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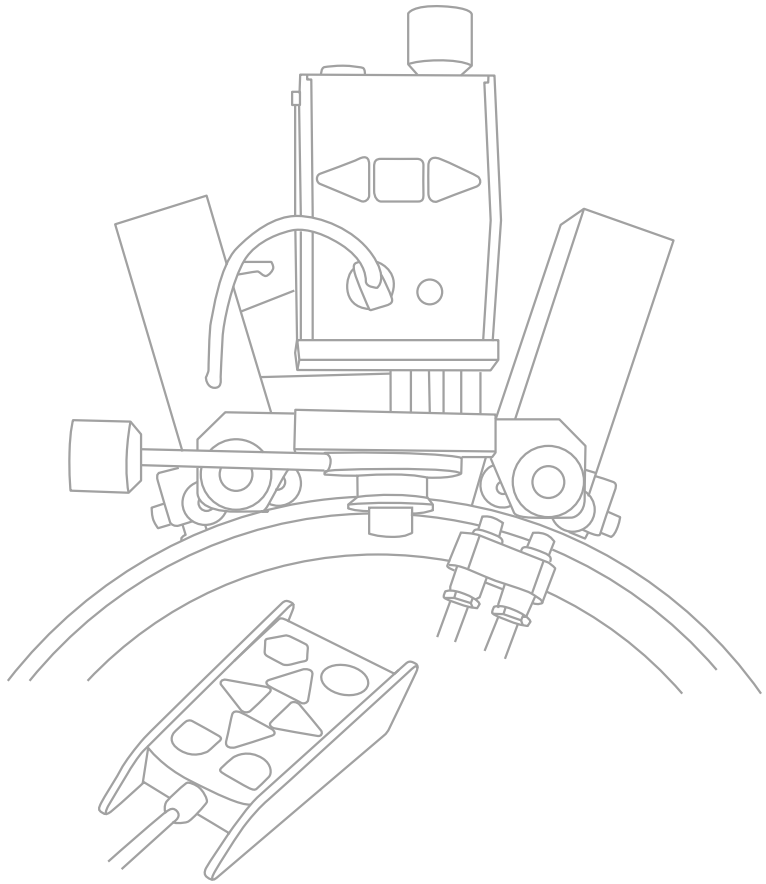
OPERATING MANUAL

A5 MIG Orbital System

1500

KEMPPI

CONTENTS



OPERATING MANUAL

1. INTRODUCTION

1.1 General

Congratulations on choosing A5 MIG Orbital System 1500 welding equipment. 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 operating manual and the safety instructions booklet 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 authorized Kemppi dealer, or visit the Kemppi website 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 harm are indicated with below symbols. Read these sections carefully and follow their instructions.

Note:
Gives the user a useful piece of information.

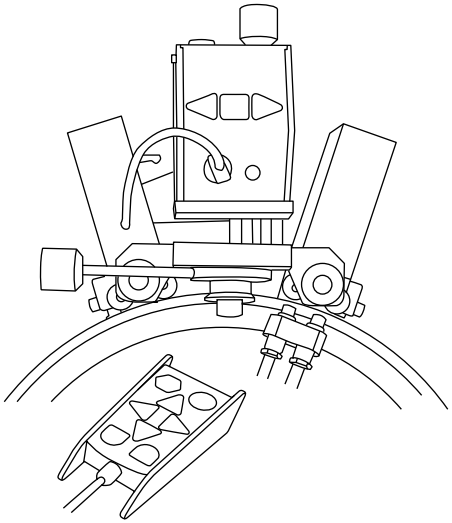
Caution:
Describes a situation that may result in damage to the equipment or system.

Warning:
Describes a potentially dangerous situation. If not avoided, it will result in personal damage or fatal injury.

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 the product



A5 MIG Orbital System 1500 is a complete set of welding mechanization equipment designed especially for orbital applications. The mechanical design of this orbital carriage is very flexible, and it can be used for:

- horizontal joints
- vertical joints
- welding with or without weaving.

The carriage is divided into two drive units, each of which can be independently adjusted for different guide ring diameters. Each drive unit has its own motor of which one pulls and the other pushes to ensure stable operation at both raising and lowering movement.

The system includes two control panels; one on the carriage front surface and the other on the remote control unit. During welding, the system can be operated by using the remote control unit that provides the operator with the most used controls of the carriage. The weaving unit is synchronized with the movement of the carriage for various weaving patterns.

1.3 Compatibility

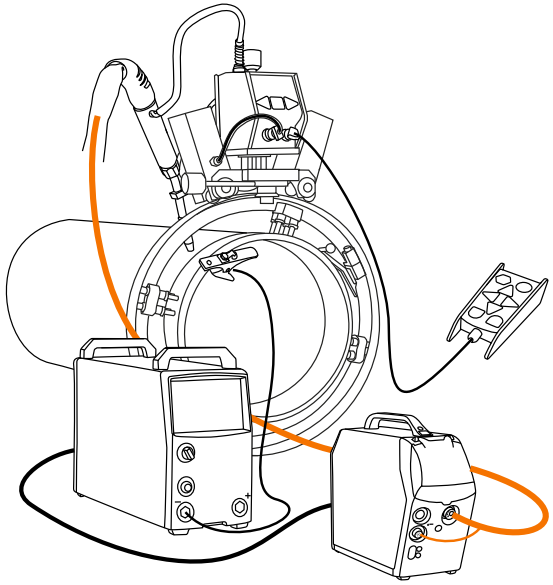
A5 MIG Orbital System 1500 is compatible with the following welding equipment:

- FastMig M and FastMig X: all wire feeders and control panels
- MXF 65 and MXF 67 wire feeders
- FastMig Pulse 350/450 power sources
- Control panel PF 65
- FastMig KMS 300/400/500 power sources
- Control panels SF 52W and SF 54
- SuperSnake mechanization models
- Other power source brands with limitations.

