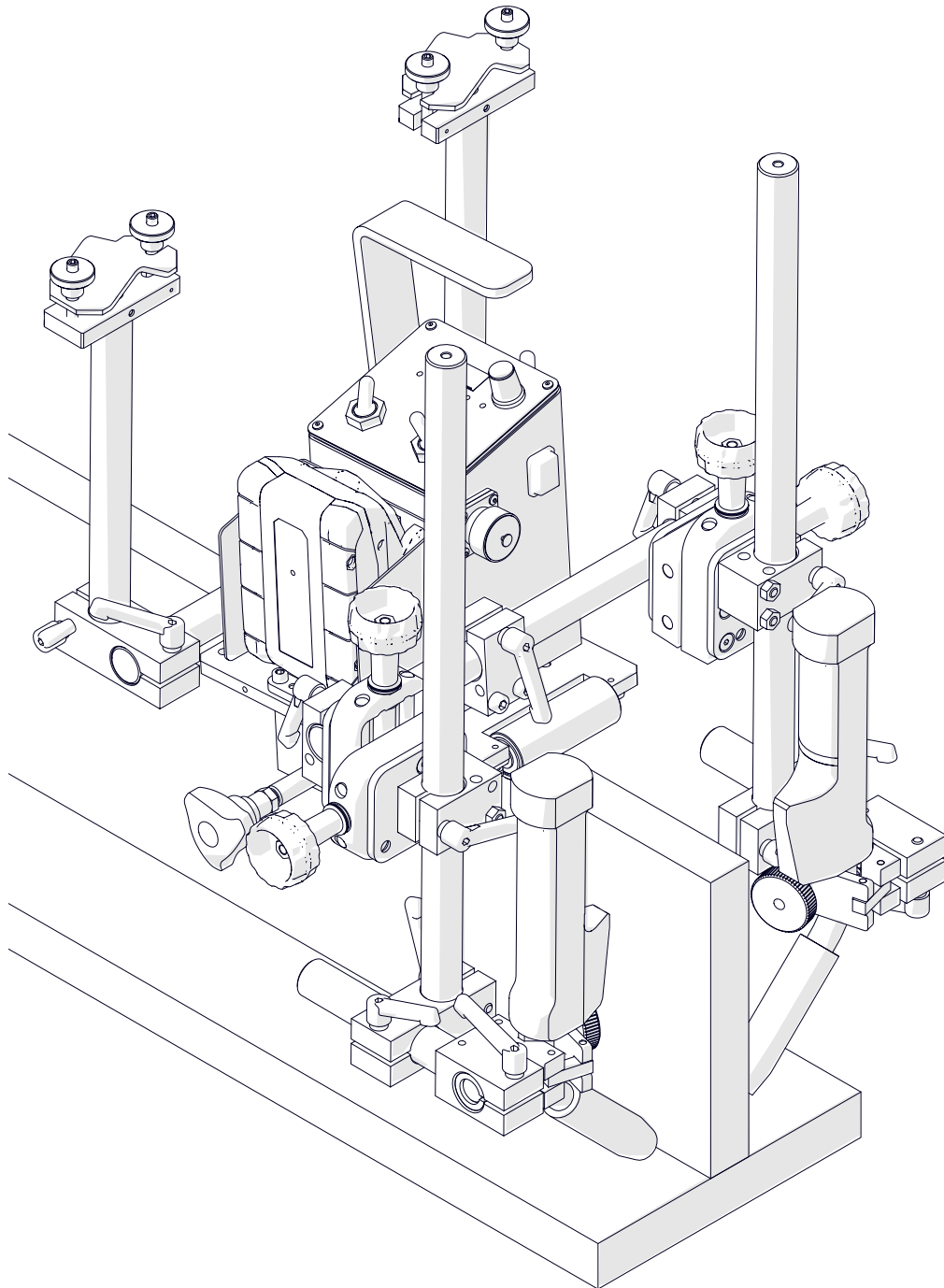




OPERATOR'S MANUAL

WELDING CARRIAGE MANTIS BATTERY



PART NO: WA-MANTIS

1. LIMITED WARRANTY

Industrial Tool & Machinery Sales (hereinafter referred to as ITMS) will, within twelve (12) months from the original date of purchase, repair or replace any goods found to be defective in materials or workmanship.

This warranty is void if the item has been damaged by accident, neglect, improper service or other causes not arising out of defects in materials or workmanship. This warranty does not apply to machines and/or components which have been altered, changed, or modified in any way, or subjected to overloading or use beyond recommended capacities and specifications. Worn componentry due to normal wear and tear is not a warranty claim. Goods returned defective shall be returned prepaid freight to ITMS or agreed repair agent, which shall be the buyer's sole and exclusive remedy for defective goods. ITMS accepts no additional liability pursuant to this guarantee for the costs of travelling or transportation of the product or parts to and from ITMS or the service agent or dealer, such costs are not included in this warranty.

Our goods come with guarantees which cannot be excluded under the Australian Consumer Law. You are entitled to replacement or refund for a major failure and to compensation for other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

THE MANUFACTURER RESERVES THE RIGHT TO MAKE IMPROVEMENTS AND MODIFICATIONS TO DESIGN WITHOUT PRIOR NOTICE.

PRODUCTS IMPORTED AND DISTRIBUTED NATIONALLY BY:

INDUSTRIAL TOOL & MACHINERY SALES

11 EASTERN SERVICE ROAD, STAPYLTON, QLD, 4207

T: 07 3287 1114 E: sales@itmtools.com.au W: www.itmtools.com.au

EN
Translation of the original manual

This document is a translation of the original manual. In case of any doubts regarding the interpretation of the content, the original version shall prevail.

APPLICATION

MANTIS BATTERY is a battery-powered welding carriage. It allows continuous and stitch MIG/MAG welding. The carriage moves along T, angle, flat and bulb profiles.

TECHNICAL DATA

Weight	7 kg / 15.4 lbs
Voltage	18 V DC
Power	18 W
Protection class	I
Protection level	IP 20
Allowed ambient temperature during operation	0–50 °C (32–122 °F)
Allowed ambient temperature during storage	-10–60 °C (14–140 °F)
Maximum allowed ambient humidity (non-condensing)	80%
Horizontal pulling force	150 N
Horizontal speed	See [AA]
Shapes and dimensions of the work track	Depending on the ordered clamp. See [H], [L], [O], [S]
Welding position	See [F]
Torch type	MIG/MAG
Torch diameter	16–22 mm (5/8–55/64 in)

EQUIPMENT INCLUDED [A]

UCW-0754-07-00-00-0	Torch holder
WSP-0523-16-00-00-0	Short rod
WSP-0824-0816-01-0	Long rod
KST-0525-11-00-00-0	Clamping block
UKL-0824-0698-01-0	Cross slide „L”
UKL-0824-0698-00-0	Cross slide
UCW-0466-55-03-00-0	Cable anchor
KLC-000008	5 mm hex wrench
KLC-000007	4 mm hex wrench
KLC-000006	3 mm hex wrench
AKM-0738-10-00-01-0*	Battery 4 Ah
KBL-0466-17-00-00-0	Arc ignition cable
WOZ-0824-0788-00-0	Carriage

DCS-0824-0037-01-0**	Clamp for T profiles and angle profiles
DCS-0824-0037-00-0**	Clamp for flat profiles
DCS-0824-0037-02-0**	Small clamp for bulb profiles
DCS-0824-0037-03-0**	Large clamp for bulb profiles
–	Box
–	Operator's manual

* supplied depending on the ordered machine configuration

** sold on individual order (not included)

DESIGN [B]

[1]	Carrying handle
[2]	Control panel
[3]	Power switch
[4]	Arc ignition socket
[5]	Knobs to adjust torch position
[6]	Knob to secure the torch
[7]	Handle
[8]	Carriage holder
[9]	Knobs to secure the cable
[10]	LEDs
[11]	Display
[12]	Speed knob
[13]	Direction switch
[14]	Arc ignition switch
[15]	Chassis
[16]	Guiding roller
[17]	Drive

SAFETY PRECAUTIONS

1. The machine is designed for use by a professional operator only.
2. Before use, read this operator's manual and complete a training in occupational health and safety.
3. Each time, a risk assessment has to be carried out at the machine's installation site.
4. Use only in applications specified in this operator's manual.
5. Make sure that the machine has all parts and they are genuine, not damaged, and correctly installed.
6. Make sure to maintain correct conditions that may influence the operation of the machine.

7. Make sure that the specifications of the power source are the same as those specified on the rating plate.
8. Do not carry the machine by the cables. Do not pull the cables.
9. Transport and position the machine using the carrying handle.
10. Before each use, make sure that the condition of the machine and equipment is correct. Especially check the condition of the control panel, power supply, cables, plugs and sockets.
11. Keep the machine dry. Do not expose the machine to rain, snow, or frost.
12. Do not expose the machine to fire or excessive temperature.
13. Do not use near flammable materials or in explosive environments.
14. Keep the work area well lit, clean and free of obstacles.
15. Make sure that the rollers are clean.
16. Connect the cables only when the power switch is set to 'O'.
17. Keep the sockets clean. Do not use high pressure during cleaning.
18. Mount only torches with a diameter as specified in the technical data.
19. Use the welding cables whose weight is not more than specified in the technical data. Hang the cables to decrease the load applied on the machine.
20. Do not stay below the machine that is put at heights.
21. At heights, use a fall arrester.
22. Use eye protection (helmet, shield, and screen), ear protection, gloves, and protective clothing. Do not use loose clothing.
23. Do not stop the machine by hand. To stop, set the direction switch to 'O'.
24. Mount and maintain the machine only after disconnecting the power supply/removing the battery.
25. Repair only in a service center appointed by the seller.
26. If the machine falls, is wet, or has any damage, stop the work and send the machine to the service center for check and repair.
27. Do not leave the machine unattended when it operates.
28. If you are not going to use the machine, remove it from the work area and keep it in a safe and dry place.
29. Do not remove the covers of the machine.
30. Do not touch moving parts and machine covers.
31. Do not put the torch more than 70 mm (2 3/4") outward from the left or right side of the machine.
32. Do not work on curves with convex or concave radius less than specified in technical data.
33. Do not use in welding positions other than specified in the technical data.
34. The machine can only be operated on horizontal surfaces.
35. The part to which the machine is mounted must be immobilized.
36. Operate the welding accessory (e.g. torch, welding source) according to its operator's manual.
37. Install/remove the battery only when the power switch is set to 'O'.
38. Before installing the battery, clean its contacts and the socket to which it is mounted. The presence of foreign objects may cause a short circuit and explosion of the battery!
39. Do not remove the battery during operation of the machine.
40. Check the condition of the battery during operation of the machine. If the battery overheats, stop operation and let it cool down.
41. Do not leave the battery in the machine.
42. Use only original battery and charger.
43. Use a battery and charger compatible with the machine. Use only CAS (Cordless Alliance System) batteries and chargers. Batteries and chargers marked with CAS are compatible with CAS devices.
44. Before using the battery, read the operator's manual. Keep all documents included with the battery.
45. Do not expose the battery to water, moisture, fire and high temperatures.
46. Do not use faulty or deformed battery.
47. Do not open the battery and do not short-circuit its contacts.
48. Do not allow full discharge. Do not store discharged battery.
49. The optimal charging and storage temperature is 10–30 °C (50–86 °F).
50. Keep the battery out of the reach of children.
51. Slightly acidic, flammable fluid may leak from a defective li-ion battery. In case it comes into contact with your eyes, wash them with clean water and seek medical attention immediately.

52. Transporting li-ion battery packs: The shipping of li-ion battery packs is subject to laws relating to the carriage of hazardous goods (UN 3480 and UN 3481). Inform yourself of the currently valid specifications when shipping. If necessary, consult your freight forwarder. Certified packaging is available from Promotech.

53. Specified use: The battery is designed for use in corresponding Promotech battery-operated power tools. The battery must only be charged using Promotech charger. Battery packs marked with CAS are 100% compatible with CAS devices (Cordless Alliance System). To select the appropriate device, please contact your dealer. Read the relevant manuals for the devices used. For example, the charging process is explained in the charger manual. The user bears sole responsibility for any damage caused by improper use. Generally accepted accident prevention regulations and the safety information must be observed.

BATTERY OPERATION

Design [C]

[18]	Charge status button
[19]	LEDs

Charging

- Charge before first use.
- Recharge if performance diminishes.
- Do not charge fully charged battery.

Checking the charge level [C]

Press the button. The LEDs indicate the charge level. If one LED flashes, charge the battery.

Installing the battery into the socket [D]

Slide the battery into the socket until you hear a click.

Removing the battery from the socket [E]

Press the lock button and slide the battery out.

NOTE: Remove the battery before installing/removing parts and connecting cables!

ADJUSTING THE GUIDING ROLLERS [G]

Adjust the guiding rollers according to the direction of movement (a, b). Perform the step if the carriage is used with a clamp for flat profiles, small clamp for bulb profiles or large clamp for bulb profiles.

USING WITH CLAMP FOR T AND ANGLE PROFILES

Design [H]

[20]	Clamping knob
[21]	Clamping rollers
[22]	Guiding rollers of the clamp

Application [H]

Adapts the carriage to move on T and angle profiles.

The allowed dimensions of the profile are shown in the figure.

Adapting to the profile size [I]

1. Remove the screws.
2. Slide out the clamping part.
3. Install the clamping rollers to suit the profile size (a, b).

Mount the clamp in reverse sequence.

Mounting [J]

Mount the clamp (as shown in the figure).

Positioning at the work area [K]

1. Position the carriage so that the guiding rollers of the clamp rest on the profile.

NOTE: Notice the alignment of the rollers. The guiding rollers of the clamp must be set in the same position. The carriage guiding rollers can be set in any position, regardless of the direction of movement.

2. Use the clamping knob to push the clamp to the profile until you hear a click.

NOTE: Ensure that the carriage is securely mounted.

USING WITH CLAMP FOR FLAT PROFILES

Design [L]

[23]	Clamping knob
[24]	Clamping rollers

Application [L]

Adapts the carriage to move on flat profiles.

The allowed dimensions of the profile are shown in the figure.

Mounting [M]

Mount the clamp (as shown in the figure).

Positioning at the work area [N]

Adjust the guiding rollers according to the direction of movement as shown in [G].

Position the carriage so that the guiding rollers rest on the profile. Use the clamping knob to

push the clamp to the profile until you hear a click.

NOTE: Ensure that the carriage is securely mounted.

USING WITH SMALL CLAMP FOR BULB PROFILES

Design [O]

[25]	Clamping knob
[26]	Handle
[27]	Spacer plate
[28]	Clamping rollers

Application [O]

Adapts the carriage to move on bulb profiles. The allowed dimensions of the profile are shown in the figure.

Adapting to the profile size [P]

Install the spacer plate to suit the profile size (a, b).

Mounting [Q]

1. Slide the clamp onto the bulge.
2. Mount the clamp (as shown in the figure).

Positioning at the work area [R]

Adjust the guiding rollers according to the direction of movement as shown in [G].

1. Position the carriage on the profile:
 - a) slide the carriage onto the profile,
 - b) hook the clamp against the underside of the profile and place the carriage on the profile in a rotating motion.
2. Position the carriage so that the guiding rollers rest on the profile. Unlock the handle and push the clamp against the profile. Lock the handle.
3. Use the clamping knob to push the clamp to the profile until you hear a click.
4. When working with one torch, it is recommended to place the torch opposite the clamp (a).
Placing the torch on the clamp side (b) may cause tilting of the carriage. To avoid this, install an accessory counterweight [II].

NOTE: Ensure that the carriage is securely mounted.

USING WITH LARGE CLAMP FOR BULB PROFILES

Design [S]

[29]	Clamping knob
[30]	Handle

[31]	Mounting plate
[32]	Clamping rollers

Application [S]

Adapts the carriage to move on bulb profiles. The allowed dimensions of the profile are shown in the figure.

Adapting to the profile size [T]

Assemble the clamping part using two holes suitable for the profile size.

Mounting [U]

1. Unlock the handle. Rotate the mounting plate by about 90 degrees.
2. Mount the clamp (as shown in the figure).

Positioning at the work area [V]

Adjust the guiding rollers according to the direction of movement as shown in [G].

1. Position the carriage so that the guiding rollers rest on the profile.
Turn the clamp towards the profile and lock with the handle in this position.
2. Use the clamping knob to push the clamp to the profile until you hear a click.
3. When working with one torch, it is recommended to place the torch opposite the clamp (a).
Placing the torch on the clamp side (b) may cause tilting of the carriage. To avoid this, install an accessory counterweight [II].

NOTE: Ensure that the carriage is securely mounted.

ASSEMBLING [W]

NOTE: Lock the position of the parts with the handles!

Assemble the parts as shown in the figure.

SETTING THE TORCH [X]

NOTE: Lock the position of the parts with the handles!

