



OPERATOR'S MANUAL

WELDING CARRIAGE

LIZARD



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1. GENERAL INFORMATION

1.1. Application

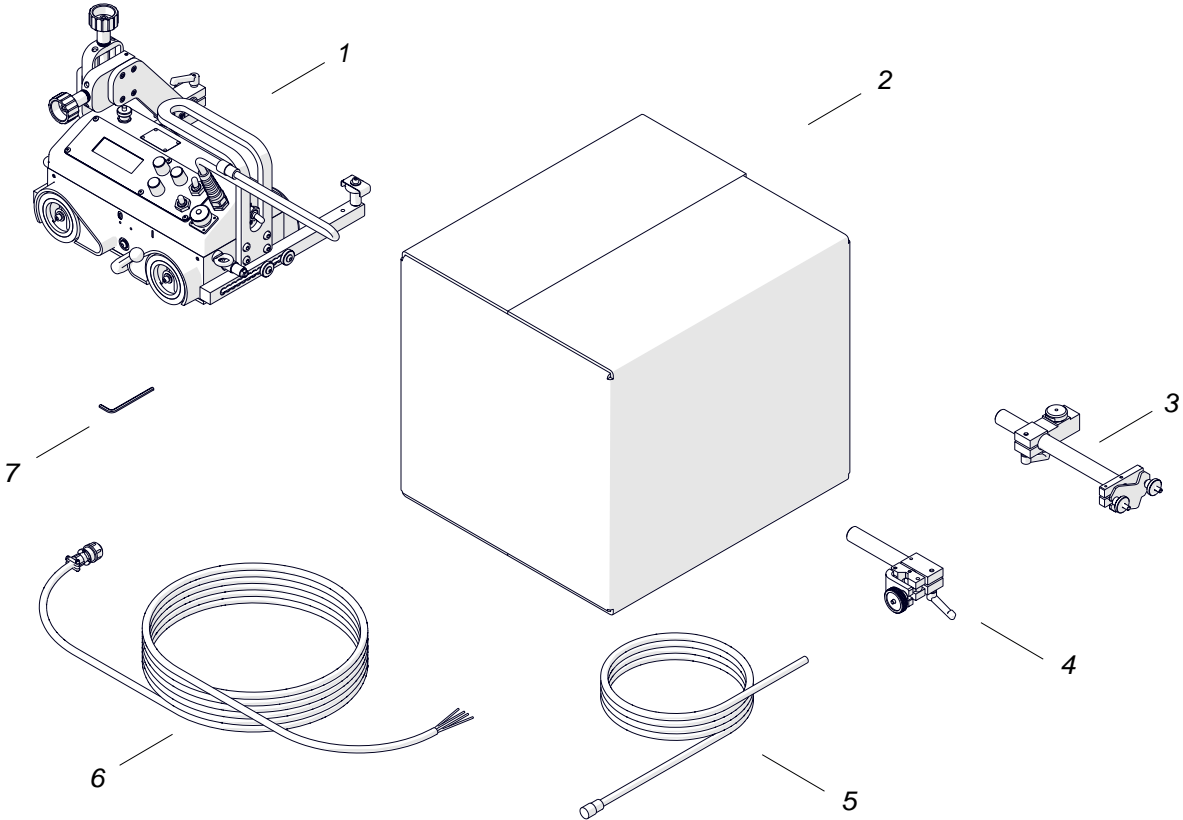
The LIZARD is a welding carriage designed to make butt and fillet welds that are continuous or stitch. The carriage allows MIG/MAG torches and is clamped with permanent magnets.

Accessories allow welding with oscillation, using torches with a larger diameter, and using two torches at the same time. They also allow the carriage to move along outside edges, lap joints and templates, walls that are low or have holes, and on ceilings, pipes, and tanks.

1.2. Technical data

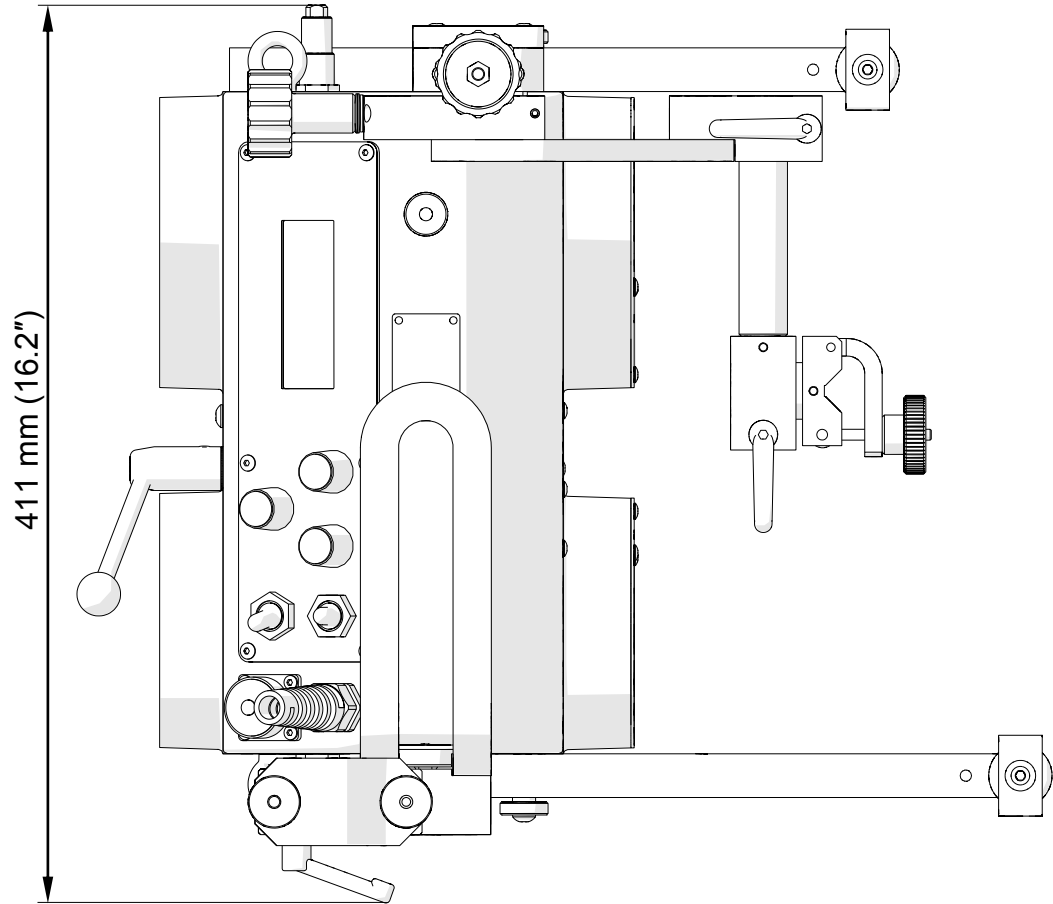
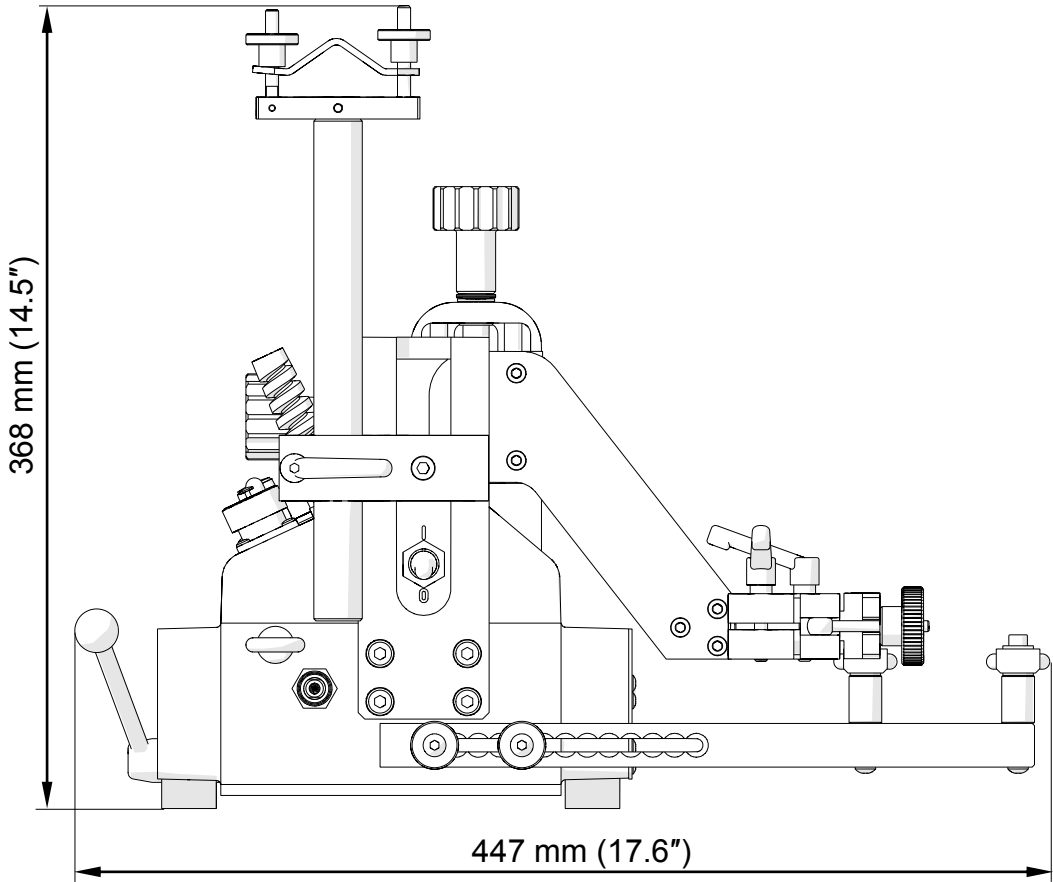
Voltage		1~ 115–230 V, 50–60 Hz 1~ 42 V, 50–60 Hz (60 V DC)
Power		25 W
Welding position (according to EN ISO 6947 and AWS/ASME)	Horizontal	PA/1F/1G PB/2F PC/2G PD/4F PE/4G
	Vertical	PF/3F/3G (with an optional oscillator) PG/3F/3G (with an optional oscillator)
Minimum path curve radius		1500 mm (5 ft)
Torch type		MIG/MAG
Torch diameter		16–22 mm (0.63–0.87")
Maximum torch reach		80 mm (3.15")
Maximum allowed cable weight	Horizontal work	12 kg (27 lbs)
	Vertical work	8 kg (18 lbs)
Minimum workpiece thickness		5 mm (0.2")
Ground clearance		5 mm (0.2")
Horizontal pulling force		220 N
Vertical pulling force		150 N
Cross slide adjustment range		0–35 mm (0–1.38") up-down, left right
Guide arm adjustment range		0–75 mm (2.95")
Horizontal speed		0–120 cm/min (0–47.2 in/min)
Vertical speed		0–110 cm/min (0–43.3 in/min)
Noise level		Less than 70 dB
Weight		14 kg (31 lbs)

1.3. Equipment included

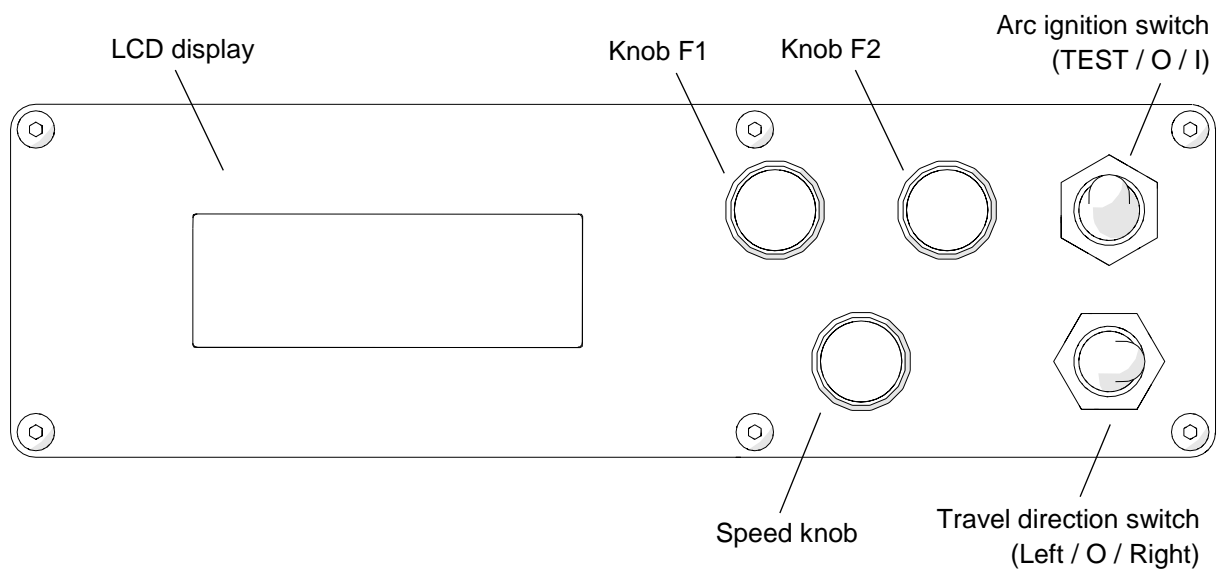
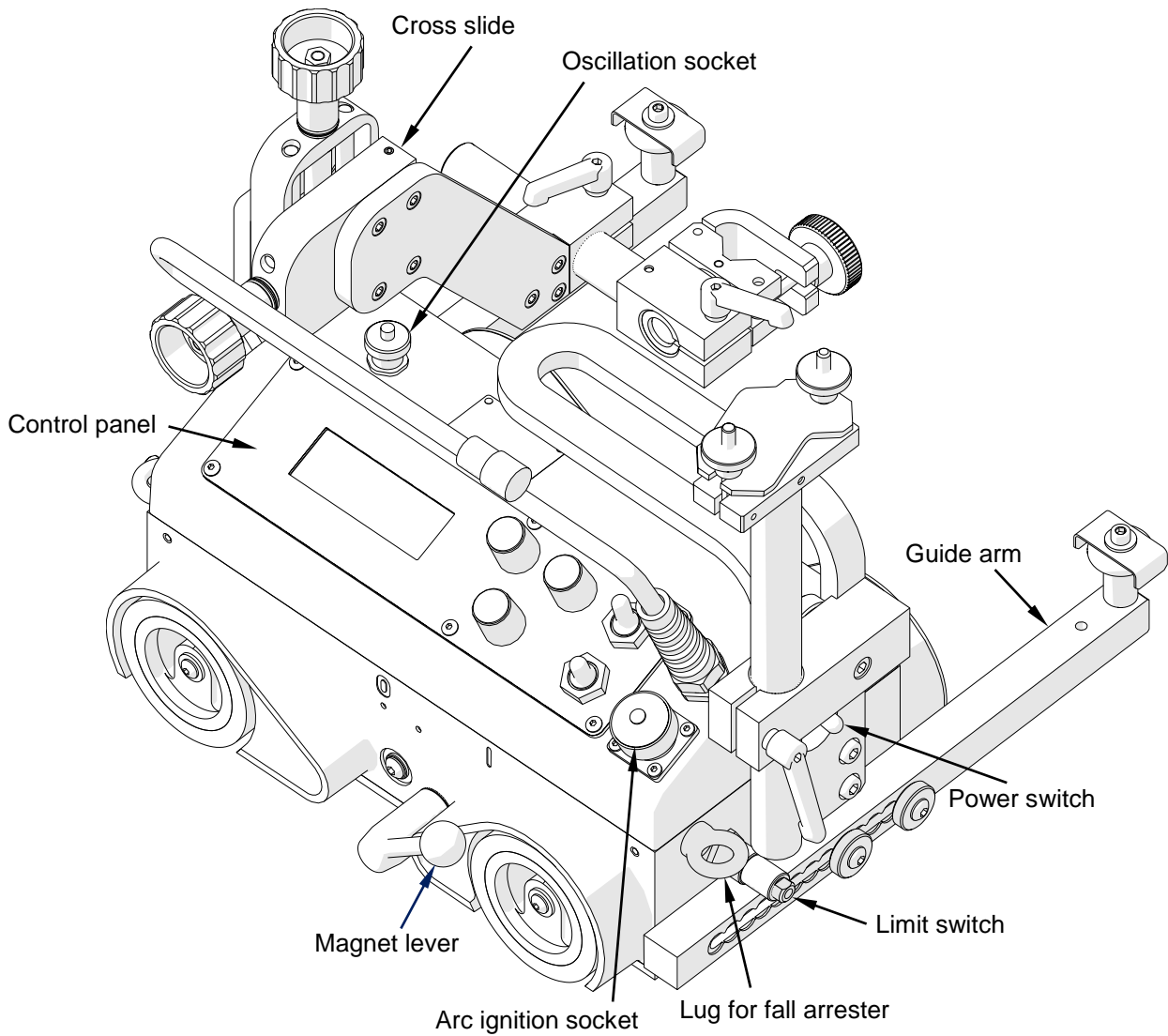


1	Carriage	1 unit
2	Cardboard box	1 unit
3	Cable anchor	1 unit
4	Short rod torch holder with clamp	1 unit
5	3 m (10 ft) power cord	1 unit
6	6.5 m (21 ft) arc ignition cable	1 unit
7	4 mm hex wrench	1 unit
-	Operator's Manual	1 unit

1.4. Dimensions



1.5. Design



2. SAFETY PRECAUTIONS

1. Before use, read this Operator's Manual and complete a training in occupational safety and health.
2. Use only in applications specified in this Operator's Manual.
3. Make sure that the carriage has all parts and they are genuine and not damaged.
4. Make sure that the specifications of the power source are the same as those specified on the rating plate.
5. Connect the carriage to a correctly grounded power source.
6. Do not carry the carriage by the cords or arc ignition cable, and do not pull them. This can cause damage and electric shock.
7. Keep untrained bystanders away from the carriage.
8. Before each use, ensure the correct condition of the carriage, power source, cords, arc ignition cable, plugs, sockets, control panel, and wheels.
9. Before each use, make sure that no part is cracked or loose. Make sure to maintain correct conditions that can have an effect on the operation of the carriage.
10. Keep the carriage dry. Do not expose the carriage to rain, snow, or frost.
11. Keep the worksite well lit, clean, and free of obstacles.
12. Do not use near flammable materials, or in explosive environments.
13. Make sure that the rubber of the wheels is clean and not damaged.
14. Do not remove the cover of the wheels.
15. Remove objects attracted to the chassis by the magnet.
16. Transport and position the carriage by using the carrying handle and only after you set the magnet lever to 'O'.
17. Put the carriage so that four wheels are on the surface. Make sure that no contact is between the surface and chassis.
18. Do not stay below the carriage that is put at heights.
19. Connect the cords and arc ignition cable only after you set the power switch to 'O'.
20. Keep the sockets clean. Do not use high pressure during cleaning.
21. Install only MIG/MAG torches whose diameter matches the diameter of the torch holder.
22. Do not put the torch more than 80 mm (3.15") outward from the left or right side of the carriage.

