cooling air flow. Preferably site the machine to a suitable carriage unit so it is above floor level.

Notes for positioning the machine

- The surface inclination may 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 circulation.
- Protect the machine against heavy rain and direct sunshine.

The machine is not allowed to be operated in the rain as the protection class of the machine, IP23S, allows preserving and storing outside only.

NOTE! Never aim the spray of sparks from a grinding machine toward the equipment.

2.4 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.

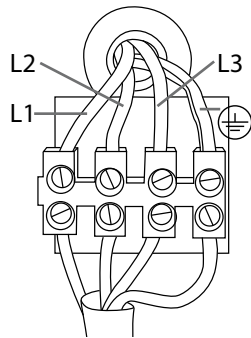
2.5 Connecting cables

On the front side of the machine, there are connectors for the interconnection cable and the control cable for connecting the power source to the wire feeder.

On the back side of the machine, there is a terminal strip connector, where you connect the mains cable leads.

2.5.1 Mains connection

HiArc must be connected to an earthed 3-phase power supply using the terminal strip connector in the backside of the machine. Attach the mains cable leads as shown in the picture below.



To connect the mains cable do the following:

1. Remove the mains lead cover plate.
2. Connect the mains cable's phase lead connectors to L1, L2, and L3 terminals.
3. Connect the protective earth lead to its terminal.
4. Secure the cable clamp.

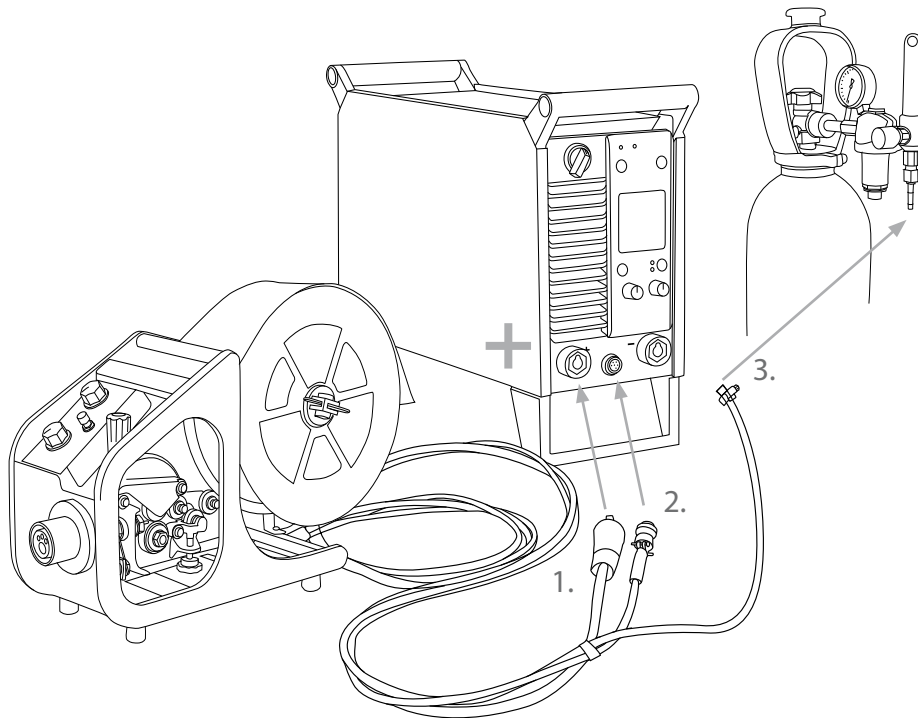
Check also that the mains cable complies with the local electrical regulations, and replace the cable if necessary. See 'Technical data'.

***NOTE!** The mains cable or wall plug may be installed or replaced only by an electrical contractor or installer authorised to perform such operations.*

2.5.2 Wire feeder connection

The HiArc power source is designed to be used with the HiArc F wire feed unit.

