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OPERATING MANUAL

# Robot Gun Mount

T2, T4

## CONTENTS

1.	Robot Gun Mounts T2 and T4.....	3
2.	Preface .....	3
3.	Identification.....	4
4.	CE marking .....	4
5.	Safety .....	4
5.1	Designated use.....	4
5.2	Responsibilities of the user .....	4
5.3	Personal protective equipment.....	4
5.4	Signs used in the documentation.....	5
5.5	Warning and notice signs .....	5
5.6	Emergency instructions .....	5
5.7	Operation safety.....	5
5.8	Product safety.....	6
6.	Technical data – T2 .....	7
6.1	Ambient conditions .....	7
6.2	Weight .....	7
6.3	The microswitch .....	7
6.4	Triggering the emergency stop.....	7
6.5	Maximum possible deflection .....	7
6.6	Triggering force.....	7
6.7	Triggering moment.....	8
6.8	Product-specific gun data.....	8
6.9	Abbreviations .....	8
6.10	The type plate.....	9
7.	Technical data – T4 .....	9
8.	Delivery scope.....	10
9.	Transport.....	10
10.	Storage.....	10
11.	Functional description.....	10
12.	Robot Gun Mount T2 installation.....	11
12.1	Fastening robot mount T2 to the robot.....	11
12.2	Adjusting the TCP.....	12
12.3	Connecting the helix cable .....	13
13.	Operation.....	13
14.	Unmounting.....	13
15.	Maintenance and cleaning .....	14
16.	Troubleshooting.....	15
17.	Removing the mount.....	16
17.1	Disposal .....	16
17.2	Materials .....	16
17.3	Consumables.....	16
17.4	Packaging .....	16
18.	Codes for ordering .....	17

## 1. ROBOT GUN MOUNTS T2 AND T4

This document provides product information for the Kemppi Robot Gun Mount units T2 and T4.

## 2. PREFACE

Congratulations on your purchase of this product. Used correctly, Kemppi products can significantly increase the productivity of your welding and provide many years of economical service.

This operation manual contains important information on the use, maintenance, and safety of your Kemppi product. The technical specifications of the equipment can be found in the chapter "Technical data" and at the end of this manual.

Please read the manual carefully before using the equipment for the first time. For your own safety and that of your work 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 Web site: [www.kemppi.com](http://www.kemppi.com).

The specifications presented in this manual are subject to change without prior notice.

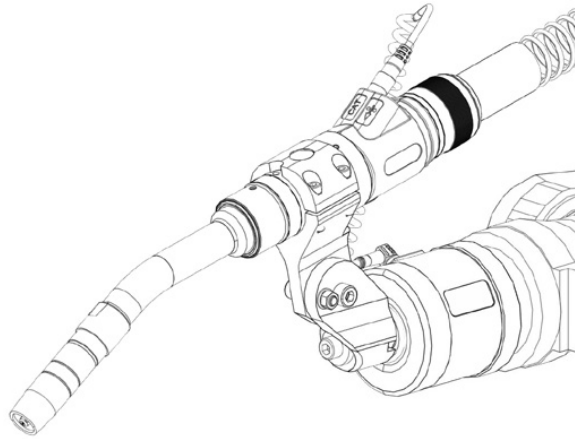
### **Disclaimer**

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.

### 3. IDENTIFICATION

Kemppi Robot Gun Mount T2 is used in industry and the trade for connecting the robot and the tool. This robot gun mount is a three-dimensionally acting safety cutout that is adaptable to all types of robots and handling machines via a robot flange. These operating instructions describe Kemppi Robot Gun Mount T2 only. Kemppi Robot Gun Mount T2 must be operated only as supplied or equipped with authentic Kemppi spare parts.

Figure 1: Kemppi Robot Gun Mount T2



### 4. CE MARKING

This device fulfils the requirements of the following EU directives:

- The Machinery Directive, 2006/42/EC
- The EMC Directive, 2004/108/EC
- The RoHS Directive, 2011/65/EU

### 5. SAFETY

Read and follow the additional safety instructions enclosed.

#### 5.1 Designated use

Robot Gun Mount T2 may be used only for the purpose described in these instructions, in the manner described. Follow the operation, maintenance, and servicing conditions whenever using the device.

