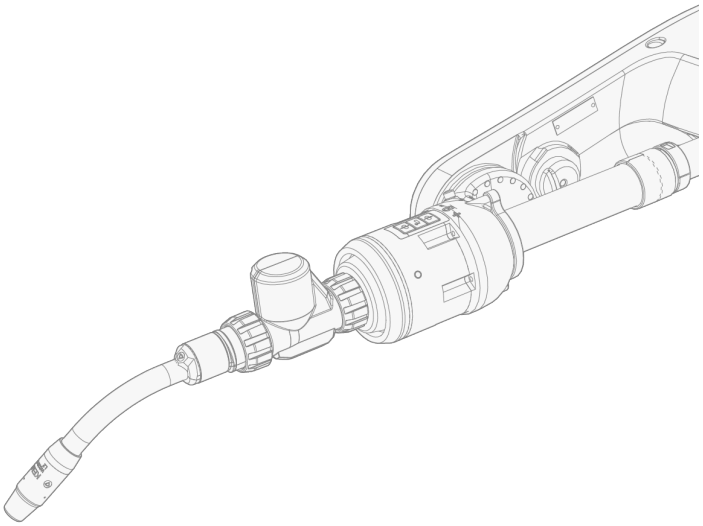
KEMPPI GX-ROBOT SYSTEM



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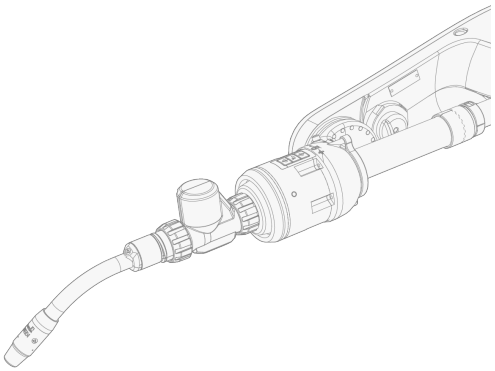
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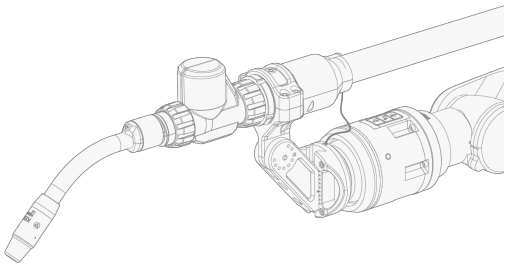
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1. GENERAL

These instructions describe the use of the Kemppi GX-ROBOT System welding torch solution for robotic MIG/MAG welding. The system consists of several components, including a welding torch, cable pack, robot adapter flange, collision sensor, mounting bracket, wire brake, welding torch alignment tool, and a welding torch cleaning station. The use and combination of components depend on the robot type and user preferences. For more information, refer to "Equipment description" on page 7.

The Kemppi GX-ROBOT System equipment is compatible with all major robot brands and includes components for both hollow-wrist robots, with cable routing through the wrist, and non-hollow-wrist robots, with external cable routing along the wrist.





Welding equipment compatibility

The Kemppi GX-ROBOT System equipment is compatible with the AX MIG Welder welding equipment. For information on the required firmware versions, refer to "Welding equipment firmware versions" on page 49.

Important notes

Read the instructions through carefully.

Items in the manual that require particular attention in order to minimize damage and harm are indicated with the below symbols. Read these sections carefully and follow their instructions.

Note: Gives the user a useful piece of information.

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

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

General notices

https://kemp.cc/ud/notices

EULA (End User License Agreement)

https://kemp.cc/ud/eula

Warranty

https://kemp.cc/ud/warranty

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.

The source language for this document is English. All other language versions available are either professional human translations or advanced machine translations. Any feedback regarding translation terminology can be sent to userdoc@kemppi.com.

1.1 WELDING SAFETY

Welding is always classified as hot work, and welding equipment typically contains high-voltage circuits. If you are not familiar with welding and welding principles, it is recommended that you acquire welding training or professional guidance before commencing welding. The welding equipment mentioned in this manual is intended for professional use in an industrial environment.

For your own safety, and that of your working environment, pay particular attention to the safety instructions delivered with the equipment.

You can also access and download the safety instructions by using these links:

- Safety

  (https://kemp.cc/safety/general)
- Welding guns and torches

  (https://kemp.cc/safety/torches)

1.2 EQUIPMENT DESCRIPTION

This section lists the components included in the Kemppi GX-ROBOT System. Some components are required depending on whether the robot is a hollow-wrist or non-hollow-wrist model, while others may be chosen according to user preferences.

Cable packs

- GX-R Cable T1
  >> For a hollow-wrist robot
  >> Water- and gas-cooled options
- GX-R Cable T2
  >> For a non-hollow-wrist robot
  >> Water- and gas-cooled options

In model names (e.g. GX-R CABLE T1 S G (1040) / GX-R CABLE T1 S W (1040)): S = slim, G = gas-cooled, W = water-cooled. The number at the end in brackets indicates the cable length.

Welding torches

- GX-R Torch
  >> Water- and gas-cooled options

In model names (e.g. GX-R TORCH 400G 340MM 22D S50 / GX-R TORCH 500W 340MM 22D S50): G = gas-cooled, W = water-cooled, MM = neck length, D = neck angle, S = second neck angle.

Robot adapter flanges

- X-R Flange
  >> Robot-specific models

In model names (e.g. X-R FLANGE 100 - 6 - M10 #14): 100 = pitch circle diameter, 6 = number of mounting holes, M10 = mounting hole size, #14 = serial number identifying the individual flange.

Collision sensors

- X-R Sensor T1
  >> For a hollow-wrist robot
- X-R Sensor T2
  >> For a non-hollow-wrist robot

Mounting brackets

- X-R Bracket
  >> For a non-hollow-wrist robot
  >> Size S/M

Wire brake

- GX-R Wire Brake
  >> Water- and gas-cooled options
  >> Optional

Welding torch alignment tool

- GX-R Torch Adjuster
  >> For water- and gas-cooled welding torches
  >> Optional

Cable adapter

- GX-R 10 Pin Cable Adapter

>> For connecting the GX-R cable to R500 Wire Feeder EUR/EUR+

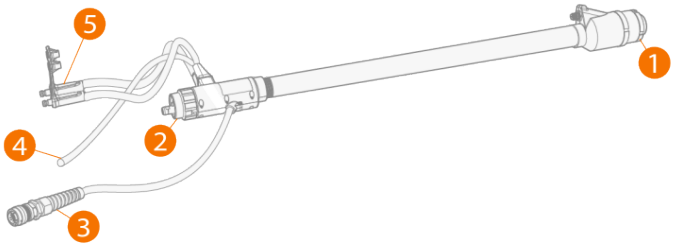
Welding torch cleaning and cutting station

- GX-R Cleaning and Cutting Station
  >> Optional
  >> Delivered with a dedicated operating manual

For more information, refer to Kemppi.com.

1.3 GX-R CABLE PACK

Model-specific variations may occur.



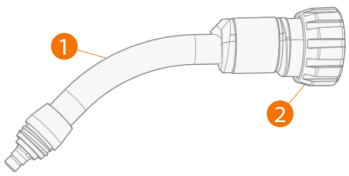
1. Welding torch connector
2. Euro connector
3. Control cable
4. Air hose
5. Coolant inlet and outlet hoses
   >> With water-cooled models only.

EQUIPMENT IDENTIFICATION

Quick Response (QR) code

Device-related information or a web link to such information may be found in the form of a QR code on the device. The code can be read, for example, with a mobile device camera and a QR code application.

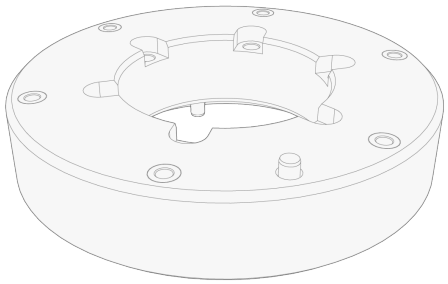
1.4 GX-R WELDING TORCH



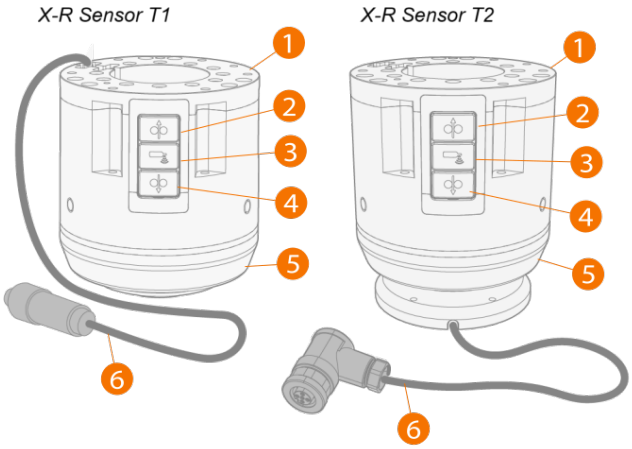
1. Welding torch neck
2. Cable pack connector

1.5 X-R ADAPTER FLANGE

The adapter flange models are robot-specific.



1.6 X-R COLLISION SENSOR

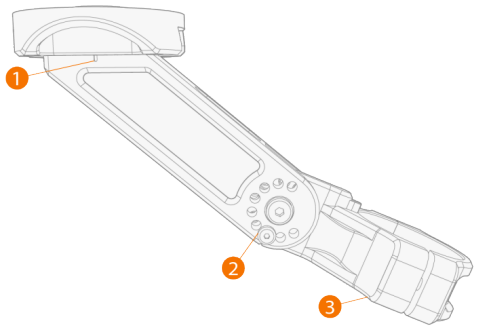


1. Mounting plate
2. Wire inch backward button
   >> This is used for fine adjustment of the filler wire length only (it does not rotate the wire spool)
3. Gas test button
4. Wire inch forward button
5. Protective cover
6. Control cable.

The collision sensor comes with default springs installed. If necessary, replace the springs. For more information, refer to "Replacing collision sensor springs" on page 47.

1.7 X-R MOUNTING BRACKET

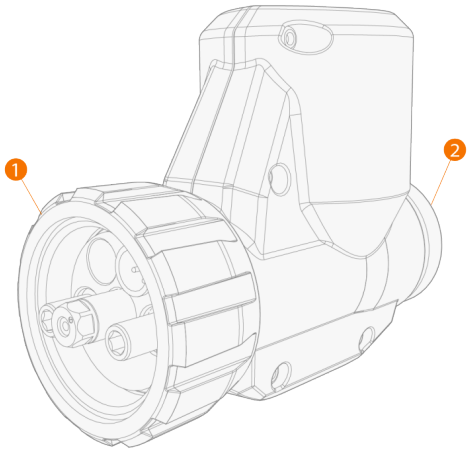
Model-specific variations occur.



