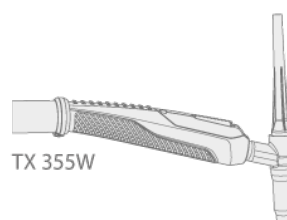
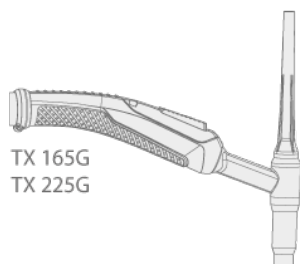
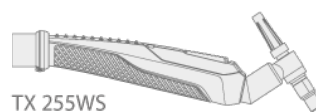
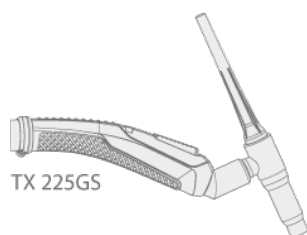
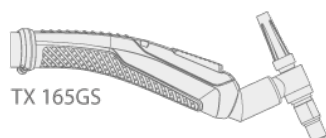
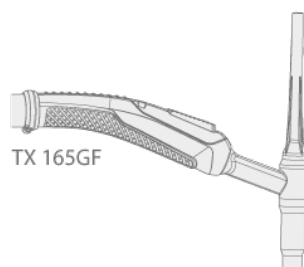
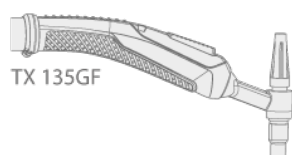


FLEXLiTE TX

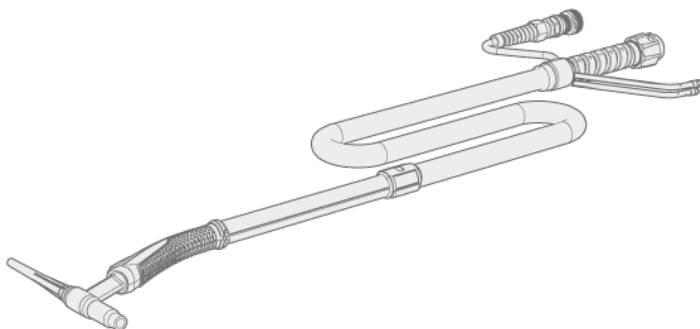


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1. FLEXLITE TX

These instructions describe the use of Kemppi's Flexlite TX TIG welding torches. Flexlite TX torches are designed for manual welding in demanding industrial use and they are compatible with Kemppi TIG welding equipment with 7-pin connectors. Flexlite TX range covers both, water-cooled and gas-cooled models.



Important notes

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

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.



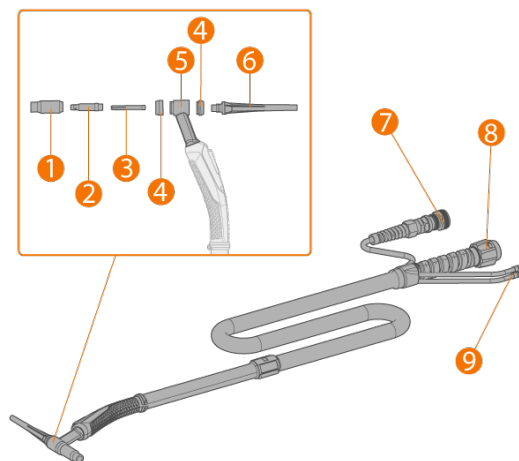
Warning: Describes a potentially dangerous situation. If not avoided, it will result in personal damage or fatal injury.

DISCLAIMER

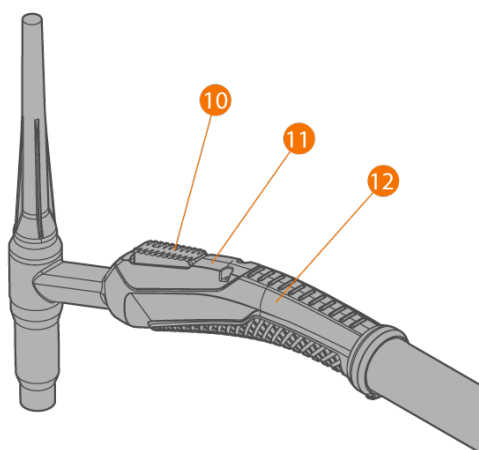
While every effort has been made to ensure that the information contained in this guide is accurate and complete, no liability can be accepted for any errors or omissions. Kemppi reserves the right to change the specification of the product described at any time without prior notice. Do not copy, record, reproduce or transmit the contents of this guide without prior permission from Kemppi.