1. Install the torch into the torch holder. Secure the torch position with the knob.
2. Depending on the position of the torches, the welds are opposite each other (a) or offset (b). Move and rotate the rods to adjust the torch position.
3. Adjust the torch position over the joint with the knobs.
4. Place the cables in the cable anchor. Secure the position of the cables with the knobs.

CONNECTING TO THE WELDING CIRCUITS [Y]

The carriage can be connected to a welding device (welding machine, wire feeder). Make sure that the welding device provides a start–stop signal. Refer to the manual included with the welding device.

Connect the arc ignition cable only to the arc ignition control contacts in the welding device remote control socket specified by the welding device manufacturer.

In the welding device, the cycle control must be set to 2-stroke. If you set it to 4-stroke, arc ignition control will work incorrectly.

NOTE: If the battery is installed, remove it!

The carriage can control two torches by using the arc ignition cable plugged into the arc ignition socket [4].

Connect one blue-jacketed wire to one terminal of the welding circuit. 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.

CHECKING THE CONNECTION TO THE WELDING CIRCUITS [Z]

1. Set the arc ignition switch and the direction switch to 'O'.
2. Insert the battery.
3. Set the power switch to "I".
4. Set the arc ignition switch to 'TEST'.
The arc should ignite for a second.

STARTUP [AA]

1. Set the arc ignition switch and the direction switch to 'O'.
 2. Insert the battery.
 3. Set the power switch to "I".
- The carriage turns on. The display will come on and display the software version, speed unit and speed.

SETTING THE MOVEMENT SPEED [AA]

Use the speed knob to set the required speed. The speed can also be adjusted during operation.

CONTROLLING THE TORCH [BB]

- a) Arc ignition switch set to 'O' – setting the direction switch to '←' or '→' and starting the movement does not ignite the arc.

- b) Arc ignition switch set to 'I' – setting the direction switch to '←' or '→' and starting movement causes **immediate arc ignition** and welding start.

WELDING SETTINGS [CC]

To enter the welding settings:

1. Press and hold the speed knob.
2. The LED of the parameter to set will light up on the control panel. Set the value with the knob. Press the knob to confirm and move to the next parameter.

NOTE: The availability of parameters depends on the values of other parameters.

3. After setting the total path, press and hold knob to exit the settings.

	Arc stabilization time (R5t *). Filling the crater at the beginning of the weld.
	Length of a single weld.
	Skip between welds (---*). If the skip is set to 0, the carriage welds in continuous mode.
	Crater filling time (cF/cFP *). Filling the crater at the end of the weld.
	Behavior of the arc ignition relay while filling the crater. Parameter available when the crater filling time is set to more than 0. ON (LED on) – welding source uses full current while filling the crater. OFF (default, LED off) – welding source decreases the current of the arc while filling the crater. Time of filling the crater must be higher or equal to the current lowering time of the welding source.
	Backweld length (-b- *). Parameter available when the skip is set to more than 0. Parameter not available for continuous welding (skip equal to 0). The maximum backweld length is equal to the length of a single weld.
All LEDs on	Total path. Total path is longer or equal to the sum of weld length and skip. If set to infinity (INF), the program executes until you stop the carriage with the direction switch.

* message shown on the display during the program.
The parameter adjustment step is indicated in parentheses ().

CONTROLLING THE WELDING PROGRAM [DD]

START – select the movement direction with the direction switch.

STOP – set the direction switch to ‘O’.

After total path (E_{nd}) is reached, set the direction switch to ‘O’.

NOTE: The carriage stops if the battery discharges during operation!

FINISHING THE OPERATION

1. Set the power switch to ‘O’. The carriage turns off.
2. Remove the battery.

POWER SAVING MODE

If the carriage is not used for 5 minutes, it turns off.

To turn the carriage on again:

1. Set the power switch to ‘O’.
2. Set the power switch to “I”.

CHANGING THE UNIT OF SPEED [EE]

1. Set the power switch to ‘O’. The carriage turns off.
2. Press and hold the speed knob. At the same time, set the power switch to ‘I’.
3. Use the speed knob to select the unit.
4. Press the speed knob to confirm.

TROUBLESHOOTING

-	Black display even though the power switch is set to ‘I’.	Set the power switch to ‘O’ and then to ‘I’.
	The carriage was not used and turned off.	
E.3	Display not fully on when powering.	Contact service center for check and repair.
USA EUR	Speed displayed in the wrong unit.	Refer to the section “Changing the unit of speed”.
E.5	Direction switch not set to ‘O’ when powering.	Set the direction switch to ‘O’.

	Shown during movement indicates a malfunction.	Contact service center for check and repair.
E.8	Arc ignition switch not set to ‘O’ when powering.	Set the arc ignition switch to ‘O’.
	Motor overload. The carriage stops.	Remove objects that block the carriage. Adjust the position of the cables so that they do not block the carriage. Use the welding cables whose weight is not more than specified in the technical data.
E.01	Battery voltage too low.	Charge the battery or replace to a fully charged.
E.02	Battery voltage too high.	Replace the battery.
E.03	Motor power supply too low.	Contact service center for check and repair.
E.10	Internal battery controller malfunction.	Clean the battery contacts. If the problem persists, replace the battery. If the error persists after replacement, contact the service center.
E.20	Battery overheated.	Let the temperature of the battery decrease.
E.30	Battery temperature sensor malfunction.	Replace the battery.

If there are two errors, the messages can be combined into one, e.g E.01 + E.30 = E.31.

ACCESSORIES

FALL ARRESTER [FF]

Protects the carriage from falling.

NOTE: Working at height is only allowed with the fall arrester!

Mount the fall arrester to a stable construction with a load capacity greater than the weight of the carriage with equipment.

Clip the hook of the fall arrester to the carriage rod so that it is impossible to fall off the hook. Make sure that all handles are locked.

CLAMPS, RODS, TORCH HOLDERS

Application and technical data [GG]

The dimensions and special features are shown in the figure according to the legend below.

Ø	Connection diameter
TØ	Torch diameter
[Z]	Toothed
[Q]	Quick release
L	Rod length

SLP-0233-13-02-00-1	Rod
KLM-0236-00-16-00-0	
WSP-0523-16-00-00-0	
WLK-0633-22-04-00-0	
WLK-0824-0816-01-0	
WLK-0633-22-02-00-0	Rod with clamp
WLK-0757-09-01-00-0	
WLK-0476-20-01-00-0	
WLK-0466-04-10-00-0	
RAM-0475-07-01-00-0	Toothed rod
RAM-0523-17-00-00-0	
RAM-0753-07-00-00-0	
RAM-0475-07-03-00-0	
RAM-0753-13-00-00-0	
KST-0525-11-00-00-0	Block
KST-0475-82-00-00-0	
ZSP-0475-62-00-00-0	Block with knob to adjust the position along the toothed rod
UCW-0475-15-00-00-1	
ZSP-0475-94-00-00-0	
ZRZ-0752-07-01-00-0	Torch clamp
ZCS-0476-06-01-00-0	
ZRZ-0466-19-00-00-0	
ZCS-0475-28-10-00-0	
ZCS-0270-42-00-00-0	
UCW-0757-09-00-00-0	Torch holder
UCW-0754-07-00-00-0	
UCW-0752-07-00-00-0	
UCW-0757-12-00-00-0	
UCW-0476-27-00-00-0	
UCW-0466-22-00-00-0	

UCW-0476-06-00-00-0	Torch holder with lowered clamp
UCW-0523-84-00-00-0	Torch holder with quick release clamp
UCW-0475-28-00-00-0	Torch holder
UCW-0753-08-00-00-0	Torch holder with precise height and angle adjustment
UCW-0475-61-00-00-0	Machine torch holder
UCW-0475-29-00-00-1	
UCW-0753-22-00-00-0	Machine torch holder with precise angle adjustment
UCW-0753-24-00-00-0	

Compatibility [GG] [HH]

The accessory must have a diameter compatible with the diameter of the carriage holder (See DESIGN).

If the accessory is not compatible, you can assemble it with another part. Example connections are shown in the figures.

Adjustment methods [HH]

UCW-0475-15-00-00-1:

The clamp can be mounted in two positions. The mounting is shown in the figure.

UCW-0753-08-00-00-0:

1. The knob can be mounted in two positions. The mounting is shown in the figure.
2. You can adjust the sliding resistance of the torch holder. To do this, remove the torch holder and adjust the resistance by tightening or loosening the screws marked in the figure.

COUNTERWEIGHT [II]

Application

Allows additional load when using a single torch.

Mounting

Install a counterweight on the rod, on the side that needs additional load.

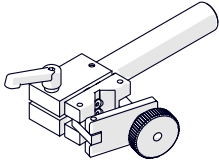
CHARGER [JJ]

Charges the battery.

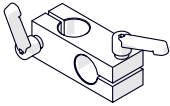
BATTERY [KK]

Power source required for machine operation.

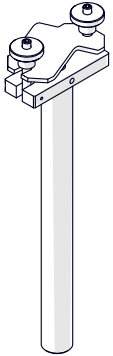
[A]



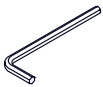
UCW-0754-07-00-00-0
(x2)



KST-0525-11-00-00-0
(x4)



UCW-0466-55-03-00-0
(x2)



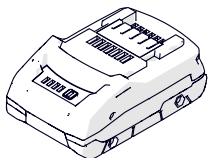
KLC-000008
(x1)



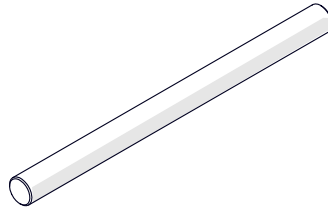
KLC-000007
(x1)



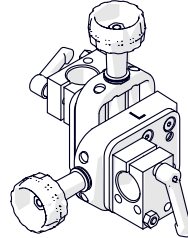
KLC-000006
(x1)



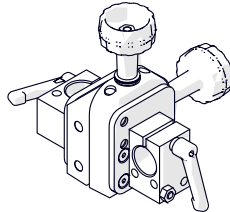
AKM-0738-10-00-01-0*
(x1)



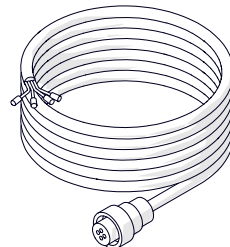
WSP-0523-16-00-00-0
(x2)



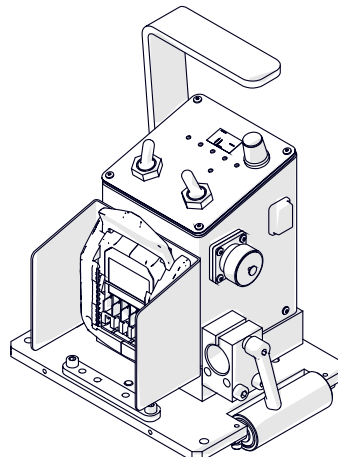
UKL-0824-0698-01-0
(x1)



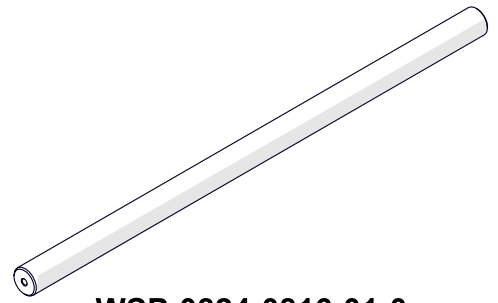
UKL-0824-0698-00-0
(x1)



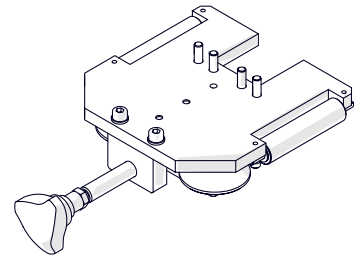
KBL-0466-17-00-00-0
(x1)



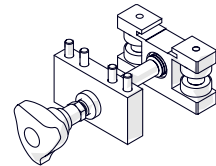
WOZ-0824-0788-00-0
(x1)



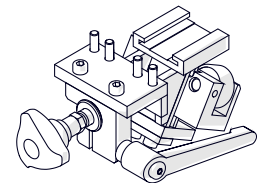
WSP-0824-0816-01-0
(x2)



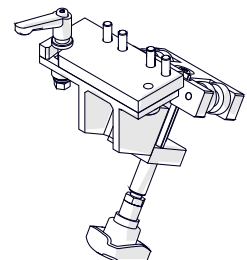
DCS-0824-0037-01-0**
(x1)



DCS-0824-0037-00-0**
(x1)

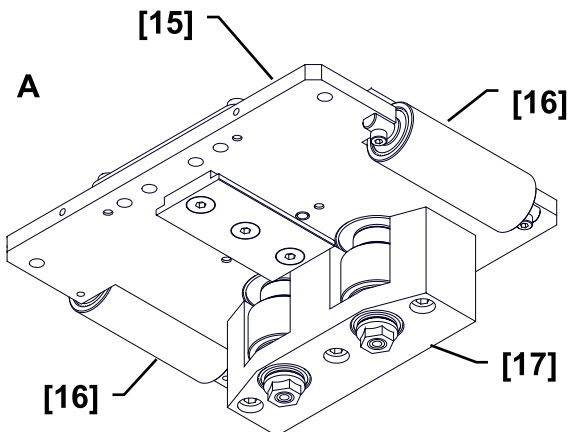
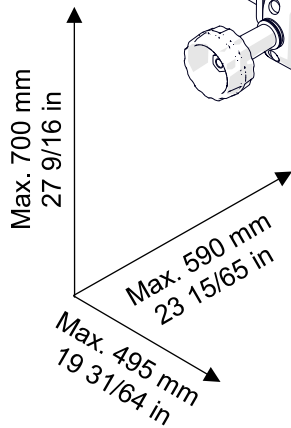
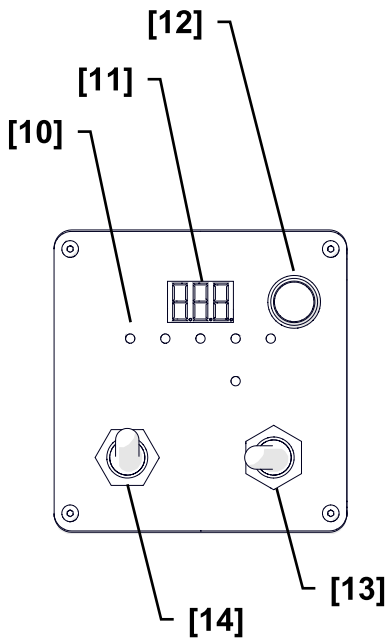
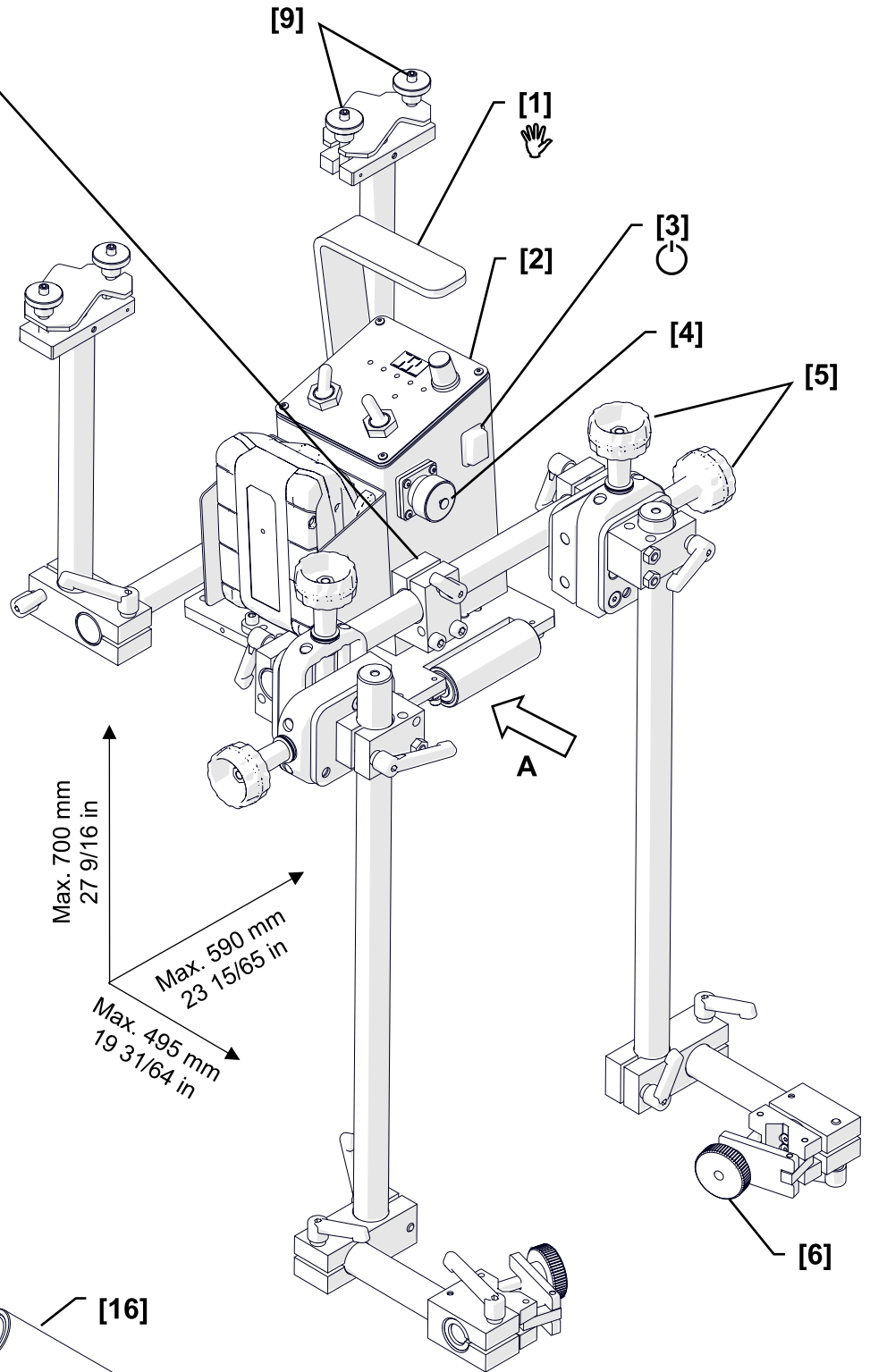
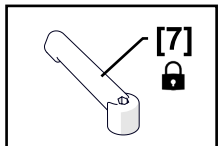
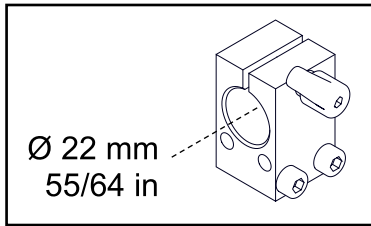