Any other use is considered contrary to the intended use.

Unauthorized conversions or power-increasing modifications are not allowed.

The warranty does not cover wear parts and damage due to overloading or improper use.

#### 5.2 Responsibilities of the user

- Keep the operating instructions within easy reach in the location of the device for reference, and include the operating instructions when handing over the product.
- Installation, operation, and maintenance work may only be carried out by qualified personnel. Qualified personnel are persons who, on account of their special training, knowledge, experience, and familiarity with the relevant standards, are able to assess the tasks assigned to them and identify possible dangers.
- Keep all other people out of the work area.
- Follow the accident prevention regulations of the relevant country.
- Ensure good lighting of the work area, and keep it clean.

- Observe the following standards and guidelines in particular:
  - 89/391/EEC: Directive on the introduction of measures to encourage improvements in the safety and health of workers at work
  - 2009/104/EC: Directive concerning the minimum safety and health requirements for the use of work equipment by workers at work
  - 2004/108/EC: Directive on the harmonization of the laws of the Member States relating to electromagnetic compatibility The occupational health and safety regulations of the country in question
  - Regulations on occupational safety and accident prevention

#### 5.3 Personal protective equipment


To avoid danger to the user, using personal protective equipment (PPE) is recommended in these instructions.

PPE consists of the following:


- Protective clothing
- Safety goggles
- A class-P3 respiratory mask
- Gloves
- Safety shoes

## 5.4 Signs used in the documentation

Items in the manual that require particular attention, to minimize damage and personal injury, are indicated with a three-level notification and warning system. Read these sections carefully, and follow the instructions.

 *Note: These items give the user a useful piece of information.*

 *Caution: A caution item describes a situation that may result in damage to the equipment or system.*

 *Warning: Warnings describe a potentially dangerous situation. If not avoided, it will result in personal harm or fatal injury.*

## 5.5 Warning and notice signs

The following warning and notice signs can be found on the product:

 *Read and observe the operating instructions!*

These markings must always be legible. They must not be covered, obscured, painted over, or removed.

## 5.6 Emergency instructions

In the event of an emergency, immediately interrupt the following:

- The power supply
- The flow of compressed air

Further measures are described in the operating instructions or in the documentation of other peripheral devices.

## 5.7 Operation safety


Please study these operation safety instructions and respect them when installing, operating, and servicing the machine.

### **The welding arc and spatter**

The welding arc harms unprotected eyes. Also be careful with reflecting flashes from the arc. The welding arc and spatter burn unprotected skin. Wear safety gloves and protective clothing.

### **Danger of fire or explosion**

Pay attention to fire safety regulations. Remove flammable or explosive materials from the welding location. Always reserve sufficient fire-fighting equipment at the welding location. Be prepared for hazards in special welding jobs – for example, the danger of fire or explosion in welding of container-type work pieces.

 *Fire can break out from sparks even several hours after the welding is done!*

### **Cables**

Always check the cables before operating the equipment. Replace damaged cables without delay.

Damaged cables may cause injury or start a fire. Connection cables must not be compressed or come in contact with sharp edges or hot work pieces.

### **The welding power circuit**

Isolate yourself by using proper protective clothing, and do not wear wet clothing. Never work on a wet surface or use damaged cables. Do not place the MIG gun or welding cables on the welding machine or on other electric equipment. Do not press the MIG gun's switch if the gun is not directed towards a work piece.

### **Welding fumes**

Make sure that there is sufficient ventilation during welding. Take special safety precautions when welding metals that contain lead, cadmium, zinc, mercury, or beryllium.

## 5.8 Product safety

### Hazards caused by improper use

If improperly used, the device can present risks to people and physical property.

- Use the device in line with its designated use only.
- Do not convert or modify the device to enhance its performance without appropriate authorization.

The device may only be used by qualified personnel.