2. ABOUT EQUIPMENT

The Flexlite TX TIG welding torches are packed with features designed to support professional welding. The equipment consists of:



1. Gas nozzle
2. Collet body
3. Collet
4. Insulating ring*
5. Torch body
6. Electrode back cap
7. Control cable connection (start and remote signals)
8. Welding cable connection (shielding gas and welding current)
9. Coolant outlet and inlet hose connectors (water-cooled models only)



10. ON/OFF switch
11. Switch cover
12. Torch handle

* Some Flexlite TX torch models also include a back cap insulating ring, in addition to the gas nozzle insulating ring.



Dedicated lens models of the collet body and the gas nozzle exist for laminar flow welding. Bigger lens consumables require an additional insulating ring.

EQUIPMENT IDENTIFICATION

Serial number

Serial number of the device is marked on the rating plate or in another distinctive location on the device. It is important to make correct reference to the serial number of the product when ordering spare parts or making repairs for example.

Quick Response (QR) code

The serial number and other device-related identification information may also be saved in the form of a QR code (or a barcode) on the device. Such code can be read by a smartphone camera or with a dedicated code reader device providing fast access to the device-specific information.

3. INSTALLATION



Ensure that the welding equipment is not connected to the mains or that the welding torch is not connected to the welding machine at this stage.



Protect the equipment from rain and direct sunshine.

"Assembling torch" below

"Installing torch remote" on the next page

"Connecting torch" on page 10

Before installation and use

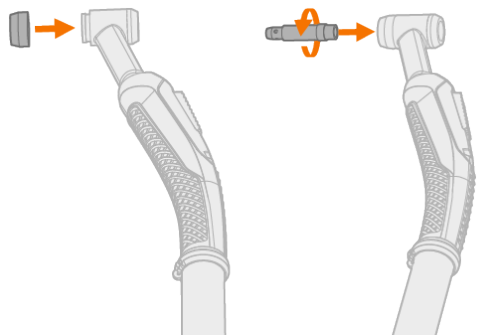
Ensure compliance with your local and national safety requirements regarding the installation and use of high voltage units.

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

Do not connect welding equipment to the mains before the installation is complete.

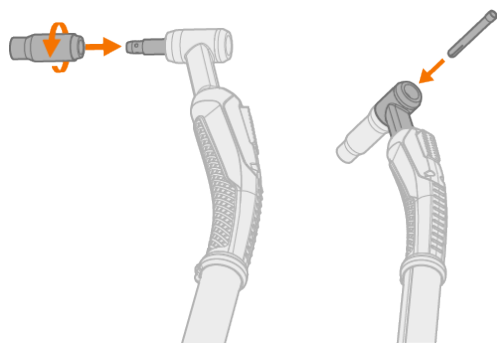
3.1 Assembling torch

1. Depending on your specific welding torch setup, assemble the torch starting with the insulating ring and collet body.

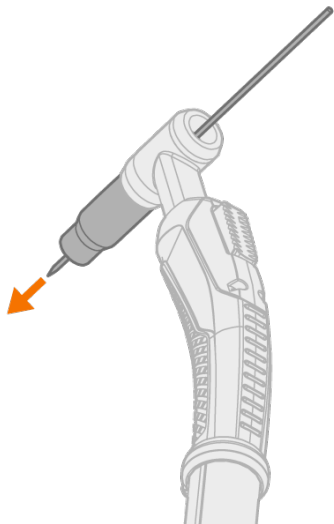


Some Flexlite TX torch models also include a back cap insulating ring, in addition to the gas nozzle insulating ring.

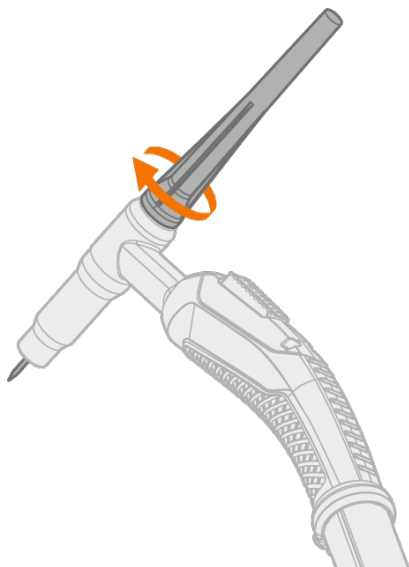
2. Install the gas nozzle and the collet.



3. Prior to installing the tungsten electrode, grind the electrode tip to the appropriate dimensions for your welding application. For more information, refer to the section "Electrode tip" on page 14.
4. Push the electrode into the torch and through the collet and gas nozzle.