To connect the HiArc F wire feeder unit to the power source, complete the following steps:

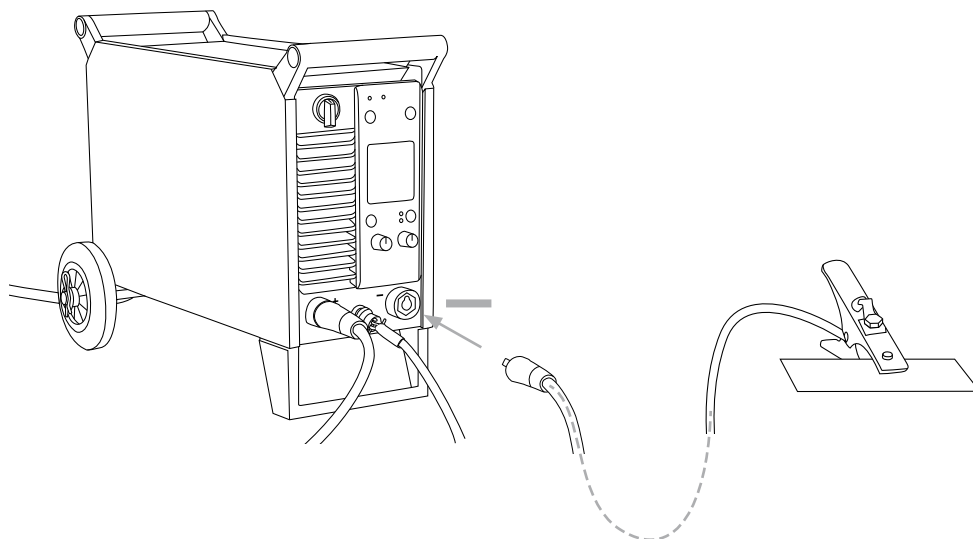


1. Attach the HiArc F wire feed unit power cable to the + connector of the HiArc power source. Hand tighten the connector with a clockwise push and twist action to lock.
2. Attach the HiArc F wire feed unit control cable plug to the control socket of the power source.
3. Connect the shielding gas hose to the gas bottle or to the shielding gas distribution system.

NOTE! Please read carefully the wire feeder installation and operation instructions in the Kemppi HiArc F operating manual.

NOTE! Normally the wire feeder should be connected to the plus pole. However, with some filler wires and shielding gases, you should connect the feeder to the minus pole, and the earth return cable to the plus pole.

2.5.3 Earth return cable connection



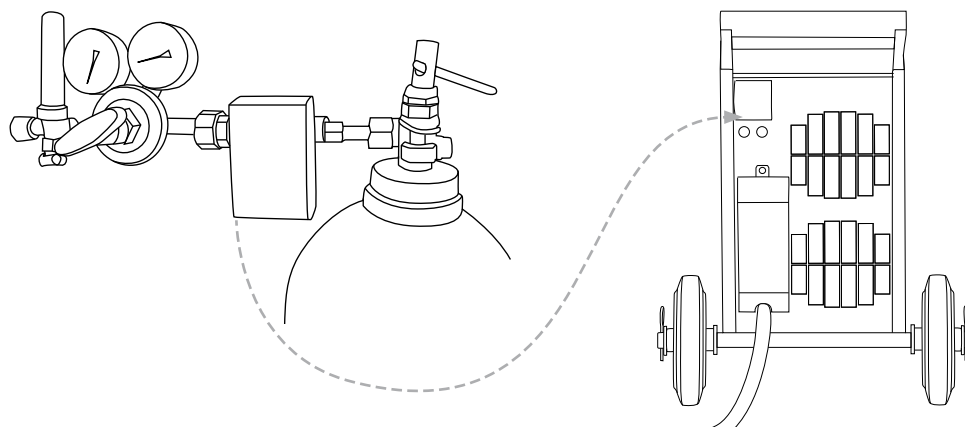
Attach the earth return cable to the minus (–) connector. Hand tighten the connector with a clockwise push and twist action to lock.

Attach the other end of the earth return cable to the workpiece before welding.