ⓘ Some of the functions are available only if the wire feeder has the right control panel. For example, changing memory channels at the welding carriage is available only if the wire feeder has a control panel with the channel remote control feature.

2. INSTALLATION

2.1 ConnectingtoaFastMigweldingmachine



To connect the carriage system to the FastMig welding equipment:

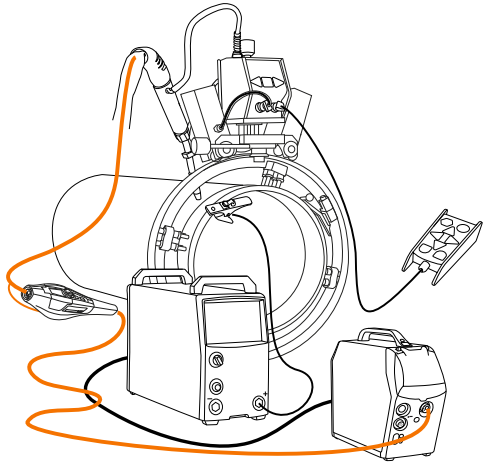
1. Connect welding cable to welding gun connector.
2. Connect control cable to remote control connection at the wire feeder.
3. Connect control cable to 7-pin connection at the carriage unit.
4. Connect remote control unit to 7-pin connector on the carriage front panel.

With Kemppi mechanization welding gun, the control cable is integrated into the gun cable. The trigger mode must be set to 2T. With other welding guns, you need to use a separate control cable. See the ordering codes at the end of this document.

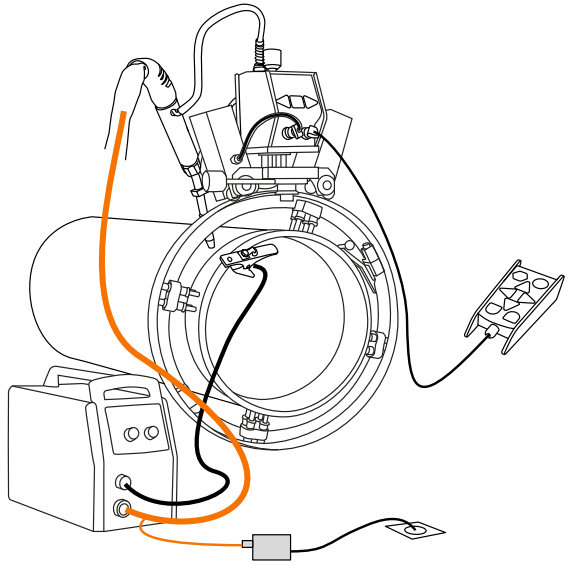
When using a manual welding gun, start and stop the arc with the gun trigger and start the carriage motion with the remote control as usual. The trigger mode must be set to 4T. See FastMig operation manual for further instructions.

When using a Supersnake:

1. Use the mechanization model of Supersnake.
2. Connect as usual to the wire feeder, and connect the carriage with the welding gun to the Supersnake. This model includes a bus coupler with which to connect.



2.2 Connecting to a non-FastMig welding machine



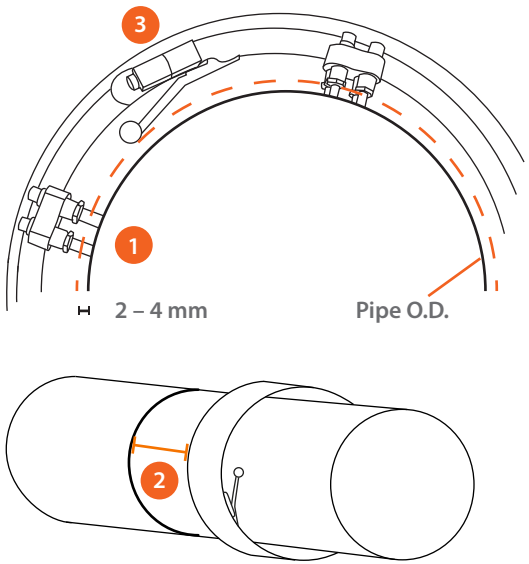
You need a transformer (1-phase, 230 VAC) to power the carriage. In this setup, the start button and the adjustment of welding voltage and wire feed speed are not accessible through the remote control device.

Do the following to connect:

1. Connect welding gun to the wire feeder.
2. Attach welding gun to the carriage gun holder.
3. Connect transformer to the carriage.
4. Start welding by pressing the gun trigger.

2.3 Guide ring assembly

Guide rings are available for all standard pipe sizes. Each guide ring includes circa ±20 mm diameter adjustment range. See ordering codes for each size at the end of this guide.