23. Keep the torch cables away from the surface. Hang the cables to decrease the load applied on the carriage. Use only cables whose weight is not more than 12 kg (27 lbs) for horizontal work and 8 kg (18 lbs) for vertical work.
24. Do not work on curves with convex or concave radius less than 1500 mm (5 ft).
25. At heights, use a fall arrester not to let the carriage fall.
26. Use eye protection (helmet, shield, and screen), ear protection, gloves, and protective clothing. Do not use loose clothing.
27. Do not stop the carriage by hand. To stop, set the travel direction switch to 'O'.
28. Do the maintenance only after you unplug the carriage from the power source.
29. Repair only in a service center appointed by the seller.
30. If the carriage falls, is wet, or has any damage, stop the work and promptly send the carriage to the service center for check and repair.
31. Do not leave the carriage unattended during work.
32. If you are not going to use the carriage, remove it from the worksite and keep in a safe and dry place.

3. STARTUP AND OPERATION

3.1. Preparing

Use the carrying handle to transport the carriage to the worksite. Then, set to 'O' all switches (power, travel direction, and arc ignition switch) and the magnet lever.

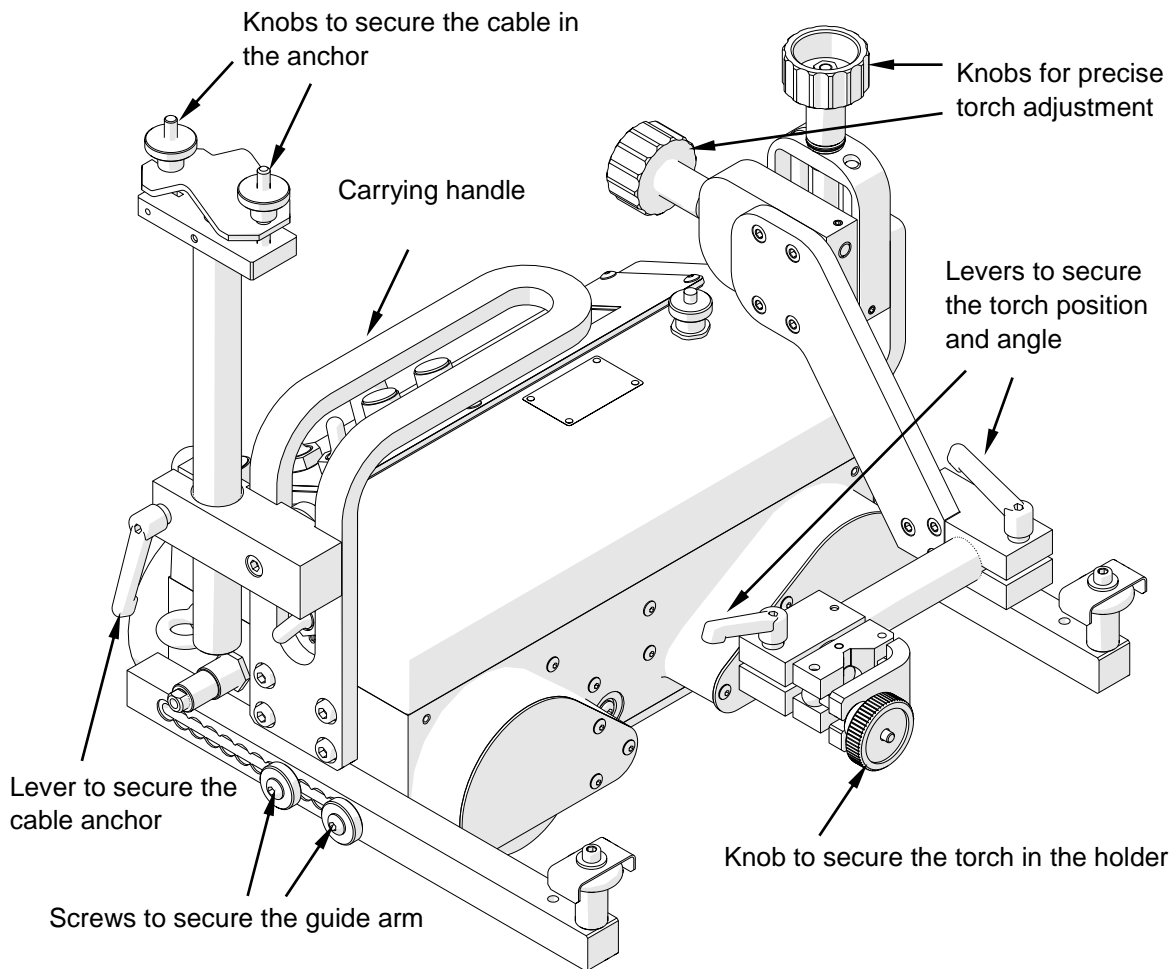


Fig. 1. View from the back side

Use the power cord to connect the carriage to the power source. Then, put the torch into the torch holder and tighten with the knob. Put the torch cables into the cable anchor and tighten with the knobs.

3.2. Connecting to the welding circuits

The carriage can control two torches by using the arc ignition cable plugged into the arc ignition socket. To do this, refer to the diagram from Fig. 2 and connect one blue-jacketed wire to one terminal of the welding circuit. Then, connect the other blue-jacketed wire to the other terminal of the same circuit. To control the second torch, connect the green-jacketed wires to the terminals of the second welding circuit.

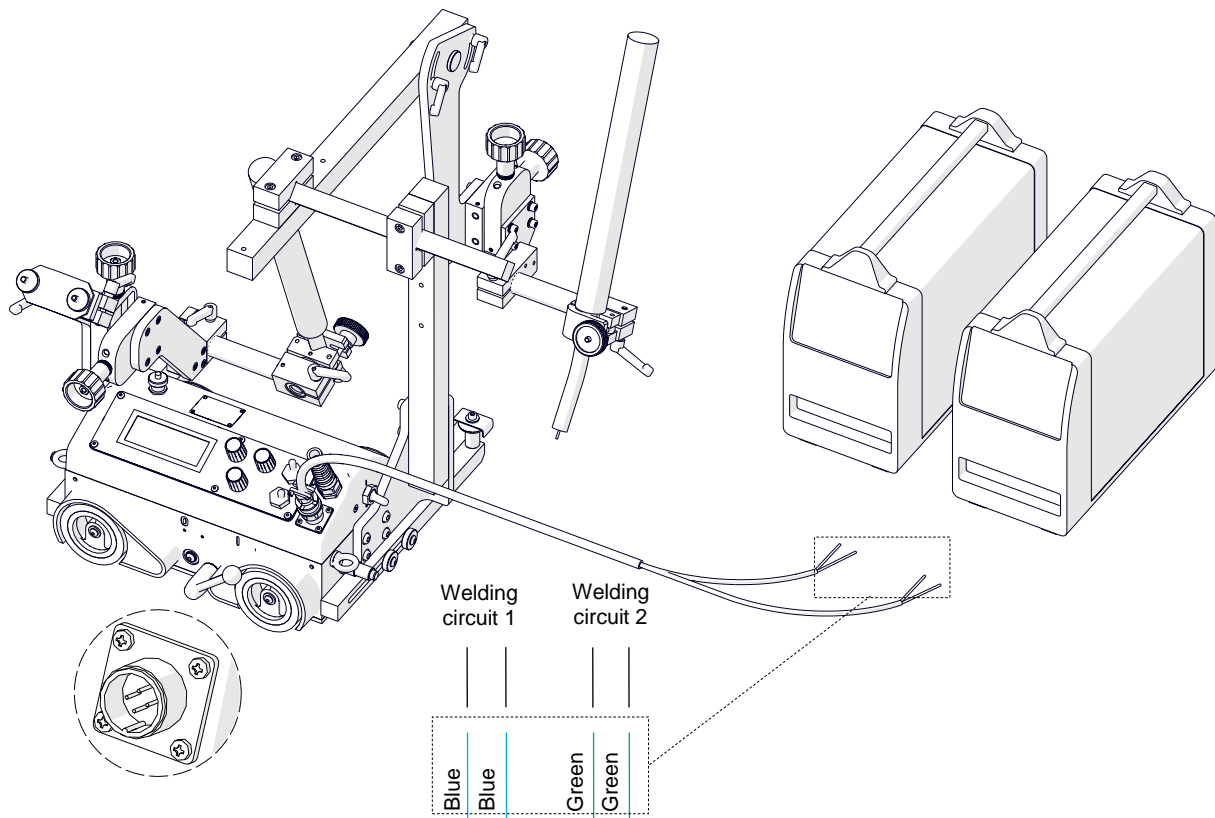


Fig. 2. Connecting the arc ignition cable to welding circuits

Make sure that the arc ignition cable is connected correctly. To do this, turn on the power of the carriage, and then set the arc ignition switch to TEST. This should enable the arc for a while.

3.3. Positioning at the worksite

Put the guide arms so that the carriage is in constant contact with the workpiece. You can set them by a constant step (interval adjustment), or continuously after you swap them (continuous adjustment). To set them correctly when the carriage moves to the left, use the 4 mm hex wrench to loosen the screws that secure the right guide arm. Next, move out the right arm about 10 mm (0.4") or one groove more than the left arm (Fig. 3), and then tighten the screws again.

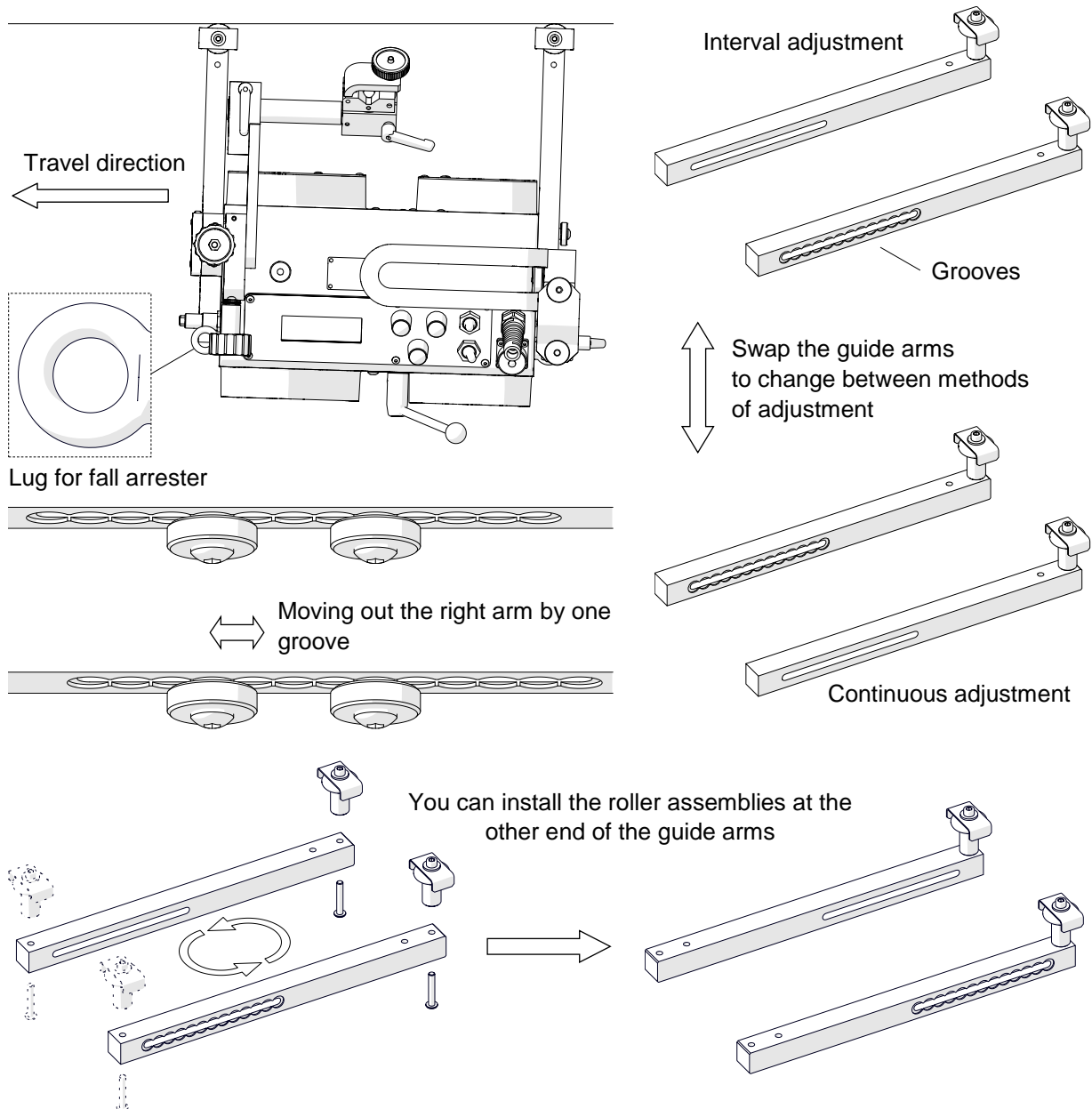


Fig. 3. Correct positioning of the guide arms

To put the carriage closer to the workpiece, use the 4 mm hex wrench to remove the roller assemblies. Next, install them at the other end of the guide arms, and then swap the guide arms (Fig. 3).

Switch the magnet lever from left ('O') to right ('I'). This will change the clamping force from minimum to maximum. Loosen the levers to adjust the position and angle of the torch. Use two knobs at the cross slide to precisely set the torch position.

At heights, attach a fall arrester (not included) to a lug (Fig. 3) to prevent fall of the carriage. This will avoid possible injury to the operator in case the carriage loses the clamping. Do not stay below the carriage that is put at heights.

3.4. Starting

Plug the power cord into the power source and set the power switch to 'I' to turn on the carriage. Then, an initial screen with the current firmware number shows. If an oscillator is connected to the oscillation socket, Oscillator found shows. After the control system is loaded, the main menu from Fig. 4 shows.

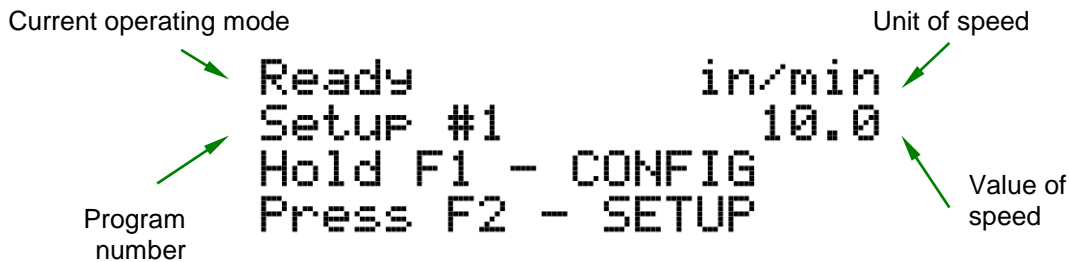


Fig. 4. View of the main menu

Press and hold the knob F1 for about 3 seconds to go into the configuration menu and set the welding parameters.