- The product has been developed and manufactured in accordance with state-of-the-art technology and the recognized safety standards and regulations. These operating instructions warn you against unavoidable residual risks to users, third parties, devices, and other physical property. Disregarding these warnings may result in risks to human life and health, harm to the environment, or other physical damage.
- The product may only be operated in unmodified, technically perfect condition, within the limits described in these instructions.
- Always observe the limit values specified in the technical data. Overloads lead to destruction.
- Safety features of the device must never be disassembled, bridged, or otherwise bypassed.
- During welding work outdoors, use suitable protection against the weather conditions.
- Check the electrical device for any damage and for proper functioning in accordance with its designated use.
- Never expose the electrical device to rain, and avoid damp or wet environments.
- Protect yourself from electrical accidents by using insulating mats and wearing dry clothing.
- Never use the electrical device in areas subject to a risk of fire or explosion.
- Arc welding may cause damage to the eyes, skin, and hearing. When working with the device, always use the prescribed protective equipment.
- Metal vapors, especially from lead, cadmium, copper, and beryllium, are all hazardous to the health! Ensure the use of sufficient ventilation or extraction systems. Always ensure compliance with the legal limit values.

- Using clean water, rinse work pieces that have been degreased with chlorinated solvents, to prevent the risk of phosgene gas forming. Do not place degreasing baths containing chlorine in the vicinity of the welding area.
- Adhere to the general fire protection regulations, and remove flammable materials from the vicinity of the welding work area before starting work.
- Keep suitable fire-extinguishing equipment in the work area, ready for use.

## 6. TECHNICAL DATA – T2

This chapter contains the technical data for the gun mount.

### 6.1 Ambient conditions

Table 1: Ambient conditions

Ambient temperature	25 °C to 55 °C
Transport and storage	-10 °C to 55 °C
Relative humidity	up to 70% at 20 °C

### 6.2 Weight

Model	Weight
Robot Gun Mount T2	0.96 kg

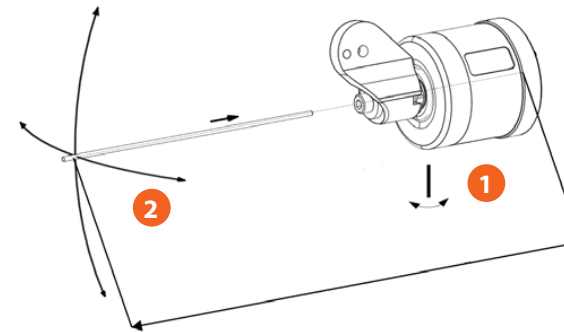
### 6.3 The microswitch

Type of voltage	DC
Voltage rating	24 V peak value
Load	max. 100 mA

### 6.4 Triggering the emergency stop

The figure depicts triggering the emergency stop switch (1). With a distance of 400 mm, it must move approx. 9–11 mm.

Figure 2: Triggering of the emergency stop



1. Triggering moment
2. Triggering force X, Y

Switching point	Deflection in X and Y direction	Approx. 1.4–1.7°
	Deflection in Z direction	Approx. 1.3–1.6 mm

### 6.5 Maximum possible deflection

In the direction	... of the X axis and Y axis	7°
	... of the Z axis	Approx. 5 mm

### 6.6 Triggering force

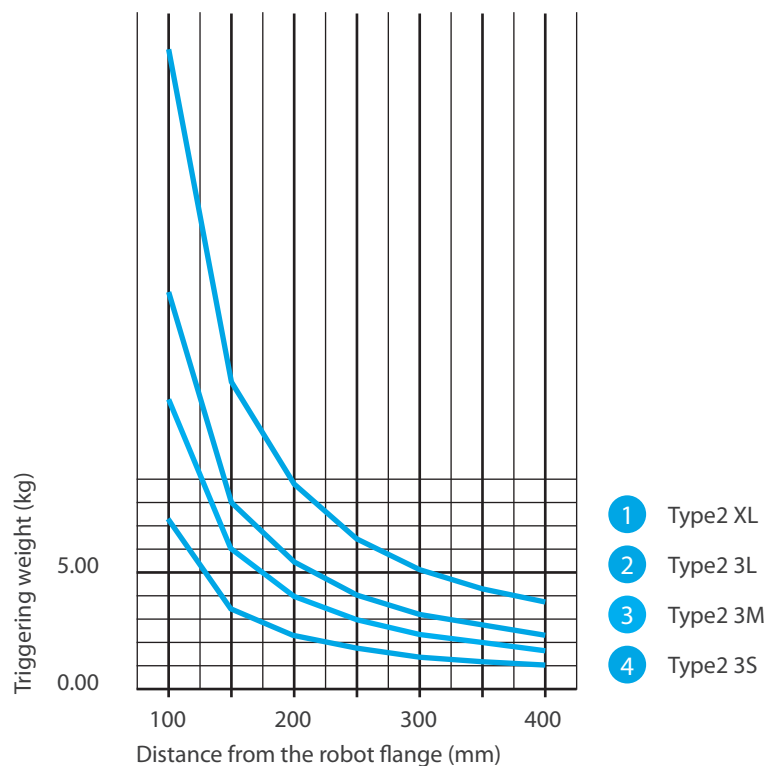
Kemppi Robot Gun Mount T2 is equipped with an L type spring. Other spring types are available on request.