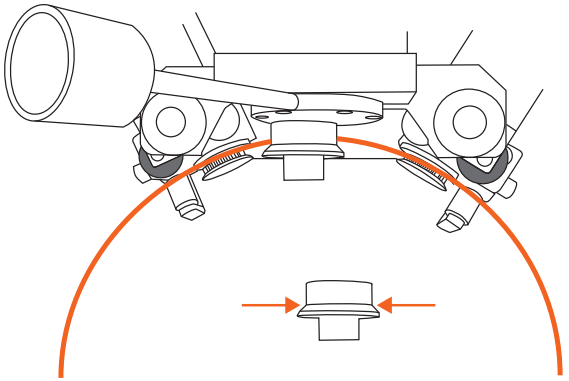


1. Adjust the support legs (1) so that the ring fits tightly around the pipe. There are four support legs, two of which are spring loaded to allow easy centering of the guide ring.

ⓘ It is important to position the guide ring in centered position, as it reduces the need to adjust stick-out length during welding.

2. Mount the guide ring around the pipe so that locking lever (2) is on the opposite side of the joint. Distance from joint center line should be about 230 mm.
3. Clamp the guide ring in position with the locking lever.

2.4 Mounting the carriage on the guide ring



1. Turn the carriage locking lever (1) to release the front support wheel (2).
2. Mount the carriage on the guide ring and adjust the angle of the drive wheels (4) so that the vertical support wheels (3) are in contact with the guide ring.
3. Lock to position with the locking lever.
4. Run the carriage forward and backward and make adjustments if necessary.

ⓘ Adjust the front support wheel (2) so that the flat surface of the wheel meets the edge of the guide ring.

2.5 Selecting a welding gun

Kemppi mechanization guns offer various benefits compared with manual welding guns. Carriage control and powering signals are integrated in the gun cable, so there is only one cable needed between the wire feeder and the welding carriage. This also enables the adjustment of carriage functions and welding parameters at the remote control device.

Kemppi offers three welding gun models designed especially for mechanized welding:

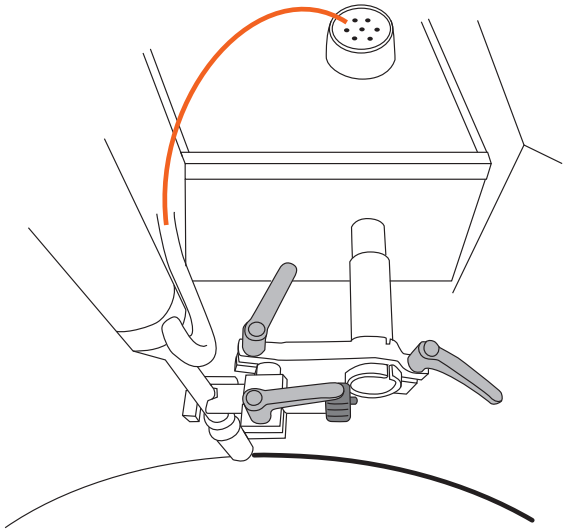
PMT MN32C (Multi Neck model)
Multiple neck designs. Slightly bent neck available for mechanized welding. Extra-long gas nozzle and contact tip are available, suitable especially for root welding in narrow grooves.

MMT42C
Gas-cooled straight neck model

MMT42C
Water-cooled straight neck model for heavy applications

ⓘ Please see the technical details of the welding guns in their documentation.

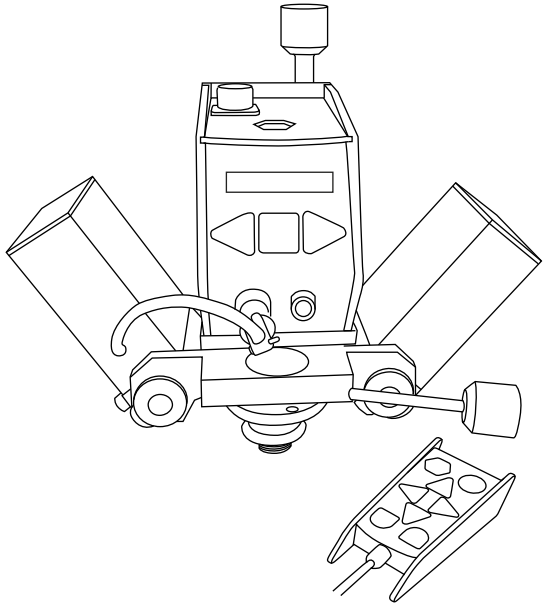
2.6 Installing the welding gun



1. Fasten the gun holder on the weaving unit.
2. Fasten the gun on the holder.
3. Connect the control cable.
4. Ensure that the weaving unit is in center position.
5. Use adjustment screws and weaving displacement adjustment to fine-adjust the position of the gun.

3. OPERATION

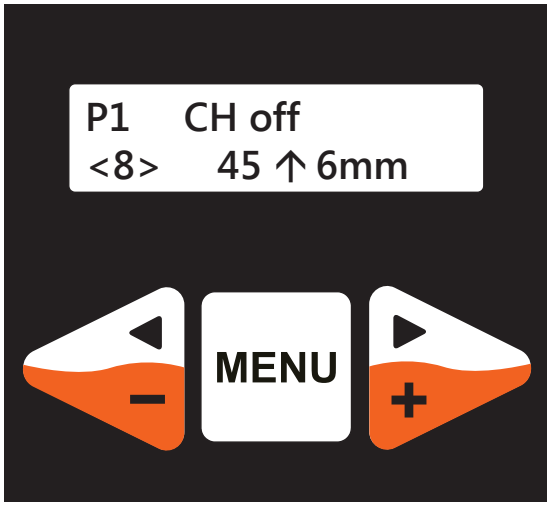
3.1 Carriage functions



1. STOP button on top of the carriage is the same as in the remote control device
2. Display to show menu settings and their values
3. Menu button move from one menu to another
4. Scroll left/right buttons to change values of menu settings