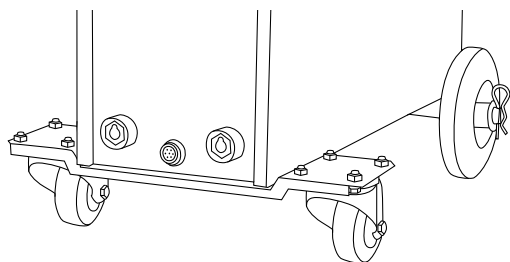
NOTE! When attaching the earth return clamp to the work piece, remember to clean the work piece surface so as to achieve safe and undisturbed operation.

2.5.4 Gas heater

When using CO₂ shielding gas, a 110 V gas heater can be connected to the power supply located at the back of the HiArc power source.



2.6 Optional accessories



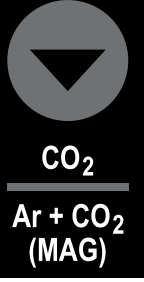
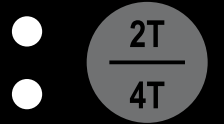

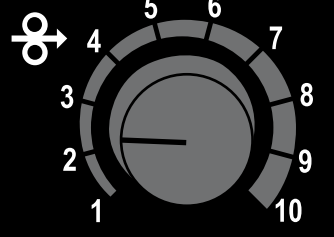
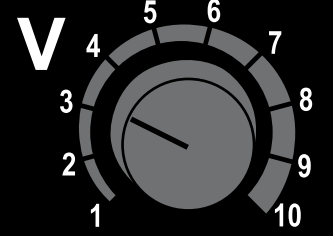


Castor wheel kit replaces the static front support leg of the machine and allows the machine to be free wheeled.

Fastening plate can be used to fasten the wire feeder on the top of the power source.

3. USING THE MACHINE

3.1 Control panel functions

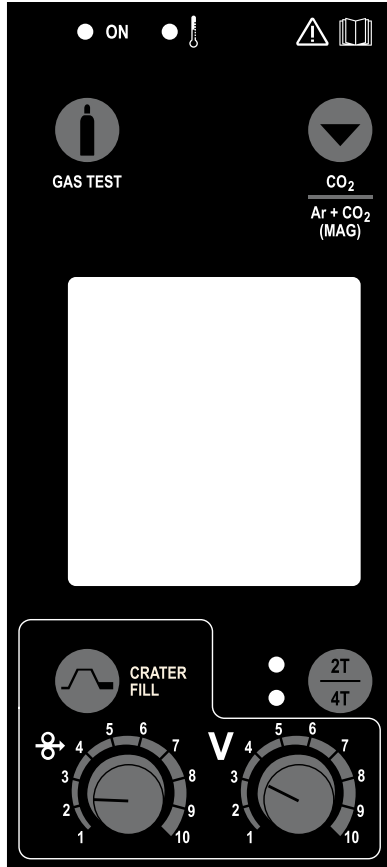
	ON/OFF switch This switch turns the machine on and off.
	Gas test button Press to test the shielding gas flow.
	Gas selection button Press to select either CO ₂ or mixed shielding gas (MAG).
	Press to select between 2T and 4T gun trigger modes.
	Crater Fill selection button Press to select the Crater Fill mode ON or OFF.
	Wire feed speed adjustment knob Turn to set the wire feed speed value for the Crater Fill mode.
	Voltage adjustment knob Turn to set the welding voltage value for the Crater Fill mode.

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3.2 Starting the machine

To start the machine, turn the main switch to position 'I'. Initially, the firmware version number is displayed in the LCD display. After that, the firmware number is replaced with the parameter display, and the machine is ready for setup.

3.3 LCD display



The HiArc power source is equipped with an LCD display. Welding parameter settings are made through the HiArc F wire feeder control panel for wire feed speed (A) and voltage (V). During welding the display always shows the welding current (A) used.

The average welding values remain on display for 10 seconds after you stop welding.

The lower part of LCD shows the Crater Fill values. The upper part of the LCD display shows wire feed speed, the selected welding voltage and gas type selection.

3.4 LED indicators

There are two LED indicator lights on the top of the control panel.