The triggering force at 400 mm can be summarized thus.	
With "L" spring	44 N
With "XL" spring	71 N

## 6.7 Triggering moment

With "L" spring	15 Nm
With "XL" spring	25 Nm

Figure 3: Triggering weight with a maximum robot acceleration of 5 m/s<sup>2</sup>



## 6.8 Product-specific gun data

The following table applies to the entire Kemppi gun system, including gun neck, gun mount and cable assembly. The table below presents product-specific gun data in line with EN 60 974-7.

Type	Type of cooling	Load (A)		ED (%)	Wire Ø (mm)	Gas flow (l/min)
		CO <sub>2</sub>	M21			
500-g	gas	340	320	100	0.8–1.6	10–30
500-w	liquid	340	340	100	0.8–1.6	approx. 20

The cable assembly length is determined on the basis of the robot brand and model.

The load data have been determined under standard conditions, at low to medium reflected heat, with free air circulation and an ambient temperature of about 28 °C. In use under more rigorous conditions, the load values must be reduced by 10–20%. Applications with the load 340 A at 100 % duty cycle require an engineered solution. Contact Kemppi sales.

## 6.9 Abbreviations

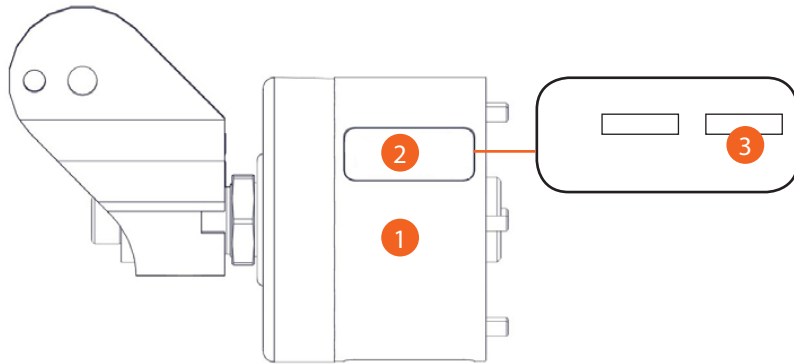
DC	Direct current
ED	Duty cycle
MIG	Metal inert gas
MAG	Metal active gas
MAC value	Maximum allowable concentration of harmful substances in the workplace
Voltage rating	Insulation resistance, electric strength, and protection class
TCP	Tool center point



## 6.10 The type plate

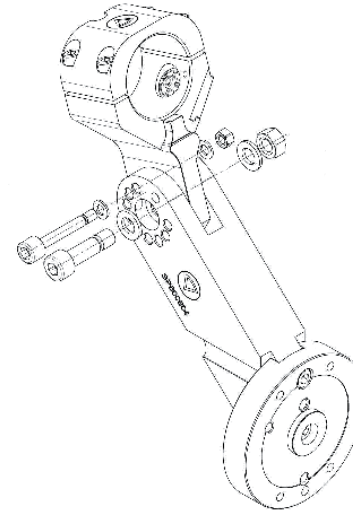
Robot Gun Mount T2 is identified by a sticker or a Kemppi logo. When contacting the service staff, please remember to check the production stamp near the Kemppi logo.

Figure 3: T2 type plate



1. Robot Gun Mount T2
2. The type plate
3. Robot mount serial number

## 7. TECHNICAL DATA – T4



Kemppi Robot Gun Mount T4 is a solid bracket without collision sensibility. It is recommended that the robot itself is equipped with the collision sensing ability, when Kemppi Robot Gun Mount T4 is used. Gun orientation can be adjusted in 30 degree steps.