3.2 Carriage control panel

3.2.1 Start menu



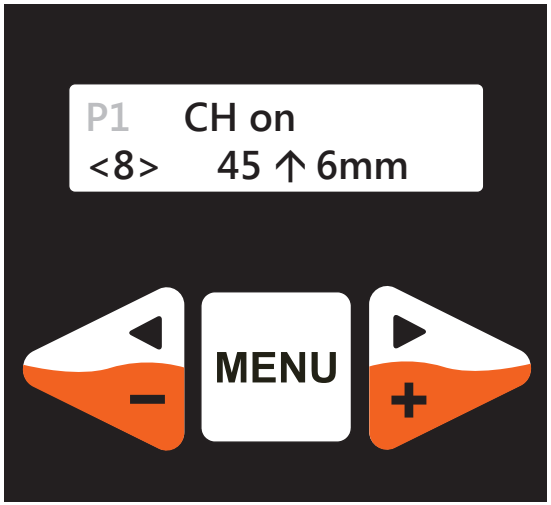
This is the initial view on the carriage display.

1. Program number (P1)
2. Remote memory channels on/off (CH Off)
3. Carriage speed (8 cm/min)
4. Weaving speed (45 mm/s)
5. Weaving width (6 mm)

Press MENU to continue.

3.2.2 Menu options

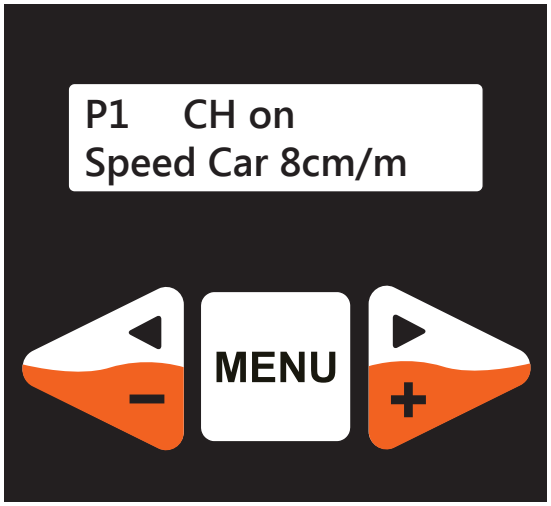
Program selection



The item to be adjusted (P1) is blinking in the display.
Select the program to store the settings:

1. Use + and – buttons to browse programs.
2. Select the program to use: P1…P5.
3. Press MENU to continue.

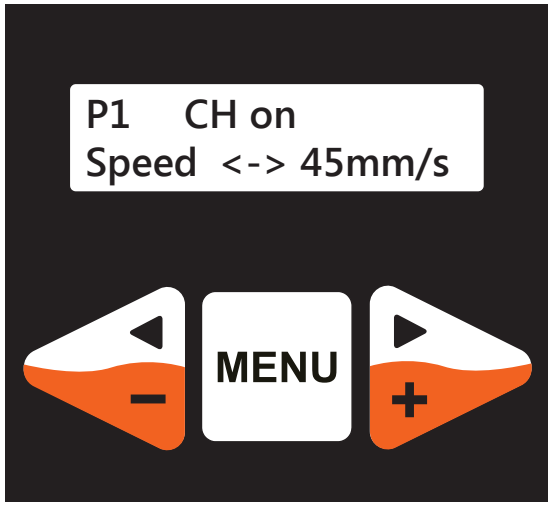
Speed Car



Set the carriage travel speed:

1. Use + and – buttons to change the speed.
2. Set the carriage speed within the range 5–150 cm/min.
3. Press MENU button to continue.

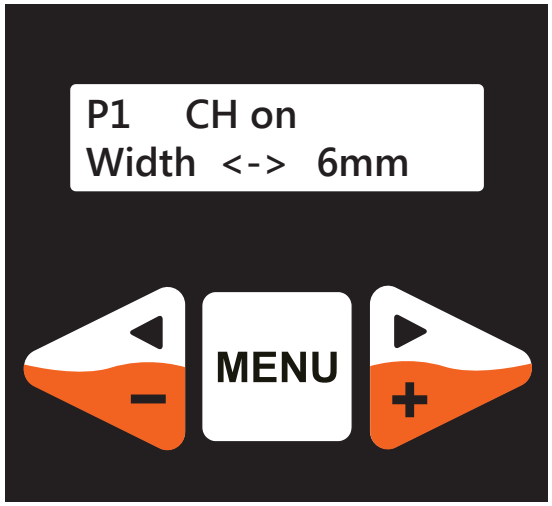
Speed



Set the weaving speed i.e. the speed at which the torch moves from one side of the groove to the other during the weaving motion:

1. Use + and – buttons to change the speed.
2. Set the weaving speed within the range 10–50 mm/s.
3. Press MENU to continue.