3.5. Programming

The carriage allows you to define up to 40 welding programs. After you go to the configuration menu, continue as described in Fig. 5.

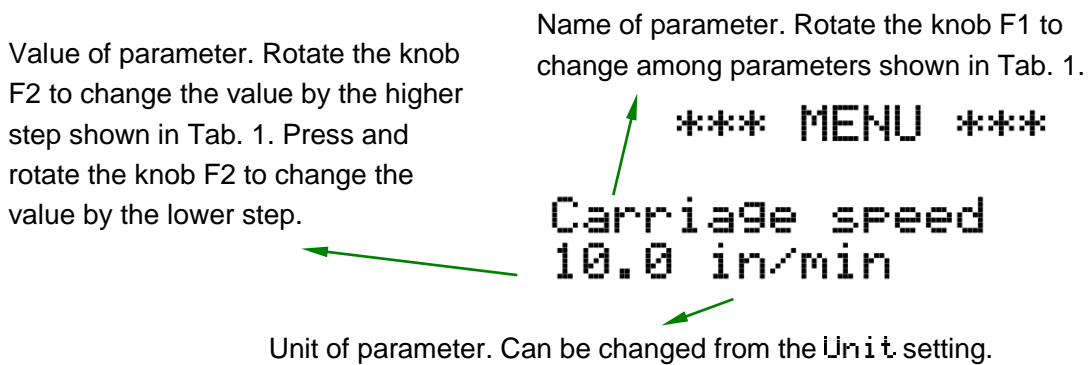


Fig. 5. Configuration menu

Parameter	Value	Description
Carriage speed	0–130 cm/min 0–52 in/min [step: 1 or 0.1]	Speed of the carriage.
Weld length	1–250 cm 1–100 in [step: 1 or 0.1]	Length of a single weld.
Skip	0–100 cm 0–40 in [step: 1 or 0.1]	Space between welds. If set to zero, 'crater fill' and 'backweld' are reset and the carriage works in the continuous welding mode.
Crater fill	0–3 s [step: 0.1]	Time of filling the crater. Inactive if 'skip' set to zero, which is indicated by the (!) sign.
Current lowering	YES NO	Function of the welding source to lower the current of the arc while filling the crater. Time of filling the crater must be set higher or equal to the time of the current lowering that is set at the welding source.
Backweld	0–2 cm 0–2 in [step: 0.1]	Length of the backweld. Shorter or equal to 'weld length'. Inactive if 'skip' set to zero, which is indicated by the (!) sign.
Total length	0–1000 cm 0–400 in infinity [step: 10 or 1]	Longer or equal to the sum of 'weld length' and 'skip'. If set to infinity, the program executes until you stop the carriage.
Unit	cm in	Unit used in the menu.
Save setup	1–40	Pressing knob F2 saves the current configuration to the indicated program number.
Load setup	1–40	Pressing knob F2 loads the configuration from the indicated program number.
Language	ENGLISH POLISH SPANISH FRENCH PORTUGUESE TURKISH GERMAN RUSSIAN	Language of the menu.

Tab. 1. Settings available in basic version of the carriage

To change the language of the menu, go to `Language` setting by rotating the knob F1 to the right, and then rotate the knob F2 to choose among the available languages. After the rest of the parameters from Tab. 1 is set, go to `Save setup`, choose a program number by rotating the knob F2, and press the knob to save the current values to this number. The message `Done` shows for a short time. To load a previously saved program, continue as described, but from `Load setup` setting. To go back to the main menu (Fig. 4), press the knob F1 and hold it for 3 seconds. If you do not save the chosen parameters, they will be active only until you change the current program number in the main menu.

3.6. Welding procedure

Fig. 6 shows a graphic description of the welding procedure that starts with the speed value shown in the main menu when you select a travel direction. The first stage is making the weld, and then the carriage fills the crater (stage 2) for the chosen time. Next, the carriage does the backweld (stage 3) and then moves to the start of the next weld (stage 4). This process is repeated until the carriage reaches the value of the total length.

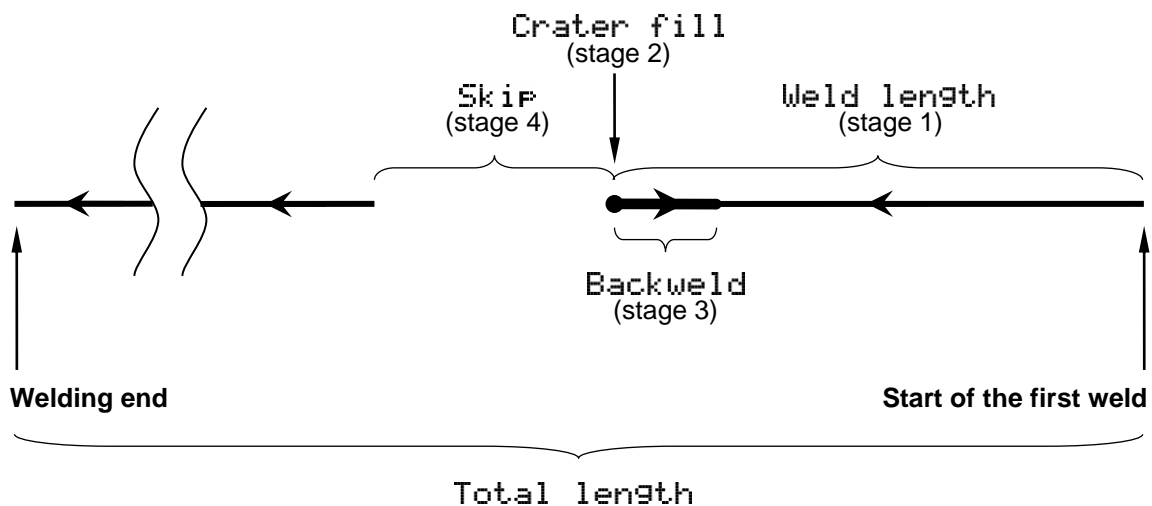


Fig. 6. Visualization of the welding procedure according to parameters from Tab. 1

3.7. Operating

To control the torch through the carriage, set the arc ignition switch to 'I'.



If the arc ignition switch is set to 'I', the torch starts welding promptly after you select a travel direction.

With **Ready** mode shown on the main menu (Fig. 4), you can press and rotate the knob F2 to change the current program **Setup #1**. You can also use the speed knob to change the current welding speed. Rotate the knob to the right to increase the speed by the step of 0.1. Rotate to the left to decrease the speed by the step of 0.1.

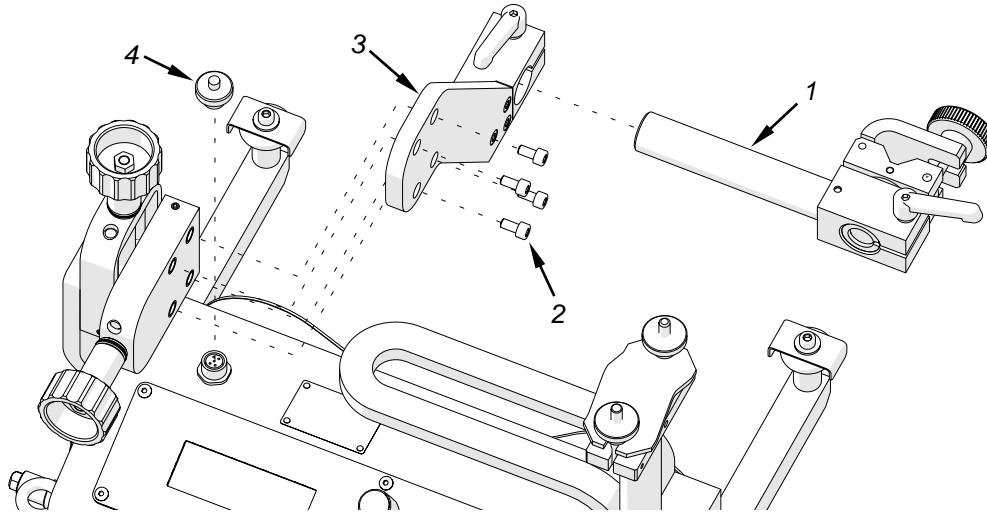
Use the travel direction switch to select a direction of travel. Then, the carriage starts moving according to the chosen program parameters. The current operating mode shows on the display while the program continues. You can change the carriage speed during work with the speed knob. The new speed will be saved only if you do not change the current program in the meantime.

The carriage stops after it reaches the total length and **Job's done** message shows on the display. Then, set the travel direction switch to 'O' to go into the main menu. After the work is finished, use the power switch to turn off the carriage. Then, unplug the carriage from the power source.

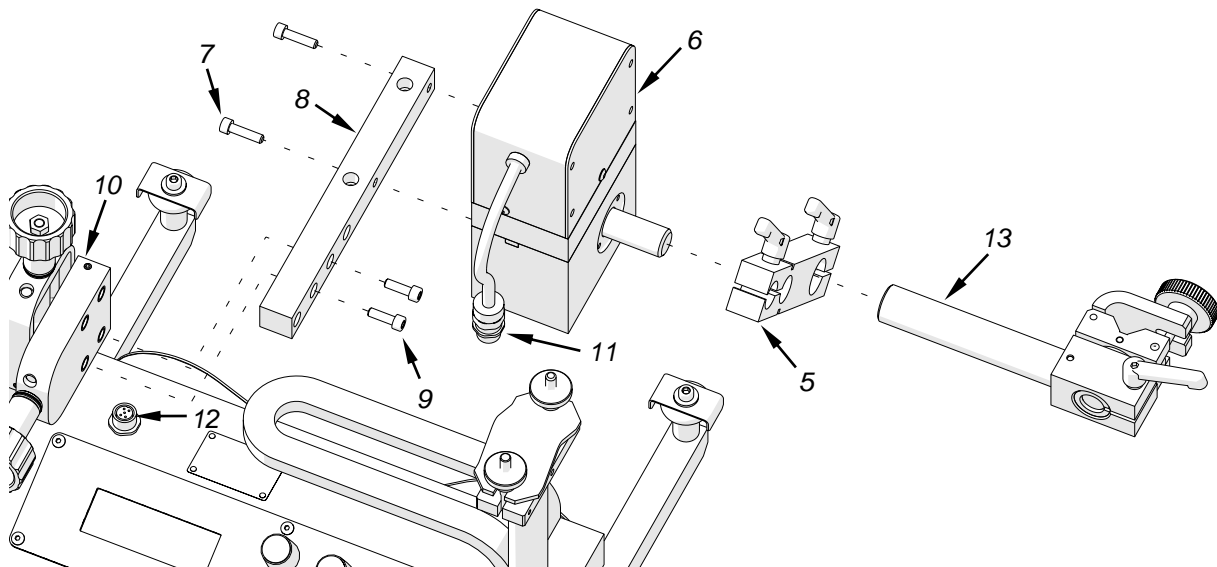
3.8. Using oscillator (option)

3.8.1. Installing

Install the oscillator in the shown sequence.



- Remove the torch holder (1).
- Use the 4 mm hex wrench to remove the screws (2) and the torch holder plate (3).
- Remove the cap (4).



- Attach the arm (5) to the oscillator (6).
- Use two screws M5x20 (7) to attach the oscillator (6) to the bracket (8).
- Use two screws M5x16 (9) to connect the bracket (8) to the cross slide (10).
- Put the oscillator plug (11) into the oscillation socket (12).
- Attach the torch holder (13) to the oscillator arm (5).

3.8.2. Welding with oscillation

After you connect the oscillator to the welding carriage, several new settings will show in the menu (Tab. 2). Welding with oscillation is done in the standard manner, but the weld form a shape similar to the shape shown in Fig. 7 instead of the straight line from Fig. 6.

Parameter	Value	Description
Osc. amplitude	0–100% [step: 10% or 1%]	Relative amplitude of the oscillation.
Osc. speed	0–100% [step: 10% or 1%]	Relative speed of the oscillation. The higher the speed, the shorter the oscillation period.
Osc. delay 1	0–5 s [step: 1 or 0.1]	Dwell time in the top position of the oscillation.
Osc. delay 2	0–5 s [step: 1 or 0.1]	Dwell time in the bottom position of the oscillation.
Dwell times lock	YES NO	With YES, you cannot change dwell times during welding.

Tab. 2. Additional settings available with connected oscillator

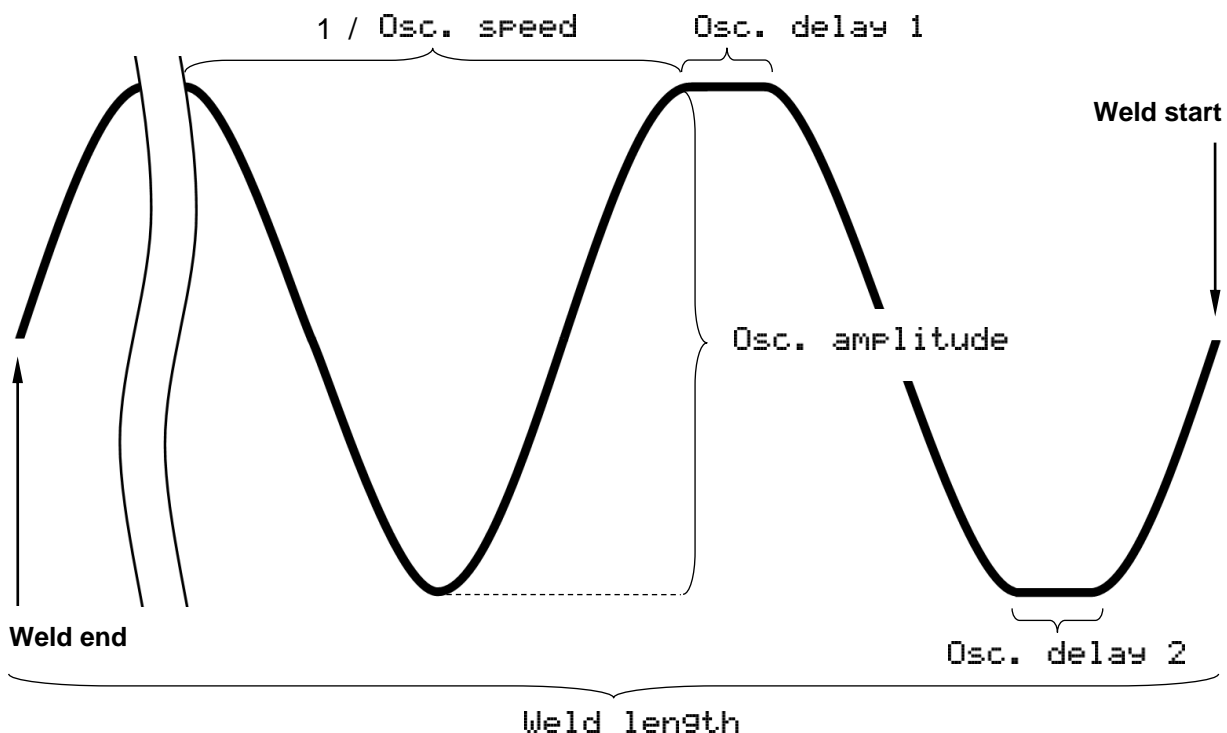


Fig. 7. Graphic description of the oscillation parameters from Tab. 2

3.8.3. Operating

The carriage with connected oscillator is operated similarly to operating without the oscillator. During welding with the oscillator, the menu from Fig. 8 shows on the display.

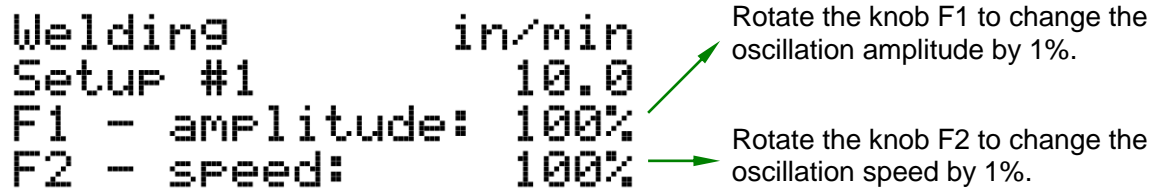


Fig. 8. Menu shown during welding with the oscillator

If you set Dwell times lock to YES, nothing happens when you press the knob F1 or F2 during work. If you set the parameter to NO, the delay parameters show on the display and you can adjust them online (Fig. 9).