1. Welding torch position adjustment
2. Welding torch angle adjustment
3. Holder (secures the cable pack to the mounting bracket)

1.8 GX-R WIRE BRAKE

Wire brake is used to hold the filler wire in place when the filler wire is not being driven.

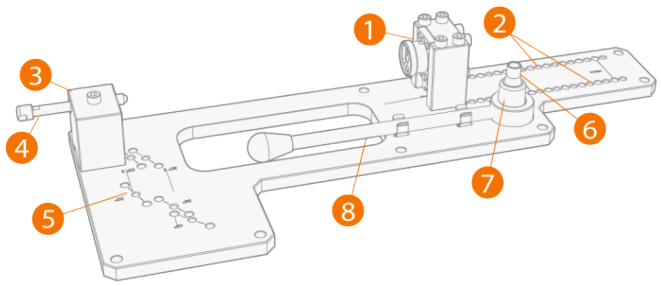


1. Cable pack connector
2. Welding torch connector

The wire brake comes with a pre-installed piston for filler wire diameters of 0.8–1.2 mm. For 1.2–1.6 mm filler wires, replace the piston with the included alternative. For more information, refer to "Changing wire brake piston" on page 36.

1.9 GX-R TORCH ALIGNMENT TOOL

The GX-R Torch Adjuster welding torch alignment tool is used to ensure the welding torch is concentric and correctly aligned.



1. Welding torch holder
2. Welding torch holder attachment points
   >> According to welding torch length
   >> Standard GX-R welding torch lengths are marked on the base plate. For other lengths, the attachment points are spaced 20 mm apart.
3. Alignment inspection tool
4. Centering pin
5. Alignment inspection tool attachment points
   >> According to welding torch angle
   >> Standard GX-R welding torch angles are marked on the base plate
6. Centering sleeve
7. Bending sleeve
8. Bending lever

For information on aligning a welding torch, refer to "Aligning welding torch" on page 44.

2. INSTALLATION

Ensure that the required firmware version is installed on your welding device. Refer to "Welding equipment firmware versions" on page 49.

Do not modify the welding equipment in any way, except for the changes and adjustments covered in the manufacturer's instructions.

Before installation and use

Ensure compliance with your local and national safety requirements regarding the installation and use of high voltage units.

Check the contents of the packages and make sure the parts are not damaged.

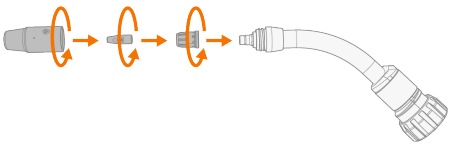
2.1 ASSEMBLING WELDING TORCH

For the correct components, refer to Kemppi.com.

Tools needed:



1. Attach the contact tip adapter and hand-tighten it firmly in place. It is important to tighten the adapter properly to enable a tight connection of the contact tip to the welding torch.
2. Attach the contact tip and tighten to a torque of 5 Nm.
3. Attach the gas nozzle and hand-tighten it firmly in place.



2.2 INSTALLING AND REPLACING WIRE LINER

The welding torch, cable pack, and optional wire brake each have their own wire liner. Install the wire liners before use.

Always use matching wire liner materials in all components to ensure reliable wire feeding.

The wire liners are consumable parts, which need to be changed if worn and when the filler wire material changes.

If you change the filler wire to a different diameter or material, change also the feed rolls in the wire feed system accordingly.

The filler wire must be removed before the wire liner replacement.

The wire liner installation method is the same for both gas- and water-cooled models.

"Installing steel wire liner in cable pack" below

"Installing DL Chili wire liner in cable pack" on the next page

"Installing wire liner in welding torch" on page 21

"Installing wire liner in wire brake" on page 22

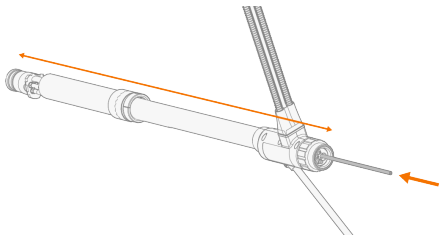
2.2.1 INSTALLING STEEL WIRE LINER IN CABLE PACK

Tools needed:

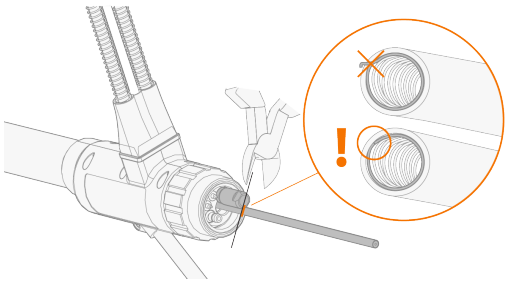




1. Straighten the cable pack.
2. Feed the wire liner into the cable until it stops at the wire liner stop.

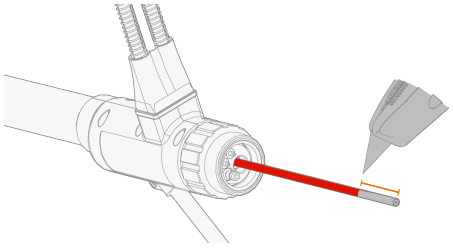


3. Insert the sleeve nut next to the wire liner for measure. (Do not install the sleeve nut in its actual position at this stage.)
4. Using side cutting pliers, cut the wire liner flush with sleeve nut end.

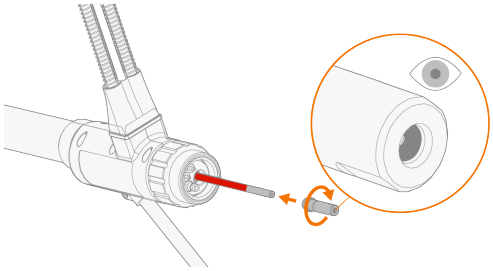


⚠ *Don't leave any rough, inward edges that could potentially damage the filler wire.*

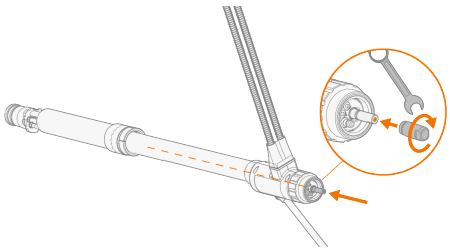
5. Strip the end of the wire liner for approximately 10...20 mm.



6. Insert the retainer cone onto the wire liner and push it in place. Ensure that the wire liner goes all the way into the tip of the retainer cone.



7. Place the sleeve nut on the wire liner and secure it in place by tightening it to a torque of 5 Nm.

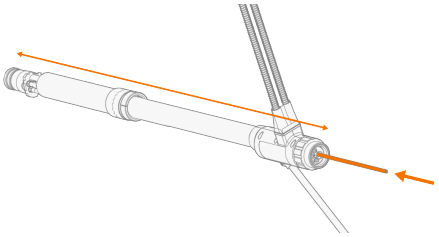


2.2.2 INSTALLING DL CHILI WIRE LINER IN CABLE PACK

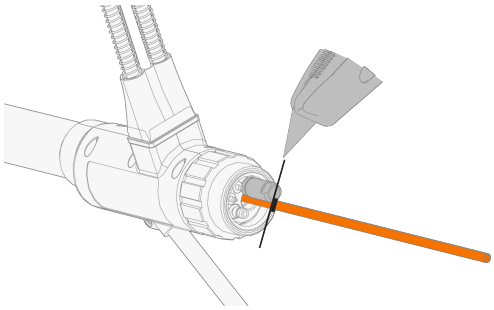
Tools needed:



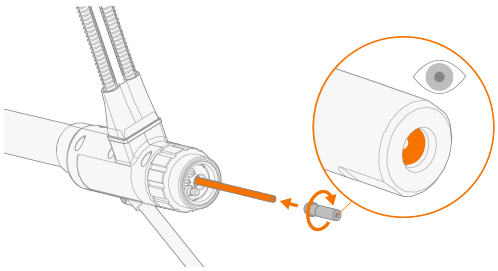

1. Straighten the cable pack.
2. Feed the wire liner into the cable until it stops at the liner stop.



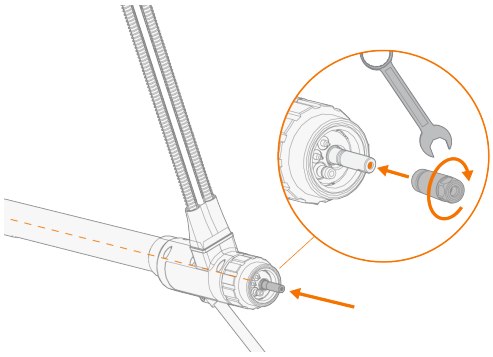
3. Insert the sleeve nut next to the wire liner for measure. (Do not install the sleeve nut in its actual position at this stage.) Using carpet knife, cut the wire liner flush with the sleeve nut end.



4. Insert the retainer cone onto the wire liner and push in place. Ensure that the wire liner goes all the way into the tip of the retainer cone.



5. Place the sleeve nut on the wire liner and secure it in place by tightening it to a torque of 5 Nm.



2.2.3 INSTALLING WIRE LINER IN WELDING TORCH

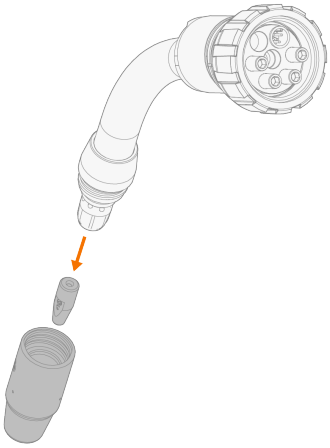
Tools needed:



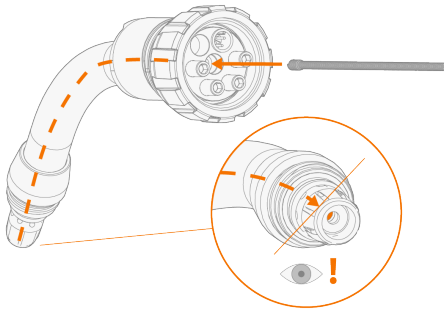


The method is the same for both steel and DL Chili wire liners.

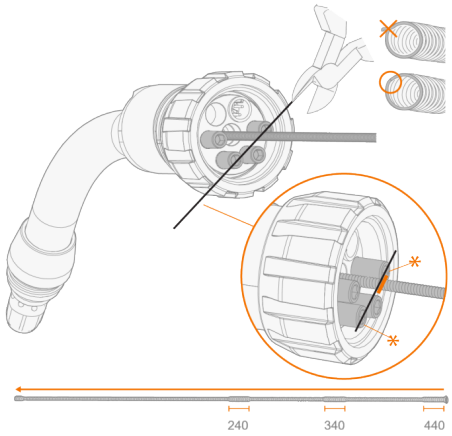
1. Remove the gas nozzle and contact tip from the welding torch.