5. Install the electrode back cap. Tightening the back cap also locks the electrode in place.



Do not use excessive force. Overtightening may damage the torch components.



By loosening the electrode back cap, the electrode can be installed also by pushing it into the torch from the other side.

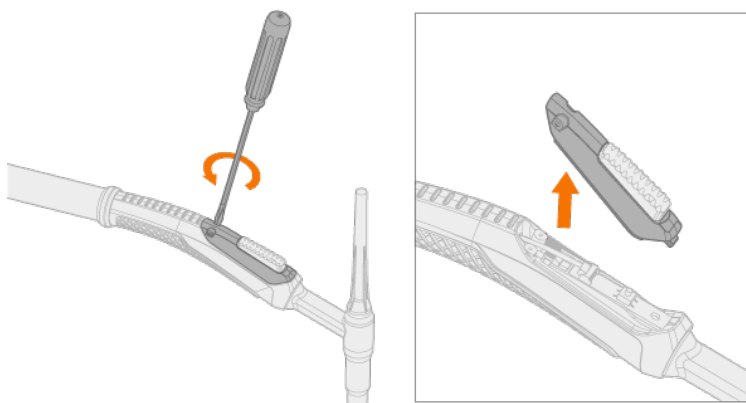
3.2 Installing torch remote

Many Flexlite TX welding torches are equipped as standard with ON/OFF start/stop switches. Optional remote control devices can be fitted to these TX torch models, allowing both start/stop function and welding current adjustment.

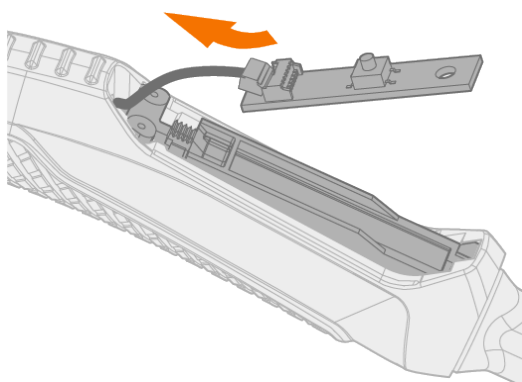


Ensure that the welding equipment is not connected to the mains or that the welding torch is not connected to the welding machine at this stage.

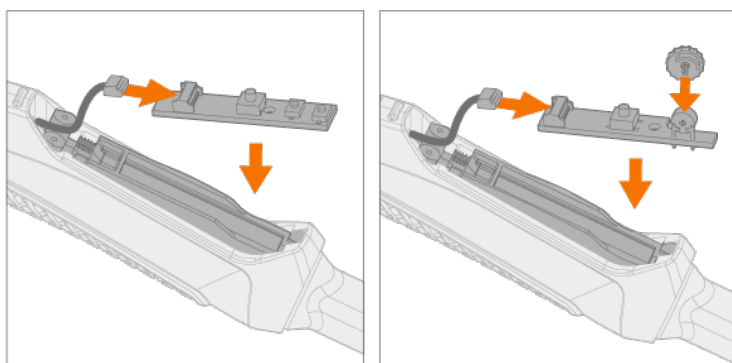
1. Open the switch cover by releasing the screws in the rear section of the cover and remove the cover.



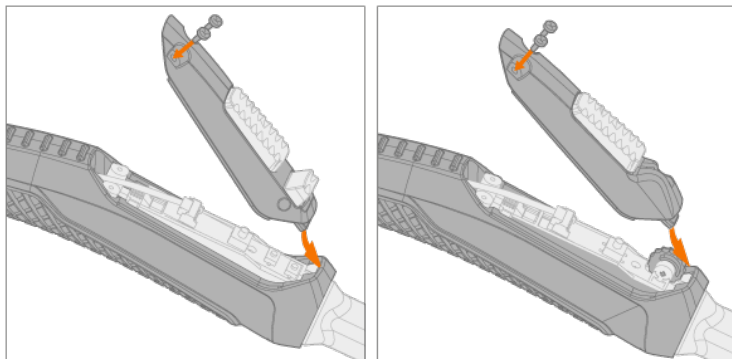
2. Take the existing circuit board out of its slot in the handle and unplug the connector.



