Water-cooled TIG torch

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Instructions for use

(note: the current version of the manual is always on the website **www.kowax.cz)**

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CONTENTS

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The document is a manual for the operation and maintenance of KOWAX® TIG welding torches from **SVARMETAL sro.** It contains detailed information on work safety, technical data of the torches, the procedure for commissioning, operation, maintenance and disposal. The emphasis is on safety precautions and the use of only original spare parts. The manual includes illustrations and diagrams to facilitate understanding. The warranty and contact information for the manufacturer are also provided.

1. Identification

The TIG welding torch is designed for arc welding of metals in a protective atmosphere. It complies with the EN 60974-7 standard and is used exclusively with original KOWAX® spare parts. This manual applies to the following models:

KOWAX® T18W
KOWAX® T20W

1.1. Security

Please read this manual carefully before first use.

- **Safety First:** Follow all safety instructions to prevent injury, damage to property and environmental hazards.
- **Qualified personnel:** Welding may only be carried out by qualified personnel.
- **Work environment:** Ensure adequate lighting and ventilation, keep the workplace clean.
- **Protective equipment:** Wear appropriate protective equipment (e.g. gloves, helmet).
- **Electrical equipment:** Check that all electrical equipment is in good condition and properly grounded.
- **Gas cylinders:** Handle gas cylinders with care and according to the manufacturer's instructions.

2. Intended use

Use the welding torch only for welding and in accordance with these instructions. **Any other use is prohibited.**

2.1. Basics

- **Read this manual:** Before carrying out any work on the burner (start-up, operation, maintenance), read Please read this manual carefully and follow it.
- **Keep the manual handy:** The manual should always be easily accessible near the burner. When selling or passing on the burner to a new user, you will pass on the manual to them.
- **Other components:** Also observe the operating instructions for other devices, such as the welding power source. current etc.
- **Gas cylinders:** When handling gas cylinders, follow the manufacturer's safety instructions and applicable regulations.

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- **Safety regulations:** Follow all applicable safety regulations.
- **Qualified personnel:** Only persons with appropriate qualifications and experiences.
- **Safe working environment:** Ensure adequate lighting and maintain order in the workplace.
- **Safety at work:** Before any work (maintenance, repairs), switch off the power supply and disconnect all hoses.
- **Waste disposal:** Dispose of waste in accordance with applicable regulations.

2.2. Electrical equipment

- **Regular inspection:** Before each use, check that all electrical equipment is undamaged and functional.
- **Safe working environment:** Do not use power tools in environments with high humidity, rain or explosion hazard.
- **Protection against injury:** Protect yourself from electric shock.
- **Fire prevention:** Do not use power tools in areas with a fire hazard.

2.3. Welding

- **Health protection:** Welding can damage your eyes, skin and hearing. **Always wear protective equipment** (safety glasses/helmets, gloves, respirators) according to applicable standards.
- **Harmful fumes:** Fumes from welding can be toxic. **Provide adequate ventilation** and exhaust, especially when welding materials containing lead, cadmium, copper or beryllium.
- **Risk of fire and explosion:** Degrease welds with suitable products and remove all flammable materials from the workplace. **Keep fire extinguishers nearby.**
- **Other risks:** When welding, there is a risk of electric shock, burns, exposure to ultraviolet radiation and inhalation of harmful particles. **Be careful and follow the safety instructions.**

2.4. Technical condition

- **Follow instructions:** Do not overload the device beyond the specified limits. Overloading can lead to damage or complete failure.
- **No modifications:** Do not make any personal adjustments or modifications to the device.
- **Weather protection:** When working outdoors, protect the device from rain, snow, and other adverse weather conditions.

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2.5. Protective clothing

- **Clothing:** Do not wear loose work clothes or jewelry.
- **Hair:** Secure long hair under a protective cap or net.
- **Protective equipment:** Always wear safety glasses/helmets, gloves and, if necessary, a respirator when welding.

2.6. Classification of warnings

In this manual, we use four types of warnings to indicate potential hazards. Their meanings are as follows (from most serious to least serious):

DANGER - Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING - Indicates a potentially hazardous situation. Failure to observe may result in result in serious injuries.

CAUTION - Indicates a potentially harmful situation. Failure to observe this may result in light or minor injuries.