DCS-0824-0037-02-0**
(x1)

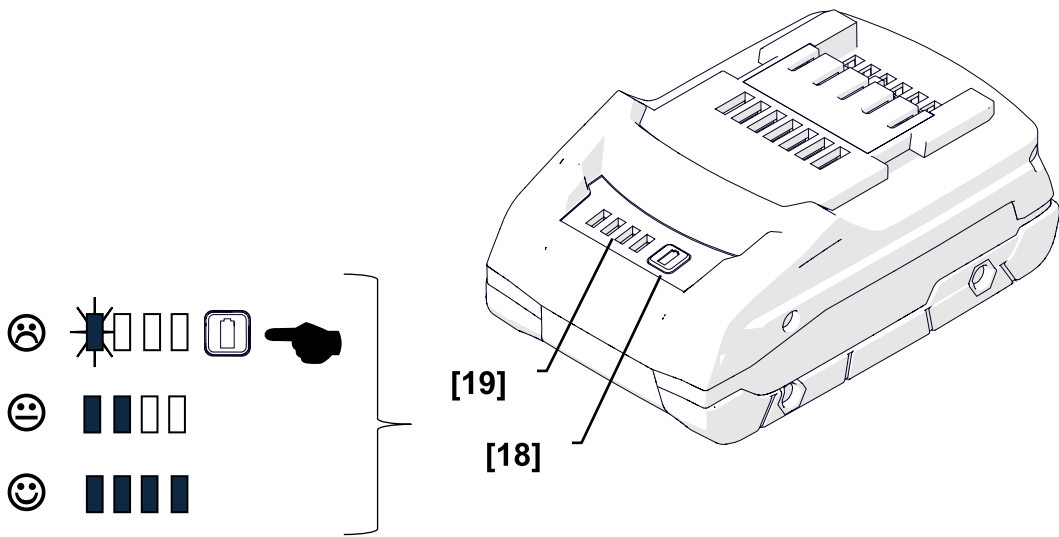


DCS-0824-0037-03-0**
(x1)

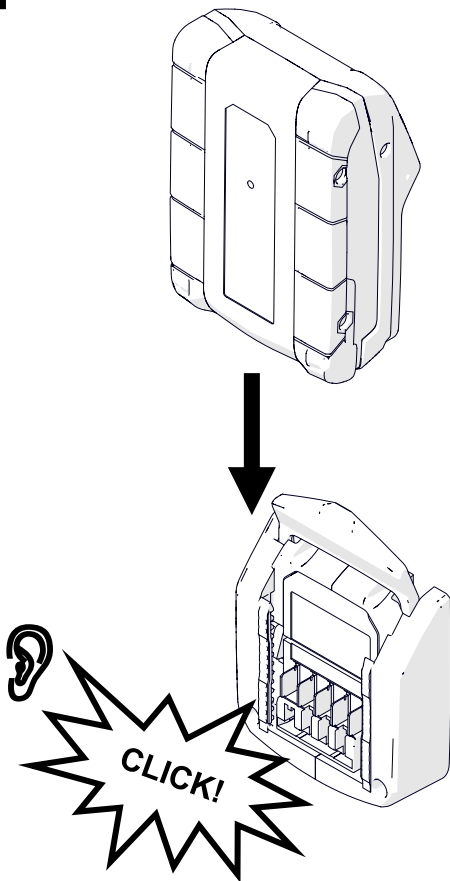
[B]



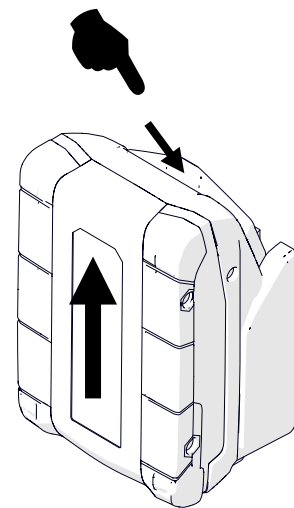
[C]



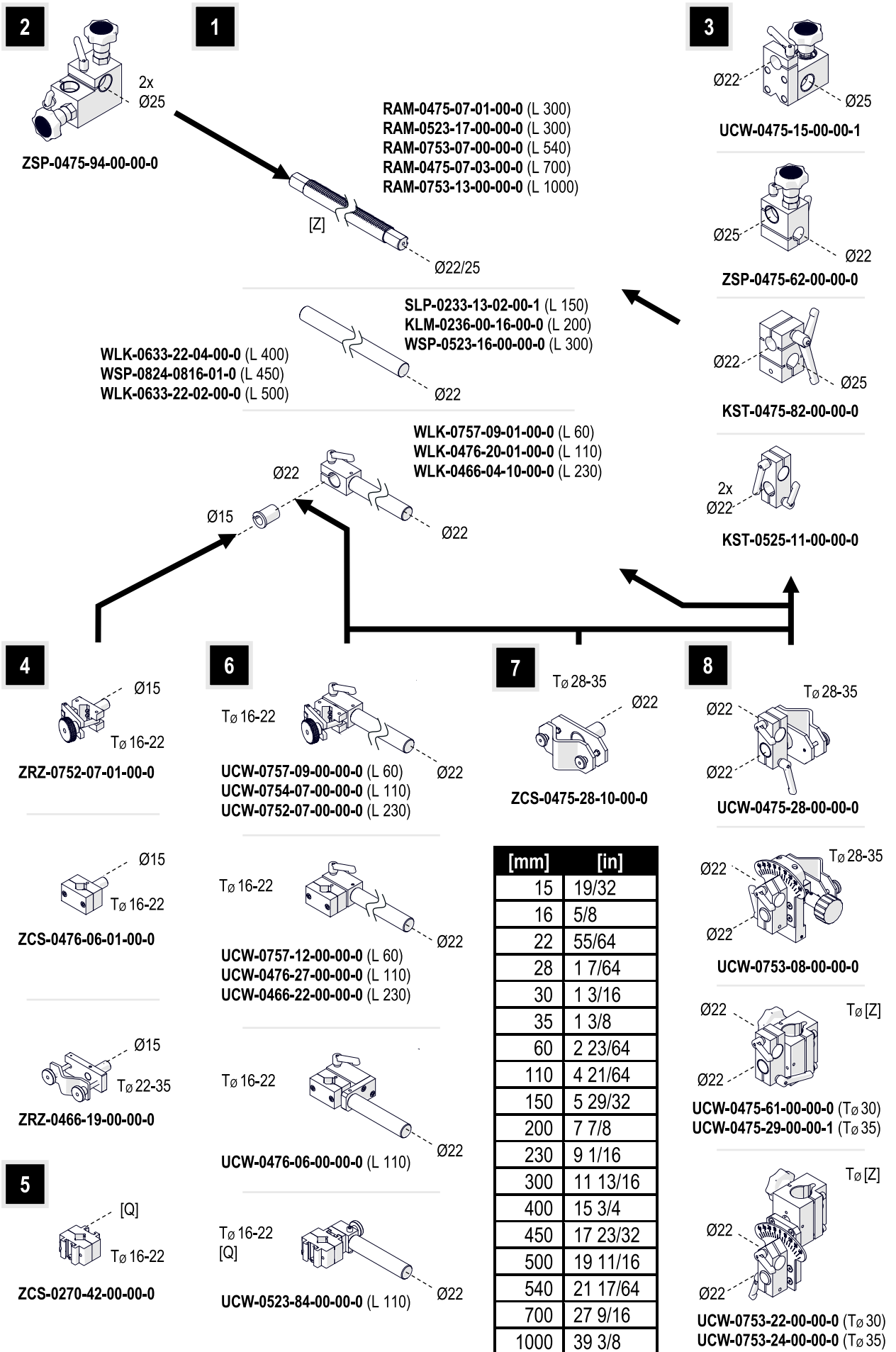
[D]



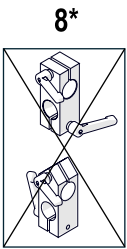
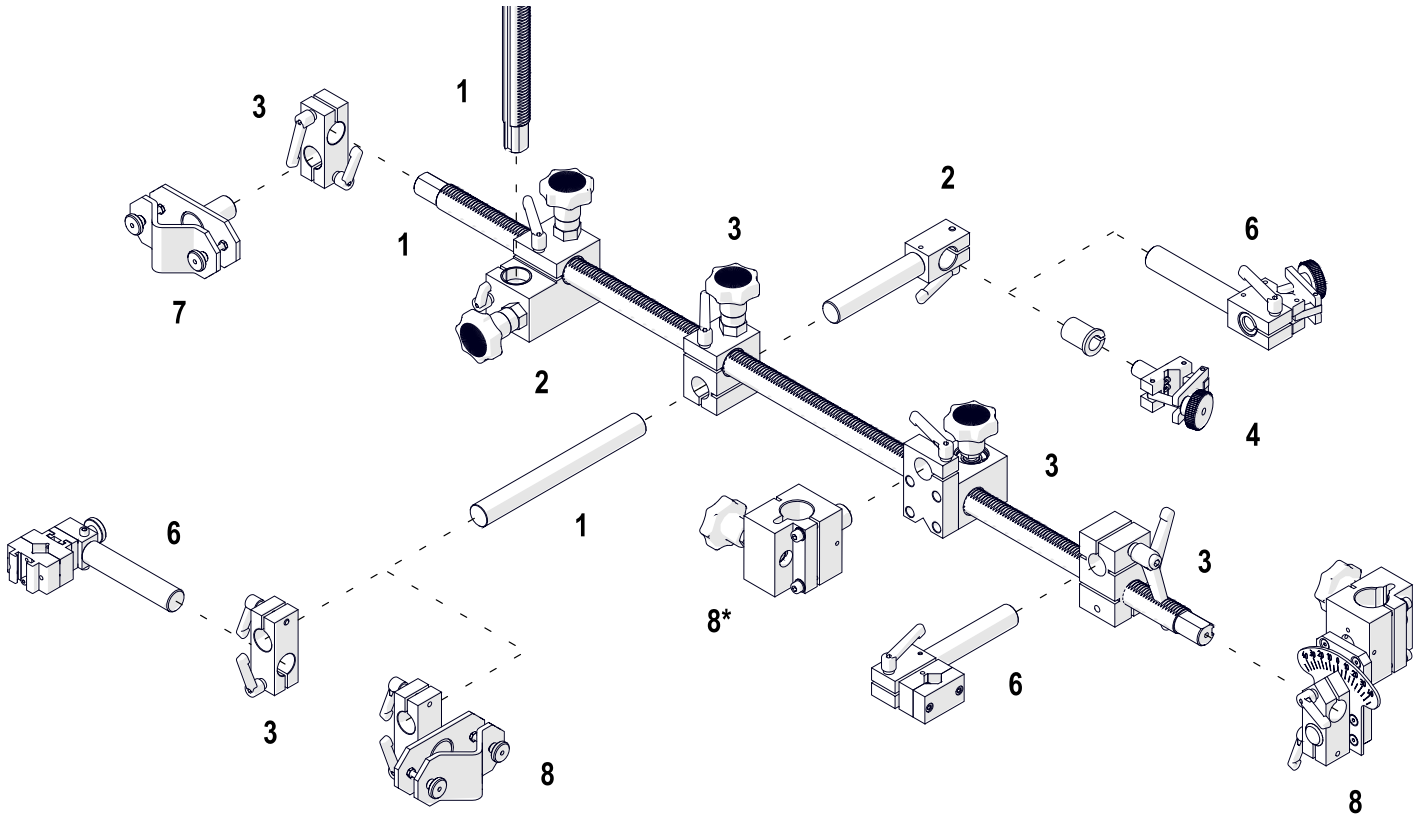
[E]



[GG]

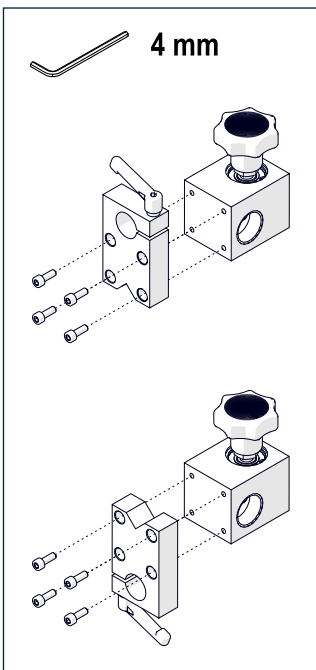


[HH]

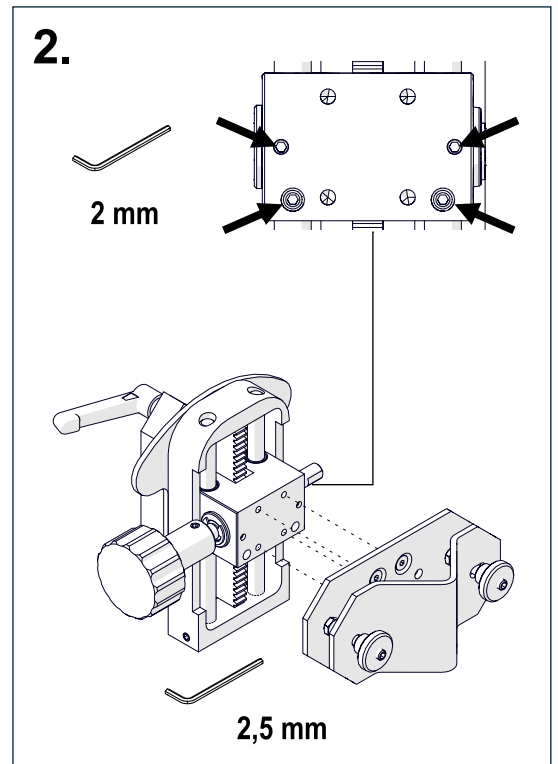
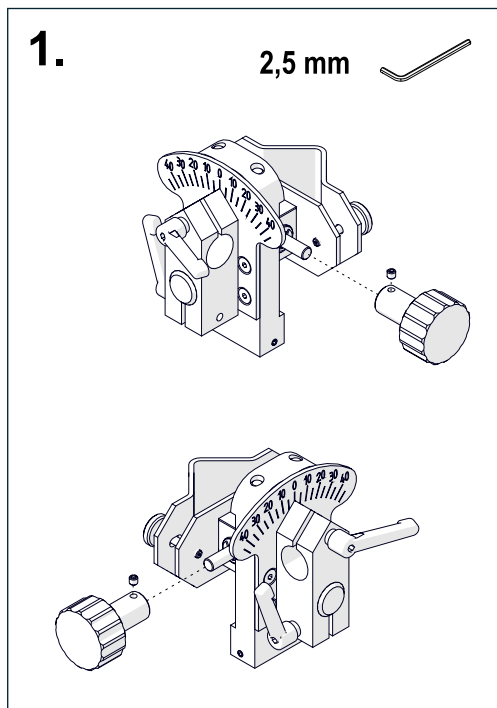