3. Connect the torch remote control circuit board to the connector and place it in its slot in the handle. (Rocker switch model shown on the left and roller switch model on the right:)



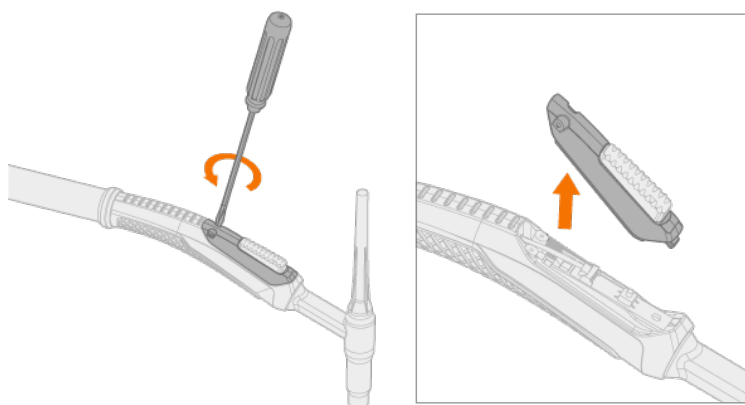
4. Install the new switch cover by placing the front end of the cover in first and then pushing the rear end of the cover down. (Rocker switch model shown on the left and roller switch model on the right)



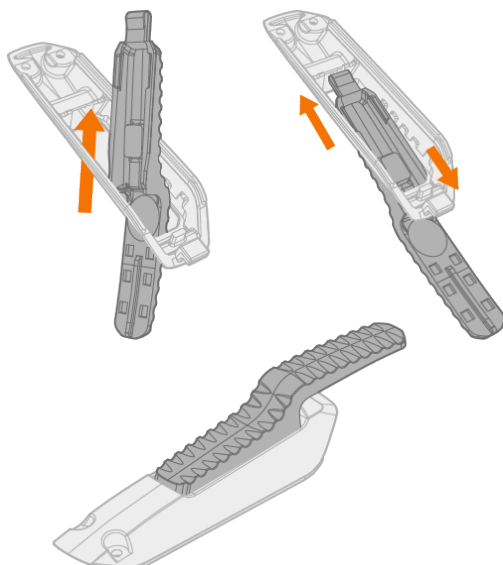
5. Secure the switch cover in place with the two screws in the rear section of the cover.

Start switch extension (For use with the standard ON/OFF switch only):

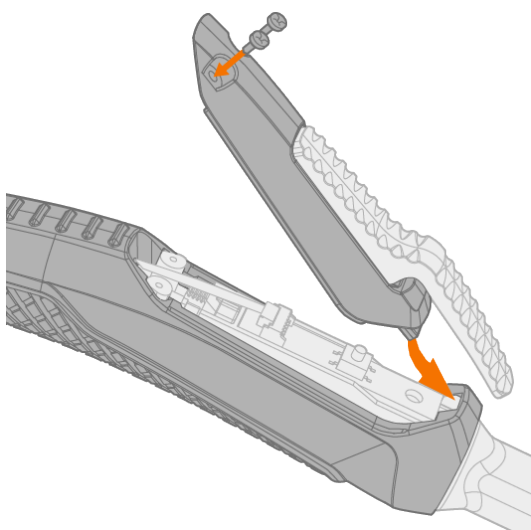
1. Open the switch cover by releasing the screws in the rear section of the cover and remove the cover.



2. Replace the standard start switch button on the cover with the extended start switch button.



3. Install the cover with the start switch extension in place.



4. Secure the switch cover in place with the two screws in the rear section of the cover.



The switch extension cannot be used with the S neck TX torch models.

3.3 Connecting torch



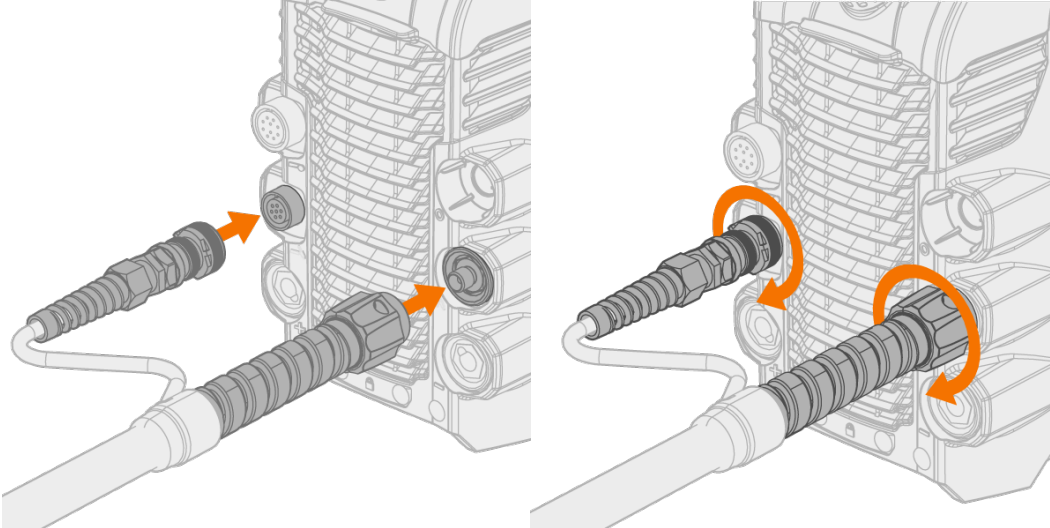
Hand tighten the torch connectors. Loose connectors may overheat, create contact disturbances, mechanical damage and water or gas leakage.