2.7. In case of emergency

In the event of an emergency, immediately cut off the power, compressed air, refrigerant and shielding gas supplies. Refer to the manuals for other equipment for further instructions.

WARNING - **Important notice: If you use the device in a way other than that specified in the instructions, it may be dangerous for you and those around you.**

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3. Product description

3.1. Technical data

Transportation and storage:

- **Temperature:** Can be stored at temperatures from -25°C to +55°C.
- **Humidity:** Tolerates high humidity up to 90% at 20°C.

Use:

- **Shielding gas:** Used with Ar or a mixture of gases.
- **Filler materials:** Common TIG rods (e.g. 1000mm) of circular cross-section are suitable.
- **Torch control:** The torch is controlled manually.
- **Voltage:** Requires direct current (DC) voltage with a maximum peak value of 1.3 V.
- **Current:** The control system in the handle operates with a current of 0.1 to 1 A at a voltage of 42 V.
- **Device protection:** The connections on the device are protected against dust (IP3X).
- **Polarity:** Negative polarity is usually used in welding.

Technical data:		**KOWAX® T20W**	**KOWAX® T18W**
Cooling		**water cooled**	**water-cooled**
DC (=)		225A	380A
AC (~)		160A	370A
Loader		100%	100%
Diameter of tungsten		1.0-3.2mm	1.0-4.0mm
electrode Min. coolant flow Min.		1.0l/min	1.0l/min
coolant inlet pressure Min. cooling		2.0Bar	2.0Bar
capacity Max. coolant inlet		700W	900W
pressure Max. coolant inlet		5.0Bar	5.0Bar
temperature		50°C	50°C
	4m	**HKT20W4**	**HKT18W4**
Order numbers	**6m**	**-**	**-**
	8m	**HKT20W8**	**HKT18W8**

Basic product data complies with IEC/EN60974:

Rated voltage:	113V peak value
Rated ignition and arc stabilization voltage: 8KV	
Description:	See the technical data sheet for your type.
Electrodes:	Tungsten electrodes suitable for TIG use, preferably with low radiation
Gas:	Argon
Torch length	4m to 16m
Operating temperature:	-10°C to +40°C
Transport/storage temperature:	-25°C to +55°C

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Relative humidity:	Up to 50% at 40°C up to 90% at 20°C
Maximum and minimum bar gas pressure at the inlet	Minimum 0.4 Maximum 2.0 Bar
Maximum coolant pressure:	5.0 bar

4. Commissioning

DANGER - Risk of injury from unexpected start-up

Before assembling, disassembling or maintaining any equipment parts, take the entire system out of service.

- Close all supply lines.
- Disconnect the power supply.

DANGER - Professional service only: All repairs and adjustments to the device may only be carried out by qualified personnel. Unauthorised intervention may result in device failure, injury and void the warranty.

WARNING - **Injury Warning:** Touching metal parts of the torch can cause fatal electric shock. Use only the designated insulated handle.

WARNING - **Electric shock due to damaged or improperly installed components**
Damaged or improperly
installed components can cause life-threatening electric shock. Components include: welding torch, cable harness, spare parts, consumable parts.

- Before each use, check the correct installation and any damage to all components and all connections.
- Clean contaminated parts immediately.
- Replace damaged parts immediately.
- Have damaged, deformed or worn parts replaced exclusively by a qualified electrician trained by SVARMETAL sro.

4.1. Before each use

- Check the welding torch, clean it and replace it if necessary.
- Check all spare and consumable parts, clean them and replace them if necessary.
- Check the wiring harness, clean it and replace it if necessary.

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- Check the cooling circuit.

- **Check the cooling function. Insufficient coolant flow can cause to permanent and irreversible damage to the burner!**

4.2. Preparing the welding torch:

- Switch off the welding power source and disconnect it from the electrical network.

- Close the gas supply and, if necessary, the compressed air supply.

4.3. Shortening the tungsten electrode

- The electrode type is determined according to **EN ISO 6848.**

- The length of the electrode depends on the type of torch.