2. Insert the wire liner into the welding torch and ensure that it goes all the way through and the liner's end sits firmly in its housing.

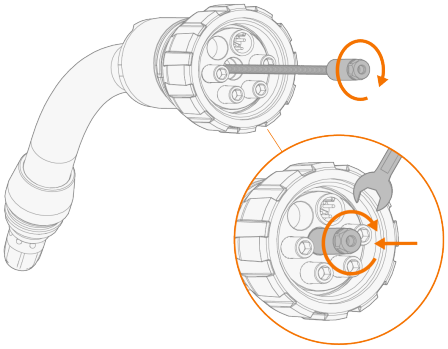


3. Using side cutting pliers, cut the wire liner flush with the connection ports (*) or up to 1 mm above them.
   >> The cutting points matching the length of the welding torch are marked on the wire liner.
   >> Do not cut the wire liner below the level of the connection ports.



⚠ *Don't leave any rough, inward edges that could potentially damage the filler wire.*

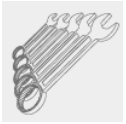
4. Place the sleeve nut on the wire liner and secure it in place by tightening it to a torque of 2 Nm.



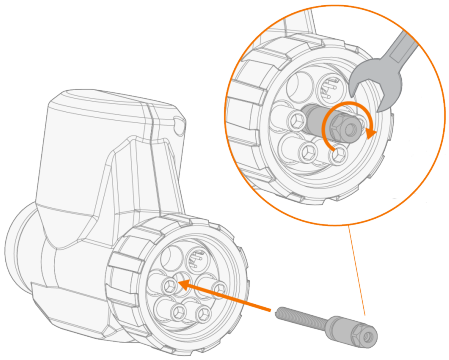
2.2.4 INSTALLING WIRE LINER IN WIRE BRAKE

Installing steel wire liner

Tools needed:



1. Insert the wire liner into the wire brake and tighten the sleeve nut.



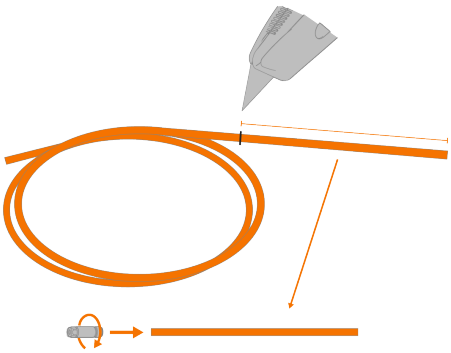
Installing DL Chili wire liner

Tools needed:

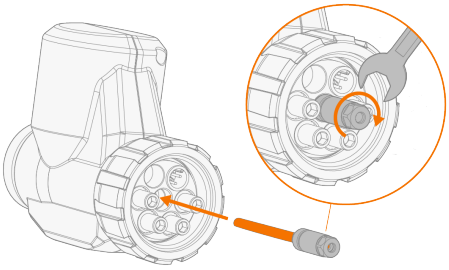




1. Cut off 60 mm (+/- 1 mm) of the wire liner and place the sleeve nut on the wire liner.



2. Insert the wire liner into the wire brake and tighten the sleeve nut.



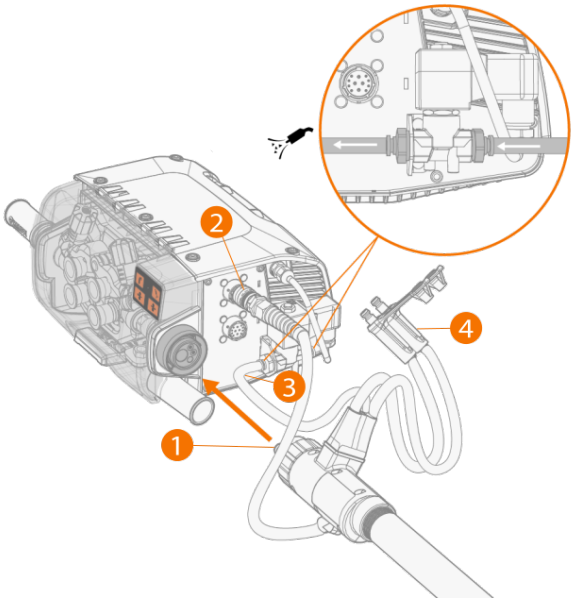
2.3 CONNECTING TO WELDING EQUIPMENT

The Kemppi GX-ROBOT System equipment is directly compatible with the AX MIG Welder equipment's wire feeder model R500 Wire Feeder HD EUR+. The R500 Wire Feeder EUR and EUR+ models require the GX-R 10 pin cable adapter.

Ensure that the required firmware version is installed on your welding device. Refer to "Welding equipment firmware versions" on page 49.

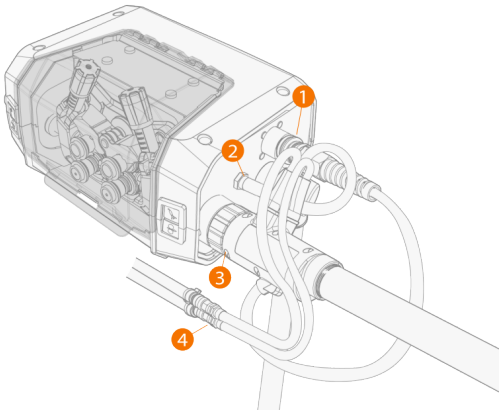
For connecting to the welding equipment, refer also to your welding equipment's instructions.

Connecting to R500 Wire Feeder HD EUR+:



1. Push the welding cable connector (1) to the Euro connector and hand-tighten the collar.
2. Connect the welding torch control cable (2) to the wire feeder's control cable connector.
3. To use welding torch cleaning with compressed air, connect the compressed air hose of the welding cable (3) to the outlet connector of the air blow valve.
4. If you have the optional cooling unit, connect the cooling liquid hoses (4).

Connecting to R500 Wire Feeder EUR/EUR+:



1. Connect the GX-R 10 pin cable adapter (1) to the peripheral connector.
2. R500 Wire Feeder EUR+: To use welding torch cleaning with compressed air, connect the compressed air hose (2) to the outlet connector.
3. Push the welding cable connector (3) to the Euro connector and hand-tighten the collar.
4. If you have the optional cooling unit, connect the cooling liquid hoses (4).

2.4 INSTALLATION ON HOLLOW-WRIST ROBOT

This section describes the installation of the collision sensor, cable pack, and welding torch on a hollow-wrist robot.

For instructions on connecting the cable pack to the welding equipment, refer to "Connecting to welding equipment" on page 24.

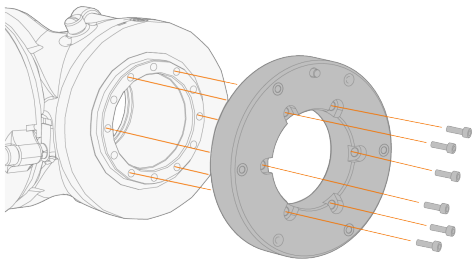
Before starting installation, ensure that the robot is in the zero position.

Do not exceed the specified torque values. Over-tightening may damage the fixing accessories.

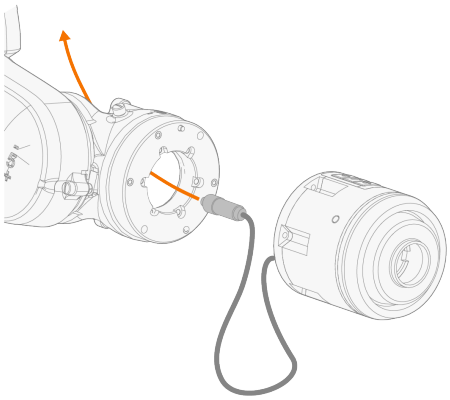
Tools needed:



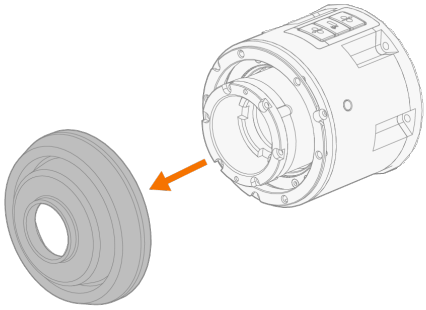
1. Install the adapter flange on the robot with the fixing screws. (For Nm torque, refer to the robot manufacturer's operating manual.)



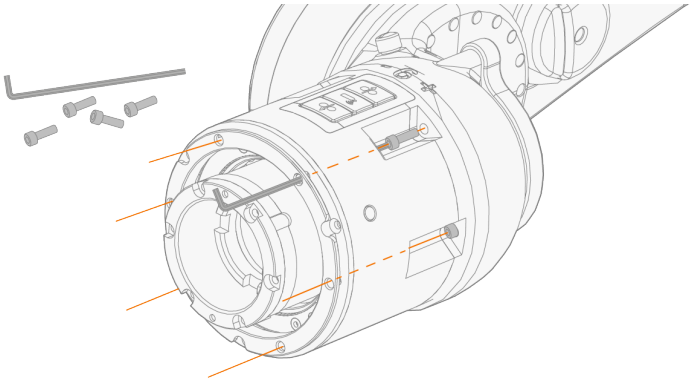
2. Route the collision sensor's control cable through the robot wrist.



3. Remove the collision sensor's protective cover before tightening the fixing screws in the next step.

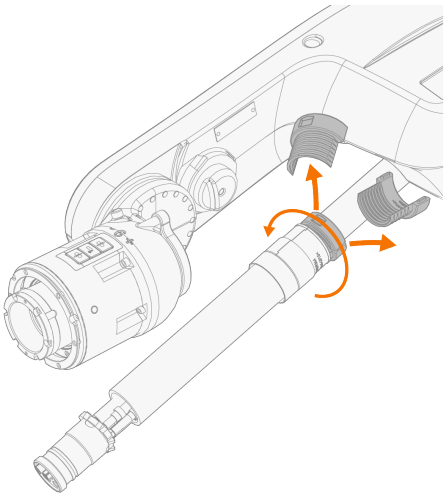


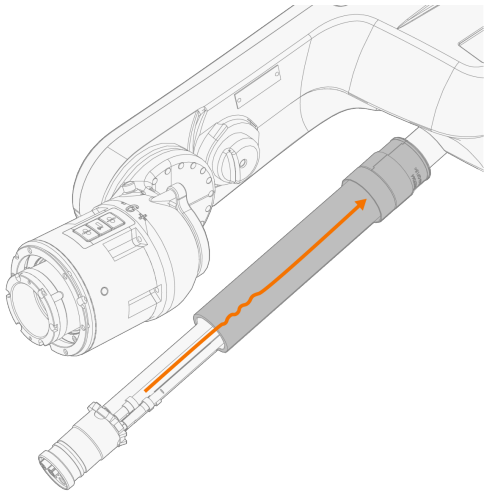
4. Attach the collision sensor to the adapter flange using the fixing screws. Tighten to a torque of 4 Nm.