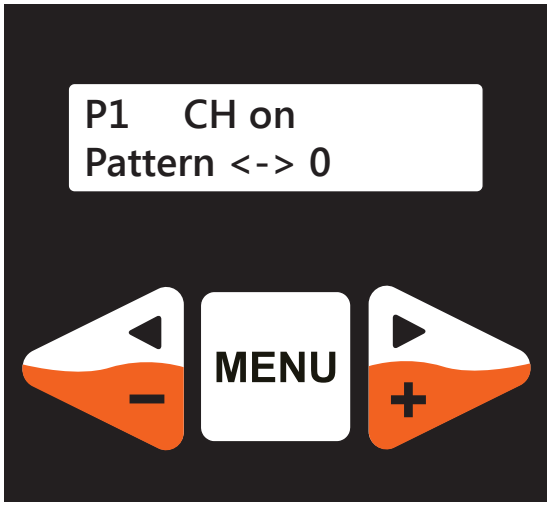
Width



Set the width of the weaving motion:

1. Use + and – buttons to change the width from center (1 mm = 0.5 mm on each side).
2. Set the weaving width within the range 0–30 mm
3. Press MENU to continue.

Pattern

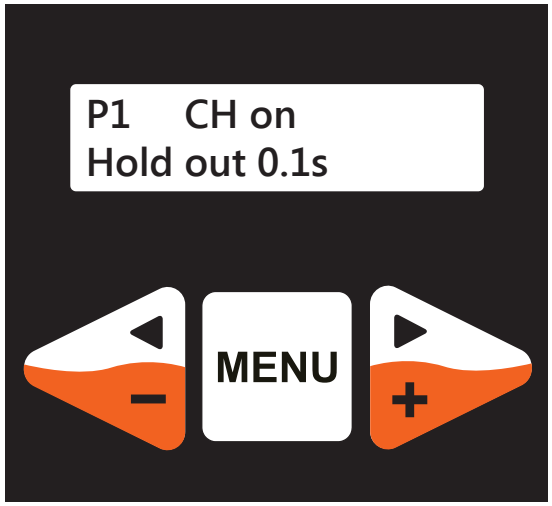


Determine the pattern used in weaving. Use + and – buttons to select any of the three patterns:

0. Travels constantly while weaving (triangular).
1. Travels when weaving, stands during delay.
2. Travels during delay, stands when weaving (square).

Press MENU to continue.

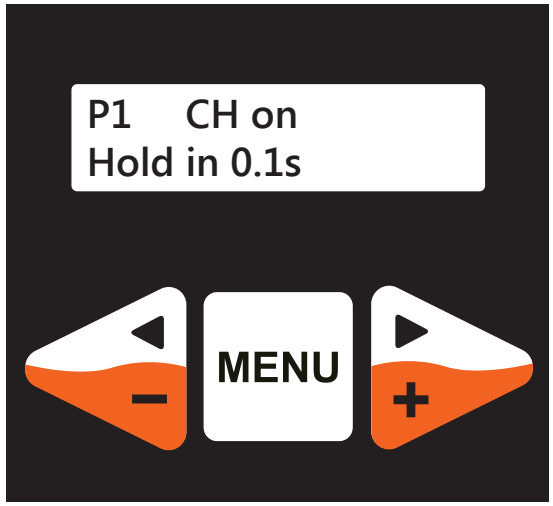
Hold out



Set outer dwell time (the time that the torch holds at the outer side of the weaving motion):

1. Use + and – buttons to change the time.
2. Press MENU to continue.

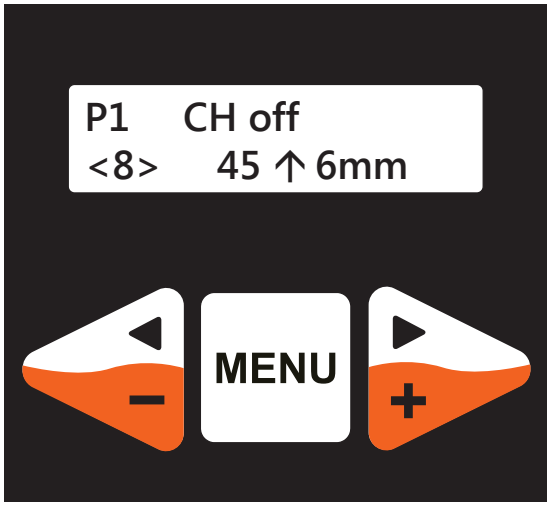
Hold in



Set inner dwell time (the time that the torch holds at the inner side of the weaving motion):

1. Use + and – buttons to change the time in seconds.
2. Press MENU to continue.

3.2.3 Setup menu A



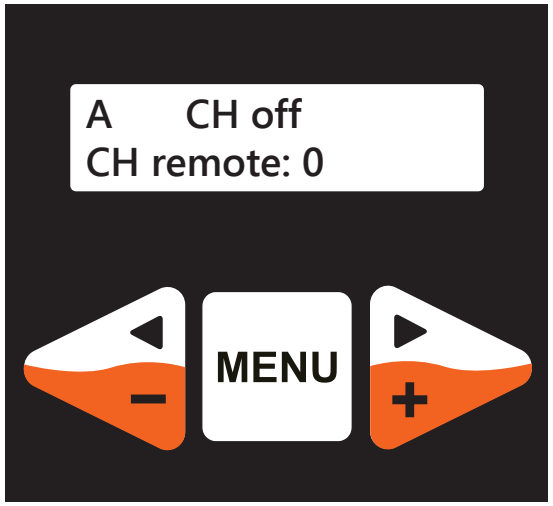
Long press of the MENU button activates Setup menu A, which contains 3 options:

- CH remote
- WF+V fac
- Delay car

Brief press of the MENU button toggles the menu items.