4.4. Preparing the torch body for welding

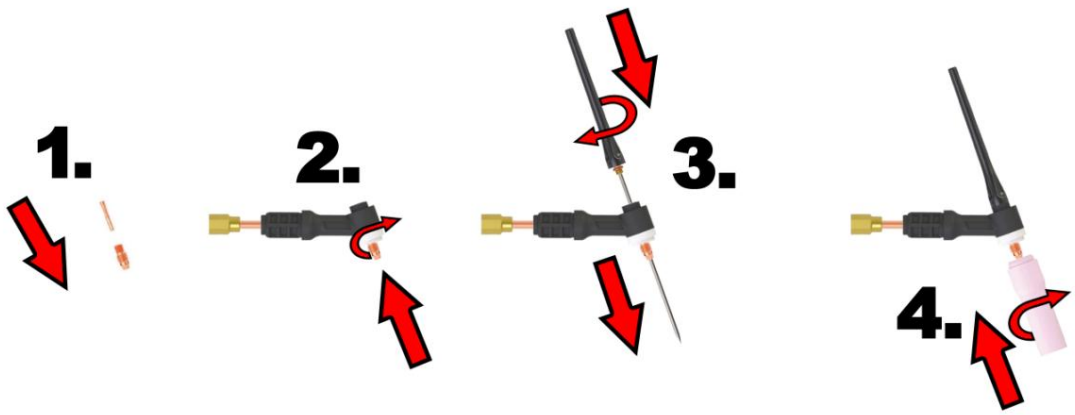
- See picture below:

1. Screw the electrode clamp into the clamping sleeve in the torch body. (Instead of the collet body, you can use use a gas lens as well.)

2. Screw the assembly into the torch body.

3. Screw on the nuts (electrode cover) with the properly sharpened tungsten electrode (see grinding below) into the torch body.

3. Screw on the ceramic nozzle.



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WARNING - Risk of injury from a sharpened electrode. A sharpened electrode is sharp and can cause serious injury. Keep hands away from the tip of the electrode. Keep the tip of the electrode away from your body. Wear proper protective gloves.

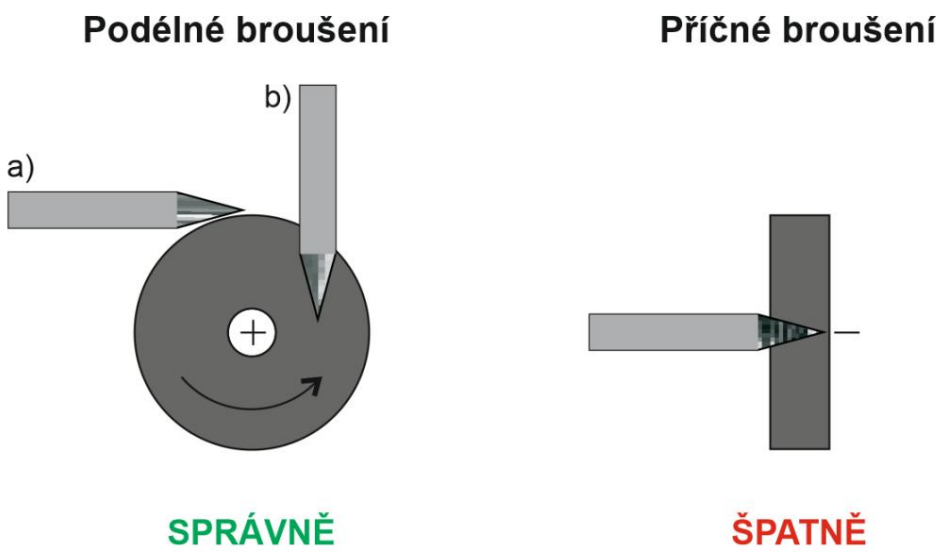
4.5. Sharpening tungsten electrodes

- See the picture below:

- The sharpening of the tungsten electrode depends on wear and must therefore be resharpened if necessary. to carry out.

- When sharpening the tungsten electrode, use a sharpening device (e.g. KOWAX GeniWolf 90 tungsten electrode grinder) with the following properties:

  - o Diamond blade
  - o Point focused longitudinally across the centerline
  - o Can be adjusted for all electrode diameters
  - o Offers continuous angle adjustment.



4.6. Bending the FLEXI torch body (optional)

- See picture below

- To extend the life of your FLEXI torch, use the recommended technique:

  - o When bending (1), support the torch head with your thumb at this point (2).