The fixing screws can also be tightened from the side (there is no need to remove the protective cover), but the tightening method described above is preferable.

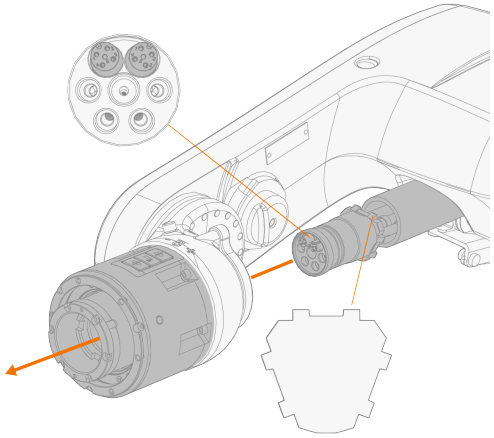
5. Loosen and detach the cable pack cover holder and slide the cover upward to uncover the collision sensor control cable, which will be connected in a later step.



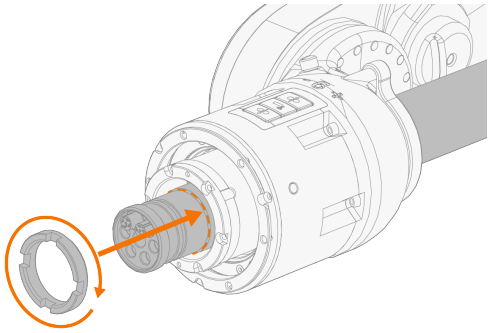


6. Attach the cable pack to the collision sensor.

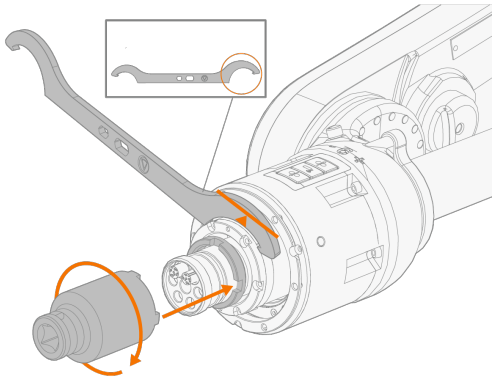
Note the correct position of the cable pack. The cable pack features outward-facing guiding angles that must align with the groove-like recesses on the collision sensor.



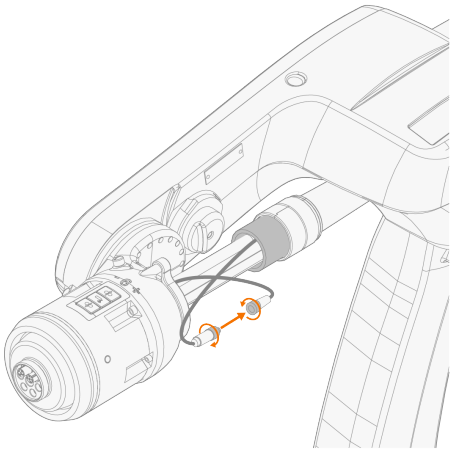
7. Secure the cable pack to the collision sensor with the retainer nut provided. Hand-tighten the retainer nut at this point.



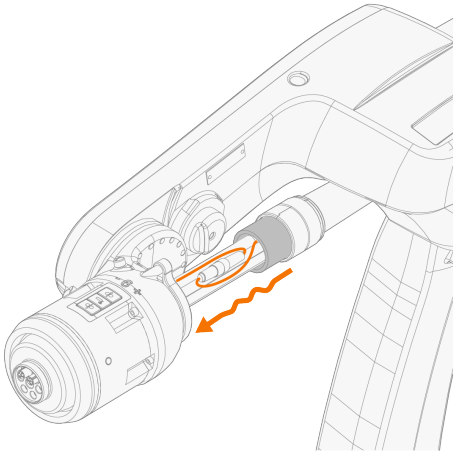
8. Place the larger end of the hook wrench into the groove on the collision sensor and hold the sensor to prevent it from turning. Tighten the retainer nut to a torque of 50 Nm with the tightening sleeve.



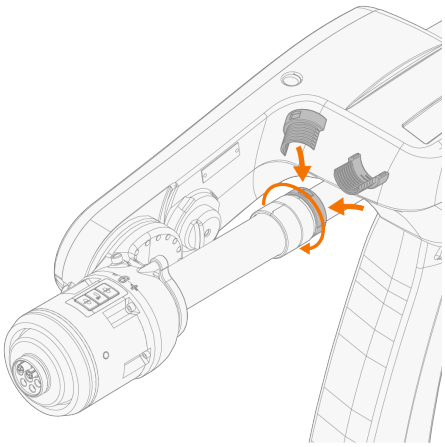
9. Connect the collision sensor control cable connectors between the collision sensor and the cable pack and tighten by turning.



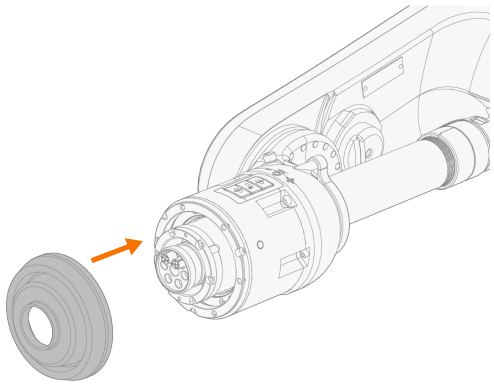
10. Bundle the excess length of the control cable into a neat loop and slide the cover back in place, making sure all cables are securely enclosed.



11. Replace the cover holder and hand-tighten.

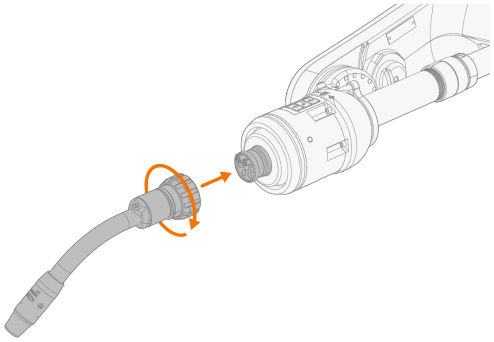


12. Reattach the collision sensor's protective cover.



13. If you want to use the wire brake, install it before connecting the welding torch. Refer to "Installing wire brake" on page 35.
14. Connect the welding torch to the cable pack and tighten the collar properly.

Before connecting, ensure that the connectors align correctly.



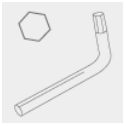
2.5 INSTALLATION ON NON-HOLLOW-WRIST ROBOT

This section describes the installation of the collision sensor, cable pack, and welding torch on a non-hollow-wrist robot.

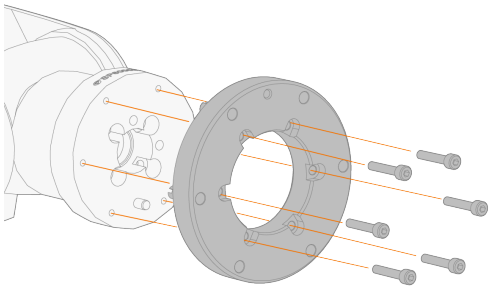
Before starting installation, ensure that the robot is in the zero position.

Do not exceed the specified torque values. Over-tightening may damage the fixing accessories.

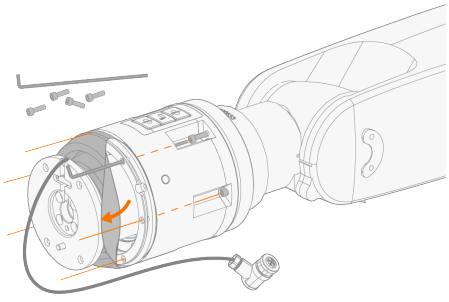
Tools needed:



1. Install the adapter flange on the robot with the fixing screws. (For Nm torque, refer to the robot manufacturer's operating manual.)

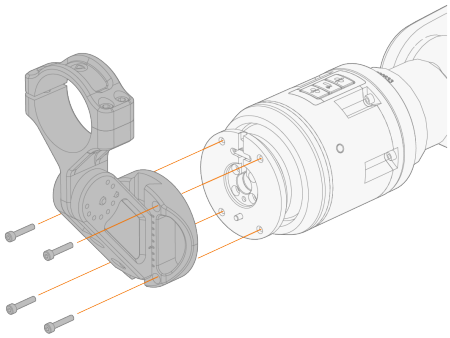


2. Lift the collision sensor's protective cover. Attach the collision sensor to the adapter flange using the fixing screws and tighten to a torque of 4 Nm.

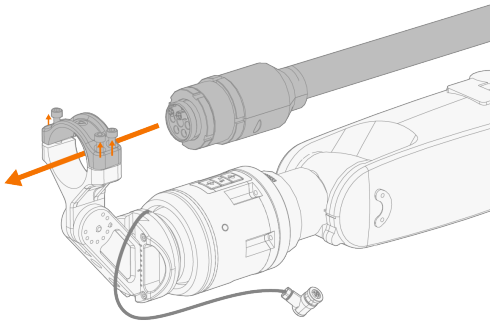


The fixing screws can also be tightened from the side (there is no need to lift the protective cover), but the tightening method described above is preferable.

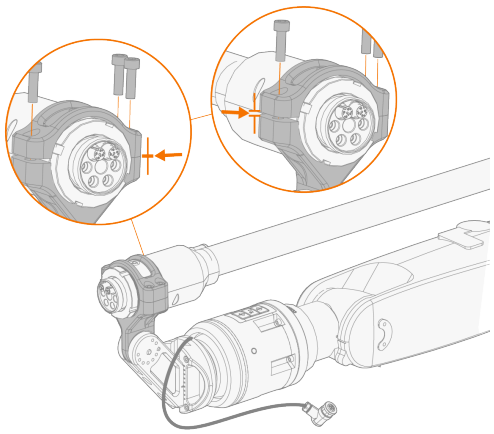
3. Replace the protective cover.
4. Install the mounting bracket on the collision sensor with the four fixing screws. Tighten to a torque of 4 Nm.



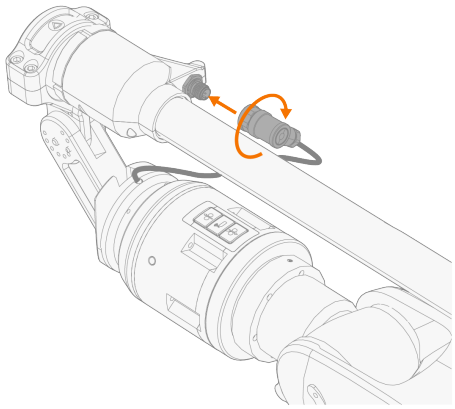
5. Loosen the holder's fixing screws, and install the cable pack in the holder.