UCW-0753-08-00-00-0

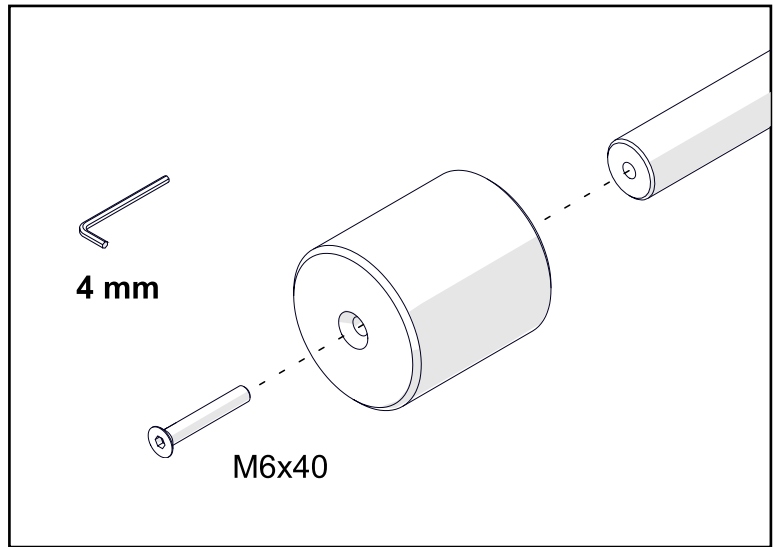
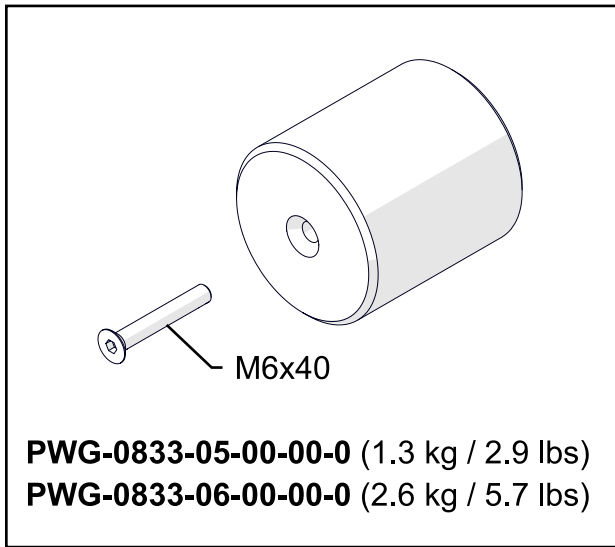
UCW-0475-15-00-00-1



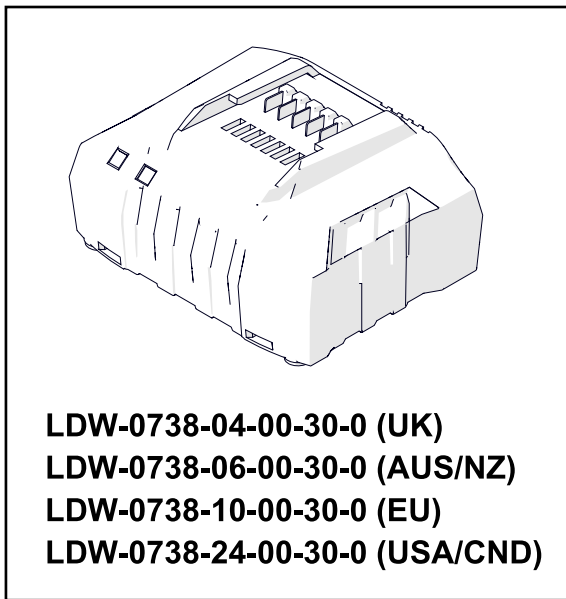
UCW-0753-08-00-00-0



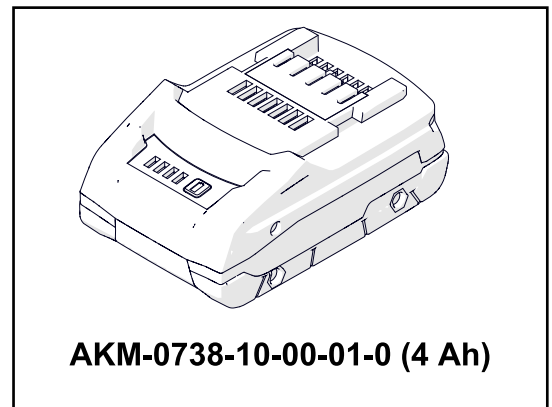
[II]



[JJ]

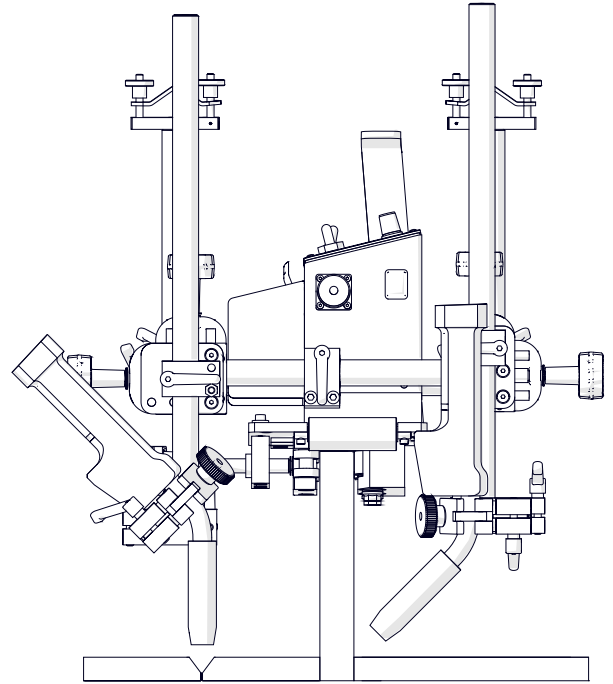
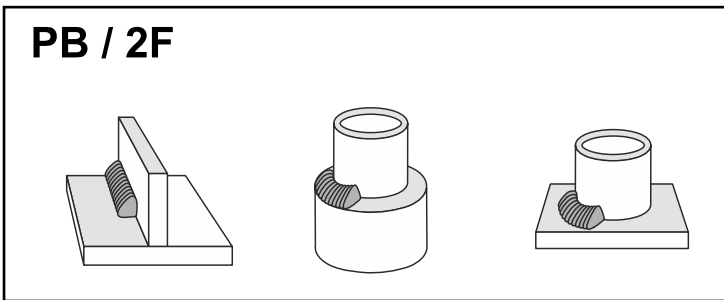
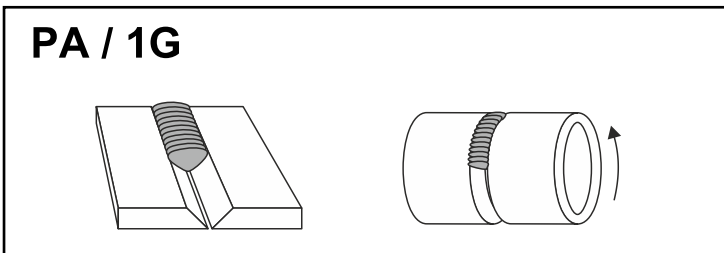
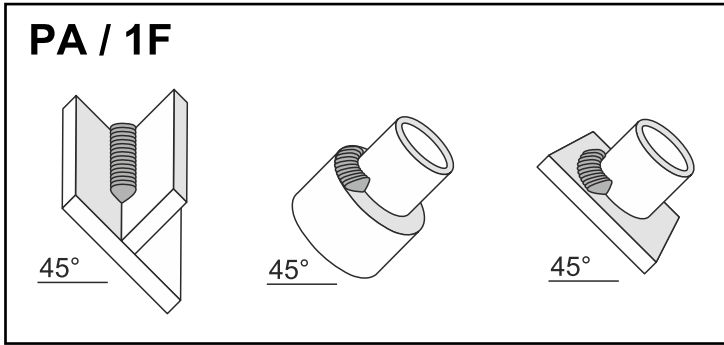


[KK]



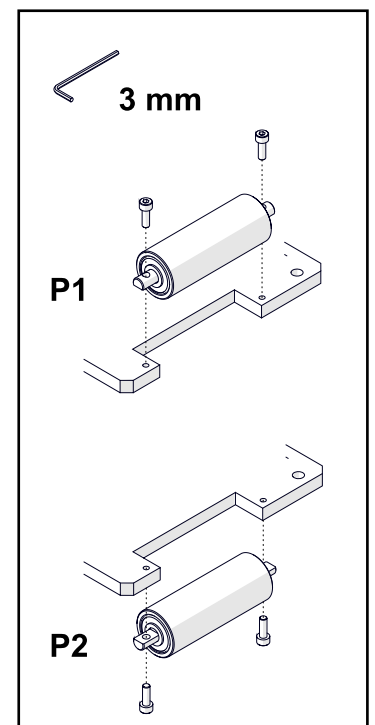
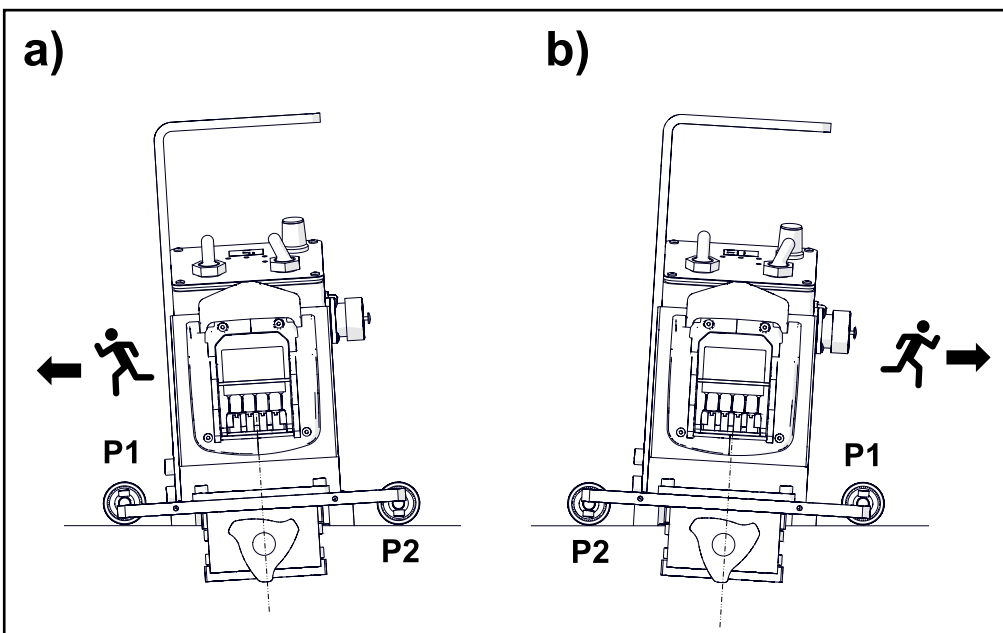
[F]

PN-EN ISO 6947 | AWS/ASME

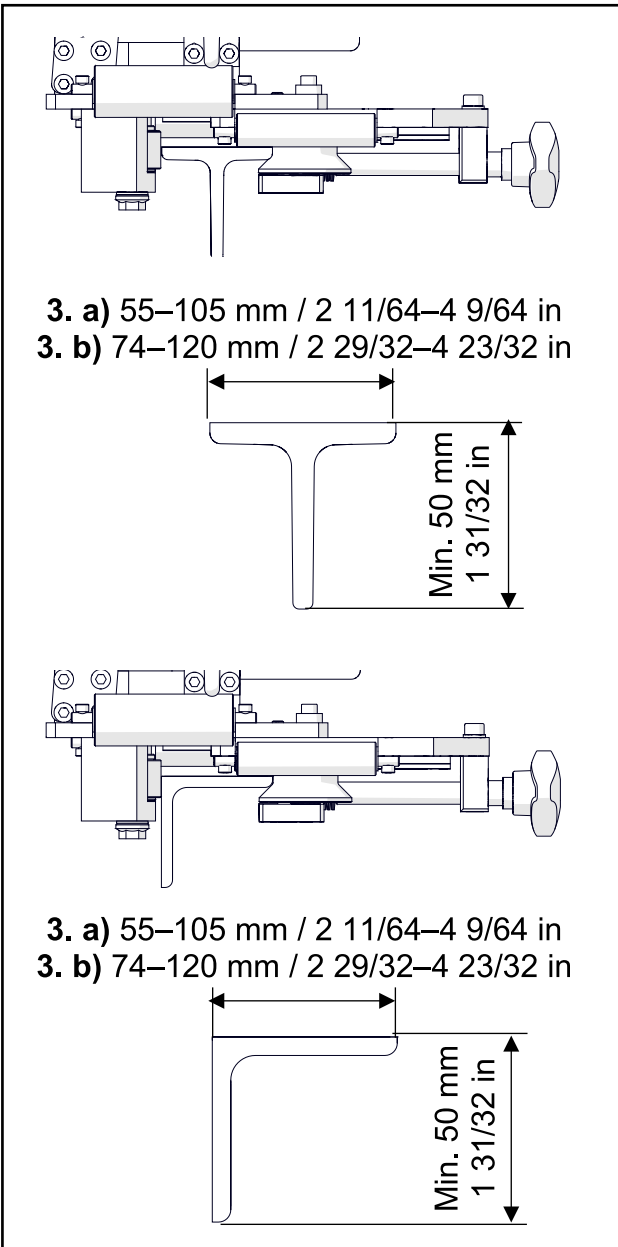
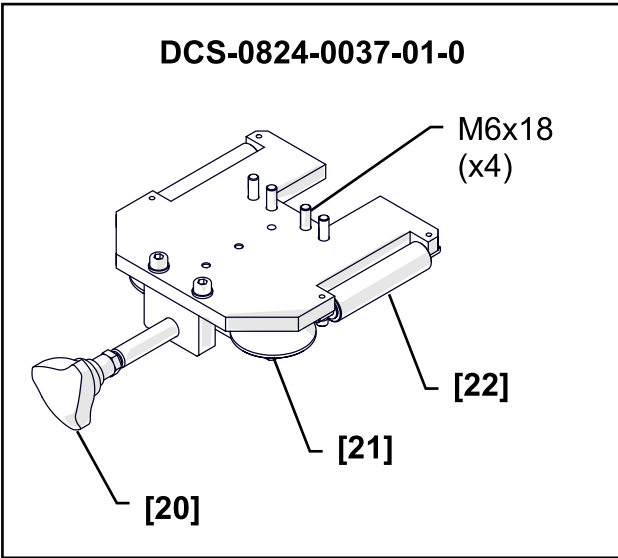


[G]

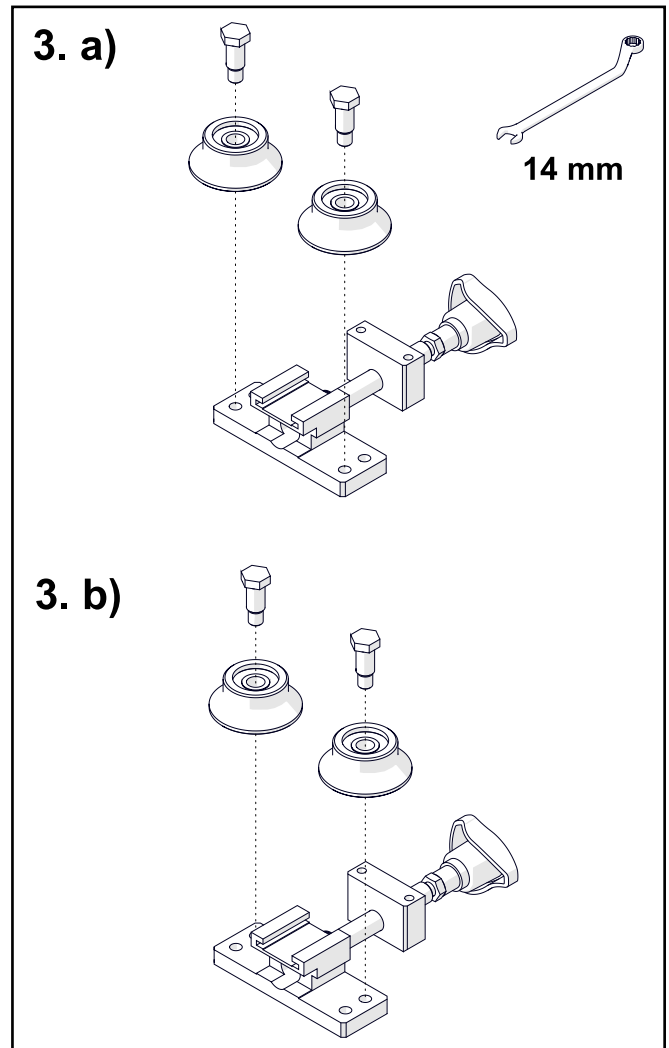
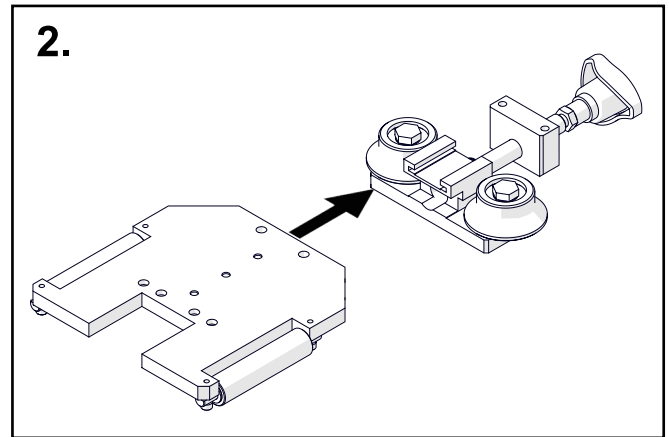
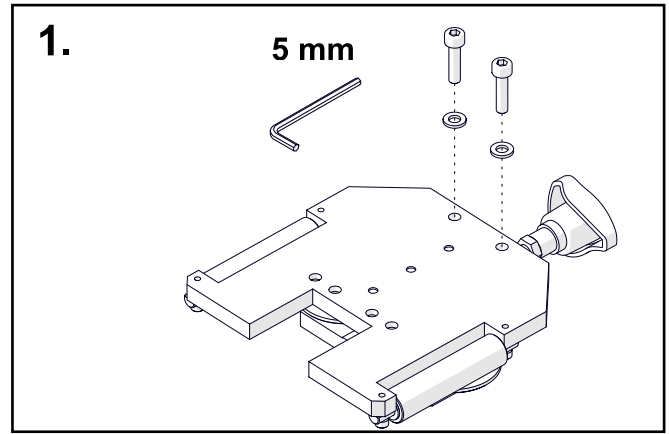
↓
DCS-0824-0037-00-0
DCS-0824-0037-02-0
DCS-0824-0037-03-0