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NOTE - In general, the maximum number of bending cycles for a flexible neck is 100x, provided that the bend is not greater than 45° with a minimum bend radius of 25mm. Bending back to the starting position is classified as a bending cycle.

4.7. Connecting the cable harness to the power source

See picture below

1. On the wire feeder, plug the central plug into the connection socket.
2. Connect the GX16 - 5-pin control terminal to the socket in the power supply.
3. Connect the red nipple to the red end (return valve), connect the blue nipple to the blue one.
4. Check that the coolant level is sufficient.
5. **Check the cooling function. Insufficient coolant flow may cause to permanent and irreversible damage to the burner!**
6. **Caution:** To avoid damage to the welding equipment, do not use deionized or demineralized water.
7. During commissioning and when replacing the wiring harness. Bleed the coolant circuit. (see details below)

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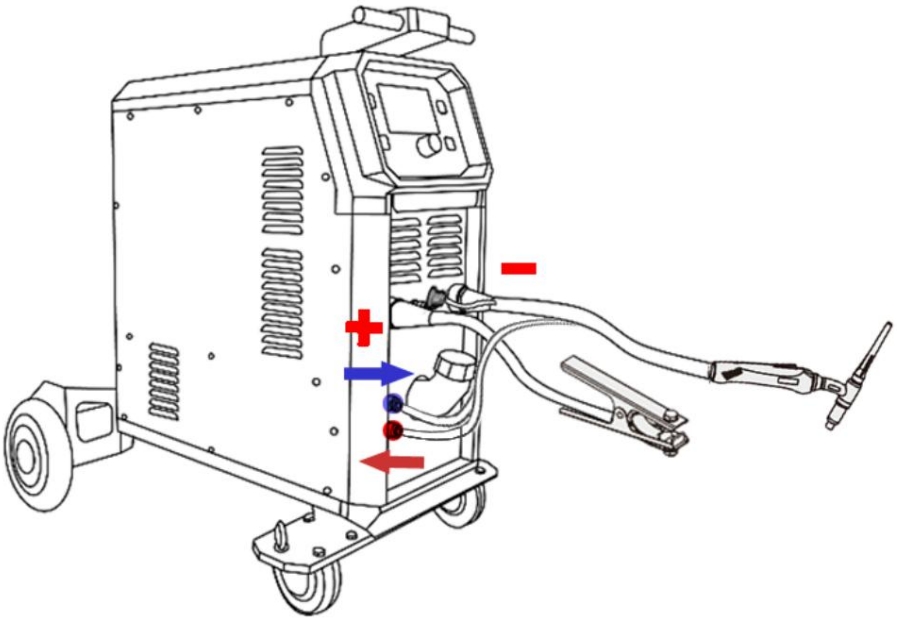

4.8. Bleeding the coolant circuit

- Connect both hoses to the cooling module (blue and red).

- Check the coolant slope.

- Disconnect the coolant return hose (red) from the cooling unit and hold it over the manifold.
  container.

- Seal the coolant return hose opening.

- Open and then close the return (red) hose opening several times until the coolant
  the liquid will not start to flow without interruption and without air bubbles.

- Reconnect the coolant return hose to the cooling unit.

4.9. Connecting the burner control to the power source

See the figure below:

- Connect the cable assembly connector to the welding power source and secure it with the union nut.

- Source control from the button:

  o Currently (1/2025) we use the following connections for all models we sell:
  Connector 16 mm GX16 - 5 pins – (torch/female, source/male)

- install original consumable parts on the burner body. **More in the KOWAX catalog on the website.**

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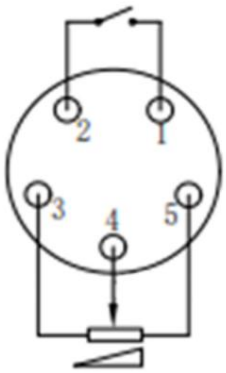
4.10. Connector connection

See the picture below:



Tlačítko na hořáku (Gun switch)
1 -
2 -
Regulace U/D (UP/Down)
3 - černá
4 - červená (potenciometer na pedálu)
5 - modrá

4.11. **Shielding gas connection**

Gas selection: Choose a shielding gas suitable for your welding application.