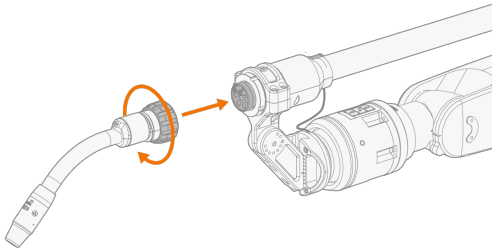
6. Tighten first the two fixing screws on the right, then the fixing screw on the left to a torque of 8 Nm.



7. Connect the collision sensor's control cable to the connector on the cable pack and hand-tighten it in place.



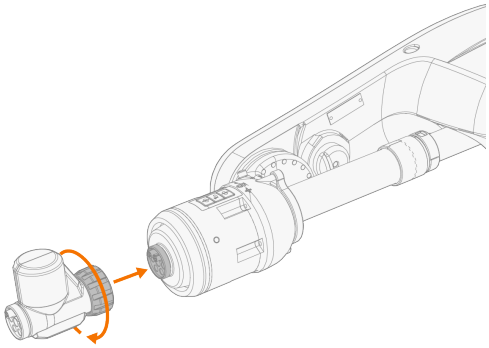
8. If you want to use the wire brake, install it before connecting the welding torch. Refer to "Installing wire brake" on the next page.
9. Connect the welding torch to the cable pack and tighten the collar properly.



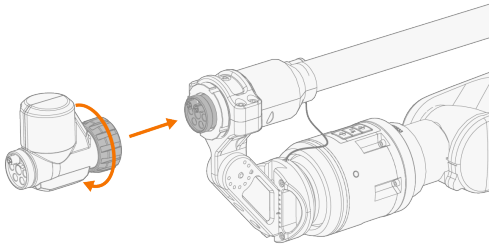
2.6 INSTALLING WIRE BRAKE

1. Connect the wire brake to the cable pack and tighten the collar.

Hollow-wrist robot

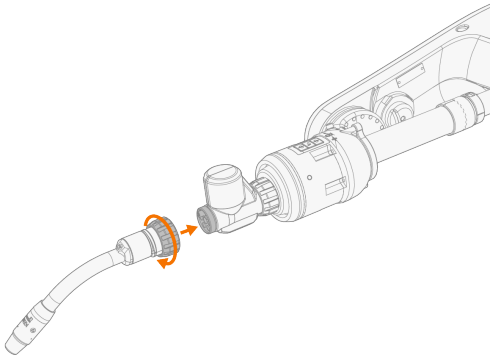


Non-hollow-wrist robot

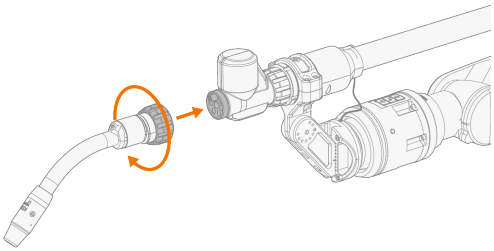


2. Connect the welding torch to the wire brake and tighten the collar.

Hollow-wrist robot

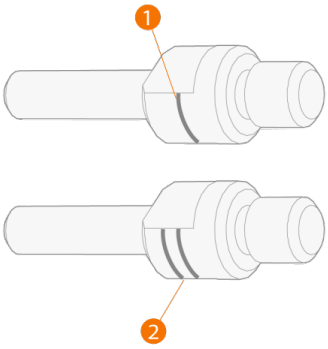


Non-hollow-wrist robot

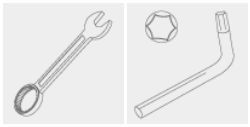


2.7 CHANGING WIRE BRAKE PISTON

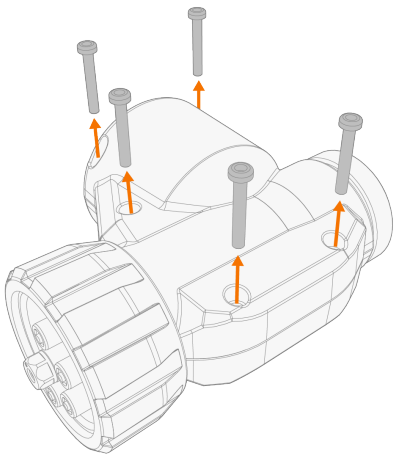
The wire brake comes with a pre-installed piston (1) for filler wire diameters of 0.8–1.2 mm. For 1.2–1.6 mm filler wires, replace the piston with the included alternative (2).



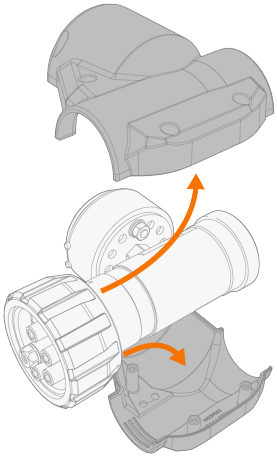
Tools needed:



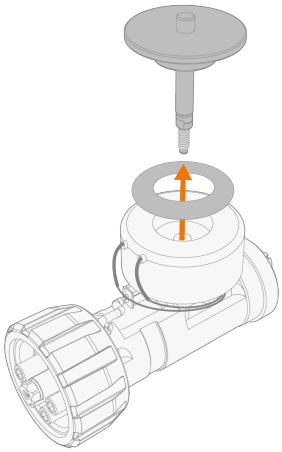
1. Unscrew the wire brake housing's fixing screws.



2. Remove the housing parts.

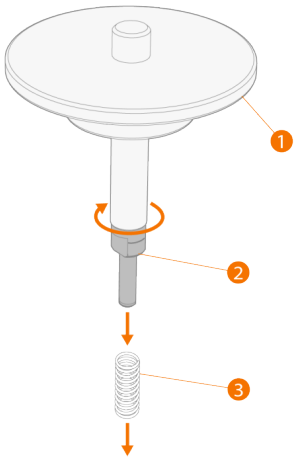


3. Detach the piston assembly and washer.

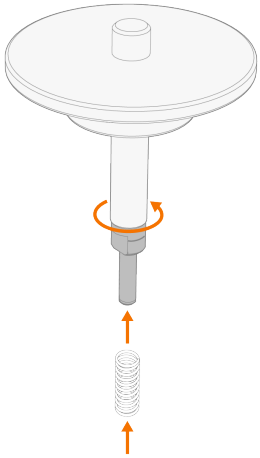


4. Detach the piston (2) from the holder (1) and remove the spring (3). (The same spring will be installed on the new piston.)

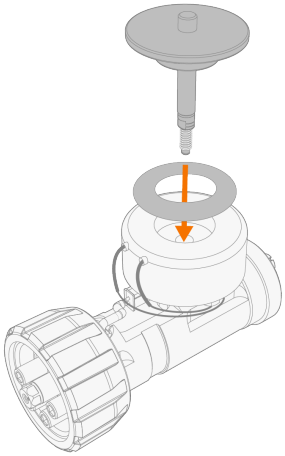
Save the piston for later use.



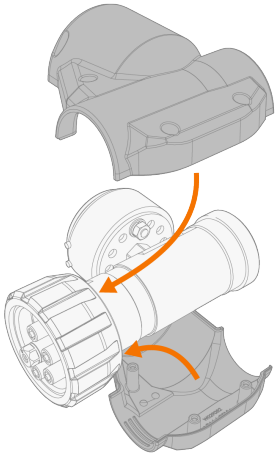
5. Insert the new piston into the holder and tighten it to a torque of 1.2 Nm. Install the spring on the piston.



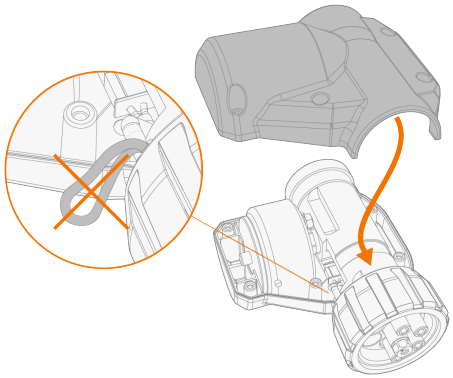
6. Put the piston assembly and washer back in place.



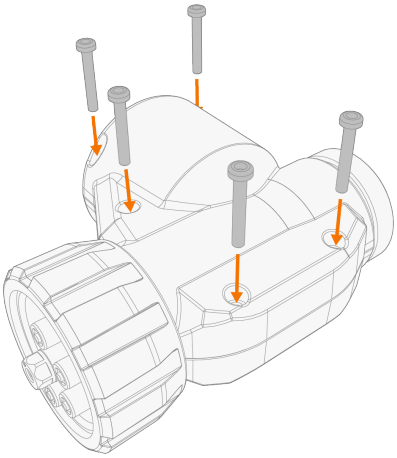
7. Reattach the housing parts.



Make sure that no cables get pinched between the edges.

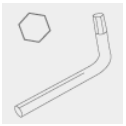


8. Tighten the fixing screws.

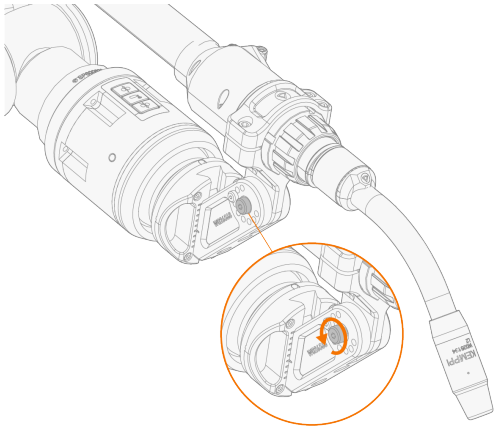


2.8 ADJUSTING WELDING TORCH ANGLE (NON-HOLLOW-WRIST ROBOT)

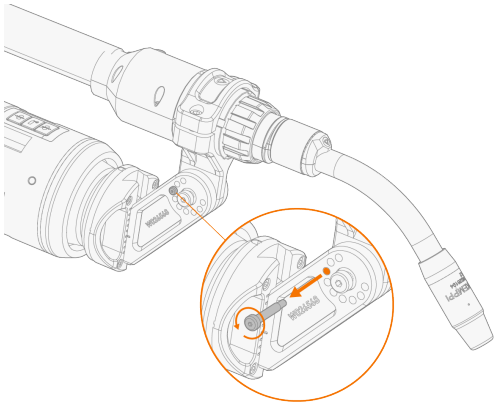
Tools needed:



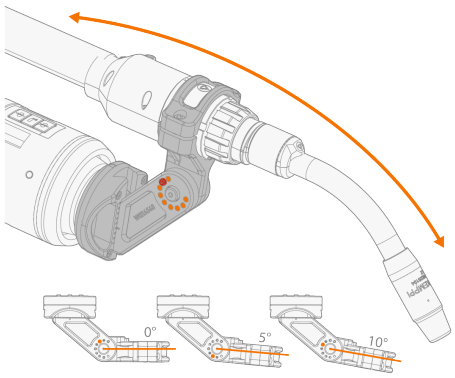
1. Loosen the holder's fixing screw.