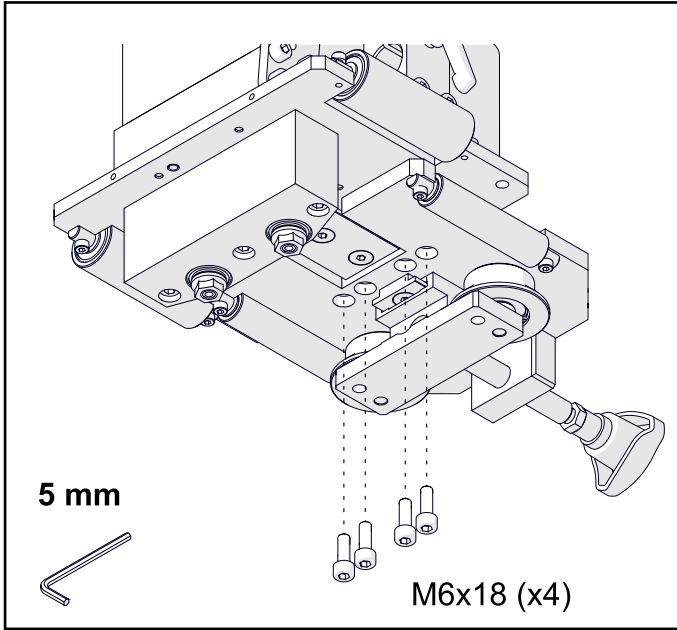
[H]



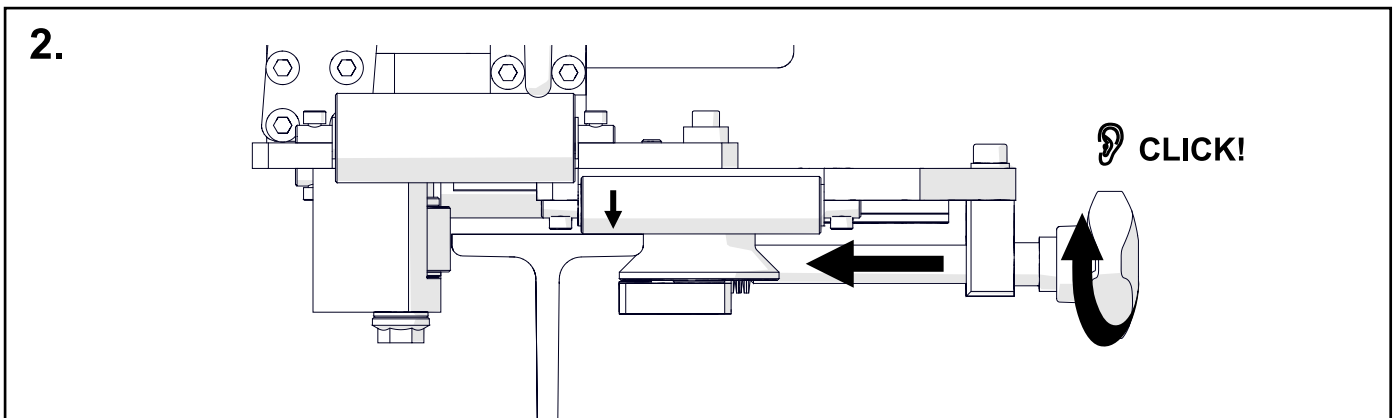
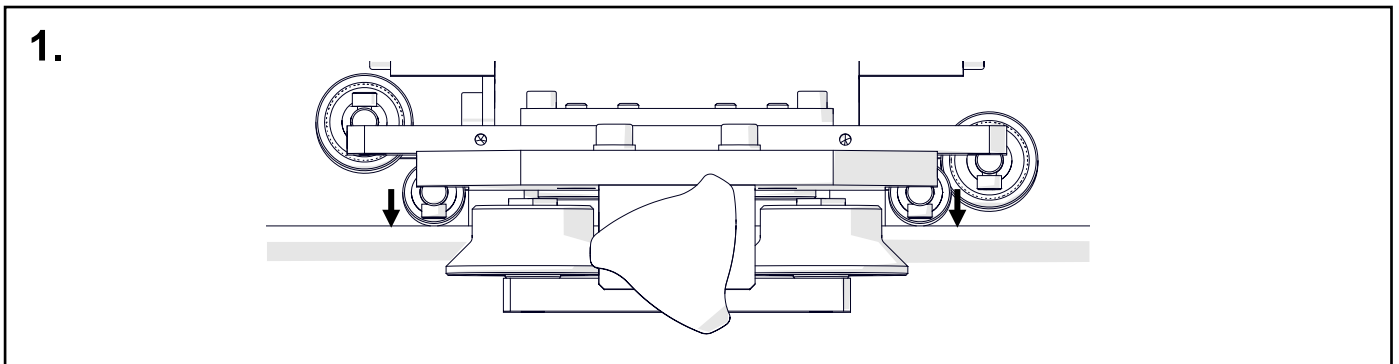
[I]



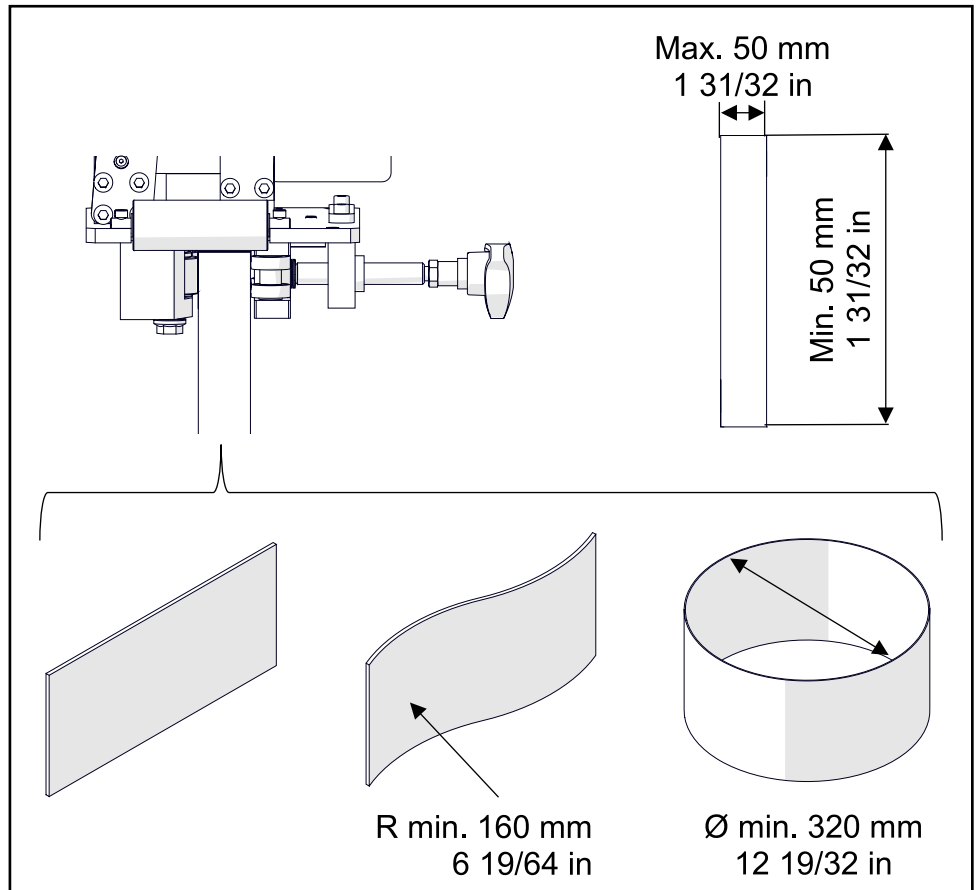
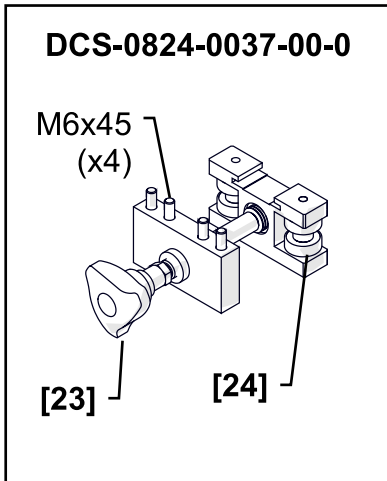
[J]



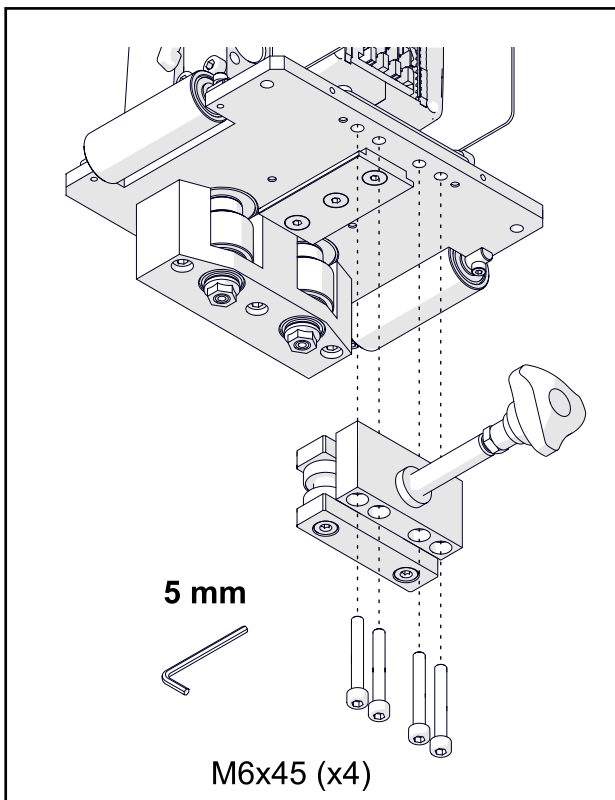
[K]



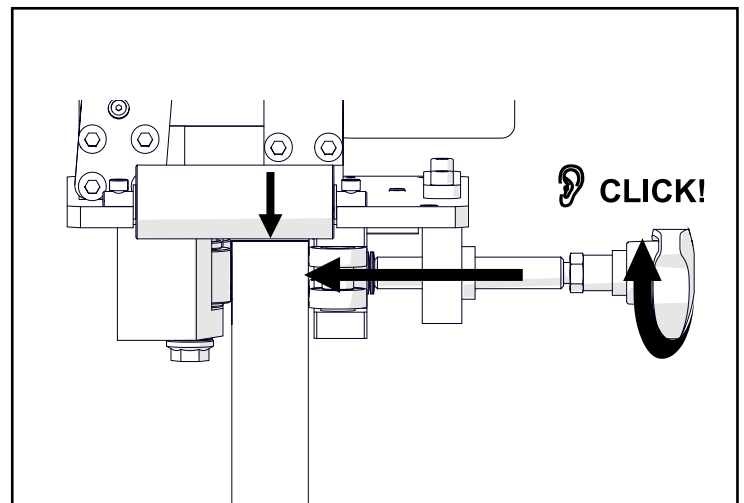
[L]



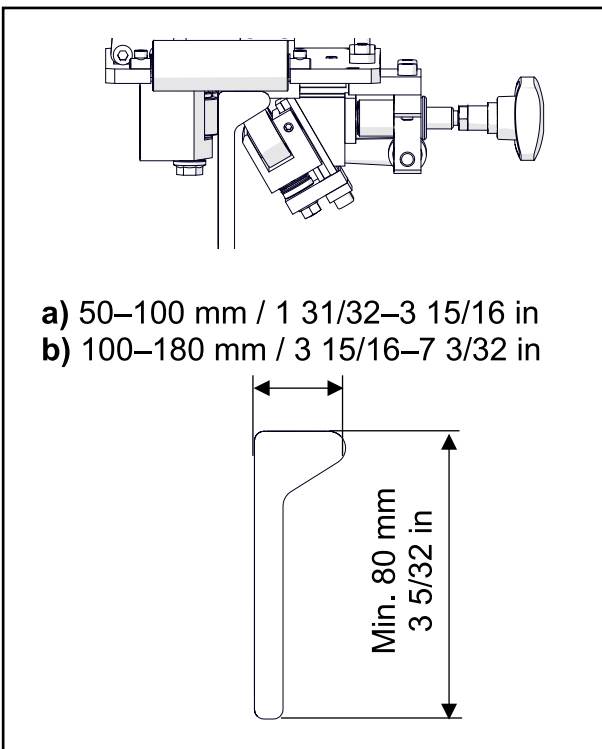
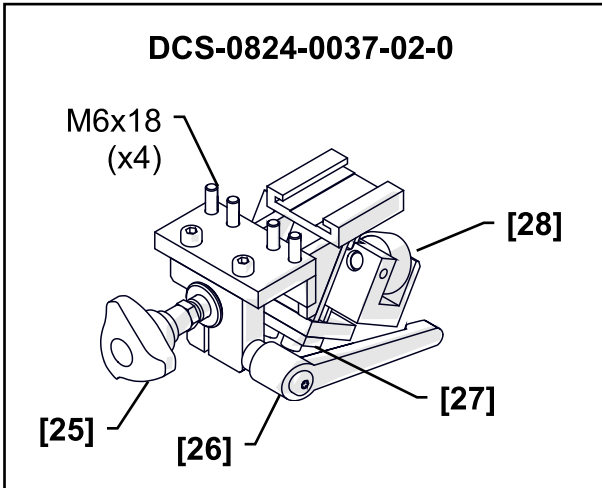
[M]



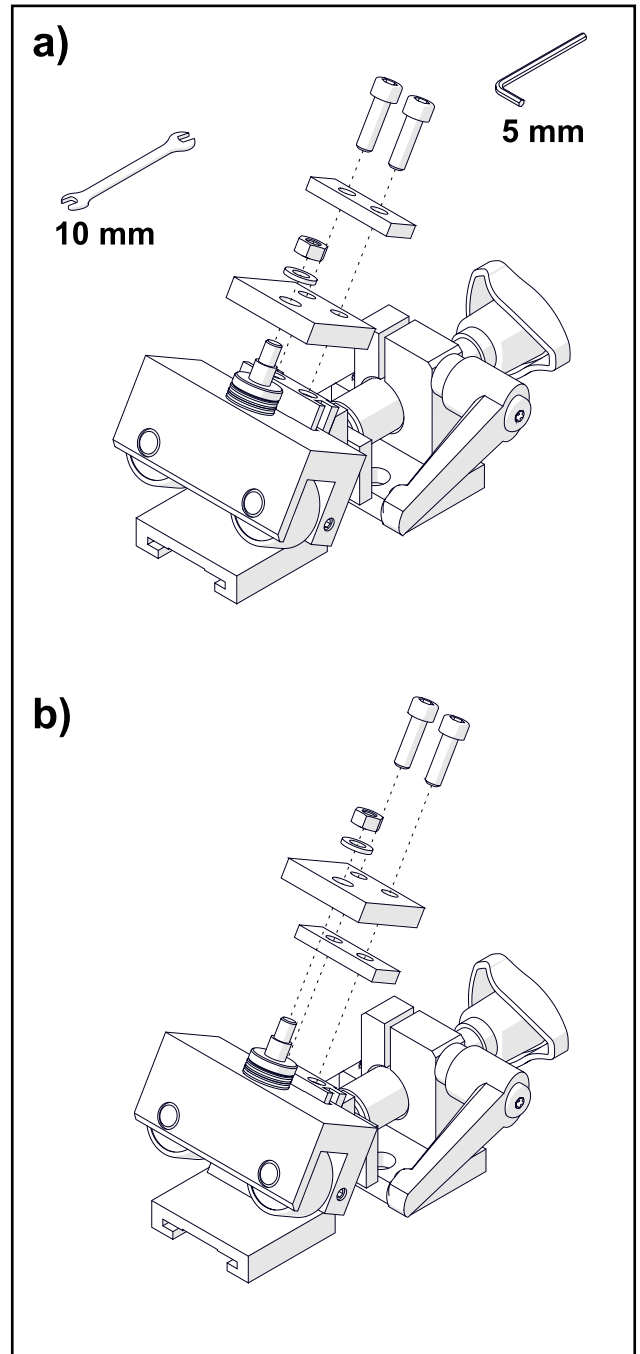
[N]