Cleaning the pressure reducing valve: Before connecting, briefly open and close the gas supply valve to remove any dirt.

Connection: Connect the shielding gas to the welding machine according to the manufacturer's instructions.

Flow Adjustment: Adjust the amount of gas on the welder according to the requirements of your welding application.

5. Burner control

see picture below.

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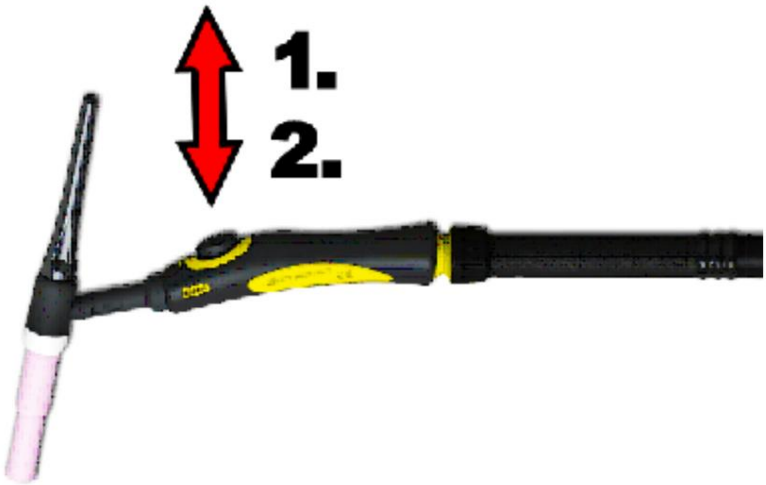

6. Operation

WARNING – Risk of injury from electromagnetic fields. The device can generate electromagnetic fields that can disrupt the proper functioning of pacemakers and implanted defibrillators. Do not use the device if you have a pacemaker or an implanted defibrillator. Use the device only in industrial areas according to DIN

EN 61000-6-3.

6.1. Welding

1. Open the shielding gas cylinder.
2. Turn on the welding power source.
3. Start the cooling unit.
4. Flush the shielding gas line.
5. Set the welding parameters.
6. Press and hold the trigger on the handle to start welding.
7. After striking the arc, hold it close to the edge of the material until a molten weld bead forms.
   bath.
8. Move the welding torch evenly along the entire length of the weld.
9. Release the trigger on the handle to stop welding.
10. After switching off the torch, hold it in the end position for a few seconds so that the residual current
    of gas allowed the molten bath to solidify without external intervention.

7. Burner maintenance and cleaning

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DANGER - Injury Prevention: To prevent an accident from unexpected start-up, always before assembly, disassembly or maintenance:

- Take the device out of service.
- Close all supplies (water, gas, air, etc.).
- Disconnect the electrical supply.

WARNING - **Risk of burns:** The welding torch becomes very hot during operation. To avoid burns, allow the torch to cool down after use and always wear protective gloves when handling it.

7.1. Annual inspection

Annual service: Have the device checked and cleaned by a qualified technician once a year. **More frequent service:** If you use the device very frequently or in demanding conditions, have it checked more often.

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7.2. Replacing consumable parts

- see picture below.