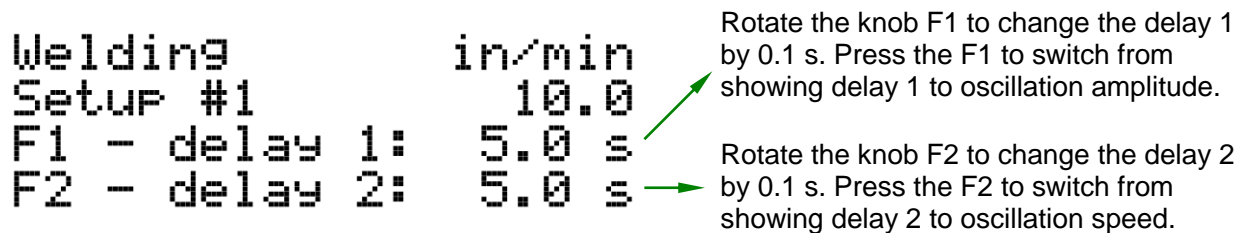


Fig. 9. Menu for changing the oscillator dwell times

3.9. Troubleshooting

Problem	Cause	Solution
Dark LCD display after powering.	Malfunction of the power cord, power switch, power supply, or controller.	Contact service center for check and repair.
Errors on the LCD display. Values cannot be read.	Malfunction of the display or power supply unit.	Contact service center for check and repair.
*** FATAL ERROR *** FRONT limit switch activated	Carriage reached an obstacle at the front.	Remove the obstacle that blocks the carriage or choose the opposite travel direction.
*** FATAL ERROR *** REAR limit switch activated	Carriage reached an obstacle at the rear.	Remove the obstacle that blocks the carriage or choose the opposite travel direction.
*** FATAL ERROR *** Travel switch incorrect signal	Too fast switching between left and right travel direction.	Set the travel direction switch to 'O'.
Set travel switch to zero	Travel direction switch not set to 'O' when powering.	Set the travel direction switch to 'O'.
	Shown during travel indicates a malfunction.	Contact service center for check and repair.

4. MAINTENANCE

Each day:

1. Clean the chassis and wheels.
2. Clean the rollers of the guide arms. Make sure that the rollers rotate freely.
3. Clean the torch nozzle and replace if damaged.

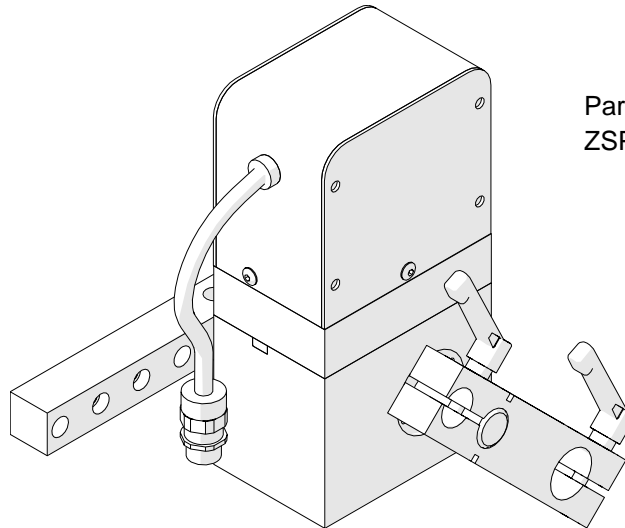
Each month:

1. Make sure that the knobs and the switches work as intended. Replace if they are loose or damaged.
2. Examine cables and cords, and replace if damaged.
3. Tighten screws if loose.

5. ACCESSORIES

5.1. Oscillator

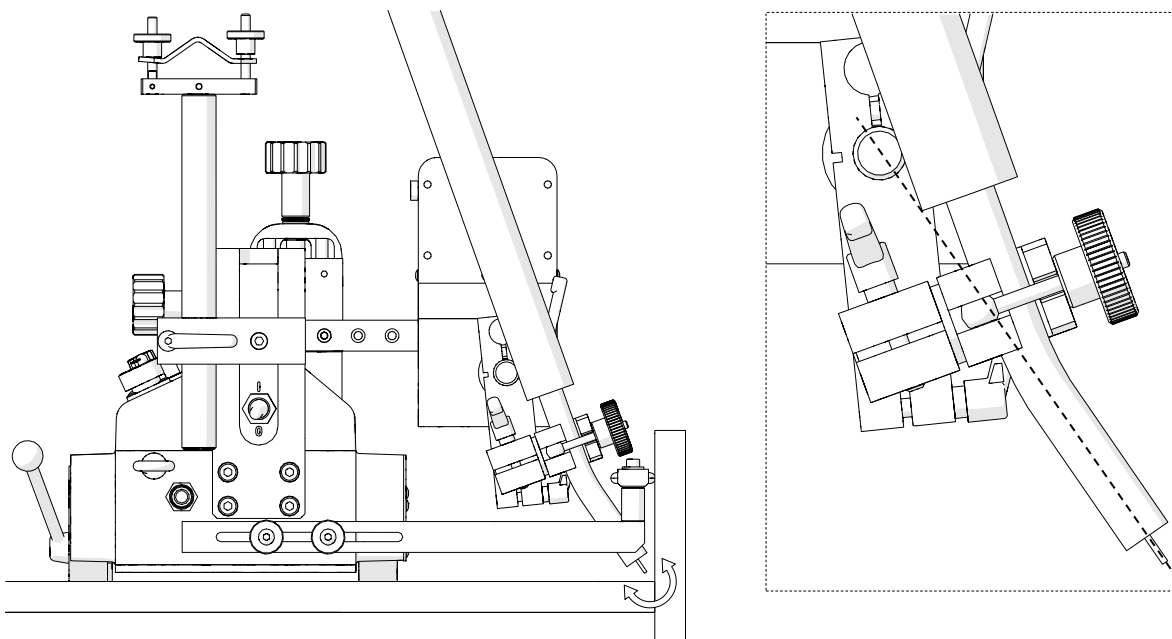
Allows welding with oscillation. Can be installed vertically or horizontally.



Part number:
ZSP-0477-10-00-00-0

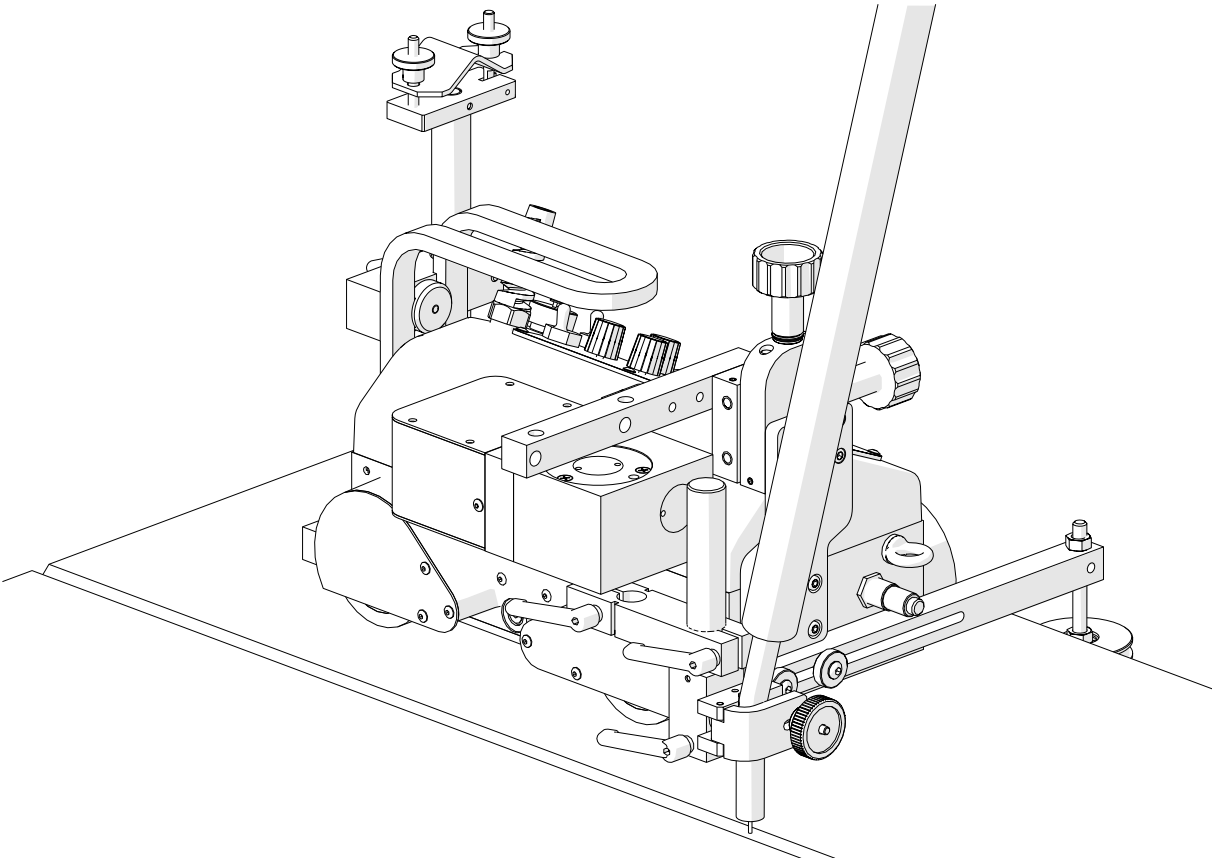
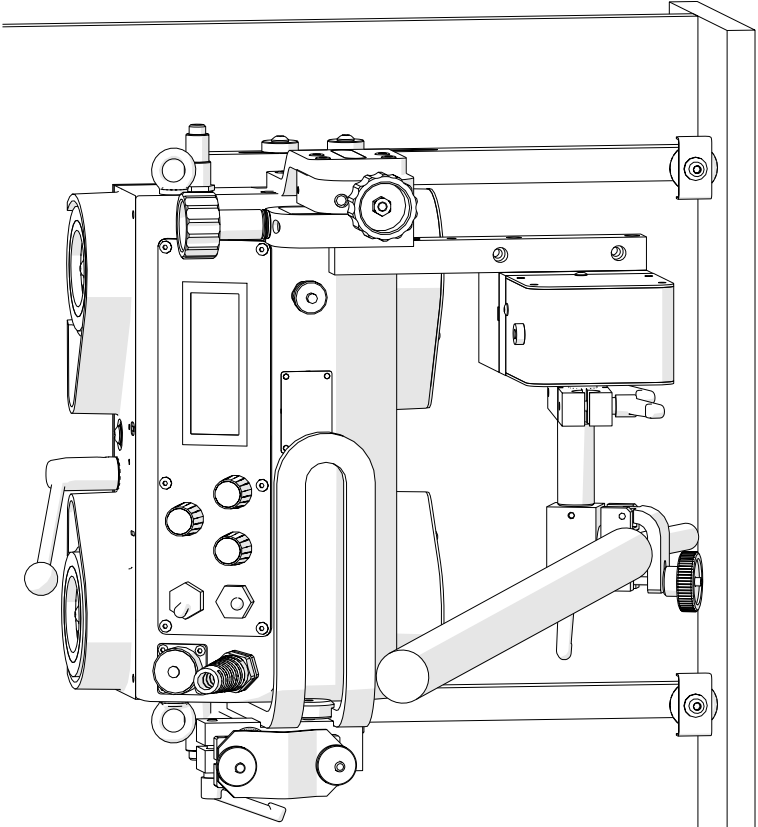
Oscillation type	Pendulum (maximum 11°)
Oscillation amplitude at r=150 mm (5.9")	1–30 mm (1–100%)
Oscillation speed at oscillation amplitude of 10 mm (0.4") and zero dwell time on ends	7–164 cycles/min (1–100%)
Dwell time on ends	0–5 s
Maximum torque	5 Nm (3.7 lb-ft)
Power	12 W
Weight	2.6 kg (5.7 lbs)

To get the correct shape of oscillation, make sure that axis of the oscillator's output shaft crosses with the axis of the torch.



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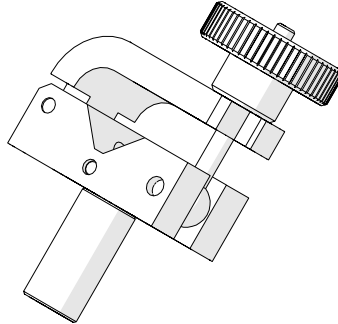


5.2. Torch clamps

5.2.1. 16–22 mm torch clamp

Allows using a torch with the diameter of 16–22 mm (0.63–0.87").

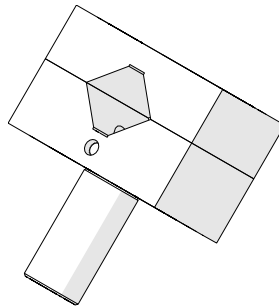
Part number:
ZRZ-0466-04-01-00-0



5.2.2. 16–22 mm torch clip

Allows using a torch with the diameter of 16–22 mm (0.63–0.87"). Use the 4 mm hex wrench to tighten the torch in the clip.

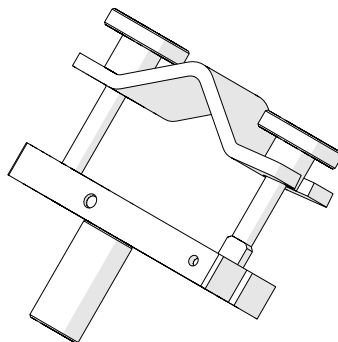
Part number:
ZCS-0476-06-01-00-0



5.2.3. 22–35 mm torch clamp

Allows using a torch with the diameter of 22–35 mm (0.87–1.38").

Part number:
ZRZ-0466-19-00-00-0

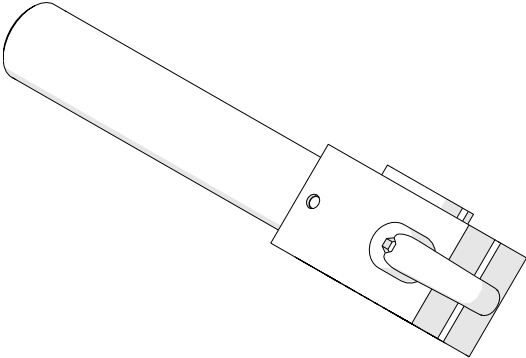


5.3. Rods

5.3.1. Short rod

Provides a 120 mm (4.72") reach.

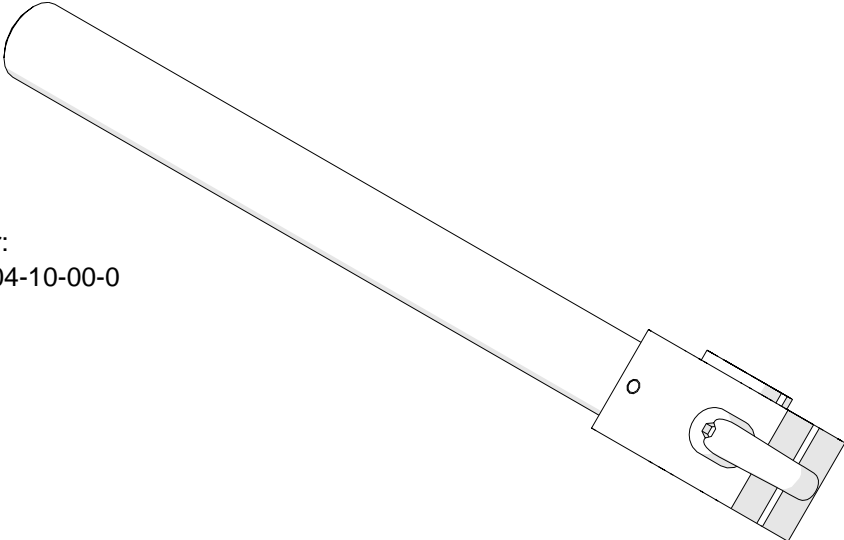
Part number:
WLK-0476-20-01-00-0



5.3.2. Long rod

Provides a 240 mm (9.45") reach.

Part number:
WLK-0466-04-10-00-0

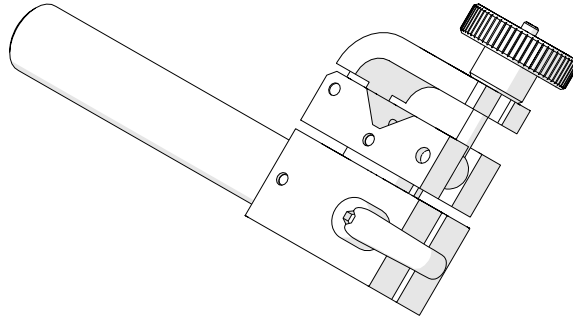


5.4. Torch holders

5.4.1. Short rod torch holder with clamp

Allows using a torch with the diameter of 16–22 mm (0.63–0.87").