## 8. DELIVERY SCOPE

The delivery for a gas-cooled gun includes the following components:

- Kemppi Robot Gun Mount T2 or T4
- Operating instructions
- Cylinder-head screws, M4×55 (6 pcs.)
- Certificate of conformity
- Connection cable

The equipment parts and wear parts are ordered separately.

Order data and ID codes for the equipment parts and wear parts can be found in the current catalogue. Contact details for advice and for placing orders can be found online at [www.kemppi.com](http://www.kemppi.com).

## 9. TRANSPORT

The components are carefully checked and packed; however, damage may still occur during shipping.

<i>Checking procedure on receipt of goods</i>	Check that the shipment is correct by referring to the shipping note.
<i>In case of damage</i>	Check the package and components for damage (perform a visual inspection).
<i>In the event of problems</i>	If the goods have been damaged during transport, contact the last carrier immediately. Keep the packaging (for possible checks by the carrier).
<i>Packaging for return of the goods</i>	Use the original packaging and the original packaging material. If you have questions about the packaging and safety during shipment, please consult your supplier.

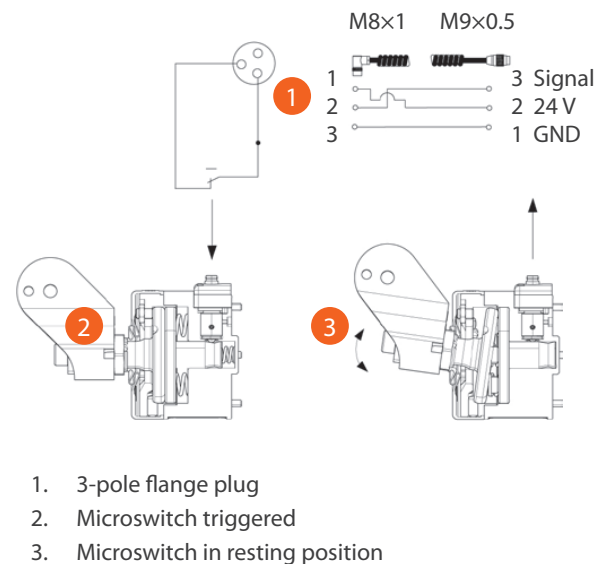
## 10. STORAGE

The physical conditions for storage in a closed room are -10 °C to 55 °C.

## 11. FUNCTIONAL DESCRIPTION

The holding force of the inserted springs is directly applied to the release flange and fixes the switching axis, which is positioned by three pins, in the zero position. In the event of collision, the switching axis tips over, the release flange pushes the spring plate toward the base of the housing, and the trigger is actuated by the spring plate's actuating mechanism. The applied switching voltage is interrupted.

Figure 5: Functional diagram



## 12. ROBOT GUN MOUNT T2 INSTALLATION

**!** Risk of injury due to unexpected start-up

For the entire duration of maintenance, servicing, unmounting, and repair work, the following instructions must be adhered to:

- Switch off the power supply.
- Cut off the compressed air supply.
- Pull the power plug.

**i** Read the safety instructions in this manual and the separate safety instructions.

The system may only be installed by authorized personnel.

### 12.1 Fastening robot mount T2 to the robot

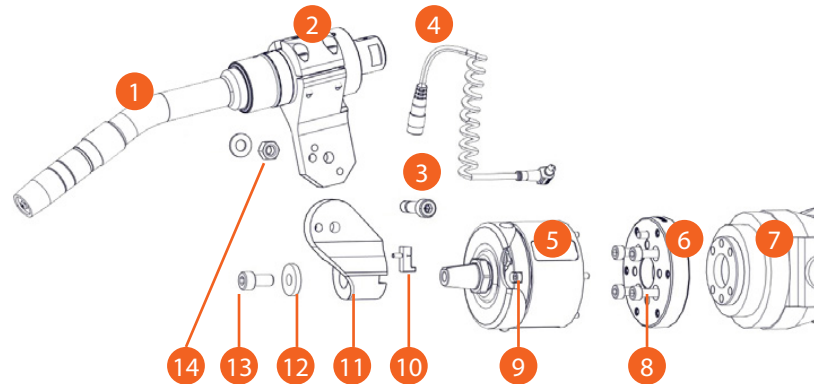
This section describes how to fasten robot mount T2 to the robot.