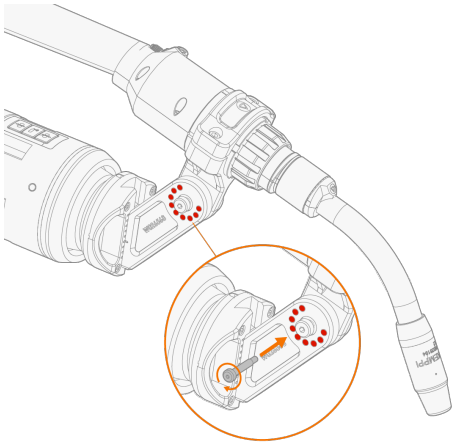
2. Remove the angle adjustment screw.



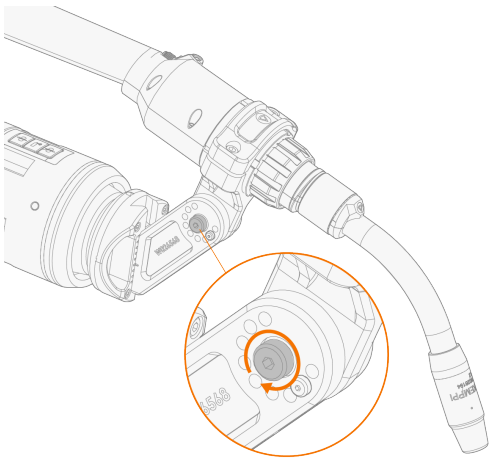
3. Find the correct angle. For more information, refer to "Bracket angles" on the next page.



4. Lock the angle by inserting the angle adjustment screw. Tighten to a torque of 0.5 Nm (or hand-tighten).



5. Tighten the holder's fixing screw to a torque of 30 Nm.

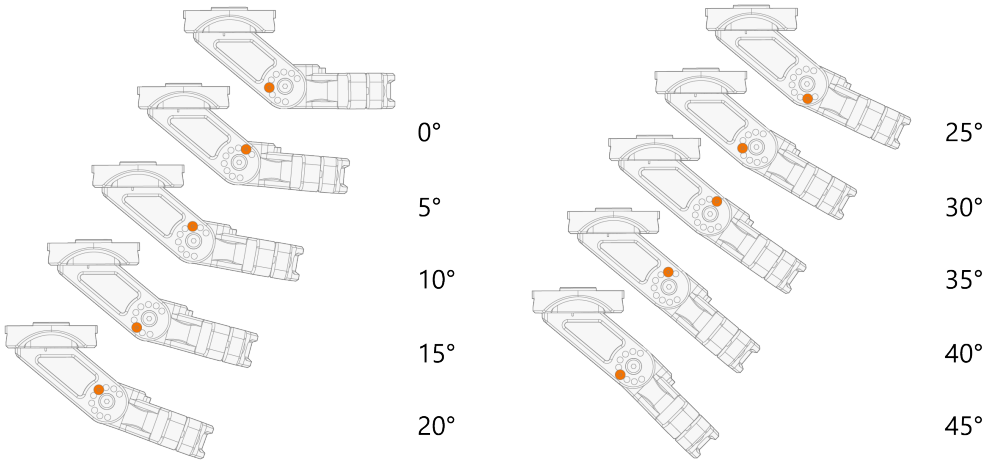


2.8.1 BRACKET ANGLES

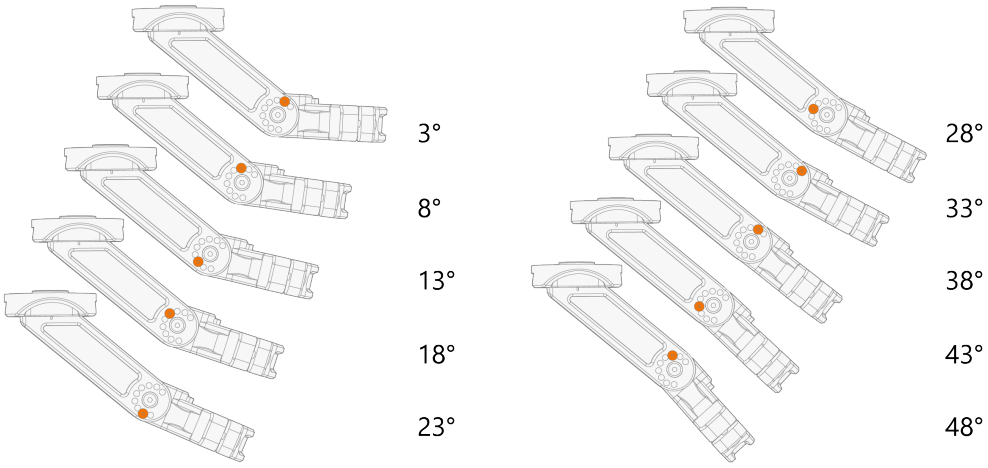
This section describes the locking positions of the angle adjustment screws for the different bracket angles.

The bracket angle is adjusted in 5° increments. Each increment has a dedicated screw locking position.

X-R Bracket S

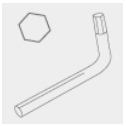


X-R Bracket M



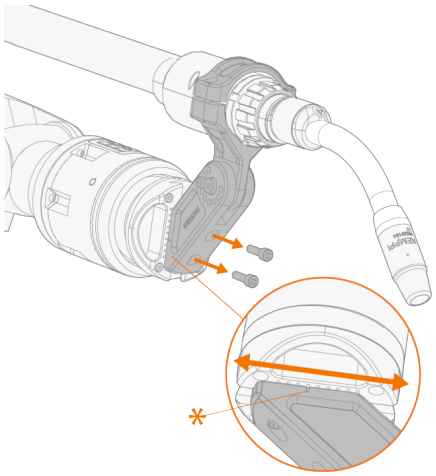
2.9 ADJUSTING WELDING TORCH POSITION (NON-HOLLOW-WRIST ROBOT)

Tools needed:

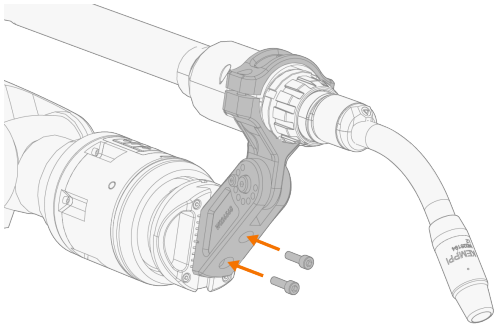


1. Remove the two fixing screws from the mounting bracket and slide the welding torch to the correct position.

The welding torch position is adjustable in 5 mm increments. Make sure the alignment mark (*) aligns with the scale mark.



2. Lock the position of the welding torch with the two fixing screws. Tighten to a torque of 8 Nm.

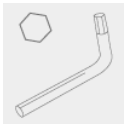


2.10 ALIGNING WELDING TORCH

For descriptions of the welding torch alignment tool parts, refer to "GX-R torch alignment tool" on page 15.

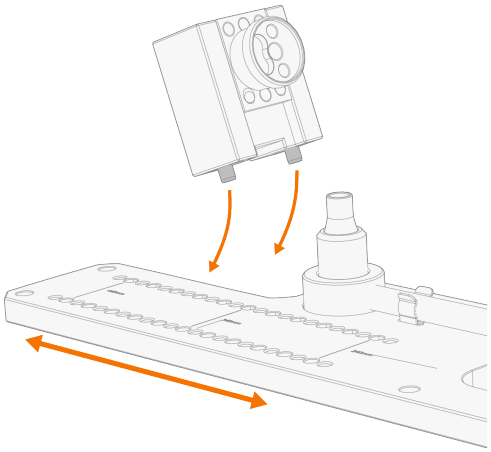
Before using the welding torch alignment tool, clean the welding torch from dust and spatter, as they cause wear and reduce alignment accuracy.

Tools needed:

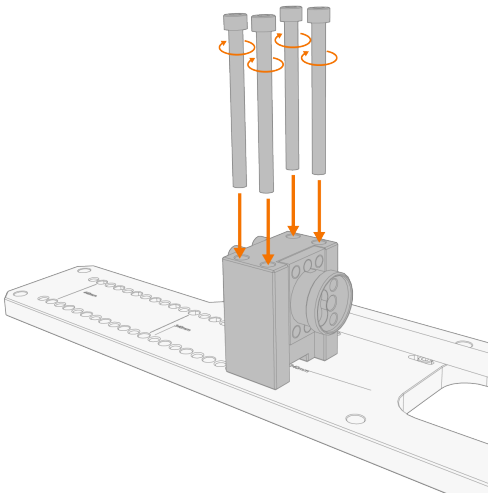




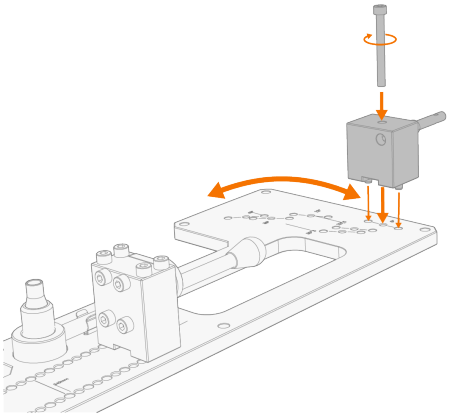
1. Secure the welding torch alignment tool on a stable surface to ensure measurement accuracy.
2. Position the welding torch holder according to the length of the welding torch.



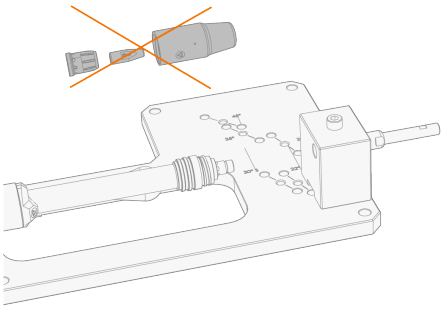
3. Secure with 4 bolts.



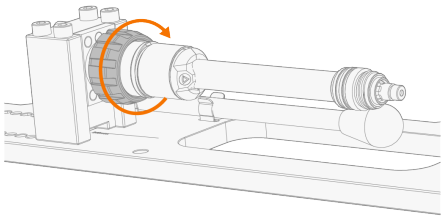
4. Position the alignment inspection tool according to the welding torch angle. Secure with the bolt.