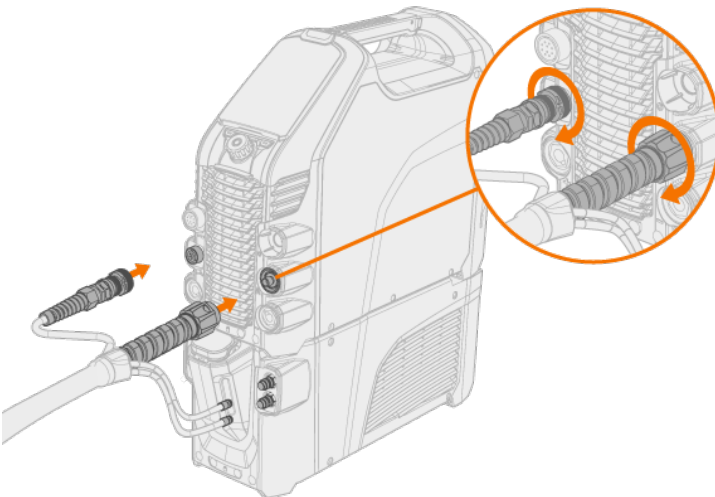
For connecting the torch (and applicable extension parts), refer also to your welding equipment's instructions.

Gas-cooled TIG torch:

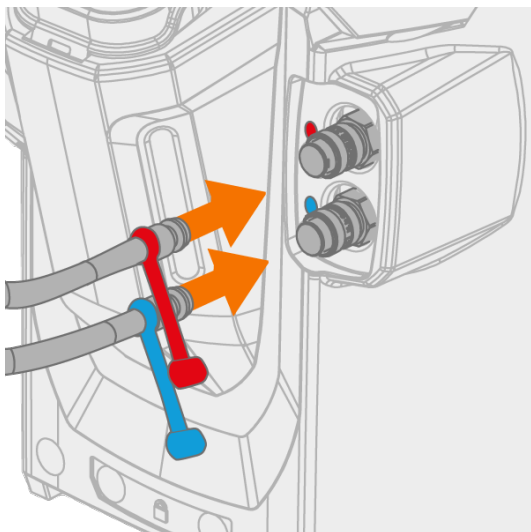
1. Connect the welding cable and the control cable to the power source. Secure by turning the connectors clockwise.

**Water-cooled TIG torch:**

1. Connect the welding cable and the control cable to the power source. Secure by turning the connectors clockwise.







2. Connect the coolant inlet and outlet hoses to the cooling unit. Note that the connectors are color-coded.



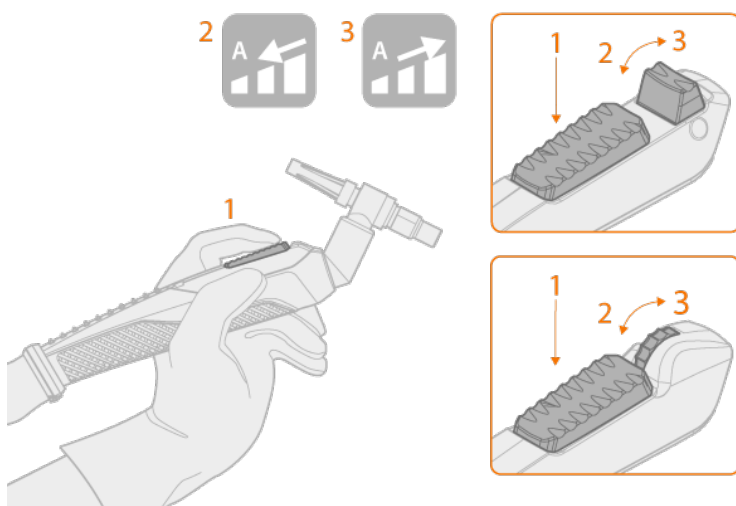
Make sure to connect the coolant hoses to the correct hose connectors. If the connections cross, the torch and torch body may overheat.