Before attaching Kemppe robot mount T2 (5), first place the robot (7) in maintenance position.

For fastening the gun (1) to the robot mount (5), a gun mount (2) is required.

The parts of the system are depicted in the figure below.

Figure 6: Fastening robot mount T2 to the robot



- |                                  |   |
|----------------------------------|---|
| 1. Gun neck                      | 8. Cylinder-head screw                  |
| 2. Gun segment holder upper part | 9. Cylinder-head screws, M4x55 (6 pcs.) |
| 3. Dowel screw, 8 H7             | 10. Feather key                         |
| 4. Helix cable                   | 11. Gun segment holder lower part       |
| 5. Robot mount T2                | 12. Clamping ring                       |
| 6. Robot flange                  | 13. Cylinder head screw, M8             |
| 7. Robot                         | 14. M8 nut with washer                  |

**i** For fastening robot mount T2 to the robot, a robot flange (2) is required. It must correspond to the hole pattern of the robot mount (1) and of the robot.

**Proceed as follows:**

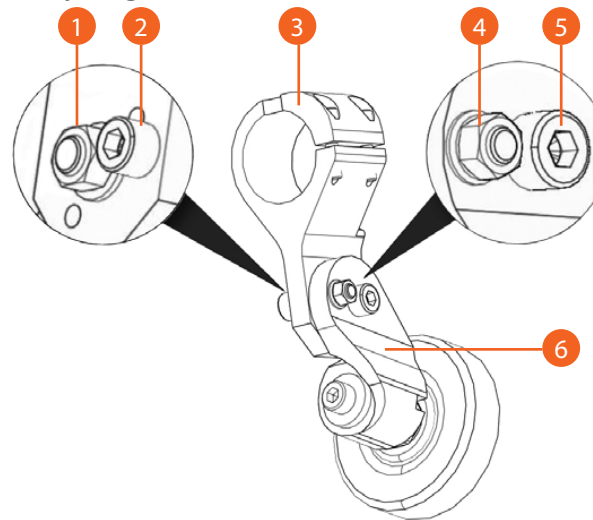
1. Use the cylinder-head screw (8) to attach the robot flange (6) to the robot (7).
2. Use cylinder-head screws (9) to attach the robot mount (5) to the robot flange (6)
3. Use the clamping ring (12) and cylinder-head screw (13) to attach the bracket (11) to the robot mount (5).
4. Use the dowel screw (3) and nut (14) to attach the gun mount (2) to the bracket (11).

## 12.2 Adjusting the TCP

This section describes how to adjust the TCP.

The parts of the system are depicted in the figure below.

Figure 7: Adjusting the TCP



1. M8 nut
2. Dowel screw, 6H7
3. Gun segment holder upper part
4. M6 nut
5. Dowel screw, 8H7
6. Gun segment holder lower part

**Proceed as follows:**

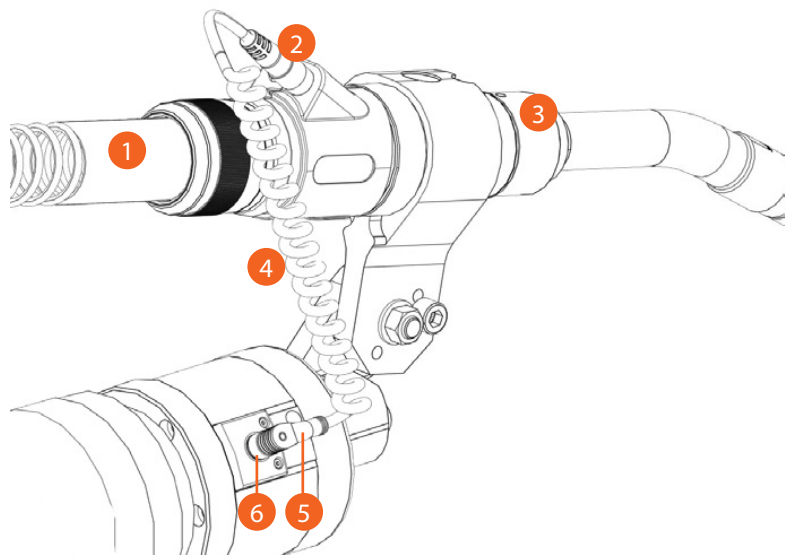
1. Loosen the nut (1), and adjust the gun mount (3) to the desired TCP.
2. Tighten the nut (1).
3. To make the position chosen permanent, proceed as follows:
  - a. Drill a  $\varnothing$  5.8 mm bore hole into the bracket (6), and use a reamer to ream the bore for the dowel screw (2).
  - b. Use a dowel screw (2) and a nut (4) to secure both brackets (6 and 3).