1. The ON light indicates that the power source is turned on.
2. The second light indicates that the machine is over heated.

NOTE! The machine stops automatically when it reaches its maximum operating temperature. If the heat indicator led is on, the machine has exceeded its normal maximum operating temperature. Stop welding and wait until the led turns off. The machine is then ready for welding to continue.

3.5 Selecting shielding gas

Press the shielding gas selection button to set the shielding gas type to either CO₂ or mixed gas according to the gas you are using.

Select CO₂ if you are using carbon dioxide. Select Ar + CO₂ (MAG) if you are using mixed gas.

NOTE! HiArc M has a factory set pre-gas time of 0.2 s and a Post-gas time of between 2 – 4 s, depending on the welding power settings.

3.6 Gas test

To test the shielding gas flow, press the gas test button once. The shielding gas starts to flow and stops automatically after 20 seconds.

To interrupt the gas test, press the button again.

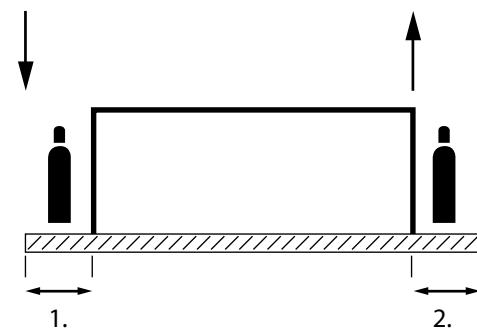
3.7 Trigger logic and Crater Fill function

The HiArc M 400R power source is equipped with a crater fill function, which makes your welding more efficient and helps you avoid welding defects at the end of the weld sequence. With this function you can use an additional crater fill current level, which can be lower or higher than your normal welding current level.

2T mode

MIG welding with 2T mode of the gun trigger.

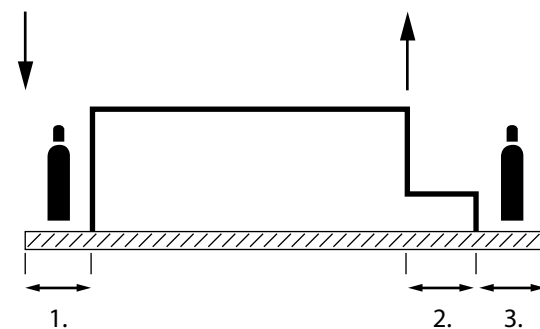
- Push the trigger – welding starts after preset pre-gas time.
- Release the trigger – welding ends. Post-gas flows for preset time.



1. Pre-gas time
2. Post-gas time

2T mode and crater fill function

- Push the trigger – welding starts after preset pre-gas time.
- Release the trigger – values drop to preset crater fill level and welding ends after preset time. Post-gas flows for preset time.



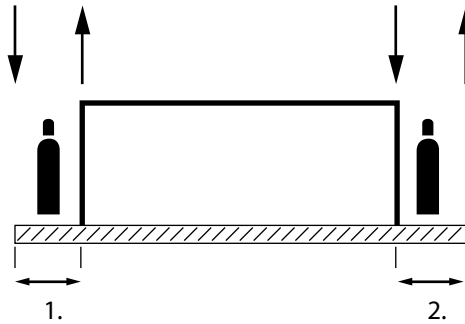
1. Pre-gas time
2. Crater fill time
3. Post-gas time

4T mode

MIG welding with 4T mode of the gun trigger.

- Trigger pushed down – flow of shielding gas starts.
- Trigger released – welding starts.
- Trigger pushed down – welding ends and shielding gas flow continues.
- Trigger released – flow of shielding gas ends.

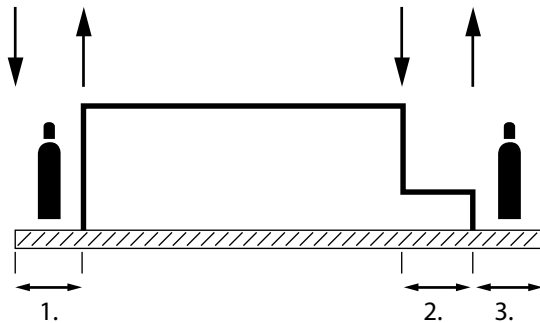
Notice: PostGas Time at least preset minimum.