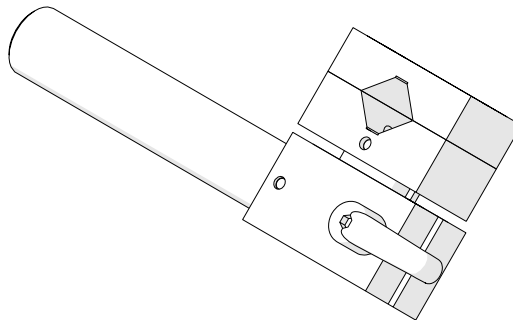
Part number:
UCW-0476-20-00-00-0



5.4.2. Short rod torch holder with clip

Allows using a torch with the diameter of 16–22 mm (0.63–0.87"). Use the 4 mm hex wrench to tighten the torch in the clip.

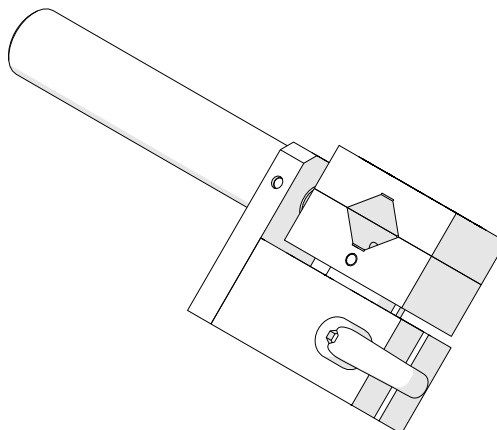
Part number:
UCW-0476-27-00-00-0



5.4.3. Short rod low torch holder with clip

Allows using a torch with the diameter of 16–22 mm (0.63–0.87"). Use the 4 mm hex wrench to tighten the torch in the clip.

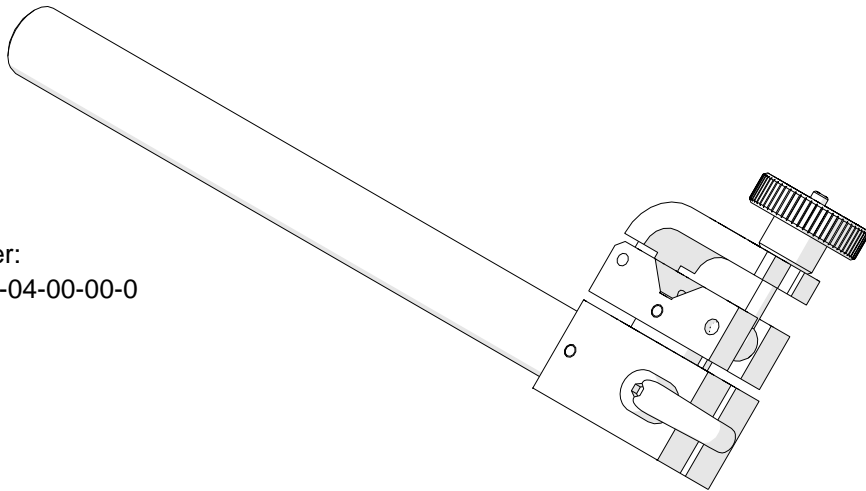
Part number:
UCW-0476-06-00-00-0



5.4.4. Long rod torch holder with clamp

Allows using a torch with the diameter of 16–22 mm (0.63–0.87").

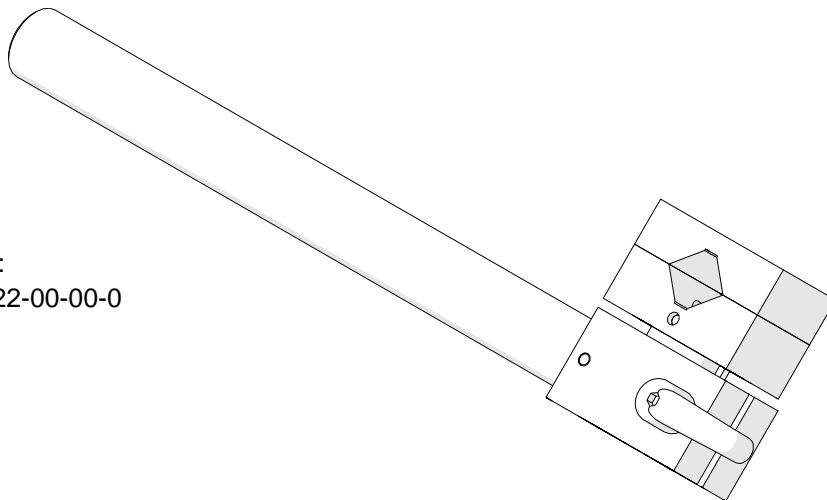
Part number:
UCW-0466-04-00-00-0



5.4.5. Long rod torch holder with clip

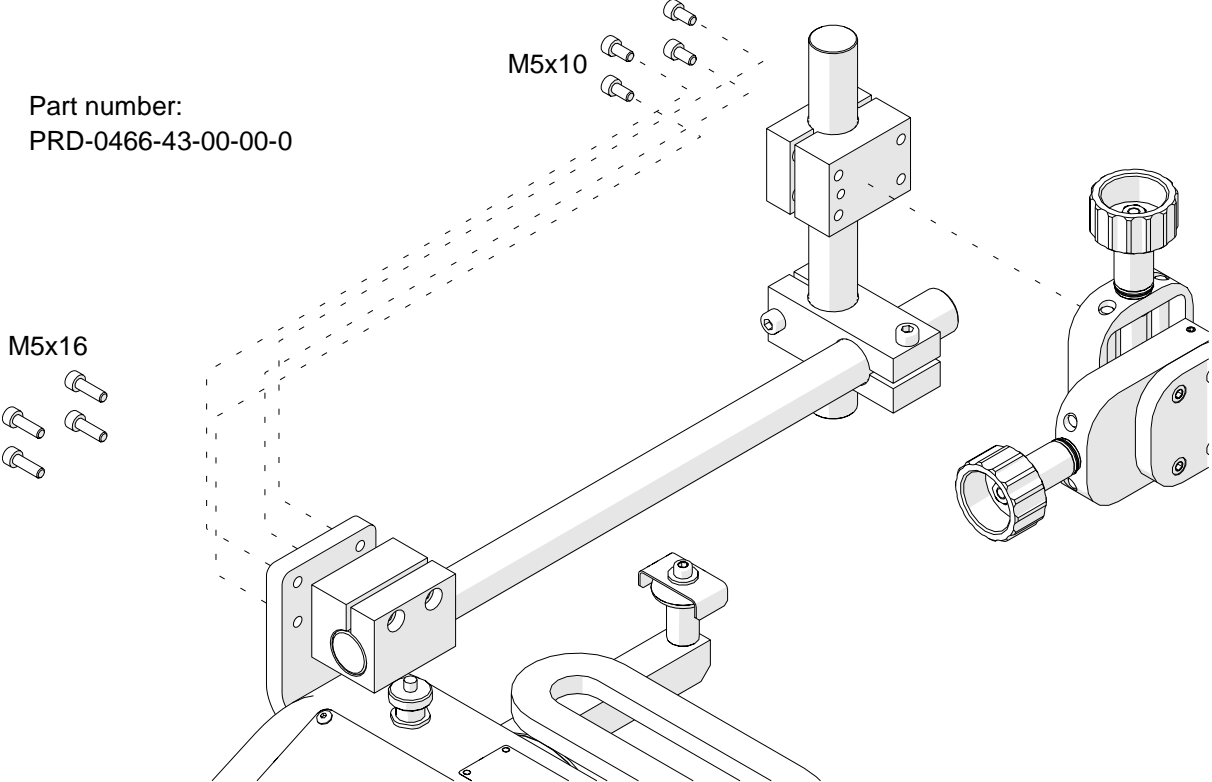
Allows using a torch with the diameter of 16–22 mm (0.63–0.87"). Use the 4 mm hex wrench to tighten the torch in the clip.

Part number:
UCW-0466-22-00-00-0



5.5. Torch extension arm

Increases the reach of the torch. Use the 4 mm hex wrench to remove the M5x10 screws that attach the cross slide. Next, use the same screws to attach the cross slide at the end of the arm as shown in the figure. Then, use M5x16 screws to attach the arm to the carriage.

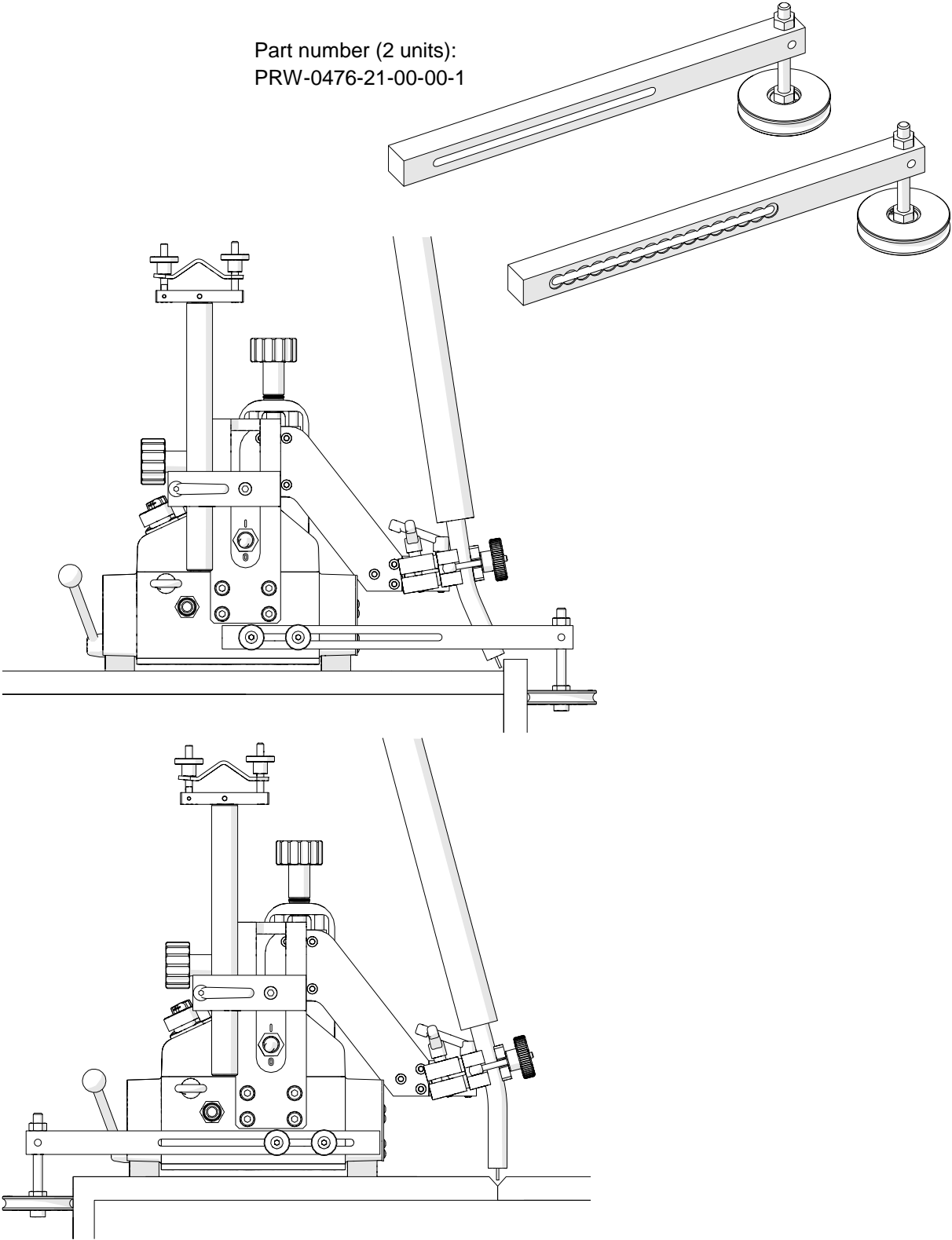


5.6. Guide arms

5.6.1. Edge following guide arms

Allow guiding the carriage along outside edges. Use the 4 mm hex wrench to remove the standard guide arms and install the new guide arms.

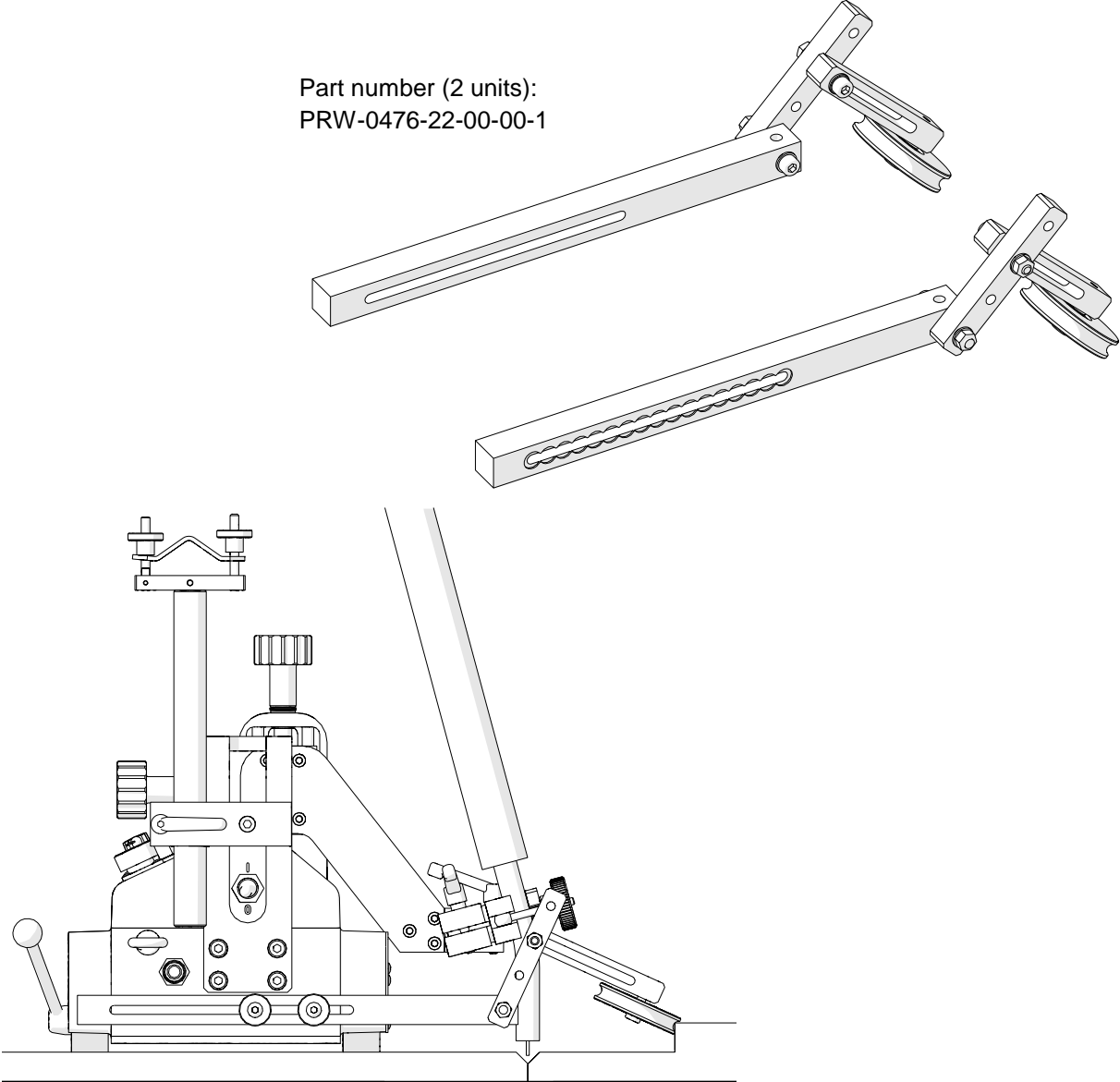
Part number (2 units):
PRW-0476-21-00-00-1



5.6.2. Adjustable guide arms

Allow guiding the carriage along lap joints and templates. Use the 4 mm hex wrench to remove the standard guide arms and install the new guide arms.