## 12.3 Connecting the helix cable

This section describes how to adjust the TCP.

The parts of the system are depicted in the figure below.

Figure 8: Connecting the helix cable



- |                   |   |
|-------------------|---|
| 1. Cable assembly | 5. Angled male connector                |
| 2. Flange plug    | 6. Robot Gun Mount T2 connector housing |
| 3. Gun            |   |
| 4. Helix cable    |   |

### Proceed as follows:

1. Plug the helix cable (4) into the connector housing (6), using the angled male connector (5).
2. Plug the flange plug (2) into the torch (3) and the cable assembly (1).
3. Lock both connectors to prevent their accidental disconnection.
4. For the switching function, see the functional diagram (10).

## 13. OPERATION

**i** The device may only be operated by qualified personnel.

Because the robot mount is integrated into the gun's welding process, the operation steps are performed after the relevant gun has been installed.

Please observe the operating instructions for the A7 MIG Gun 500-g or the A7 MIG Gun 500-w welding guns, as applicable.

## 14. UNMOUNTING

**i** Unmounting may only be carried out by specialist personnel. Please make sure that the shutdown procedures for all components mounted in the welding system are strictly observed before removal from operation begins.

**!** Risk of injury due to unexpected start-up

For the entire duration of maintenance, servicing, unmounting, and repair work, the following instructions must be adhered to:


- Switch off the power supply.
- Cut off the compressed air supply.
- Pull the power plug.

Removal from operation depends on the type of welding gun. Please observe the operating instructions for the A7 MIG Gun 500-g or the A7 MIG Gun 500-w welding guns, as applicable.

## 15. MAINTENANCE AND CLEANING

Scheduled maintenance and cleaning are prerequisites for a long service life and trouble-free operation.

Once a month, thoroughly clean the robot mount to remove all dirt and welding spatter.

 *Risk of injury due to unexpected start-up*


For the entire duration of maintenance, servicing, unmounting, and repair work, the following instructions must be adhered to:

- Switch off the power supply.
- Cut off the compressed air supply.
- Pull the power plug.

 *Electric shock*

Dangerous voltages can be produced because of defective cables.

- Check all live cables and connections for proper installation.
- Replace any parts that have suffered damage, deformation, or wear.

 *The maintenance intervals listed are recommended values and assume single-shift operation.*

- Maintenance and cleaning work may only be carried out by qualified and trained specialists.
- Always wear your personal protective clothing when performing maintenance and cleaning work.
- When replacing the liquid-cooled A7 MIG Gun 500-w hose assemblies, make sure that any coolant residues are removed from the robot mount.
- The maintenance intervals listed are recommended values and assume single-shift operation.


## 16. TROUBLESHOOTING

 Risk of injury due to unexpected start-up

For the entire duration of maintenance, servicing, unmounting, and repair work, the following instructions must be adhered to:

- Switch off the power supply.
- Cut off the compressed air supply.
- Pull the power plug.

In the event of any doubts or problems, please contact your retailer or the manufacturer.

 Please also consult the operating instructions for the other welding components, such as the power supply and air pressure line.

Problem	Cause	Solution
Robot gun mount cannot be attached	Wrong gun mount used	Use the correct gun mount
	Robot Gun Mount T2 mounting flange is defective	Send the robot mount for repair
Robot Gun Mount T2 does not activate the stop signal	Cable not connected between the robot mount and the cable assembly	Connect the cable
	Cable defective	Replace the cable
	Robot gun mount switch defective	Send the robot mount for repair
Robot Gun Mount T2 does not reset to the zero position	Mounted load is too heavy	Reduce the mounted load
	Mechanical defect	Observe the data provided by the manufacturer
	Attachment parts (bracket etc.) not correctly connected	Send the robot mount for repair Check whether the attachment parts are properly connected
Robot Gun Mount T2 triggered when there is no fault	Mounted load is too heavy • Robot speed is too high	Adapt the load to the specifications See Chapter 6

## 17. REMOVING THE MOUNT

This section describes how to remove robot mount T2.