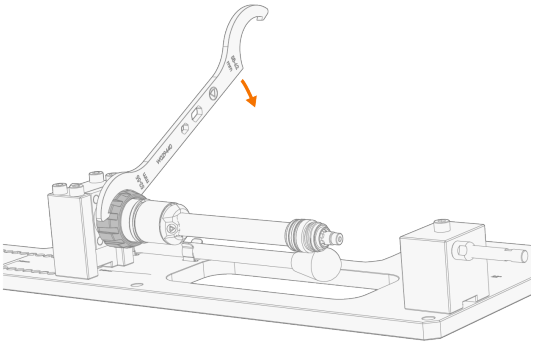


5. Remove the gas nozzle, contact tip and contact tip holder from the welding torch.

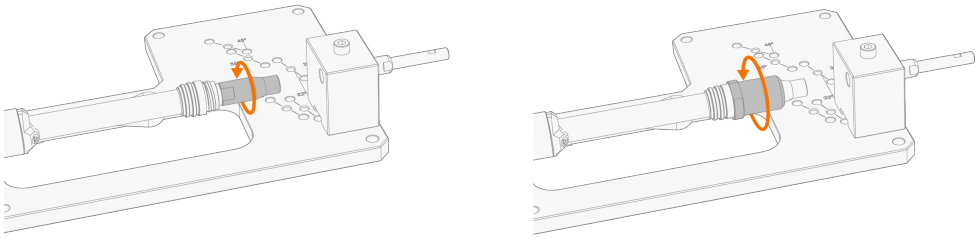


6. Place the welding torch into the welding torch holder and tighten properly by turning the collar clockwise.

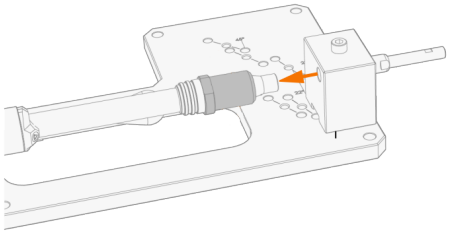




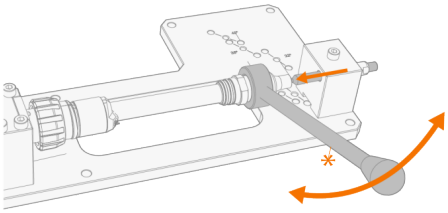
7. Attach the centering sleeve and bending sleeve to the welding torch.



8. Push the centering pin into the centering sleeve. If the centering pin does not enter the centering sleeve, alignment is required.



9. Bend the welding torch with the bending lever (*) until the centering pin goes into the centering sleeve smoothly. Now the welding torch is correctly aligned.



2.11 REPLACING COLLISION SENSOR SPRINGS

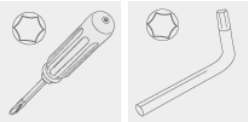
The collision sensor has four spring stiffness options. Replace the springs if different stiffness is required.

Spring stiffness	Color marking	X-R Sensor T1	X-R Sensor T2
Light	Green	○	○
Medium	Blue	●	○
Strong	Red	○	●
Extra strong	Yellow	○	○

● = The spring type pre-installed when delivered.

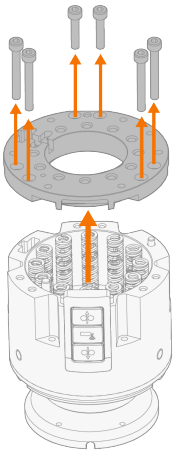
○ = Available.

Tools needed:



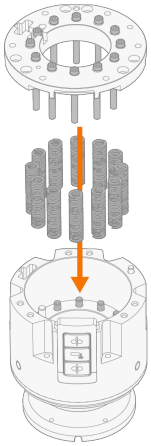
This replacement method applies to both X-R Sensor T1 and X-R Sensor T2, but the visual details may vary.

1. Remove the mounting plate fixing screws, mounting plate and springs.

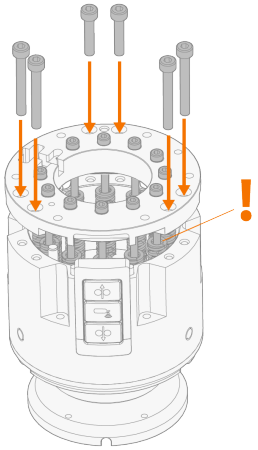


2. Install the new springs so that they align with the pins in the sensor.

Use suitable bolts to help align the springs.



3. Reattach the collision sensor's mounting plate and secure it with the fixing screws.



4. Remove the bolts you used to help align the springs.

2.12 WELDING EQUIPMENT FIRMWARE VERSIONS

⚠ *Ensure that the required firmware version is installed on your welding device.*

The following lists the required welding equipment firmware versions:

- AX MIG Welder
  >> R500 Wire Feeder HD EUR+: 1.00.00.0 or later.
  >> R500 Wire Feeder EUR: 1.14.00.0 or later and S/N C0009418 (A001 PCB W020545 -R04) or later.
  >> R500 Wire Feeder EUR+: 1.14.00.0 or later and S/N C0008277 (A001 PCB W020545-R04) or later.
  >> R500 Wire Feeder RH EUR+: 1.14.00.0 or later.
  >> AX Manager: 1.18.48.0 or later.

You can find the firmware version information in the AX Manager user interface: **Info - Device info**.

For more information on firmware and software updates, contact your local Kemppi dealer or go to Kemppi.-com.

3. OPERATION

Before using the equipment, ensure that all the necessary installation actions have been completed according to your equipment setup and instructions.

Welding is forbidden in places where there is an immediate fire or explosion hazard!

Welding fumes may cause injury. Take care to ensure sufficient ventilation during welding and wear respiratory protection!

Always check before use that all connection cables, shielding gas hose, earth return lead/clamp and mains cable are in serviceable condition. Ensure that the connectors are correctly fastened. Loose connectors can impair welding performance and damage connectors.

4. MAINTENANCE

When planning routine maintenance, consider the operating frequency of the welding equipment and the working environment.

Correct operation of the welding equipment and regular maintenance helps you avoid unnecessary down-time and equipment failure. Mainly due to the high temperatures, MIG welding torches require regular checks and maintenance. Periodically, check the cables set for damage and ensure connections are tightened correctly.

Daily maintenance

⚠ *Disconnect the power source from the mains power supply before handling electrical cables.*

- Check regularly that all the components are tightly fastened.
- Check that the current transfer surface on the Kemppi torch adapter is clean and unscratched, and the connector pins are straight and undamaged.
- Check the protective hose on the cable for damage.
- Check the O-rings in the welding cable's welding torch connector and welding torch gas connector for wear and damage.
- Clean dust from the liner with pressurized air every time you change the wire spool, or every day during heavy use.
- Check and remove any spatter build-up from the nozzle.

For repairs, contact your Kemppi dealer.

Periodic maintenance

⚠ *Only qualified service personnel are allowed to carry out periodic maintenance.*

Check the electrical connectors of the unit at least every six months. Clean oxidized parts and tighten loose connectors.

ⓘ *Use the correct tension torque when fastening loose parts.*

ⓘ *Do not use pressure washing devices.*

Service workshops

Kemppi Service Workshops complete the welding system maintenance according to the Kemppi service agreement.

The main aspects in the service workshop maintenance procedure are:

- Cleanup of the machine
- Maintenance of the welding tools
- Checkup of the connectors and switches
- Checkup of all electric connections
- Checkup of the power source mains cable and plug
- Repair of defective parts and replacement of defective components
- Maintenance test
- Test and calibration of operation and performance values when needed.

Find your closest service workshop at Kemppi website.

4.1 TROUBLESHOOTING

The problems and the possible causes listed are not definitive, but suggest some typical situations that may turn up during normal use of the welding system. For further information and assistance, contact your nearest Kemppi service workshop.

General:

The welding system does not power up

- Check that the mains cable is plugged in properly.
- Check that the mains switch of the power source is at the ON position.
- Check that the mains power distribution is on.
- Check the mains fuse and/or the circuit breaker.
- Check that the earth return cable is connected.

The welding system stops working

- The torch may have overheated. Wait for it to cool down.
- Check that none of the cables is loose.
- The wire feeder may have overheated. Wait for it to cool down and see that the welding current cable is properly attached.
- The power source may have overheated. Wait for it to cool down and see that the cooling fans work properly and the air flow is unobstructed.

Wire feeder:

The filler wire on the spool unravels

- Check that the spool locking cover is closed.

The wire feeder does not feed the filler wire

- Check that the filler wire has not run out.
- Check that the filler wire is properly routed through the feed rolls to the wire liner.
- Check that the pressure handle is properly closed.
- Check that the feed roll pressure is adjusted correctly for the filler wire.
- Blow compressed air through the wire liner to check that it is not blocked.

Welding torch:

The wire burns into the contact tip

- Make sure the size and type of the current tip and liner are suitable for the filler wire.
- Make sure the wire liner is clean.
- Make sure the wire liner does not make any steep loops.
- Check the motor current level. If the current is too high, there may be problems in the wire liner.
- Check the tightness of the feeding rolls. Too tight feeding rolls may affect soft filler wires, such as aluminum and flux-cored wires.

The torch overheats

- Make sure the torch neck is correctly connected to the handle.
- Make sure that the contact tip adapter is properly hand-tightened and the contact tip properly attached to it.
- Make sure that the welding parameters are within the range of the welding torch and the neck. The torch and the neck have separate limits for the maximum current; the lower one of these is the maximum current that can be used.

The torch neck overheats

- Make sure you are using original Kemppi consumable and spare parts. Incorrect spare part materials may cause the overheating of the neck.

The welding torch connector overheats

- Make sure the connector is properly connected to the wire feeder.
- Make sure the current transfer surface and the connector pins of the torch connector are clean and undamaged.

The torch vibrates too much during welding

- Check the tightness of the contact tip adapter and contact tip.
- Check the motor current.
- Check the wire liner (e.g. for dirt and to ensure that the wire liner has been cut properly).
- Check the filler wire. It must be straight and start coiling when it comes out from the contact tip. If not, check the tightness of the feeding rolls.
- Check the filler wire batch for any quality issues with the wire.

Weld quality:

Dirty and/or poor weld quality

- Check that the shielding gas has not run out.
- Check that the shielding gas flow is unobstructed.
- Check that the gas type is correct for the application.
- Check the polarity of the torch/electrode.
- Check that the welding procedure is correct for the application.

Varying welding performance

- Check that the wire feed mechanism is adjusted properly.
- Blow compressed air through the wire liner to check that it is not blocked.
- Check that the wire liner is correct for the selected wire size and type.
- Check the welding torch contact tip's size, type and wear.
- Check that the welding torch is not overheating.
- Check that the earth return clamp is properly attached to a clean surface of the workpiece.

High spatter volume

- Check the welding parameter values and welding procedure.
- Check the gas type and flow.
- Check the polarity of the torch/electrode.
- Check that the filler wire is correct for the current application.