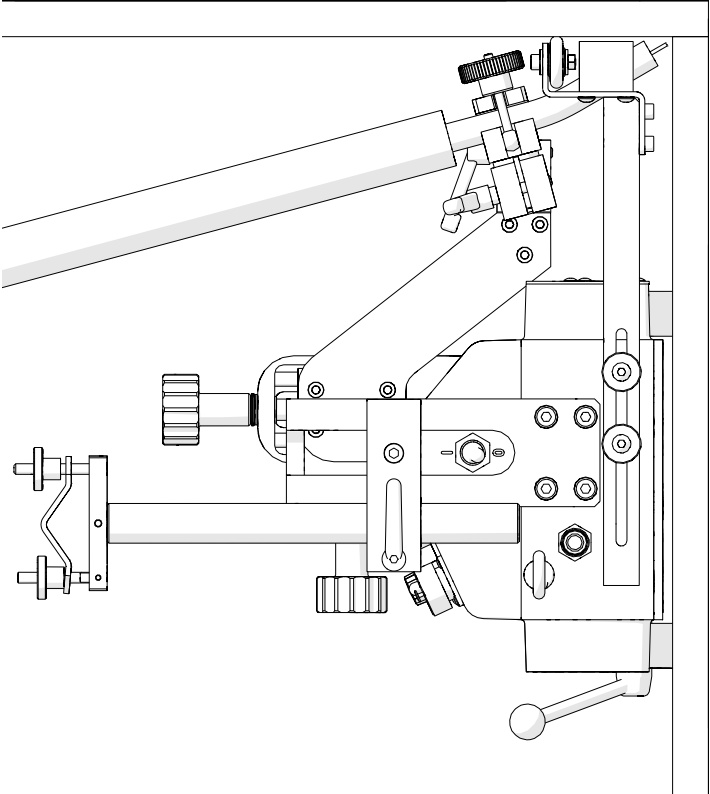
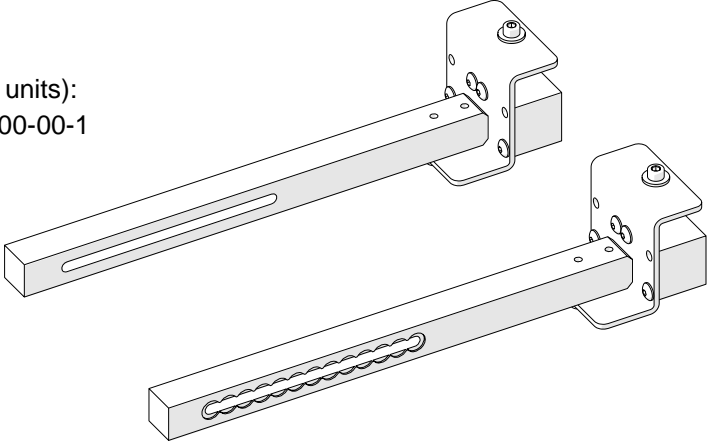
Part number (2 units):
PRW-0476-22-00-00-1



5.6.3. Magnet guide arms

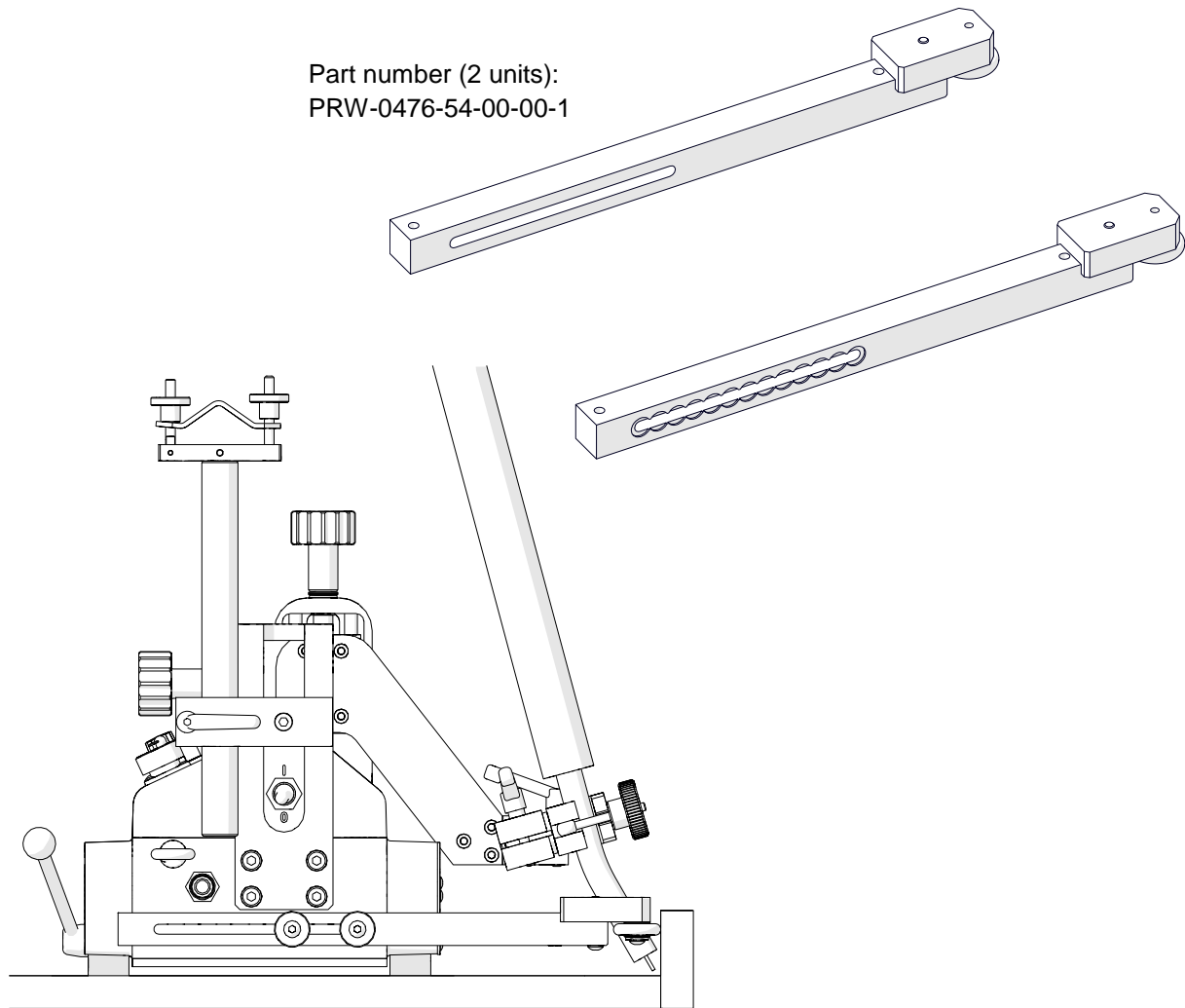
Allow guiding the carriage on ceilings. Use the 4 mm hex wrench to remove the standard guide arms and install the new guide arms.

Part number (2 units):
PRW-0476-52-00-00-1

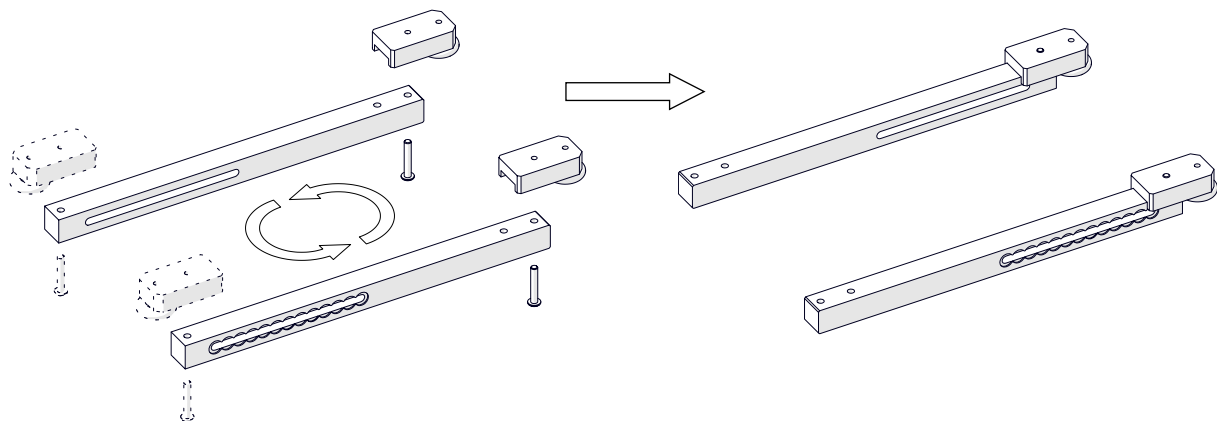


5.6.4. Low guide arms

Allow guiding the carriage along low walls. Use the 4 mm hex wrench to remove the standard guide arms and install the new guide arms.



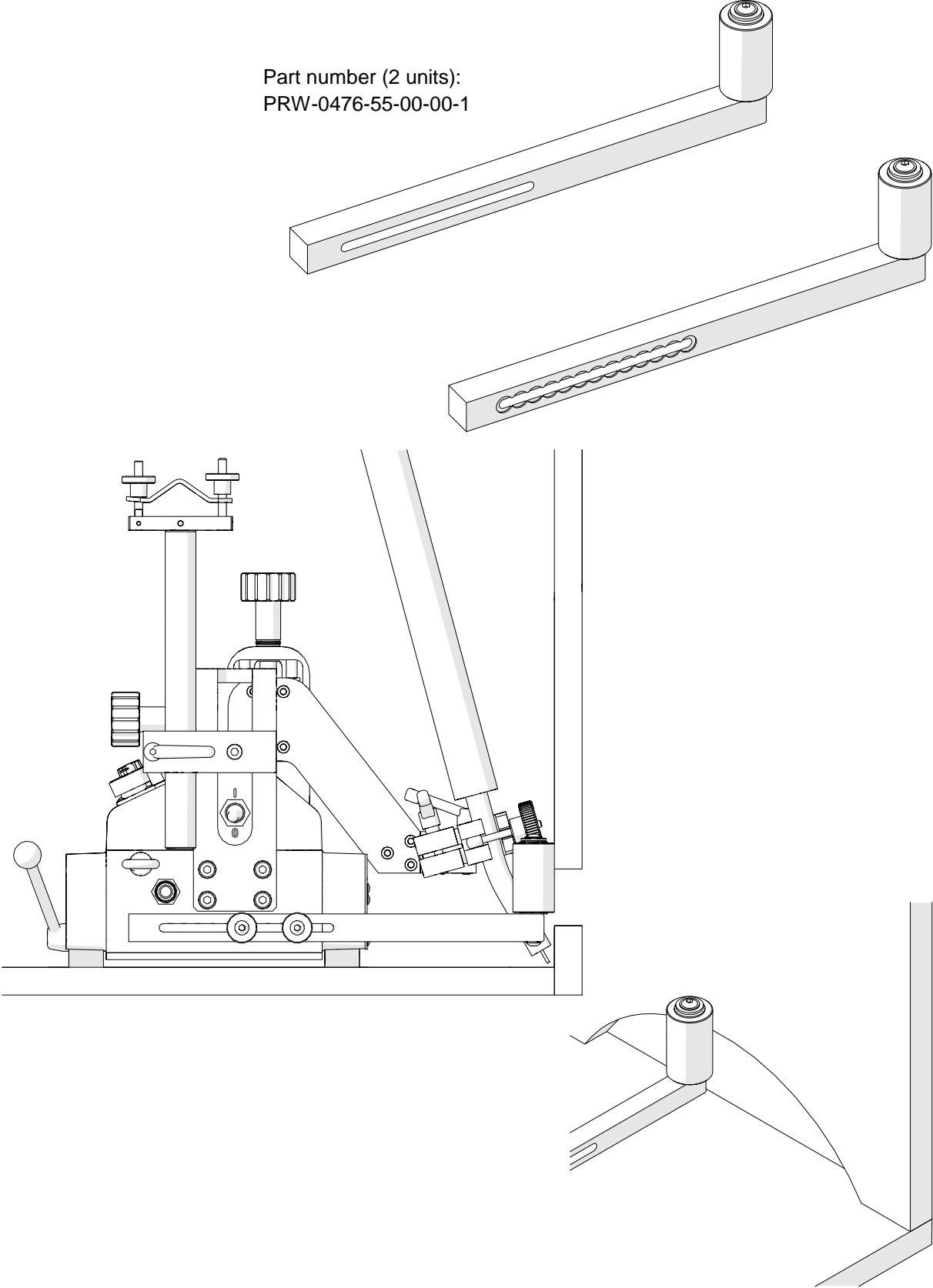
To put the carriage closer to the workpiece, use the 4 mm hex wrench to remove the roller assemblies. Next, install them at the other end of the guide arms, and then swap the guide arms.



5.6.5. High guide arms

Allow guiding the carriage along walls that have holes. Use the 4 mm hex wrench to remove the standard guide arms and install the new guide arms.

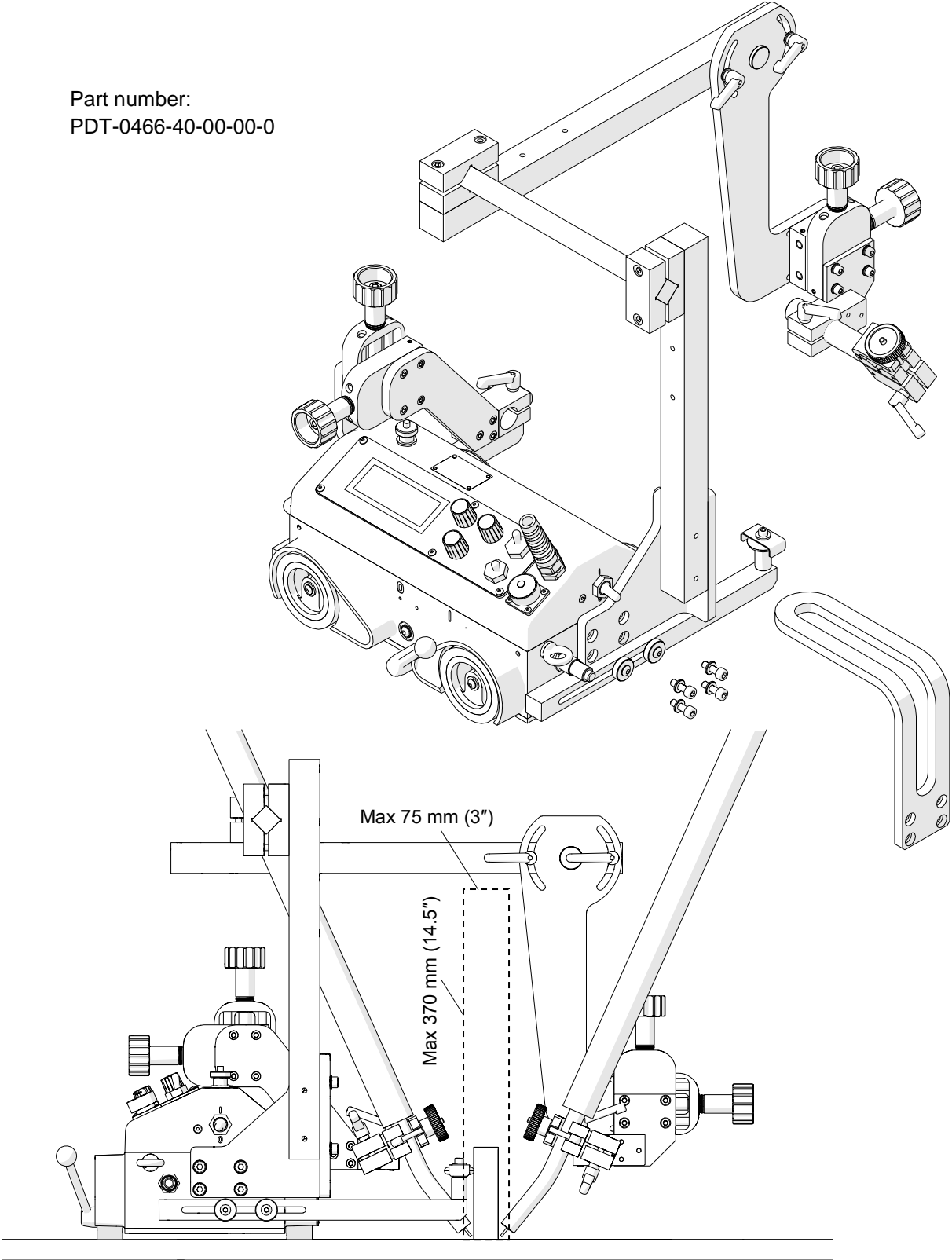
Part number (2 units):
PRW-0476-55-00-00-1



5.7. Dual torch mount

Allows using a second torch. Use the 5 mm hex wrench to remove the M6x20 screws and washers that attach the carrying handle. Next, use the same screws and washers to attach the mount to the carriage.

Part number:
PDT-0466-40-00-00-0



5.8. Flexible guide set

Allows guiding the carriage on planes along a straight line, and on pipes and tanks. A single flexible guide is 1.85 m (6 ft) long. Its minimum curve radius is 1 m (3.3 ft).