No buttons pressed in 3 seconds or a new long press on MENU button exits the Setup Menu A.

CH remote

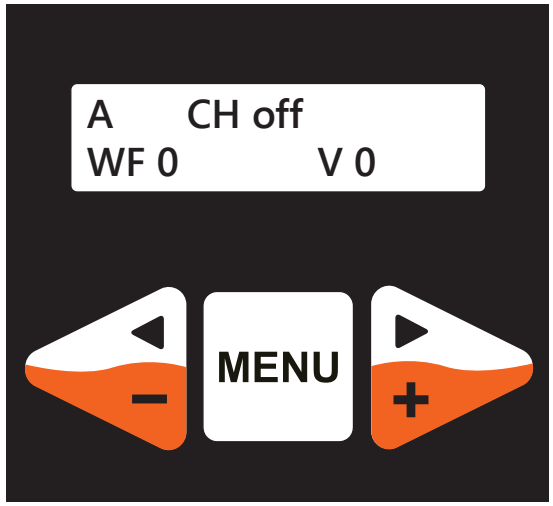


Use + and – buttons to set the remote memory channels function on or off:

- If CH setting is OFF, the selected P setting only enables the corresponding carriage program (P1, P2 etc.).
- If CH setting is ON, the selected P setting also activates the corresponding memory channel at the wire feeder (CH1, CH2 etc.).

ⓘ To use the wire feeder's memory channels, the CH REMOTE setting must be ON at the wire feeder. In this case, the fine tuning is disabled at the carriage remote control unit.

WF+V fac

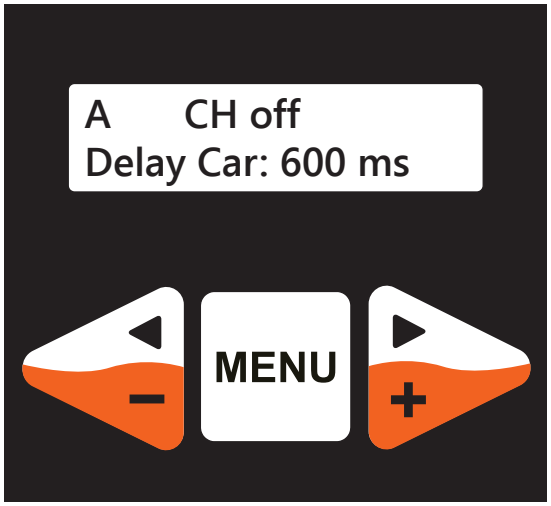


Set the factor that is used for determining the roughness of fine tuning and affects the adjustment of WFS and arc voltage:

1. Use + button to select value 0, 1, 2, 3 or 4 (default = 2).
   - Higher setting = wider steps
   - Lower setting = narrower steps
2. Press MENU to continue.

ⓘ The wire feeder scale varies according to the min/max limits set in the power source. If the power source holds narrow limits, the carriage may require a rough scale. If limits have not been set in the power source, the carriage requires a finer scale. Different applications may benefit from different scaling.

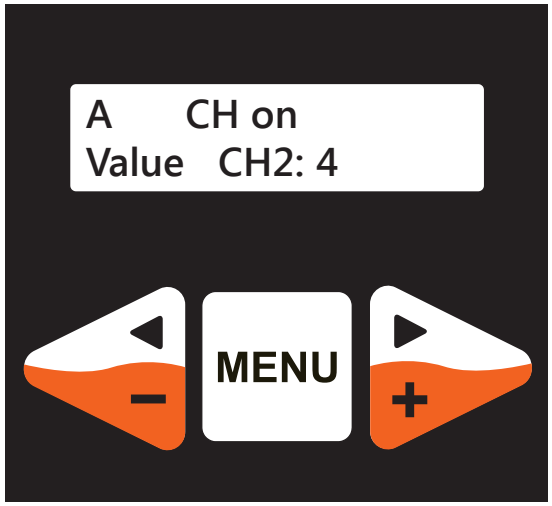
Delay Car



Set the start delay (the time that the carriage stands still after welding has started):

1. Use + and – buttons to change the time.
2. Range: 100–3000 milliseconds
3. Press MENU to continue

Value CH2-CH5

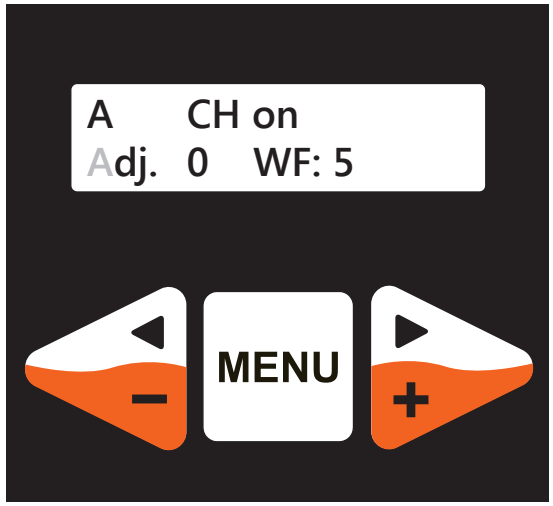


Fine adjust the signal level of the memory channels at the welding carriage for channels 2 to 5.

- Use + and – buttons to change the value.

ⓘ You need to change these settings only if there is a conflict between the memory channels set by the wire feeder and the welding carriage.