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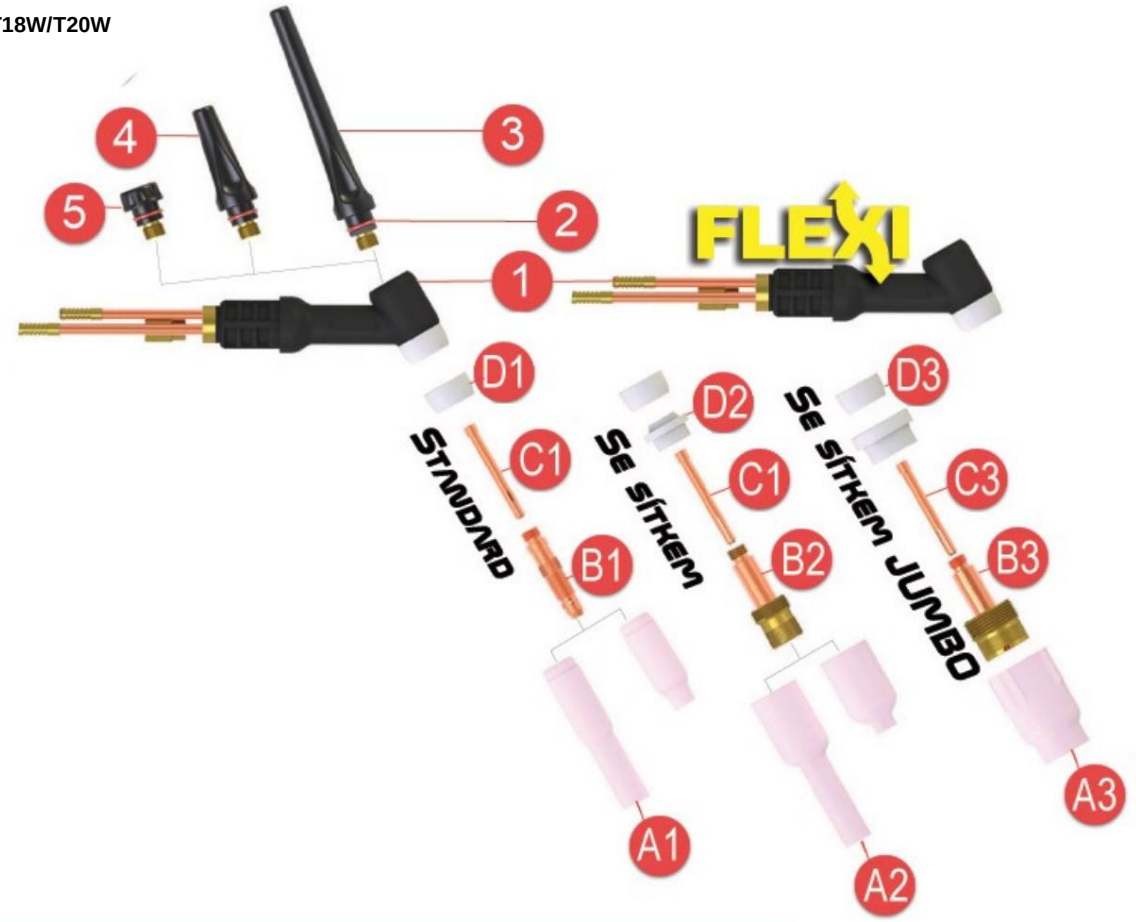
T18W/T20W



Item Name
A1. Ceramic nozzle
B1. Clamping sleeve
C1. Electrode clamp
D1. Insulating ring
D3. Insulating ring
1. Torch body
1. FLEXI torch body
2. Insulating O-ring 4.6x2 3. TIG nut long
4. TIG medium nut
5. TIG nut short

Complete parts lists here.

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WARNING – Material damage may occur due to the use of unsuitable consumable parts. The use of consumable parts from other manufacturers and incorrect installation of consumable parts may cause material damage to the welding torch and impair working results. Use only original KOWAX consumable parts. Ensure that the consumable parts are correctly tightened for each specific welding torch. Make sure that the parts are installed in the correct order.

8. Decommissioning

- Stop welding.
- Let the burner cool down sufficiently.
- Wait for the shielding gas flow to stop and turn off the power source.
- Close the valve of the shielding gas cylinder.

WARNING - Material damage due to overheating Liquid-cooled cable assemblies can leak if they overheat. Let the cooling unit run for approx. 5 min. after the welding process.

9. Waste management

Devices marked with this symbol are subject to European Directive 2012/19/EU on waste electrical and electronic equipment.

electronic devices.

- Electrical appliances must not be disposed of in household waste.
- Electrical appliances must be collected separately from other waste and to be handed over for ecological recycling purposes.
- Observe local regulations, laws, regulations, standards and guideline.
- Information regarding the collection and disposal of waste electrical equipment can be obtained from your local municipal office.
- Proper disposal of the product requires its disassembly.

10. Warranty

10.1. Warranty duration

Generally 2 years from the date of sale upon presentation of proof of purchase.

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10.2. Provision of warranty

We only provide a warranty for manufacturing defects or faults, not for damage caused by natural wear and tear, excessive load, or unprofessional or incorrect handling.

10.3. Warranty validity

The warranty does not cover damage caused by the use of non-original parts, unprofessional interventions or normal wear and tear of components.