4. 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 interconnecting cable, 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.*
-  *Many Flexlite TX torches are equipped with an ON/OFF switch. The exact operation and function of the switch may vary depending on your welding machine settings (e.g. 2T, 4T or Minilog).*

1. Ensure that the earth return cable is connected to the welding machine and piece to be welded.
2. To start welding, press the ON/OFF switch (1) on the welding torch handle.



3. With the roller and rocker switch versions only: Adjust the welding current by rolling the roller switch (2/3) or by pulling/pushing the rocker switch (2/3).

4.1 Consumable and gas flow selection

 *The tables in this chapter provide some basic guidance only and must not be considered as a definitive source of electrode and gas flow rate information.*

The welding current setting defines the electrode size and the shielding gas flow rate. The most typical shielding gas for TIG welding is argon.

The following tables provide some basic guidance for the electrode size and shielding gas flow rate selection.

Welding current DC- (AC)	Electrode	Gas nozzle		Gas flow rate
A	ø mm	Number	ø mm	l/min
5...80 (5...50)	1.0	4/5	6.5/8.0	5...6

70...150 (30...100)	1.6	4/5/6	6.5/8.0/9.5	6...7
130...250 (80...150)	2.4	6/7	9.5/11.0	7...8
220...350 (120...210)	3.2	7/8/10	11.0/12.5/16.0	8...10
330...500 (180...280)	4.0	10/11/12	16.0/17.5/19.0	10...12

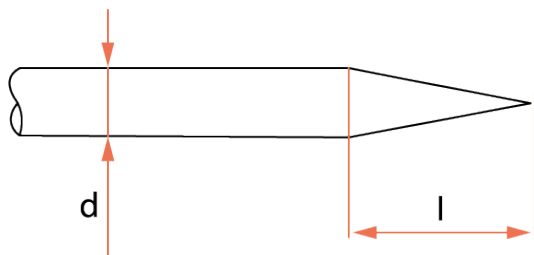
Electrode		Welding current	Base material			
Type	Symbol color		Fe	Ss	Al	Ti
WC20	grey	AC, DC-	x	x		x
WZ8	white	AC, DC-			x	
W	green	AC, DC-			x	

4.2 Electrode tip

DC welding

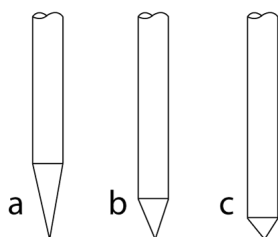
For DC TIG welding, grind the tip of the tungsten electrode lengthways, into cone shape. The sharpened electrode tip provides a steady and concentrated arc into the weld piece. The sharpening angle and length has an effect on the arc width and penetration depth.

Sharpening principle:



Where $l = 1 \dots 5 \times d$.

The sharpening length best suited for your purposes depends on the most used welding current level:



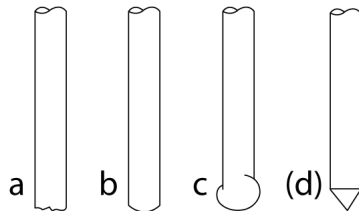
- a. Low currents
- b. Mid currents
- c. High currents



When sharpening the electrode, always grind along the electrode.

AC welding

In AC TIG welding the electrode tip temperature can exceed the melting point of the electrode. Therefore the electrode diameter selected and its suitability for welding current applied, can be evaluated based on the formation of the electrode tip.



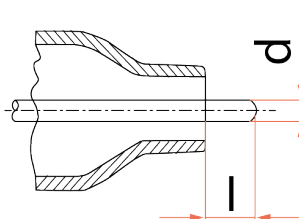
- a. Too low welding current or too big electrode size. The arc is not steady and directed on the weld piece.
- b. Suitable current.
- c. The welding current is too high for the electrode diameter selected.

i When using Kemppi AC TIG equipment for specific applications, it is also possible to prepare and maintain a small point on the electrode tip (d). This improves the directional control of the welding arc and weld pool size.

Tip: You can also prepare the basic tip formation for AC welding with the following technique:

1. Adjust the welding current a little higher than required.
2. Burn the arc over a waste piece of material, keeping the torch electrode in a vertical position.
3. Extinguish the arc immediately when the electrode tip has formed rounded spherical surface, no larger than the diameter of the electrode, holding the same torch position as the electrode cools during the post gas cycle.
4. Reduce the current setting to a level suitable for the work target and start welding.

Electrode tip length



The optimal protrusion (l) of the electrode tip measured from the gas nozzle tip depends on the electrode diameter, welding current level and weld joint type.