Adj0 WF



With this parameter you can fine-tune the signal zero level for setting the wire feed speed value.

- Use + and – buttons to change the value.

ⓘ In normal use, you never need to change the value of this parameter.

Adj0 V

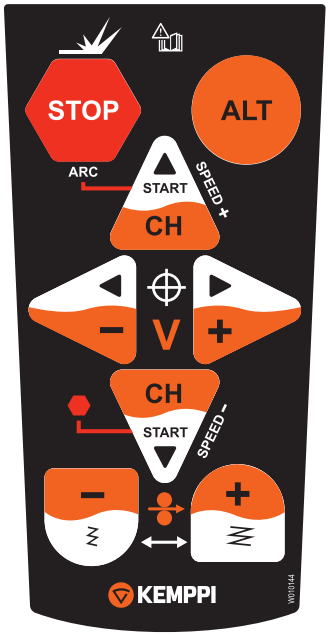
With this parameter you can fine-tune the signal zero level for setting the voltage value.

- Use + and – buttons to change the value.

ⓘ In normal use, you never need to change the value of this parameter.

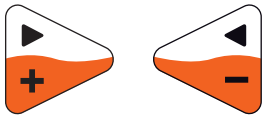
3.3 Remote control unit

3.3.1 Basic functions



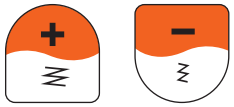
1. Press Stop to extinguish the arc and stop the carriage.
2. Hold down ALT to activate the orange marked secondary functions of the buttons.
3. CH first press: Start test run (arc off) with programmed speed and weaving.
4. CH second press during welding/running: Carriage speed increases (up), or decreases (down).
5. CH long press: High-speed transportation (arc off).

Moves the centerline of weaving or welding to the button's direction



The direction is determined when facing the carriage control panel. If you are standing on the other side of the carriage, the directions are reversed

Increases or decreases the weaving width by 1 mm per press of button (0.5 mm on both sides).



3.3.2 Alt functions

Starts welding to the button's direction. If on test run, the arc ignites.

Activate the next (up) or previous (down) program, including memory channel, if CH REMOTE is ON at the wire feeder.

Increase (+) or decrease (-) the arc voltage

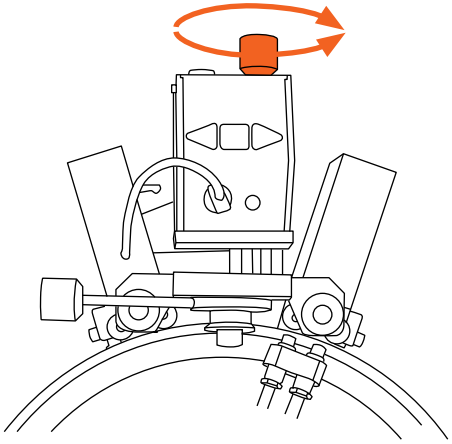
Increase (+) or decrease (-) the wire feed speed

Fine-adjustment of voltage and wire feed only works when CH REMOTE is OFF at the wire feeder.

Stop terminates the operation of the carriage and stops welding.

3.4 Fine-adjustment of gun position

When the welding gun is fixed in position and connected, adjust its position vertically by turning the wheel on the vertical slide clockwise (up) or counterclockwise (down).



3.5 Kemppi Wise application software

When using Kemppi FastMig welding equipment, you can further optimize the quality and productivity of your mechanized welding by using Wise application software. There are several Wise processes and functions available for different welding applications. For more information about Wise, please refer to FastMig documentation or Kemppi website at www.kemppi.com.

3.6 Ordering information

Product name	*Product code*
A5 MIG ORBITAL CARRIAGE 1500	6190715
A5 WEAVING TILT BRACKET	6190708
A5 WEAVING TURN BRACKET	6190709
A5 TORCH FLOATING HEAD	6190711
A5 MIG CARRIAGE TRANSFORMER	6190714
A5 MIG CARRIAGE CONTROL CABLE	6190716
PMT MN 32C welding gun (gas-cooled, multi-neck, 5 m, 320 A)	6250405
Neck 30°, 198 mm, RP (slightly bent neck for mechanized welding)	W010975
MMT 42C welding gun (gas-cooled, 4.5 m)	6254207
MT51MWC welding gun (water-cooled, 4.5 m)	6255162
Root contact tip	W008123
Root gas nozzle	W008124
SUPERSNAKE GT 02SWC 15M	61541501
SUPERSNAKE GT 02SWC 25M	61542501C1
SUPERSNAKE GT 02SWC-70 20M	61542001
SUPERSNAKE GT 02SC 15 M	61531501
GUIDE RING FOR 6" PIPE	6190806
GUIDE RING FOR 8" PIPE	6190808
GUIDE RING FOR 10" PIPE	6190810
GUIDE RING FOR 12" PIPE	6190812
GUIDE RING FOR 14" PIPE	6190814
GUIDE RING FOR 16" PIPE	6190816
GUIDE RING FOR 18" PIPE	6190818
GUIDE RING FOR 20" PIPE	6190820
GUIDE RING FOR 22" PIPE	6190822
GUIDE RING FOR 28" PIPE	6190828
GUIDE RING FOR 36" PIPE	6190836
GUIDE RING FOR 48" PIPE	6190848