4.2 DISPOSAL



Do not dispose of any electrical equipment with normal waste!

In observance of WEEE Directive 2012/19/EU on waste of electrical and electronic equipment and European Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment, and their implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and taken to an appropriate environmentally responsible recycling facility. The owner of the equipment is obliged to deliver a decommissioned unit to a regional collection center, as per the instructions of local authorities or a Kemppi representative. By applying these European Directives you improve the environment and human health.

For more information:



5. TECHNICAL DATA

"Technical data: GX-R Torch 400G (gas-cooled)" on page 59
"Technical data: GX-R Torch 400G S50 (gas-cooled)" on page 60
"Technical data: GX-R Torch 500W (water-cooled)" on page 61
"Technical data: GX-R Torch 500W S50 (water-cooled)" on page 62
"GX-R welding torch dimensions" on the next page
"Technical data: GX-R Cable T1 G (gas-cooled)" on page 63
"Technical data: GX-R Cable T1 S G (gas-cooled)" on page 64
"Technical data: GX-R Cable T1 W (water-cooled)" on page 65
"Technical data: GX-R Cable T1 S W (water-cooled)" on page 66
"Technical data: GX-R Cable T2 G (gas-cooled)" on page 67
"Technical data: GX-R Cable T2 W (water-cooled)" on page 68
"Technical data: X-R Sensor T1" on page 69
"Technical data: X-R Sensor T2" on page 70
"Technical data: GX-R Wire Brake" on page 71
"Component selection" on page 72
"Ordering information" on page 73

For more information, refer to Kemppi.com.

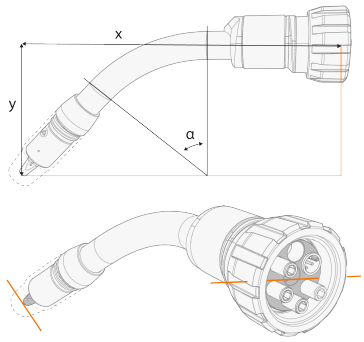
5.1 GX-R WELDING TORCH DIMENSIONS

The GX-R welding torches are available in different neck lengths, heights, and angles.

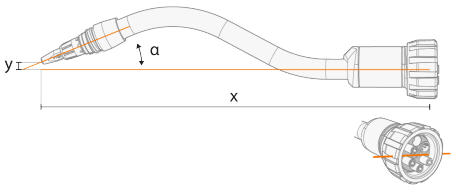
Model name	Length (mm) *x*	Height (mm) *y*	Angle (degrees) *α*	Weight (g)
GX-R TORCH 500W 240MM 0D	268	0	0	667
GX-R TORCH 500W 240MM 22D	256.9	59.8	22	667
GX-R TORCH 500W 240MM 35D	243.6	84.6	35	667
GX-R TORCH 500W 240MM 45D	232.3	98.2	45	667
GX-R TORCH 500W 340MM 0D	368	0	0	838
GX-R TORCH 500W 340MM 22D	356.9	59.8	22	838
GX-R TORCH 500W 340MM 35D	343.6	84.6	35	838
GX-R TORCH 500W 340MM 45D	332.3	98.2	45	838
GX-R TORCH 500W 440MM 0D	468	0	0	1004
GX-R TORCH 500W 440MM 22D	456.9	59.8	22	1004
GX-R TORCH 500W 440MM 35D	443.6	84.6	35	1004
GX-R TORCH 500W 440MM 45D	432.3	98.2	45	1004
GX-R TORCH 400G 240MM 0D	268	0	0	651
GX-R TORCH 400G 240MM 22D	256.9	59.8	22	651
GX-R TORCH 400G 240MM 35D	243.6	84.6	35	651
GX-R TORCH 400G 240MM 45D	232.3	98.2	45	651
GX-R TORCH 400G 340MM 0D	368	0	0	803
GX-R TORCH 400G 340MM 22D	356.9	59.8	22	803
GX-R TORCH 400G 340MM 35D	343.6	84.6	35	803
GX-R TORCH 400G 340MM 45D	332.3	98.2	45	803
GX-R TORCH 400G 440MM 0D	468	0	0	950
GX-R TORCH 400G 440MM 22D	456.9	59.8	22	950
GX-R TORCH 400G 440MM 35D	443.6	84.6	35	950
GX-R TORCH 400G 440MM 45D	432.3	98.2	45	950
GX-R TORCH 500W 340MM 22D S50	350.5	5.7	22	838
GX-R TORCH 500W 440MM 22D S50	442.2	7.6	22	1004
GX-R TORCH 500W 440MM 30D S50	450.5	5.7	30	1004
GX-R TORCH 400G 340MM 22D S50	350.5	5.7	30	803
GX-R TORCH 400G 440MM 22D S50	442.2	7.6	22	950
GX-R TORCH 400G 440MM 30D S50	450.5	5.7	30	950

The following figures illustrate the measurement points for GX-R welding torch dimensions.

GX-R



GX-R S



5.2 TECHNICAL DATA: GX-R TORCH 400G (GAS-COOLED)

GX-R Torch 400G	
Feature	Value
Type of cooling	Air
Contact tip	M10X1
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	400 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8...1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, MC/FC	0.9...1.6 mm
Filler wire diameter, Al	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Neck type	Changeable
Remote control	No
LED light	No
Compressed air line for neck cleaning	Yes
Gas nozzle sensing	Yes
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.3 TECHNICAL DATA: GX-R TORCH 400G S50 (GAS-COOLED)

GX-R Torch 400G S50	
Feature	Value
Type of cooling	Air
Contact tip	M10X1
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	400 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8... 1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, MC/FC	0.9...1.6 mm
Filler wire diameter, Al	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Neck type	Changeable, Double bend
Remote control	No
LED light	No
Compressed air line for neck cleaning	Yes
Gas nozzle sensing	Yes
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.4 TECHNICAL DATA: GX-R TORCH 500W (WATER-COOLED)

GX-R Torch 500W	
Feature	Value
Type of cooling	Liquid
Contact tip	M10X1
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	500 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8...1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, MC/FC	0.8...1.6 mm
Filler wire diameter, Al	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Coolant flow rate	1 l/min
Minimum cooling power at 1 l/min	0.9 kW
Maximum coolant pressure	5 Bar
Neck type	Changeable
Remote control	No
LED light	No
Compressed air line for neck cleaning	Yes
Gas nozzle sensing	Yes
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.5 TECHNICAL DATA: GX-R TORCH 500W S50 (WATER-COOLED)

GX-R Torch 500W S50	
Feature	Value
Type of cooling	Liquid
Contact tip	M10X1
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	500 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8...1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, MC/FC	0.9...1.6 mm
Filler wire diameter, Al	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Coolant flow rate	1 l/min
Minimum cooling power at 1 l/min	0.9 kW
Maximum coolant pressure	5 Bar
Neck type	Changeable, Double bend
Remote control	No
LED light	No
Compressed air line for neck cleaning	Yes
Gas nozzle sensing	Yes
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.6 TECHNICAL DATA: GX-R CABLE T1 G (GAS-COOLED)

GX-R Cable T1 G	
Feature	Value
Welding connection type	Euro
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	400 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8...1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.7 TECHNICAL DATA: GX-R CABLE T1 S G (GAS-COOLED)

GX-R Cable T1 S G	
Feature	Value
Welding connection type	Euro
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	400 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8...1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.8 TECHNICAL DATA: GX-R CABLE T1 W (WATER-COOLED)

GX-R Cable T1 W	
Feature	Value
Welding connection type	Euro
Type of cooling	Liquid
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	500 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8...1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Coolant flow rate	1 l/min
Cooling power at 1 l/min	0.9 kW
Maximum coolant pressure	5 Bar
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.9 TECHNICAL DATA: GX-R CABLE T1 S W (WATER-COOLED)

GX-R Cable T1 S W	
Feature	Value
Welding connection type	Euro
Type of cooling	Liquid
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	500 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8...1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Coolant flow rate	1 l/min
Cooling power at 1 l/min	0.9 kW
Maximum coolant pressure	5 Bar
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.10 TECHNICAL DATA: GX-R CABLE T2 G (GAS-COOLED)

GX-R Cable T2 G	
Feature	Value
Welding connection type	Euro
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	400 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8...1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.11 TECHNICAL DATA: GX-R CABLE T2 W (WATER-COOLED)

GX-R Cable T2 W	
Feature	Value
Welding connection type	Euro
Type of cooling	Liquid
Method of guidance	Mechanical
Load capacity 100% / Ar + 18% CO2	500 A
Load capacity test, filler wire material	Fe
Load capacity test, filler wire diameter	1.6 mm
Load capacity test, stick out length	22 mm
Filler wire diameter	0.8...1.6 mm
Filler wire diameter, Fe	0.8...1.6 mm
Filler wire diameter, Ss	0.8...1.6 mm
Filler wire diameter, Fe-MC/FC	0.9...1.6 mm
Filler wire diameter, Ss-MC/FC	0.9...1.6 mm
Coolant flow rate	1 l/min
Cooling power at 1 l/min	0.9 kW
Maximum coolant pressure	5 Bar
Operating temperature range	-20...40 °C
Storage temperature range	-40...60 °C
Standards	IEC 60974-7

5.12 TECHNICAL DATA: X-R SENSOR T1

X-R Sensor T1	
Feature	Value
Rating of electrical components (remote, nominal)	24 V
Rating of electrical components (remote, nominal)	10 mA
Remote control	Yes
Weight	1306 g
Length	115 mm

5.13 TECHNICAL DATA: X-R SENSOR T2

X-R Sensor T2	
Feature	Value
Rating of electrical components (remote, nominal)	24 V
Rating of electrical components (remote, nominal)	10 mA
Remote control	Yes
Weight	1457 g
Length	119 mm

5.14 TECHNICAL DATA: GX-R WIRE BRAKE

GX-R Wire Brake G

GX-R Wire Brake G	
Feature	Value
Type of cooling	Air
Rating of electrical components (remote, nominal)	24 V
Weight	955 g
Length	100 mm

GX-R Wire Brake W

GX-R Wire Brake W	
Feature	Value
Type of cooling	Liquid
Rating of electrical components (remote, nominal)	24 V
Weight	902 g
Length	100 mm

5.15 COMPONENT SELECTION

The following lists the gas nozzles suitable for the GX-R welding torches.

Gas nozzle	Ordering code
Thread, L60 HD / Conical / OD28 / D15 	W021182
Thread, L62 HD / Conical / OD28 / D15 	W026194
Thread, L64 HD / Conical / OD28 / D17 	W021186
Thread, L60 HD / Straight / OD28 / D21 	W026133
Thread, L64 HD / Straight / OD28 / D21 	W026208

The markings stand for: D = diameter (inner diameter of the gas nozzle tip), L = length, OD = outer diameter (at the widest point).



5.16 ORDERING INFORMATION

For ordering information, refer to Kemppi.com.