Tip: Cleaning the electrode with steel wool can improve ignition and overall welding properties, by removing surface oxides.

5. 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 downtime and equipment failure. Mainly due to the high temperatures, the TIG torch head and parts 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.

Torch head maintenance

- All insulations are undamaged and intact.
- Gas nozzle is intact and suitable for work.
- Shielding gas flows freely and steadily.
- Electrode is intact and suitable for work.
- Fastening parts of the electrode are intact and the electrode is fastened tightly in place.
- Check all the cables and connectors. Do not use them if they are damaged.

Maintenance of torch cable

- Torch cable insulations and connectors are intact.
- There are no sharp bends in the torch cable.
- Components are tightly fastened.
- Check that the current transfer surface on the torch current connector is clean and undamaged.
- Check the protective hose on the cable for damage.

For repairs, contact your Kemppi dealer.

Periodic maintenance



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

Check the electric 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 Kemppei website.

5.1 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 Kemppei 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 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.

Welding torch:

The torch overheats

- Make sure the torch body is properly connected.
- Make sure that the welding parameters are within the range of the welding torch. If different torch components have separate limits for the maximum current; the lower one of these is the maximum current that can be used.
- Make sure the coolant circulation is working normally (see the coolant circulation warning LED on the power source).
- Measure the coolant circulation speed: detach the coolant output hose from the cooler unit when the power source is on, and let the coolant run into a measurement cup. The circulation must be at least 0.5 l/min.
- Make sure you are using original Kemppei consumable and spare parts. Incorrect spare part materials may also cause overheating.
- Make sure the connectors are clean, undamaged and properly fastened.

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 the welding electrode 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.

Arc is not ignited

- Cable is loose or there is a bad connection.
- The torch electrode is highly oxidized. Sharpen again lengthwise. Check that the post gas time is long enough. Check ignition by using pre gas.
- There are impurities in shielding gas (moisture, air).
- Protective hose or another insulation of torch is broken and ignition spark is "escaping".
- Torch is wet.
- Too big or blunt electrode is used at low currents.

Gas shielding is bad (weld pool "boils", electrode gets oxidized)

- There are impurities in shielding gas (moisture, air).
- There are impurities in base material (rust, base coat, grease).
- Impurities stuck on gas nozzle or on collet body.
- Net of gas lens is damaged.
- There is too much draft at welding place.

5.2 Disposal of machine



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 Kempfi representative. By applying these European Directives you improve the environment and human health.

6. TECHNICAL DATA

"Technical data TX 135" below

"Technical data TX 165" on the next page

"Technical data TX 225 and TX 255" on the next page

"Technical data TX 305 and TX 355" on page 21

6.1 Technical data TX 135

Flexlite TX 135GF		
Feature		Value
Type of cooling		Gas
Coolant flow rate (l/min)	l/min	-
Coolant pressure (min)	MPa	-
Coolant pressure (max)		-
Arc striking voltage	kV	10
Rating of electrical components (remote, nominal)	V	10
	mA	10
Type of connection	Current-gas	R1/4
	Control	7-pin
	Coolant	-
Electrode diameters	mm	1.0...2.4
Load capacity @ 40 % (Argon)	A	130
Load capacity @ 100 % (Argon)	A	-
Operating temperature range (°C)	°C	-10...+40 °C
Storage temperature range	°C	-40...+60 °C
Minimum cooling power at 1.0 l/min	kW	-
Remote control		Optional
Neck type		Bendable

This equipment complies with standard IEC 60974-7.

6.2 Technical data TX 165

Flexlite TX 165GF, TX 165GS, TX 165G				
Feature		Value		
		TX 165GF:	TX 165GS:	TX 165G:
Type of cooling		Gas	Gas	Gas
Coolant flow rate (l/min)	l/min	-	-	-
Coolant pressure (min)	MPa	-	-	-
Coolant pressure (max)		-	-	-
Arc striking voltage	kV	10	10	10
Rating of electrical components (remote, nominal)	V	10	10	10
	mA	10	10	10
Type of connection	Gas/current	R1/4	R1/4	R1/4
	Control	7-pin	7-pin	7-pin
	Coolant	-	-	-
Electrode diameters	mm	1.0...4.0	1.0...2.4	1.0...4.0
Load capacity @ 40 % (Argon)	A	160	160	160
Load capacity @ 100 % (Argon)	A	-	-	-
Operating temperature range (°C)	°C	-10...+40 °C	-10...+40 °C	-10...+40 °C
Storage temperature range	°C	-40...+60 °C	-40...+60 °C	-40...+60 °C
Minimum cooling power at 1.0 l/min	kW	-	-	-
Remote control		Optional	Optional	Optional
Neck type		Bendable	Rotating	70° angle

This equipment complies with standard IEC 60974-7.