KEMPPI GUIDE RINGS					
Pipe outer diameter (O.D.)			Suitable guide ring		
[Inch]		[mm]		Ordering code	Guide ring
min	max	min	max		
5	7	127.0	177.8	6190806	RING FOR 6" PIPE DIAMETER
7	9	177.8	228.6	6190808	RING FOR 8" PIPE DIAMETER
9	11	228.6	279.4	6190810	RING FOR 10" PIPE DIAMETER
11	13	279.4	330.2	6190812	RING FOR 12" PIPE DIAMETER
13	15	330.2	381.0	6190814	RING FOR 14" PIPE DIAMETER
15	17	381.0	431.8	6190816	RING FOR 16" PIPE DIAMETER
17	19	431.8	482.6	6190818	RING FOR 18" PIPE DIAMETER
19	21	482.6	533.4	6190820	RING FOR 20" PIPE DIAMETER
21	23	533.4	584.2	6190822	RING FOR 22" PIPE DIAMETER
27	29	685.8	736.6	6190828	RING FOR 28" PIPE DIAMETER
35	37	889.0	939.8	6190836	RING FOR 36" PIPE DIAMETER
39	41	990.6	1041.4	6190840	RING FOR 40" PIPE DIAMETER
47	49	1193.8	1244.6	6190848	RING FOR 48" PIPE DIAMETER
49	51	1244.6	1295.4	6190850	RING FOR 50" PIPE DIAMETER
51	53	1295.4	1346.2	6190852	RING FOR 52" PIPE DIAMETER
53	55	1346.2	1397.0	6190854	RING FOR 54" PIPE DIAMETER
55	57	1397.0	1447.8	6190856	RING FOR 56" PIPE DIAMETER
57	59	1447.8	1498.6	6190858	RING FOR 58" PIPE DIAMETER
59	61	1498.6	1549.4	6190860	RING FOR 60" PIPE DIAMETER
61	63	1549.4	1600.2	6190862	RING FOR 62" PIPE DIAMETER
63	65	1600.2	1651.0	6190864	RING FOR 64" PIPE DIAMETER
65	67	1651.0	1701.8	6190866	RING FOR 66" PIPE DIAMETER
67	69	1701.8	1752.6	6190868	RING FOR 68" PIPE DIAMETER
69	71	1752.6	1803.4	6190870	RING FOR 70" PIPE DIAMETER

3.7 Technical data

Input Power	30 – 55 V DC or 24 – 50 V AC
Carriage Speed	5 – 150 cm/min
Transport Speed	200 cm/min
Weaving speed	10 – 50 mm/s
Weaving width	0 – 30 mm
Weaving displacement	± 40 mm
Dwell time (Adjustable on both sides separately)	0 – 2.0 s
Weaving patterns	3
Torch horizontal adjustment (manual)	± 40 mm
External dimensions (LxWxH)*	365 x 385 x 300 mm
Weight	9.0 kg
*) Height measured from pipe surface	

4. TROUBLESHOOTING

4.1 Operation problems

Should you experience a malfunction from your machine, please consult the troubleshooting sections below first, and complete some basic checks.

If the machine malfunction cannot be corrected with these measures, contact your Kemppi maintenance service workshop.

ⓘ The problems listed and the possible causes are not definitive but serve to suggest some standard and typical situations that may present during normal environmental use when using the A5 MIG Orbital System 1500.

Below instructions only apply to possible problems with the carriage. Always ensure that the related welding system is functional and ready for welding.

Problem:	*Check the following:*
Carriage won't work	• Check that power reaches carriage (display is ON). • Check that the welding power source is switched ON. • Check the gun control connection and possible Supersnake and separate control cable connections • Check that control panels are switched on.
Dirty, poor quality weld	• Check shielding gas supply. • Check and set gas flow rate. • Check gas type for application. • Check that correct welding program is selected. • Check correct selection on the control panel. • Check power supply – phase down?
Arc is not ignited or welding starts or stops strangely	Check that remote control buttons have been pressed correctly: • Stop+Up/Down ignites the arc and starts the carriage. • If carriage is moving fast but arc is off, you may have pressed Start button for too long.
Carriage moves unevenly	• Carriage is not correctly mounted on the guide ring. Check carriage position. • Wheels are not in line with the guide ring. Check the angle and adjust if necessary.
Torch height varies along the pipe	• Pipe is not precisely round shaped. Adjust height if necessary.

5. MAINTENANCE

When considering and planning routine maintenance, please consider the frequency of machine use and the working environment.

Correct operation of the machine and regular maintenance will help you avoid unnecessary downtime and equipment failure.

⚠ Make sure that the carriage does not start accidentally when your fingers are in the wheel area.

5.1 Daily maintenance

- Check that all cables and plugs are intact.
- Keep the carriage and the torch holder clean.
- Check that all parts slide smoothly. Add grease or clean spatters if necessary.
- Check the gun's condition.

5.2 Periodic maintenance

ⓘ Periodic maintenance should only be carried out by a suitably qualified person.

Check at least every half year:

- Electric connectors of the machine – clean any oxidized parts and tighten loose connections.
- Condition of the drive and support wheels. If worn, change.

ⓘ Do not use compressed air for cleaning as there is a risk that the dirt will compact even more tightly into gaps of cooling profiles.

ⓘ Do not use pressure washing devices.

ⓘ Only an authorized trained electrician should carry out repairs to Kemppi machines.

6. DISPOSAL

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, as per the instructions of local authorities or a Kemppi representative. By applying this European Directive you will improve the environment and human health.

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