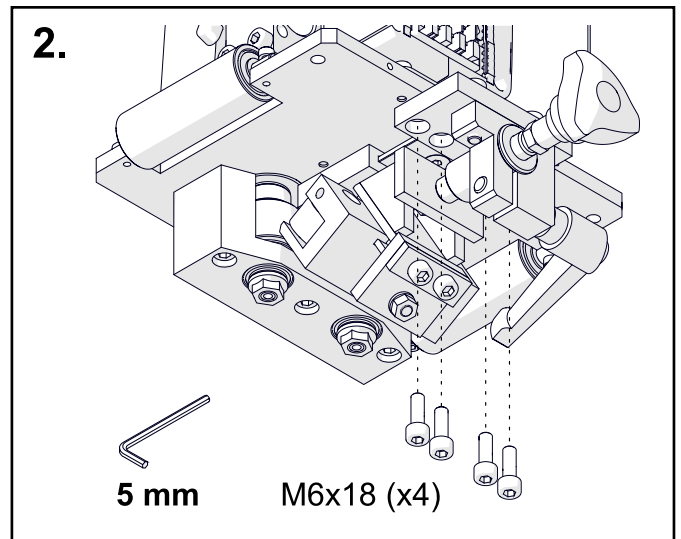
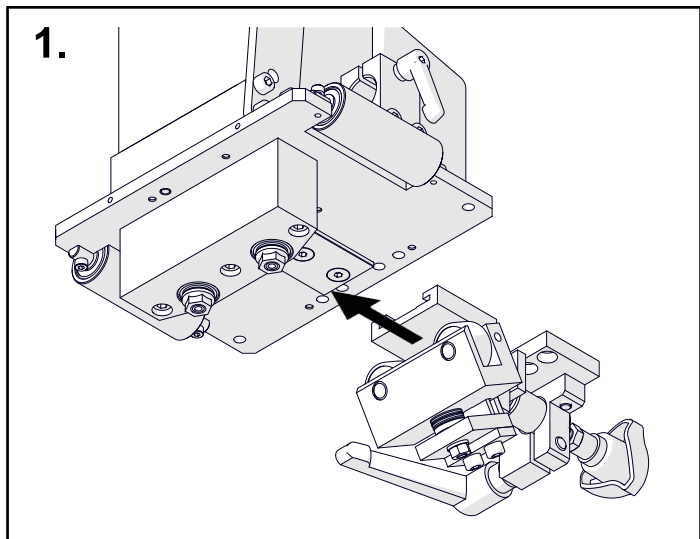
[O]



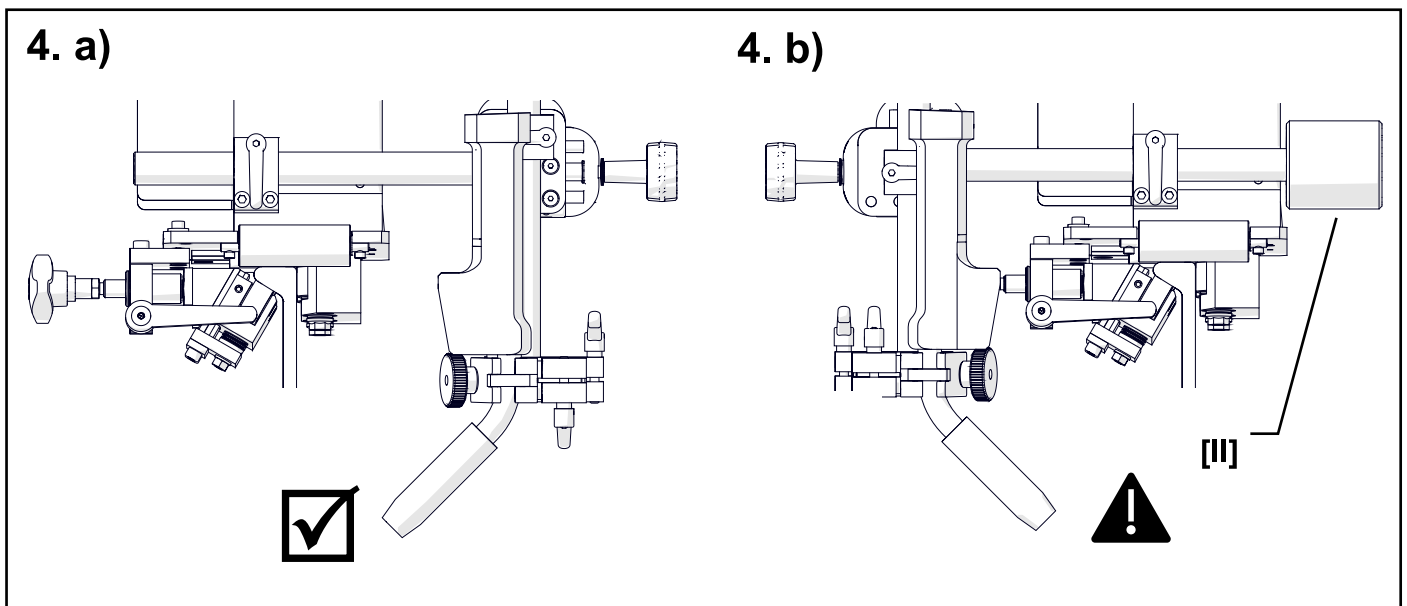
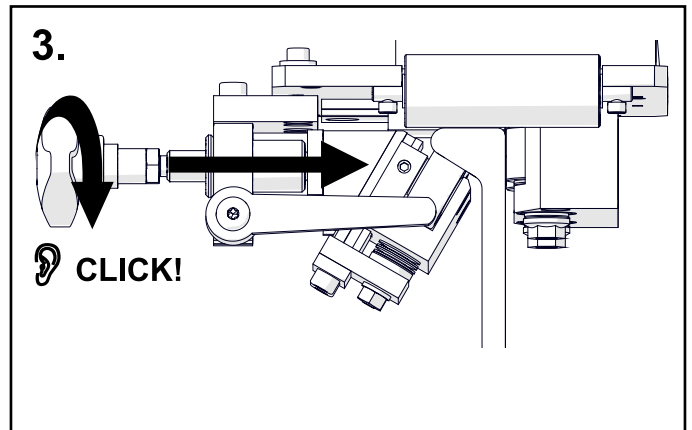
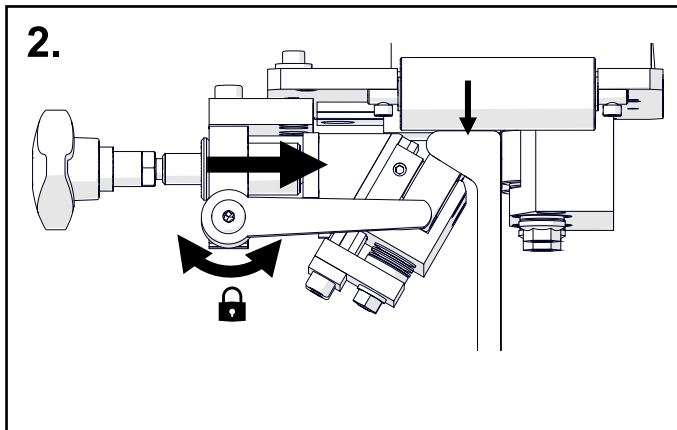
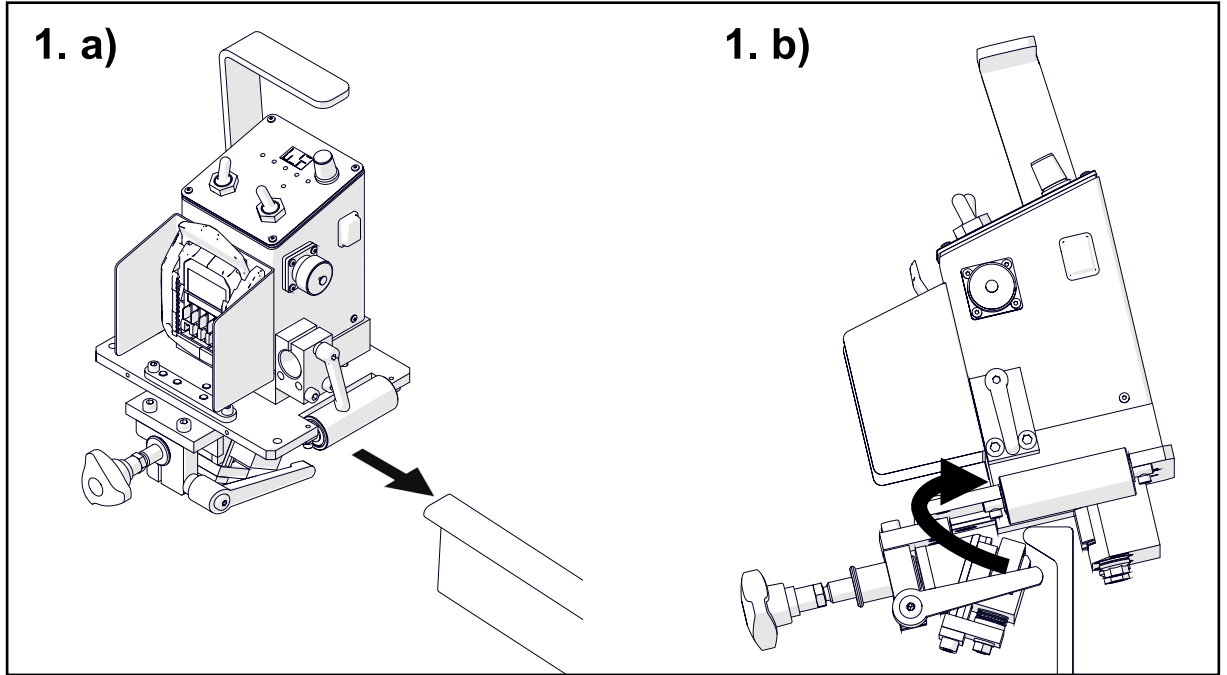
[P]



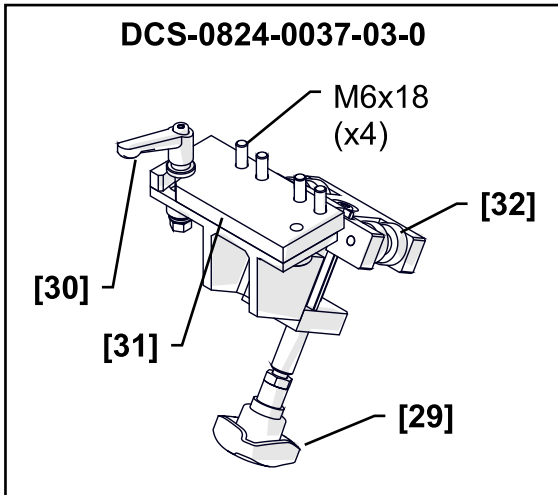
[Q]



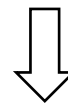
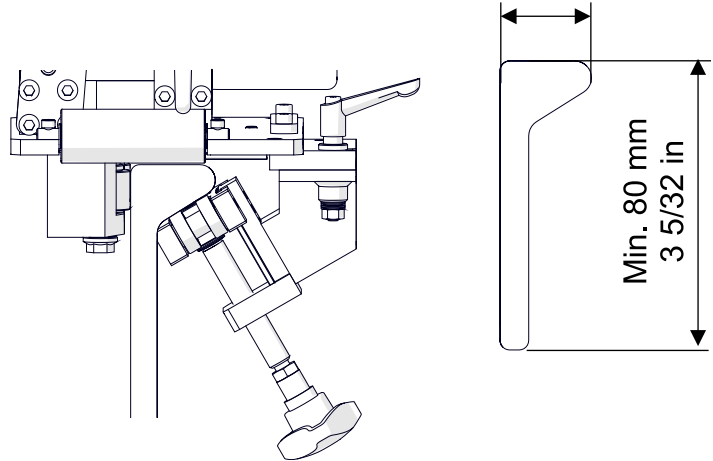
[R]



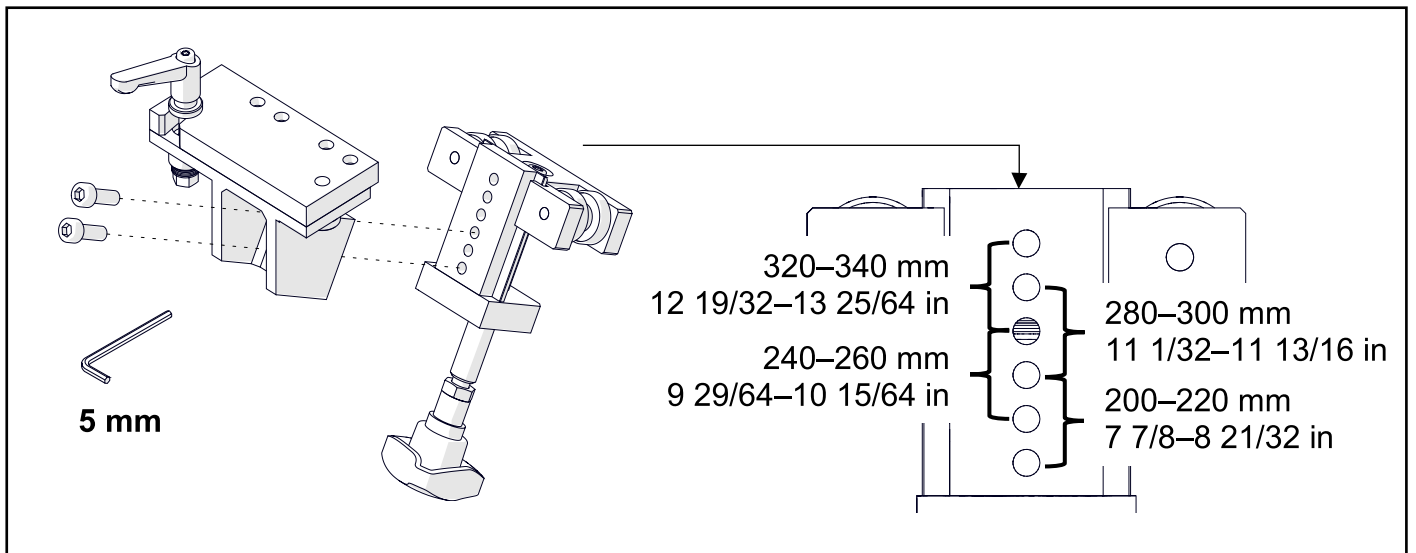
[S]



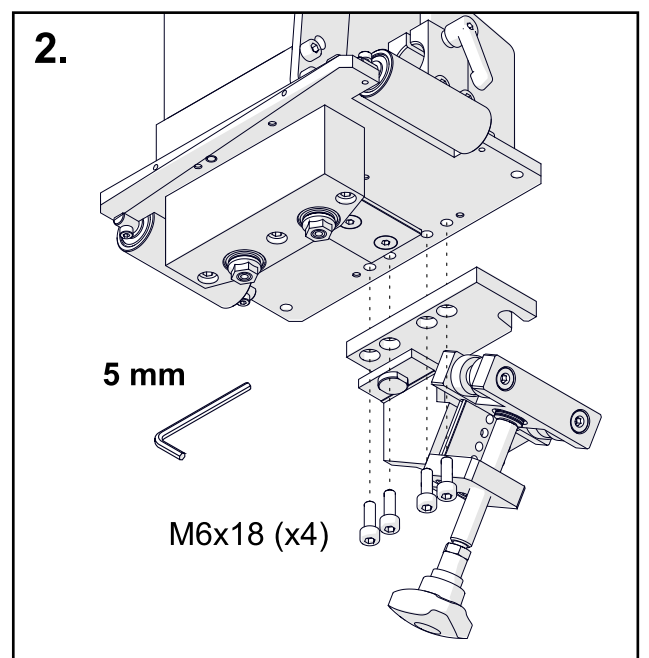
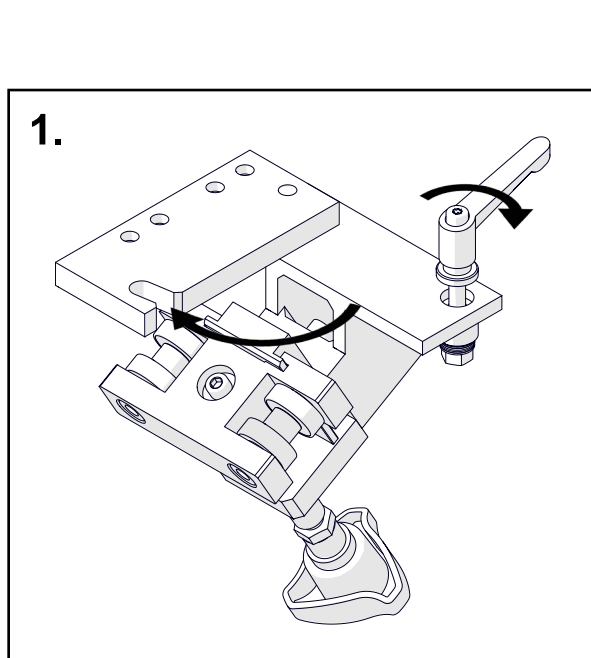
[T] 200–340 mm / 7 7/8–13 25/64 in