1. Pre-gas time
2. Post-gas time

4T mode and crater fill function

- Trigger pushed down – flow of shielding gas starts.
- Trigger released – welding starts.
- Trigger pushed down – welding values change to crater fill level.
- Trigger released – welding ends. Post-gas time flows for preset time.



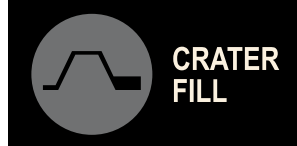
1. Pre-gas time
2. Crater fill time
3. Post-gas time

3.8 Calibrating wire feed speed

To ensure that the pre-sets and meter displays work as planned, you must calibrate the wire feed speed of your HiArc power source and F 10 wire feeder welding equipment.

Calibration

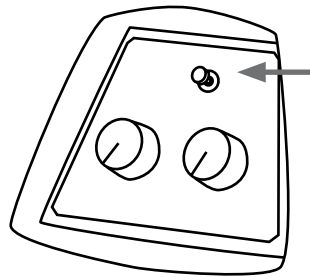
1. Start the calibration by pressing Crater Fill button for 3 seconds.



2. Press Gas Test button to select either HiArc F 10 or HiArc F 30 wire feeder.


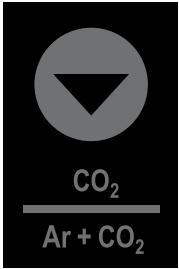
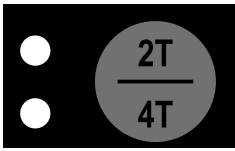


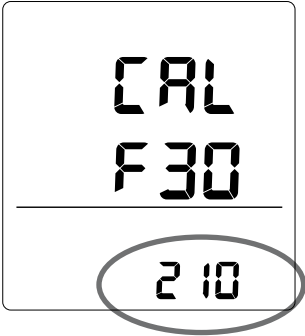
3. Cut the filler wire at the contact tip.
4. Press Wire Inch button at the wire feeder.
 - Wire feed starts and continues for 12 seconds



5. When wire feed stops, cut the wire at the contact tip and measure the length of the fed wire in mm.

6. At the power source control panel, enter the length of the wire using the buttons below.

	To toggle between ones, tens and hundreds
	To add the number by one
	To subtract the number by one



NOTE! If you enter a value that does not fit in, the machine forces the value within the acceptable limits. This is to prevent you from entering false values.

- 7. Press Wire Inch button again.
 - Wire feed starts and continues for 2 seconds.
- 8. When wire feed stops, cut the wire and measure its length.
- 9. At the power source control panel, enter the length of the wire in the same manner as in step 6
- 10. Press Wire Inch button.

To skip the calibration

- If you want to skip the calibration, press Crater Fill button for 3 seconds. The machine exits the calibration mode.
- If the device is left idle for 5 minutes, it automatically exits the calibration mode.
- If the device is turned off before the step 10, it automatically exits the calibration mode, and the old calibration values remain.

4. TROUBLESHOOTING

Problem	Cause
The machine stops working. Overheating indicator is lit, and Err 4 is displayed.	<p>The machine has overheated.</p> <ul style="list-style-type: none"> • Ensure that cooling air has unrestricted flow. • The machine's duty cycle has been exceeded. <p>If no other damage is caused, the fan starts working and the machine recovers within a couple of minutes.</p> <p>If the problem persists, please contact Kemppi service representative.</p>
Machine stops working. Err 2 or Err 3 is displayed.	<p>The mains voltage is either too low (Err 2) or too high (Err 3). *</p> <p>The machine recovers automatically, when the mains voltage is in the recommended range (342 – 484 V).</p>
Machine stops working. Err 43 is displayed.	<p>The wire feeder motor is overloaded.</p> <p>Check that you are using the right wire type and that the wire feed route is unobstructed.</p>
Poor welding result	<p>Several factors affect the welding quality.</p> <ul style="list-style-type: none"> • Check wire feed calibration. • Check that the earth return clamp is properly attached, the point of contact is clean and that the cable and its connectors are intact. • Check the voltage and wire speed settings on the control panel are correct for the given wire size and type. • Check that the shielding gas flow rate at the gun nozzle is correct. • Check that the shielding gas is suitable for the filler wire used. • Check that the wire feed is constant, and adjust if necessary. • Check that the mains voltage is not too irregular.
Main switch indicator does not switch on	<p>The machine has no mains voltage</p> <ul style="list-style-type: none"> • Check the mains fuses • Check the mains cable and the wall plug
* Contact Kemppi service in case of Err 2 and Err 3 without mains voltage cause.	