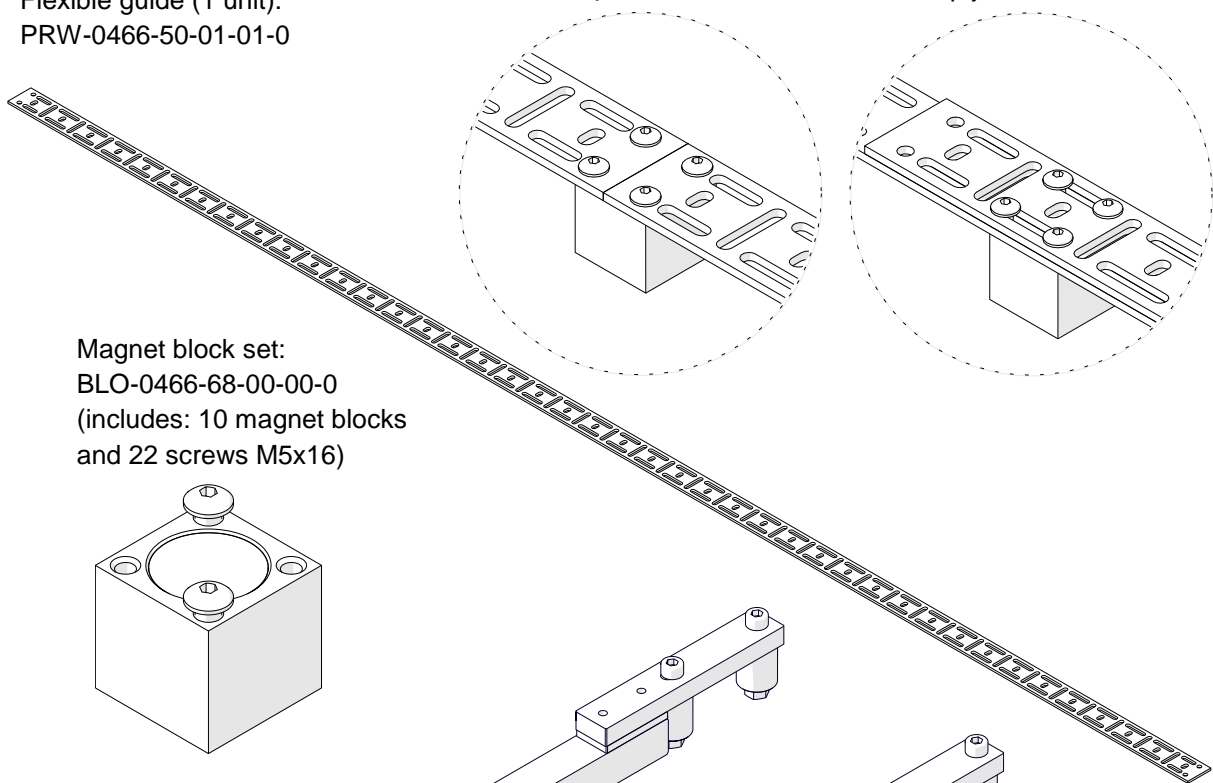
Holding force on a 5 mm (0.2") thick surface	Temperature
100% (90 N)	20°C (68°F)
75% (68 N)	80°C (176°F)
50% (45 N)	120°C(248°F)

Connect two guides with the 3 mm hex wrench and M5x16 screws to form a butt or lap joint. Next, use the 4 mm hex wrench to remove the standard guide arms and install the new guide arms.

Flexible guide (1 unit):
PRW-0466-50-01-01-0

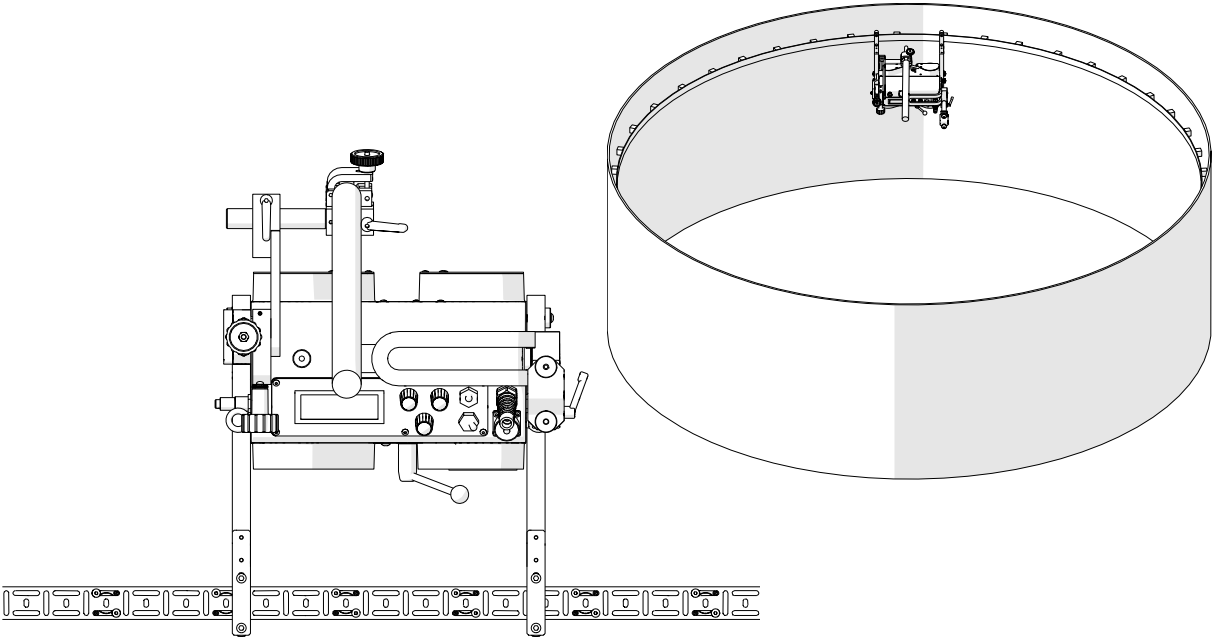
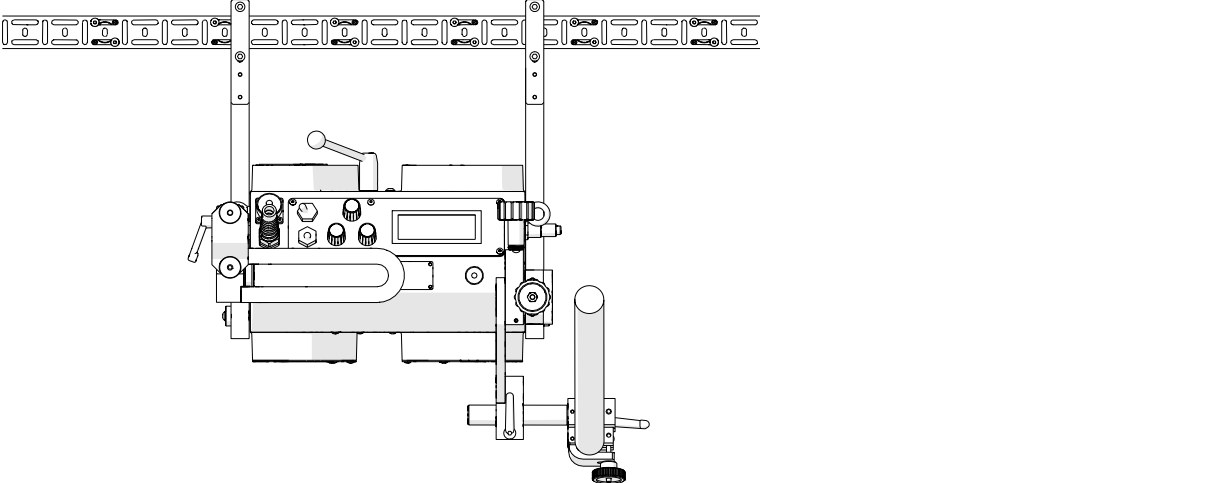
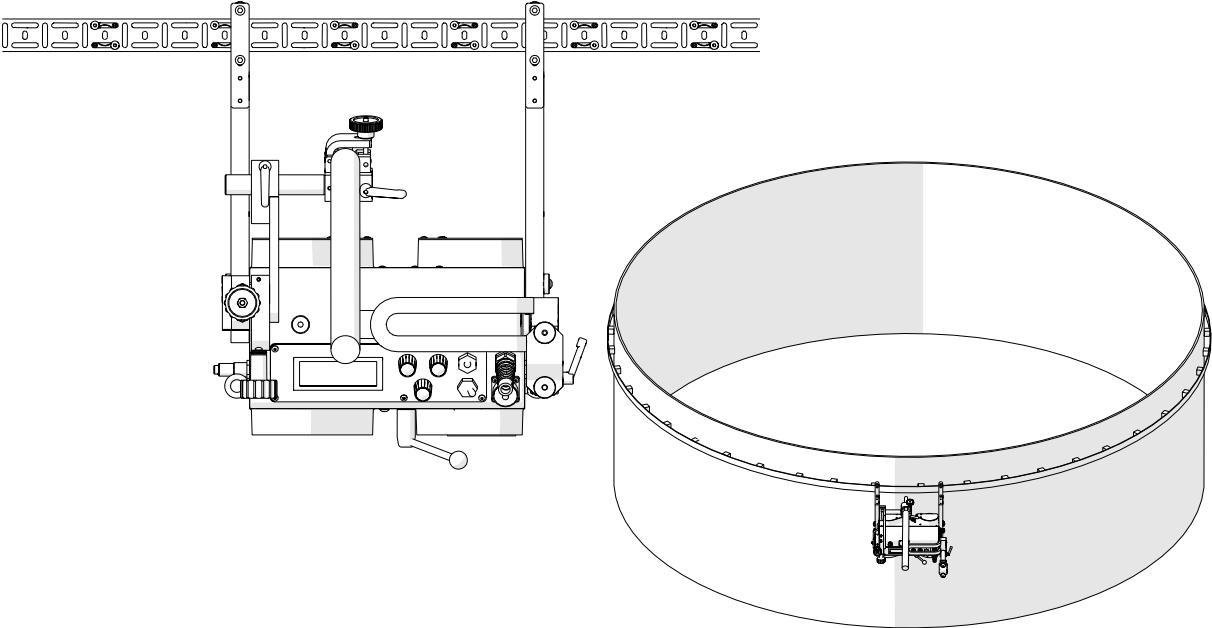
Butt joint

Lap joint



Magnet block set:
BLO-0466-68-00-00-0
(includes: 10 magnet blocks
and 22 screws M5x16)

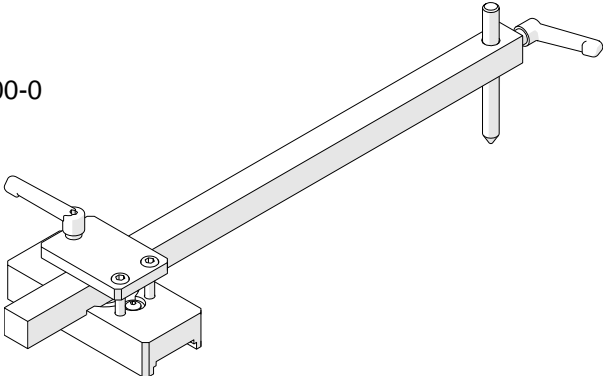
Guide arms (2 units):
PRW-0476-50-01-00-1



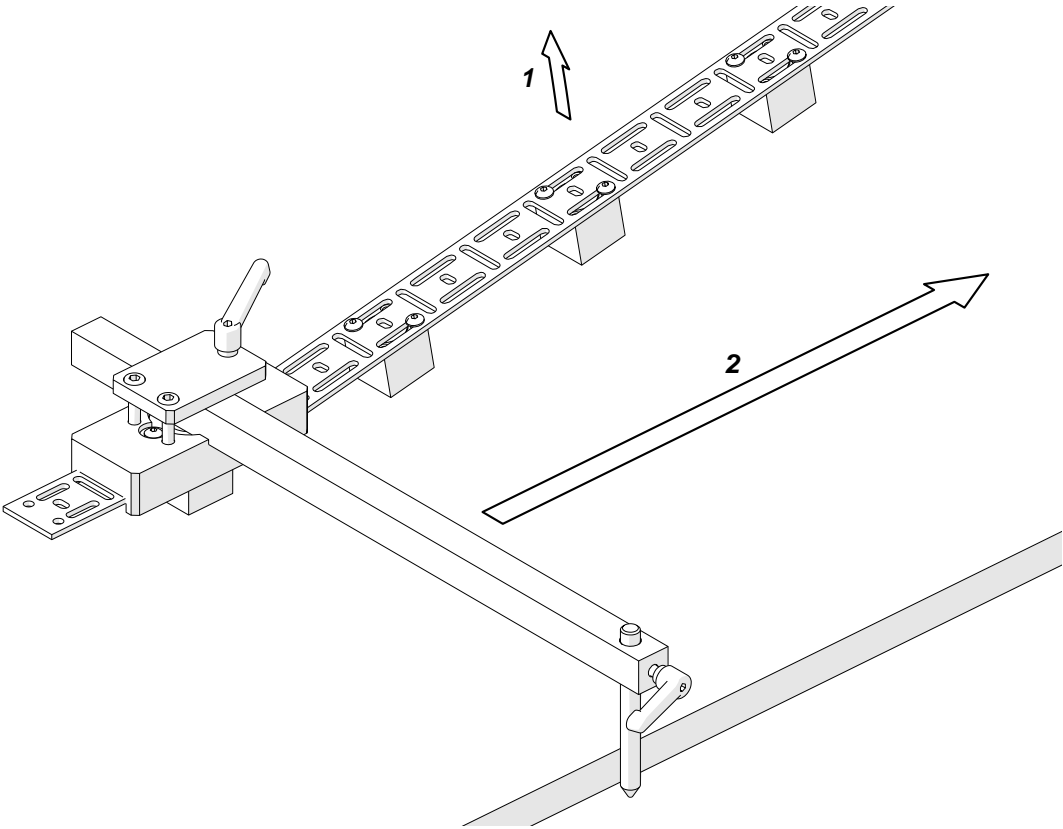
5.9. Guide adjustment tool

Allows the guide to be put parallel to an outside edge or a groove.

Part number:
UST-0466-53-00-00-0



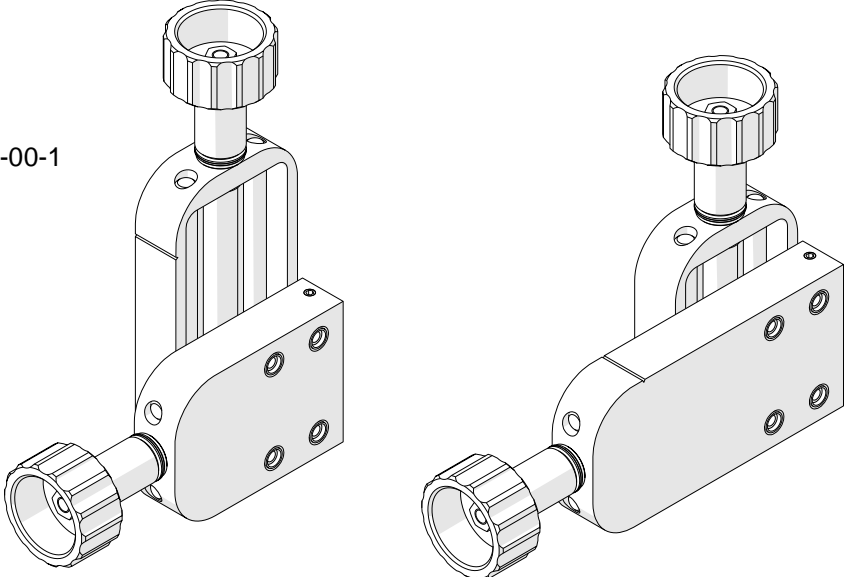
Attach the magnets to the guide, and put the guide on the workpiece along the direction of welding. Loosen the levers and put the tool onto the first magnet, resting the side of the pilot pin on an outside edge or putting the tip of the pilot pin in a groove. Then, lock the levers in this position and pull the further part of the guide off the workpiece (1). Next, start moving the tool along the guide (2) to clamp the successive magnets to the workpiece.