6.3 Technical data TX 225 and TX 255

Flexlite TX 225G, TX 225GS, TX 255WS				
Feature		Value		
		TX 225G:	TX 225GS:	TX 255WS:
Type of cooling		Gas	Gas	Liquid
Coolant flow rate (l/min)	l/min	-	-	1
Coolant pressure (min)	MPa	-	-	1
Coolant pressure (max)		-	-	5
Arc striking voltage	kV	10	10	10
Rating of electrical components (remote, nominal)	V	10	10	10
	mA	10	10	10

Type of connection	Gas/current	R1/4	R1/4	R1/4
	Control	7-pin	7-pin	7-pin
	Coolant	-	-	Snap connector
Electrode diameters	mm	1.0...4.0	1.0...4.0	1.0...2.4
Load capacity @ 40 % (Argon)	A	220	220	250
Load capacity @ 100 % (Argon)	A	-	-	200
Operating temperature range (°C)	°C	-10...+40 °C	-10...+40 °C	-10...+40 °C
Storage temperature range	°C	-40...+60 °C	-40...+60 °C	-40...+60 °C
Minimum cooling power at 1.0 l/min	kW	-	-	1.0 kW
Remote control		Optional	Optional	Optional
Neck type		70° angle	Rotating	Rotating

This equipment complies with standard IEC 60974-7.

6.4 Technical data TX 305 and TX 355

Flexlite TX 305WF, TX 355W			
Feature		Value	
		TX 305WF:	TX 355W:
Type of cooling		Liquid	Liquid
Coolant flow rate (l/min)	l/min	1	1
Coolant pressure (min)	MPa	1	1
Coolant pressure (max)		5	5
Arc striking voltage	kV	10	10
Rating of electrical components (remote, nominal)	V	10	10
	mA	10	10
Type of connection	Gas/current	R1/4	R1/4
	Control	7-pin	7-pin
	Coolant	Snap connector	Snap connector
Electrode diameters	mm	1.0...2.4	1.0...4.0
Load capacity @ 40 % (Argon)	A	300	350
Load capacity @ 100 % (Argon)	A	200	250

Operating temperature range (°C)	°C	-10...+40 °C	-10...+40 °C
Storage temperature range	°C	-40...+60 °C	-40...+60 °C
Minimum cooling power at 1.0 l/min	kW	1.0 kW	1.0 kW
Remote control		Optional	Optional
Neck type		Bendable	70° angle

This equipment complies with standard IEC 60974-7.

7. ORDERING CODES

Tip: Letters with the product model names stand for:

W = water-cooled, G = gas-cooled, F = flexible neck, S = S neck, N = no switch (no remote option).

Flexlite TX			
Product	Ordering code		
	4m:	8m:	16m:
Flexlite TX 135GF	TX135GF4	TX135GF8	TX135GF16
Flexlite TX 165GF	TX165GF4	TX165GF8	TX165GF16
Flexlite TX 165GS	TX165GS4	TX165GS8	TX165GS16
Flexlite TX 165G	TX165G4	TX165G8	TX165G16
Flexlite TX 225G	TX225G4	TX225G8	TX225G16
Flexlite TX 225GS	TX225GS4	TX225GS8	TX225GS16
Flexlite TX 305WF	TX305WF4	TX305WF8	TX305WF16
Flexlite TX 255WS	TX255WS4	TX255WS8	TX255WS16
Flexlite TX 355W	TX355W4	TX355W8	TX355W16
Flexlite TX 135GFN	TX135GFN4	TX135GFN8	-
Flexlite TX 165GFN	TX165GFN4	TX165GFN8	-
Flexlite TX 165GSN	-	TX165GSN8	-
Flexlite TX 225GN	TX225GN4	TX225GN8	-
Flexlite TX 255WSN	-	TX255WSN8	-
Flexlite TX 305WFN	-	TX305WFN8	-
Flexlite TX 355WN	-	TX355WN8	-

External package dimensions, mm (L x W x H): 590 x 390 x 130 / 80.

Flexlite TX remotes (optional)		
Product	Ordering code	
	For water-cooled torch:	For gas-cooled torch:
Flexlite TXR10 remote, roller switch	TXR10W	TXR10G
Flexlite TXR20 remote, rocker switch	TXR20W	TXR20G

Flexlite TX other accessories (optional)	
Product	Ordering code
Flexlite TX trigger extension	SP014802