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5. MAINTENANCE

5.1 Regular maintenance

Check regularly the electrical connections of the machine. Clean any oxidised connections, and tighten the loosened cable connections.

Let authorised Kemppi service workshop make periodic service to your machine. Appropriate use and regular service guarantee trouble-free use of the machine. This allows you to avoid interruptions and increase the productivity of the machine.

NOTE! Remember that the machine may be repaired only by an electrical contractor or installer authorised to perform such operations.

5.2 Disposal of the machine



Do not dispose of electrical equipment with normal waste!

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 Kemppi representative. By applying this you will improve the environment and human health.

6. TECHNICAL DATA

HiArc		M 400R	M 500R
Connection voltage	3~, 50/60 Hz	380 – 440 V (–10 %...+10 %)	380 – 440 V (–10 %...+10 %)
Rated power at max. current	60 % ED	17.6 kVA	24.5 kVA
	100 % ED	12.5 kVA	17 kVA
Supply current	I _{1max}	27 A	37 A
	I _{1eff}	19 A	29 A
Output at 40 °C	60 % ED	400 A / 34 V	500 A / 39.0 V
	100 % ED	310 A / 29 V	390 A / 33.5 V
Fuse (delayed)		25 A	35 A
Open circuit voltage		60 – 70 V	60 – 70 V
Power factor at 60 %		0.90	0.92
Efficiency at 100 %		87 %	87 %
Welding range		13 – 39 V	13 – 50 V
External dimensions	L x W x H	647 x 385 x 485 mm	716 x 385 x 485 mm
Weight		36 kg	41 kg
EMC class		A	A
Degree of protection		IP23S	IP23S
Gas heater connection		110 V/150 W	110 V/150 W
Standards IEC 60974-1 IEC 60974-10			

7. ORDERING CODES

HiArc M 400R power source		63104002
HiArc M 500R power source		63105002
HiArc F 10 wire feeder		6310010
HiArc F 30 wire feeder		6310030
Welding guns		
FE 42	3.5 m	6604203
FE 42	5.0 m	6604204
Interconnection cables		
HiArc F30 50-5-GH	50 mm ² , 5 m	6260500
HiArc F30 70-5-GH	70 mm ² , 5 m	6260501
HiArc F30 50-10-GH	50 mm ² , 10 m	6260513
HiArc F30 70-10-GH	70 mm ² , 10 m	6260514
HiArc F30 50-15-GH	50 mm ² , 15 m	6260515
HiArc F30 70-15-GH	70 mm ² , 15 m	6260516
HiArc F30 70-20-GH	70 mm ² , 20 m	6260523
HiArc F30 70-30-GH	70 mm ² , 30 m	6260633
Optional extensions		
HiArc 10-70-G	70 mm ² , 10 m	6310710
HiArc 15-70-G	70 mm ² , 15 m	6310715
HiArc 10-50-G	50 mm ² , 10 m	6310510
HiArc 15-50-G	50 mm ² , 15 m	6310515
Earth return cables		
Earth return cable, HiArc	50 mm ² , 5 m	6184511H
Earth return cable, HiArc	70 mm ² , 5 m	6184711H
Accessories		
Castor wheel kit		W005977
Fastening plate	HiArc M 400R	W007362
	HiArc M 500R	W007378

EN

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