Unmounting may only be carried out by specialist personnel. Please make sure that the shutdown procedures are strictly observed before the unmounting work begins. Ensure this also for the components integrated into the welding system.

**!** Risk of injury due to unexpected start-up

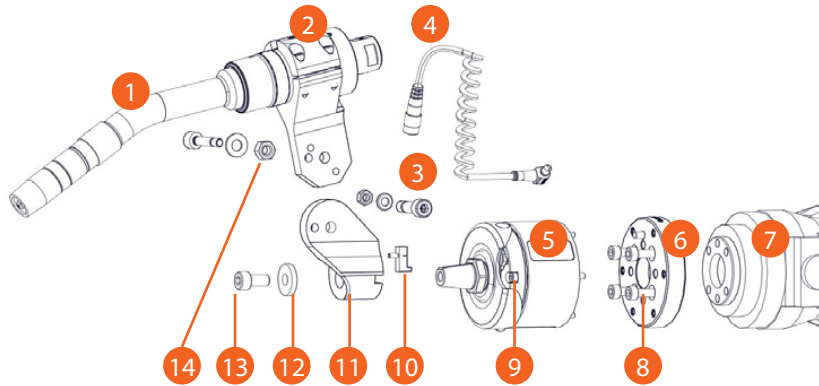
For the entire duration of maintenance, servicing, unmounting, and repair work, the following instructions must be adhered to:

- Switch off the power supply.
- Cut off the compressed air supply.
- Pull the power plug.

**i** See also Chapter 13.

**Proceed as follows:**

1. Remove the parts to be disconnected:



- |                                  |  |
|----------------------------------|--|
| 1. Gun neck                      | 9. Cylinder-head screws, M4x55<br>(6 pcs.) |
| 2. Gun segment holder upper part | 10. Feather key                            |
| 3. Dowel screw, 8 H7             | 11. Gun segment holder lower part          |
| 4. Helix cable                   | 12. Clamping ring                          |
| 5. Robot Gun Mount T2            | 13. Cylinder-head screw, M8                |
| 6. Robot flange                  | 14. M8 nut with washer                     |
| 7. Robot                         |  |
| 8. Cylinder-head screw           |  |

### 17.1 Disposal

For disposal, the locally applicable regulations, laws, provisions, standards, and guidelines must be observed. For the welding torch system to be properly disposed of, it must be unmounted first.

### 17.2 Materials

This product consists for the most part of plastics, steel, and non-ferrous metals. Steel and non-ferrous metals can be melted down, so iron materials are almost infinitely recyclable. The plastic materials used are marked in preparation for appropriate sorting of the materials for later recycling.

### 17.3 Consumables

Oils, greases, and cleaning agents must not contaminate the ground or enter the sewer system. These materials must be stored, transported, and disposed of in suitable containers. Please observe the relevant local regulations and the disposal instructions on the safety data sheets supplied by the manufacturer of the consumables. Also, contaminated cleaning tools (brushes, rags, etc.) must be disposed of in accordance with the information provided by the manufacturer of the consumables.

### 17.4 Packaging

The shipping packaging has been reduced to a minimum. Packaging materials are always selected with attention to their possible recyclability.



## 18. CODES FOR ORDERING

<i>Robot gun mount</i>	<i>Product code</i>
Robot Gun Mount T2 L	SP600605
Robot Gun Mount T2 XL	SP600606
Robot Gun Mount T4	SP600604
Segment holder for Robot Gun Mount T2	SP600608

The pull-in tool accessory serves for the correct mounting of cable assemblies. The O-rings at the rod of the pull-in tool indicate the mounting positions of cable assembly versions A7 MIG Gun 500-g and A7 MIG Gun 500-w. The pull-in tool must only be used for Robot Gun Mount T2.

To get the correct type of the adapter flange for the robot's 6th axis, please notify Kemppi about the robot manufacturer and model.

And you know.