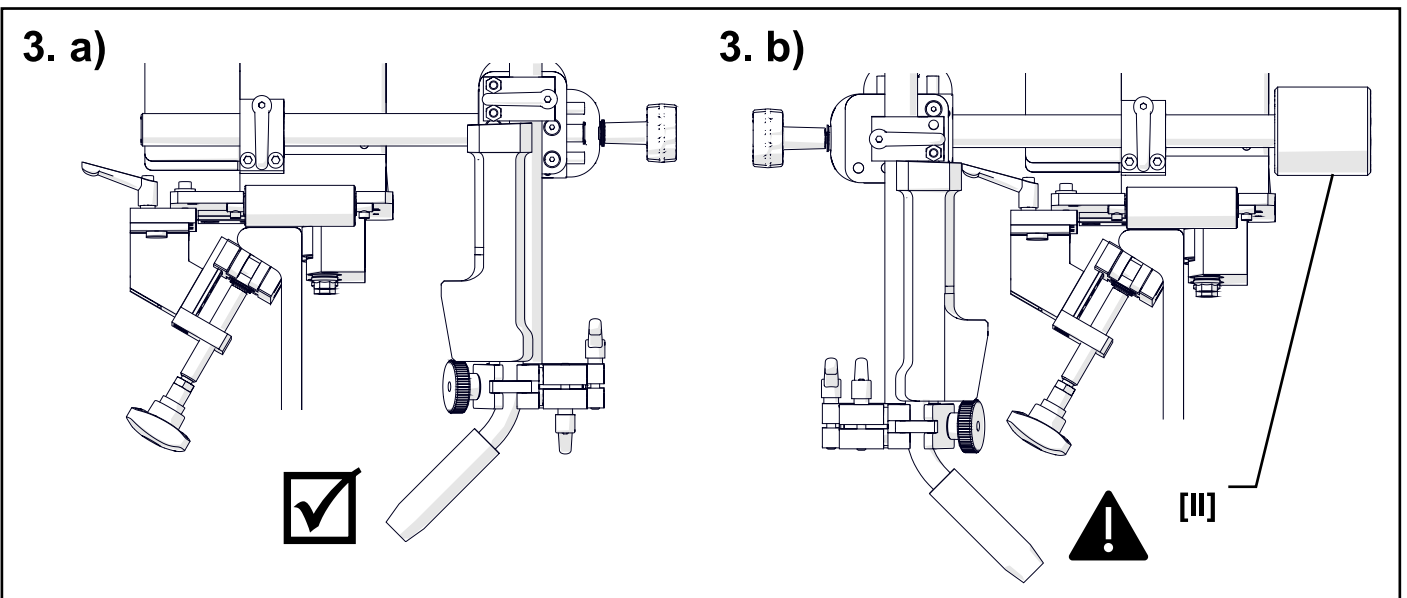
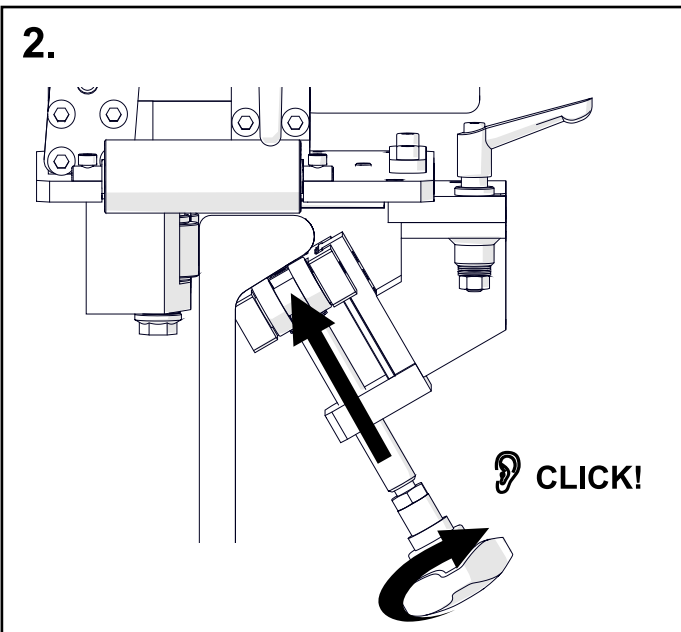
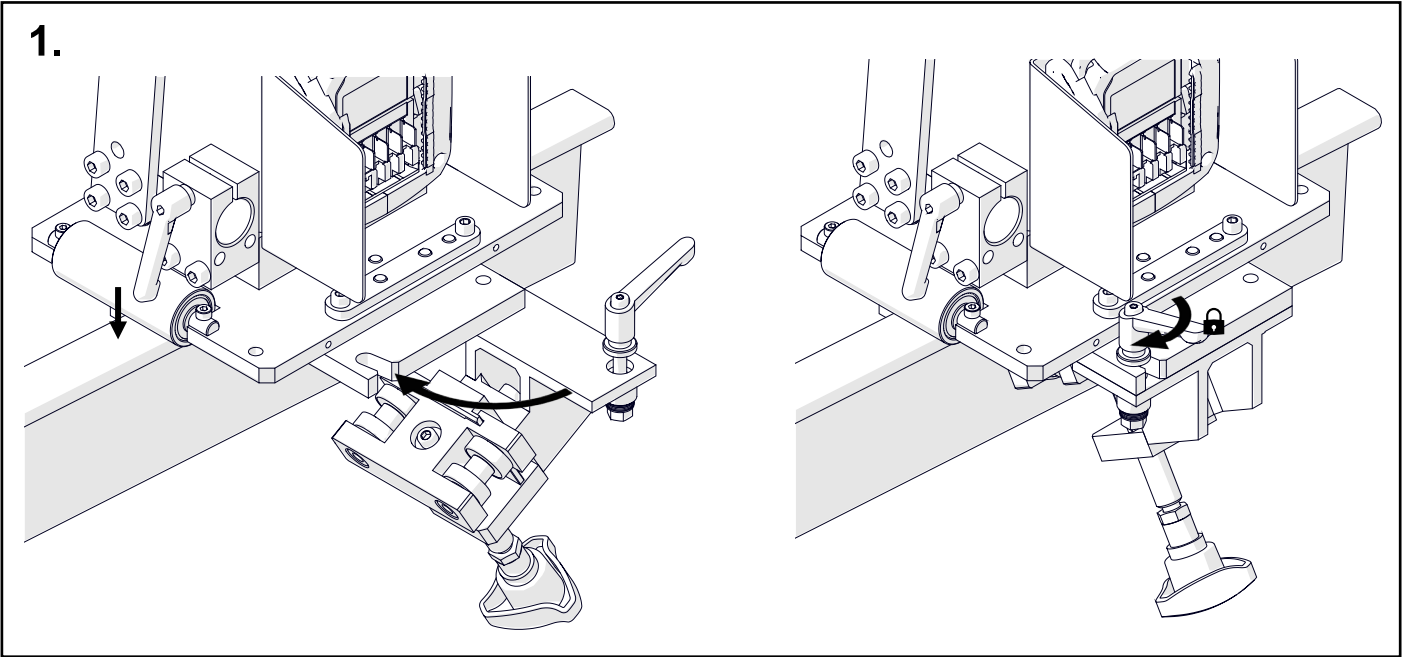
[T]



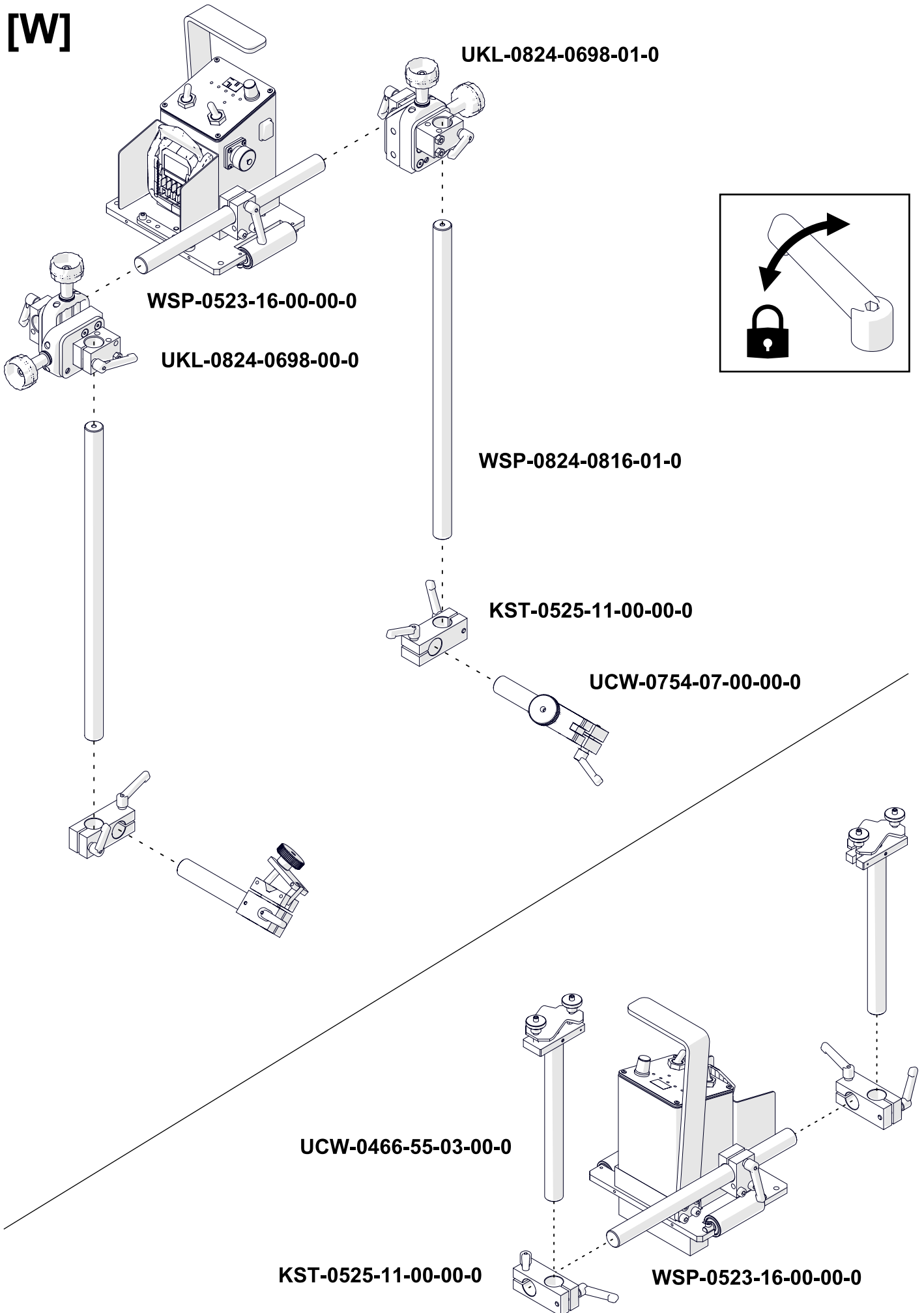
[U]



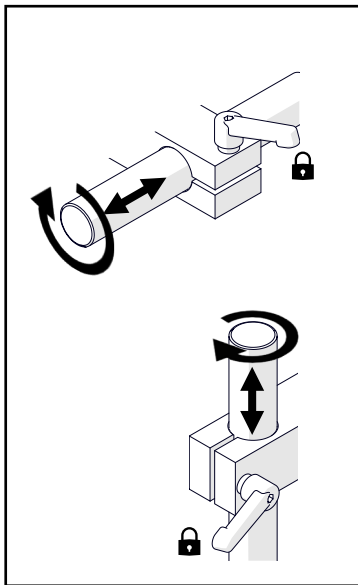
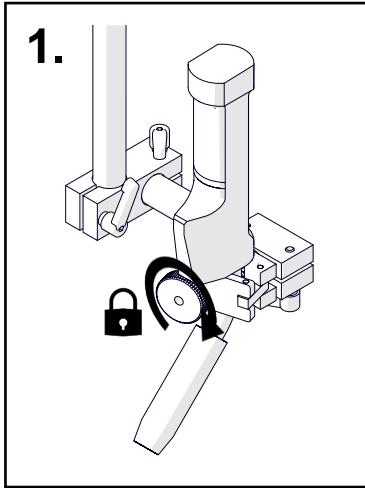
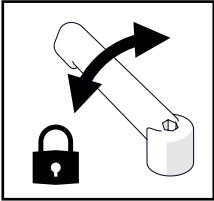
[V]



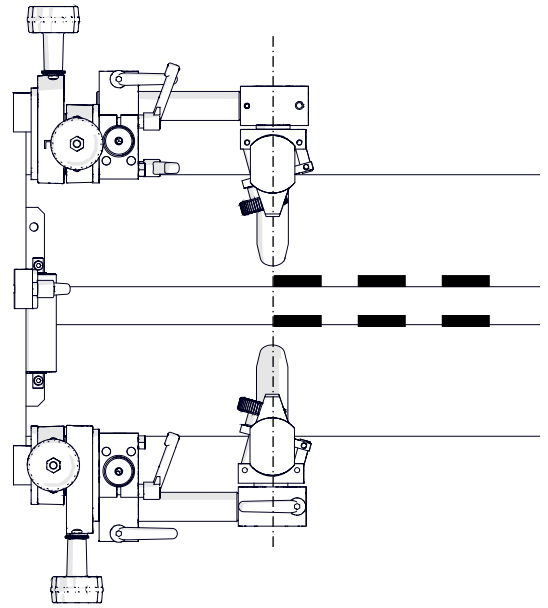
[W]



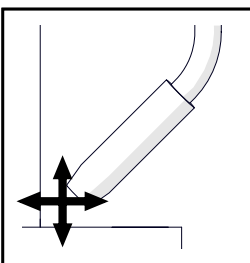
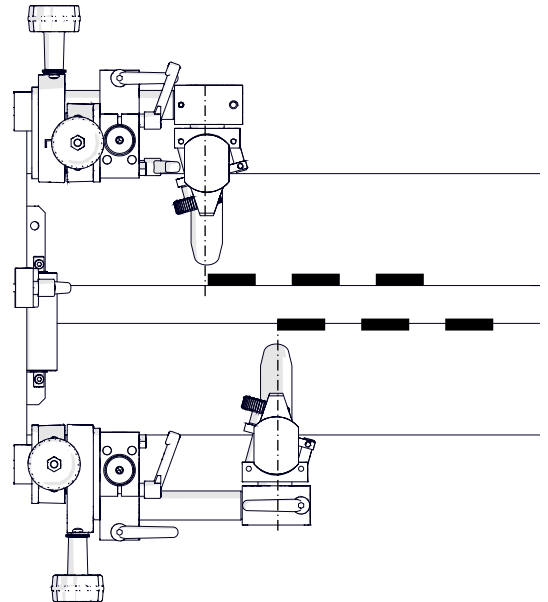
[X]



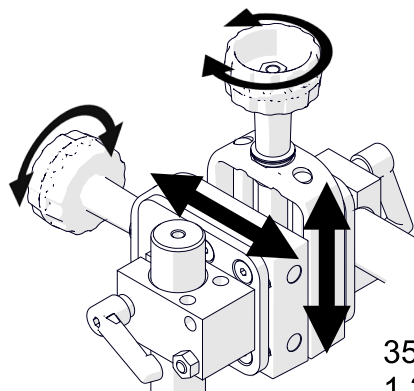
2. a)



2. b)

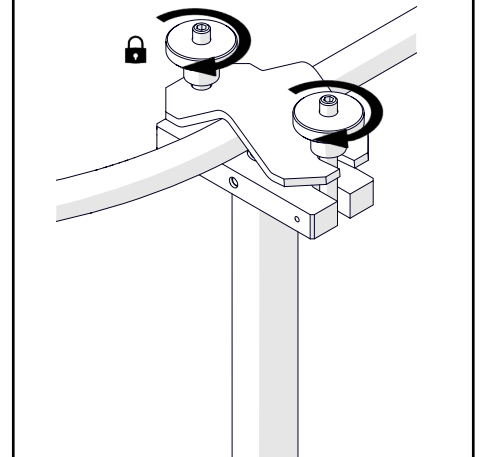


3.