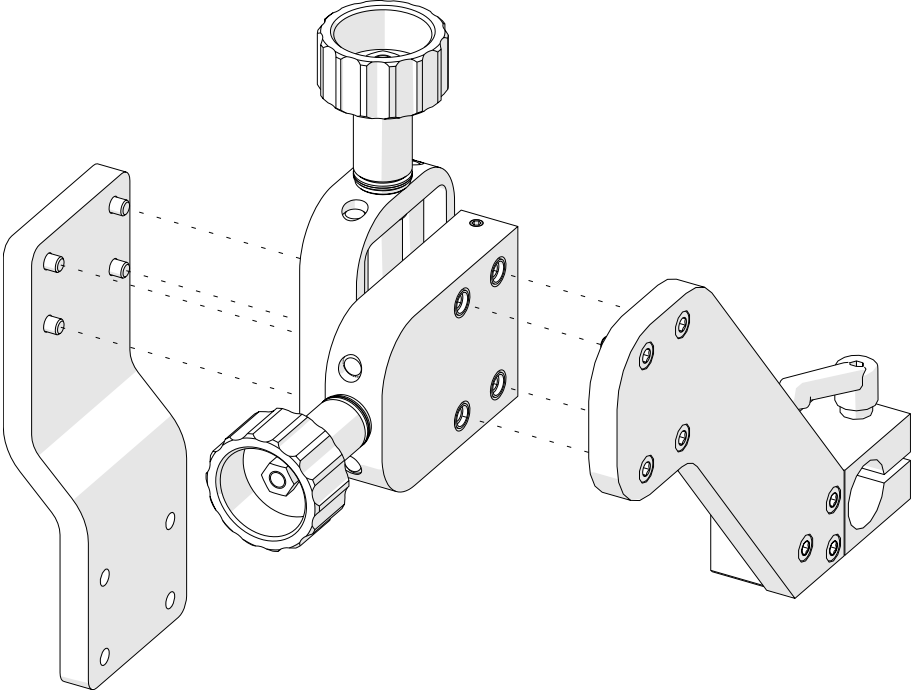
5.10. 76 mm cross slide

Increases the up-down or left-right adjustment range from 0–35 mm (0–1.38") to 0–76 mm (0–3").

Part number:
ZSP-0466-46-00-00-1



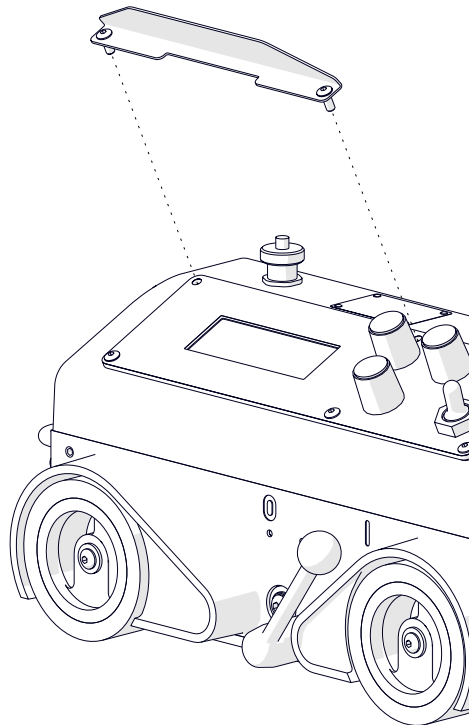
Use the 4 mm hex wrench to remove eight side screws and the standard cross slide, and then install the new cross slide.



5.11. Display protection shield

Protects the display from dirt. Use the 2.5 mm hex wrench to remove the top screws of the panel, and use them to attach the shield.

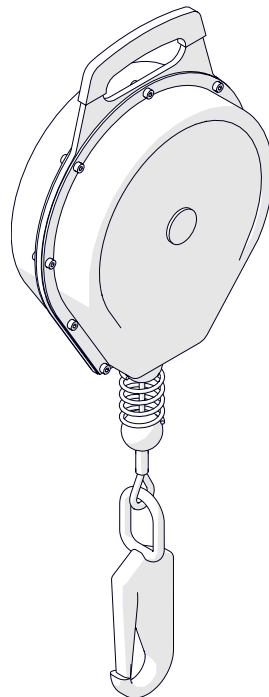
Part number:
OSL-0476-23-00-00-0



5.12. Fall arrester

Protects the carriage from falling. The length of the line is 10 m (33 ft).

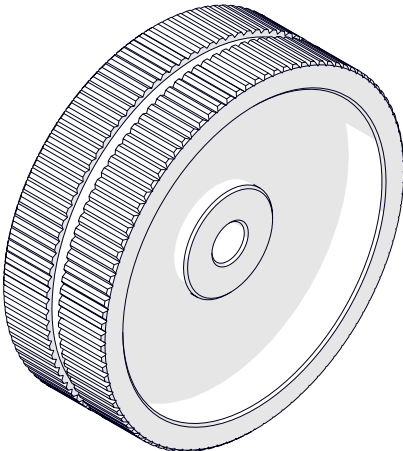
Part number:
URZ-000001



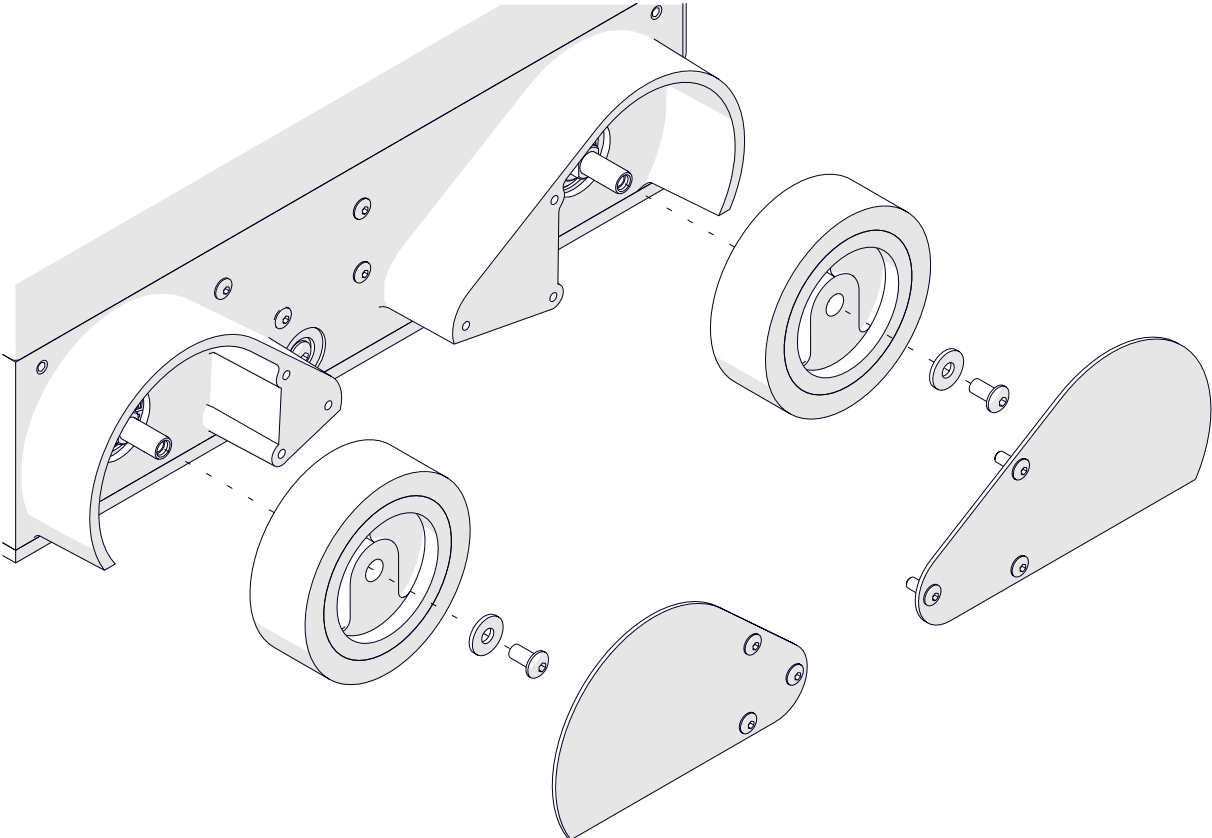
5.13. Stainless steel wheels

Allow working in horizontal position on a preheated plate.

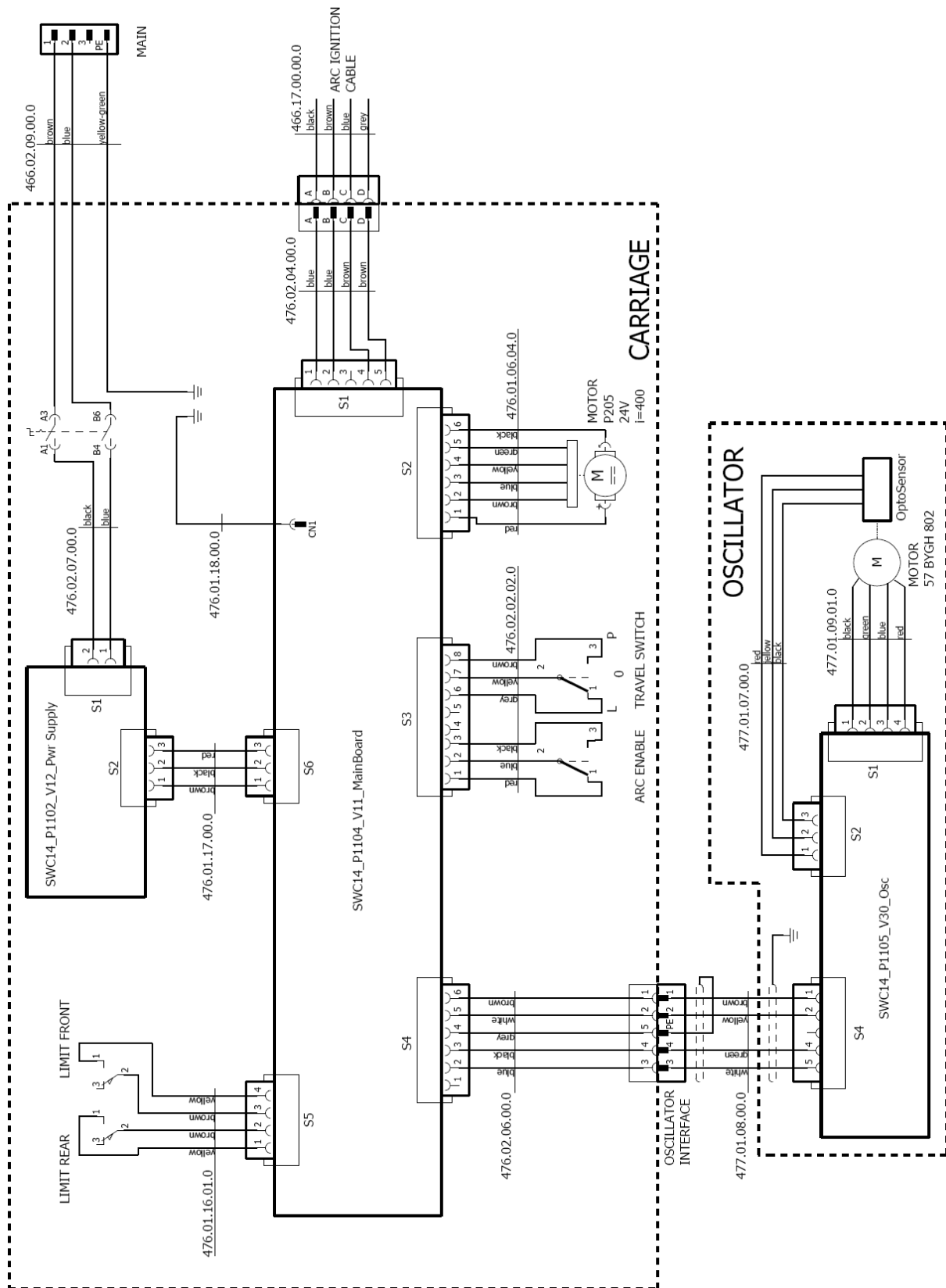
Part number (1 unit):
KOL-0476-57-00-00-0



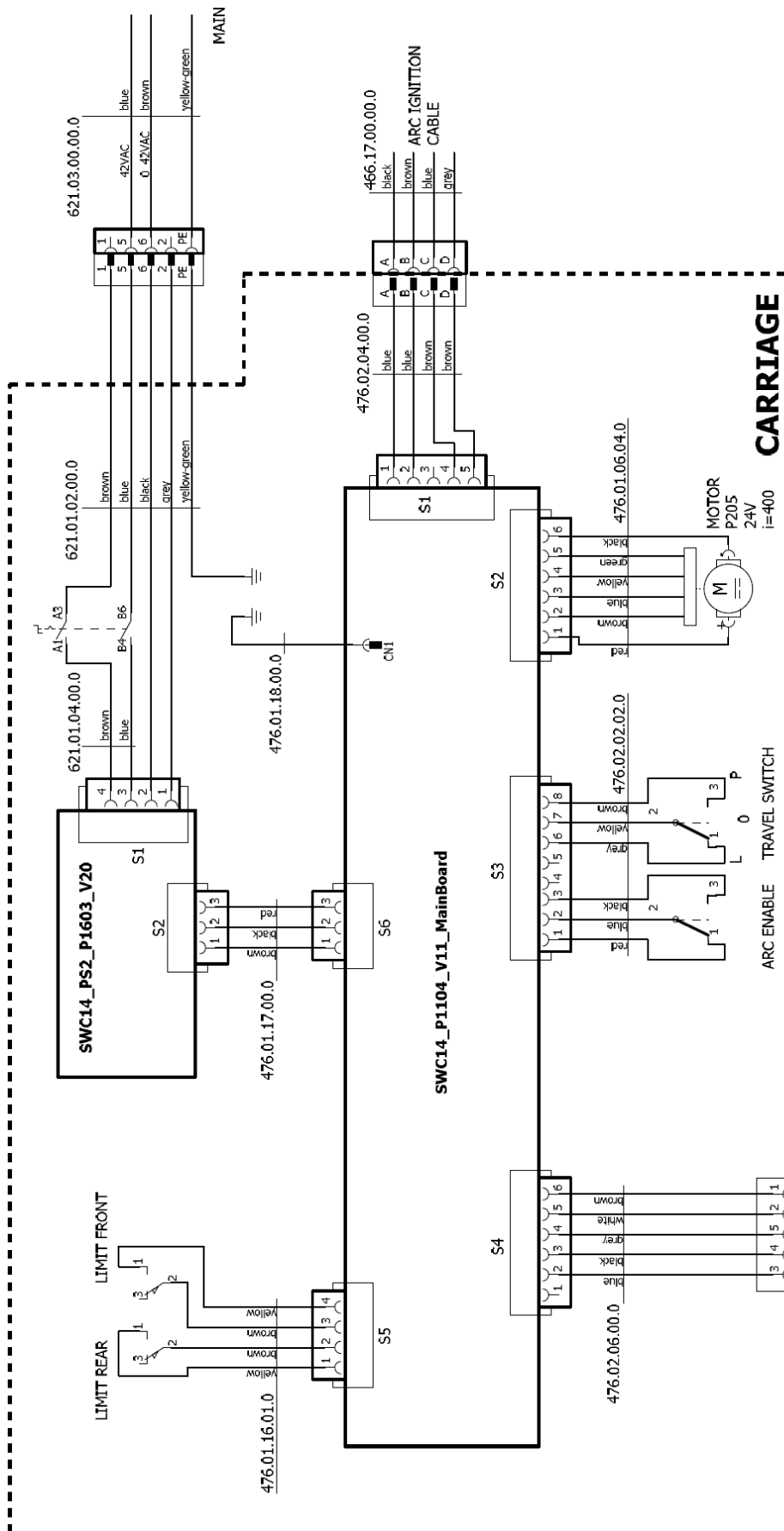
As shown in the figure, use the 2.5 mm hex wrench to remove the cover and use the 3 mm hex wrench to remove four wheels. Install in reverse sequence.



6. 115-230 V WIRING DIAGRAM



7. 42 V WIRING DIAGRAM



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8. DECLARATION OF CONFORMITY

Declaration of Conformity

***JEI Group Ltd
Unit 21 Empire Business Park
Enterprise Way, Burnley
Lancs, BB12 6LT, UK***

We declare with full responsibility that:

LIZARD WELDING CARRIAGE

is manufactured in accordance with the following standards:

- EN 12100
- EN 60745-1
- EN 60974-10

and satisfies regulations of the guidelines: 2004/108/EC, 2006/95/EC, 2006/42/EC.

Person authorized to compile the technical file:

David McFadden, Unit 21 Empire Business Park, Burnley, United Kingdom



Burnley, 22 January 2015

David McFadden
Managing Director

9. WARRANTY CARD

WARRANTY CARD No.....

..... in the name of Manufacturer warrants the LIZARD Welding Carriage to be free of defects in material and workmanship under normal use for a period of 12 months from the date of sale.

This warranty does not cover wheels as well as damage or wear that arise from misuse, accident, tempering, or any other causes not related to defects in workmanship or material.

Serial number

Date of sale

Signature and stamp of the seller

2.13 / 9 April 2019

WE RESERVE THE RIGHT TO MAKE CHANGES IN THIS MANUAL WITHOUT NOTICE