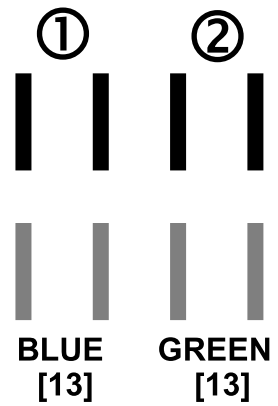
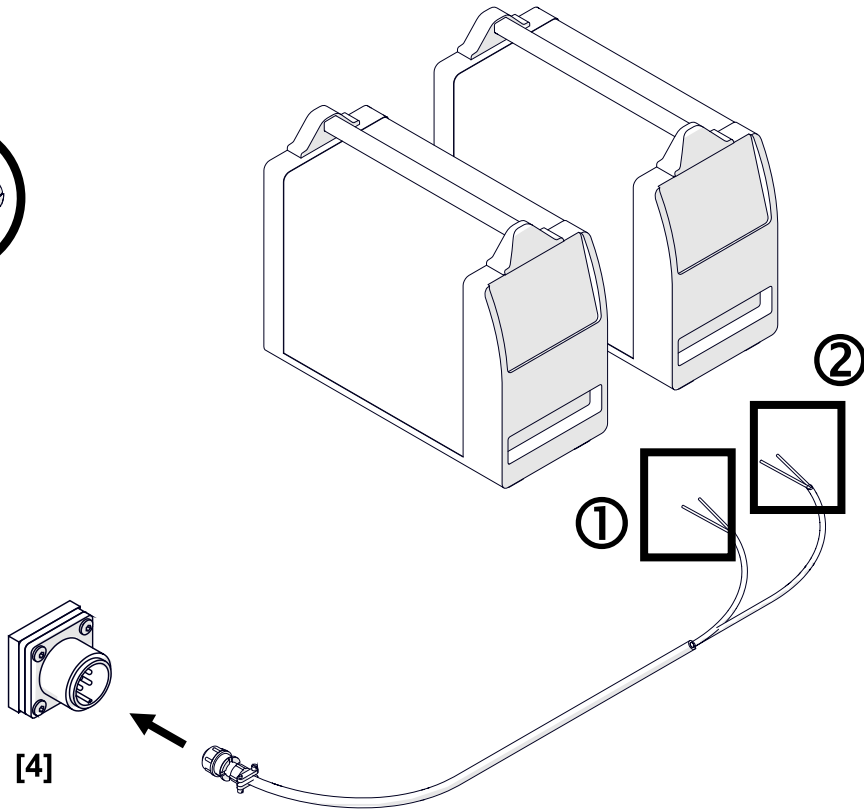


35 mm
1 3/8 in

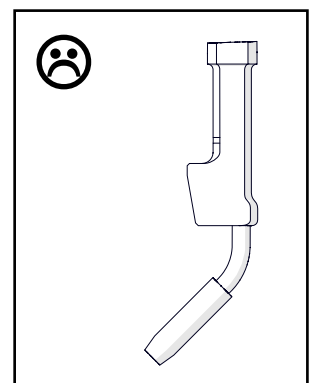
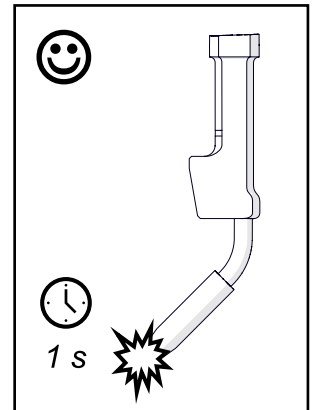
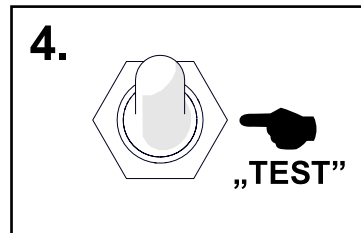
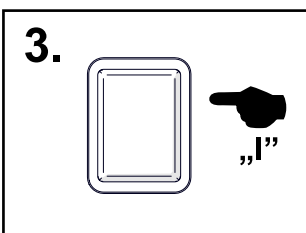
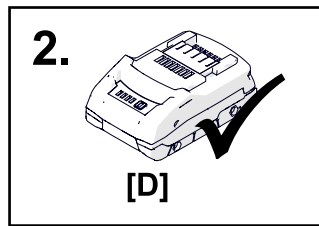
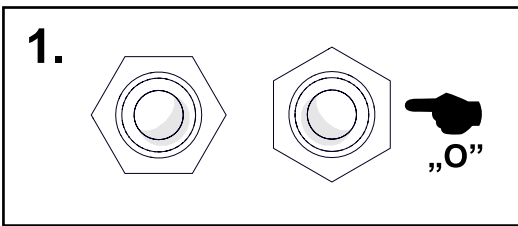
4.



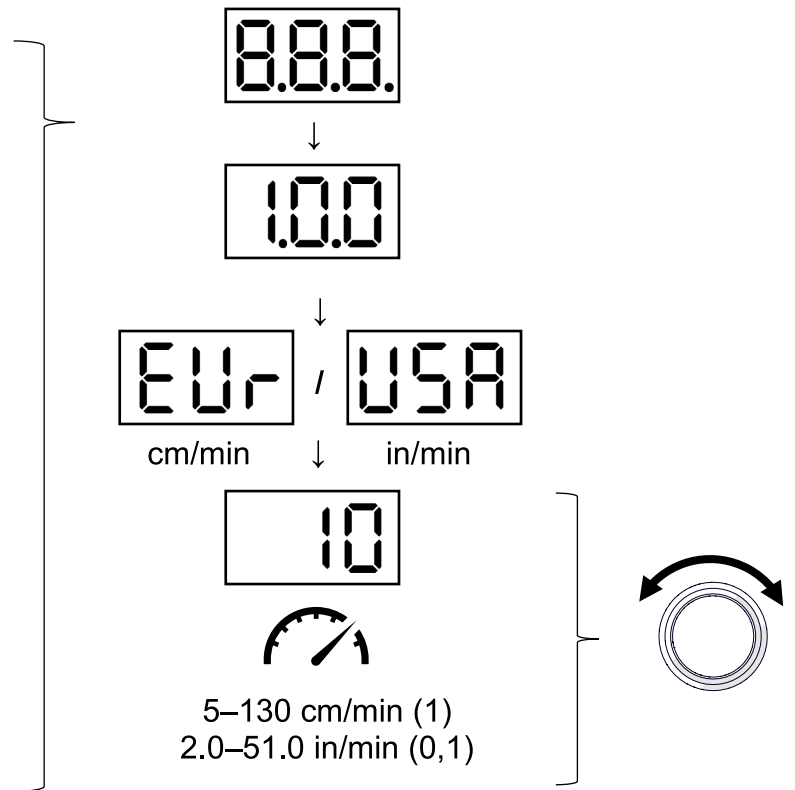
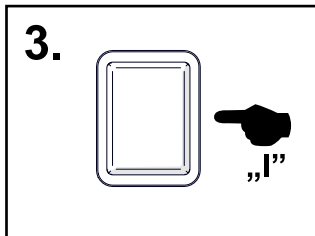
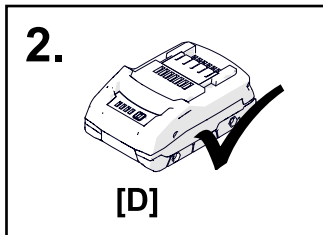
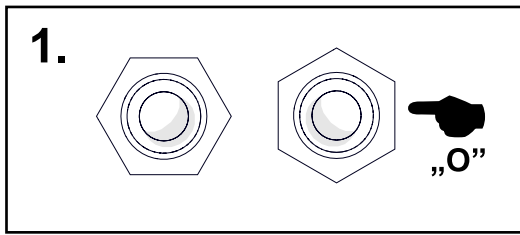
[Y]



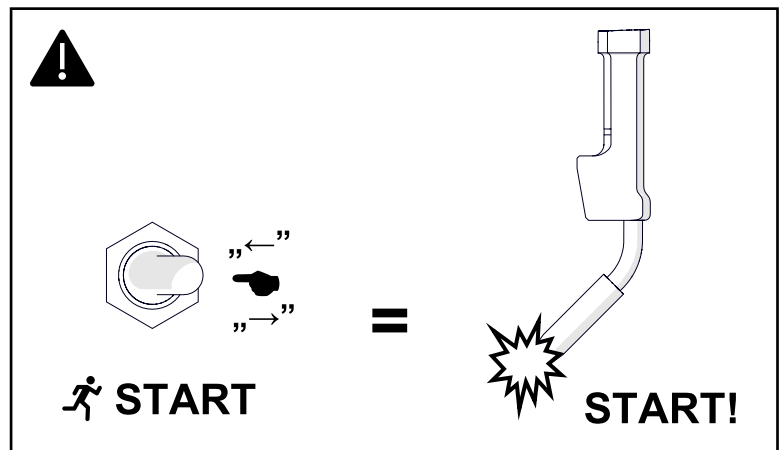
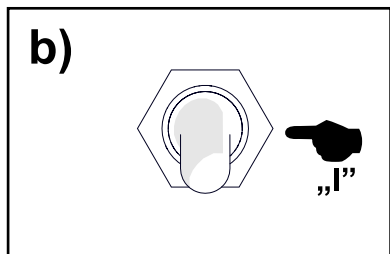
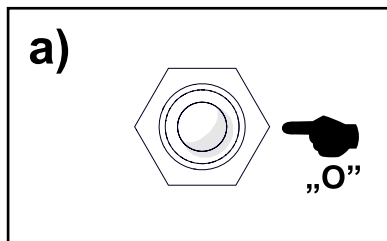
[Z]



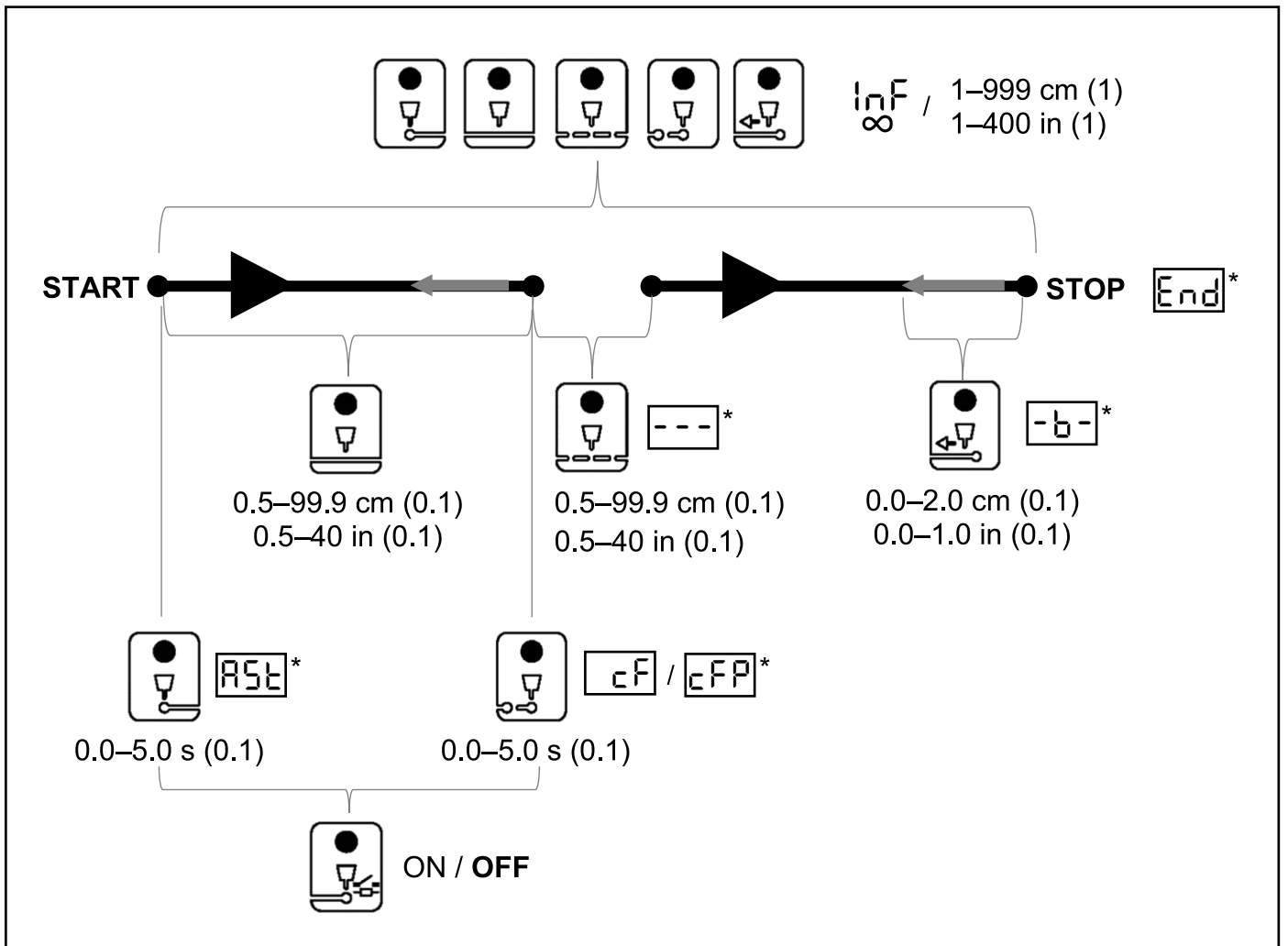
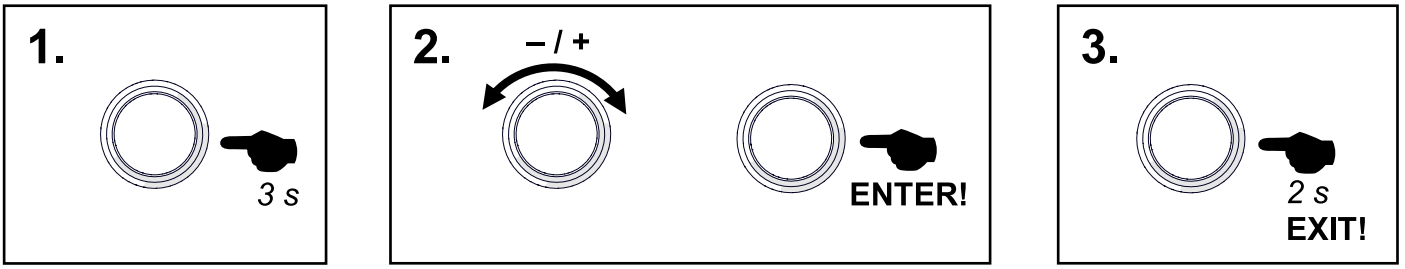
[AA]



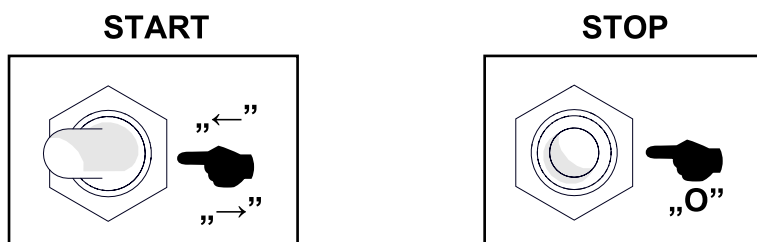
[BB]



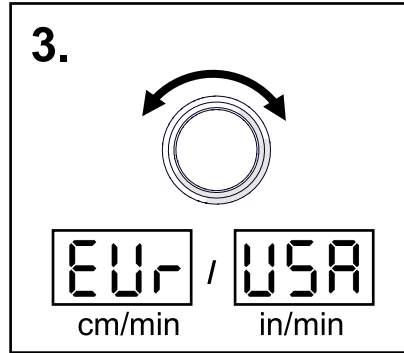
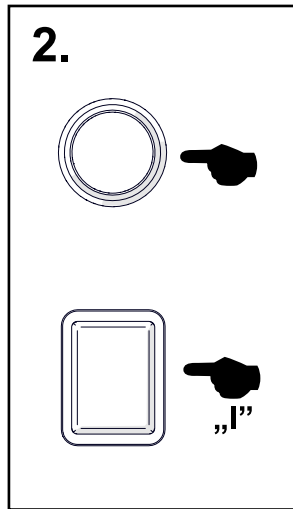
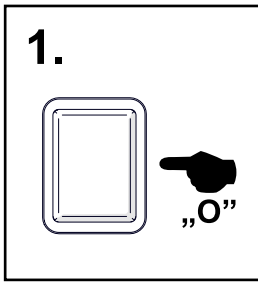
[CC]



[DD]



[EE]



[FF]

