

THERMACUT[®]

EX-TRAFIRE[®]

40SD

PLASMA ARC CUTTING SYSTEM

Operator Manual

Revision: T-15
English
2020



!IMPORTANT!

BEFORE SWITCHING ON OR OPERATING THE SYSTEM, READ THIS MANUAL, BECOME FAMILIAR WITH THE CONTENT. KEEP THE MANUAL LOCAL TO THE JOB SITE WITH EASY ACCESS TO ALL PERSONNEL. THE SYSTEM IS TO BE USED FOR METAL CUTTING ONLY.

PLEASE, CHECK THE LATEST VERSION OF THE OPERATOR MANUAL ON OUR WEBSITE:

www.ex-trafire.com

THERMACUT[®]
THE CUTTING COMPANY[®]

EX-2-902-001
N-21593

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SECTION 1.

SAFETY:

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SAFETY

1



!CAUTION!

The symbol shown in this section means: **!Caution!** !Beware!
 ¡There are possible hazards with this procedure!

When you find this symbol in the manual or on the system, be cautious, and follow the related instructions to avoid the hazard.



CAUTION! READ OPERATOR'S MANUAL

Follow the safety instructions to avoid danger.

Only qualified persons should install, operate, maintain and repair the system.

Keep out of reach of children.

2



PLASMA ARC RAYS CAN BURN EYES AND SKIN

Arc rays from the cutting/gouging processes produce intense visible and invisible rays that can burn eyes and skin.

Use protective clothing made from durable, flame-resistant material, appropriate footwear and hand protection.

- Use face protection (welding helmet or shield) with the correct shade of filter lens fitted to protect your eyes and face (see Table 1.1).
- Warn people of the dangers of looking at the arc, use signs to warn/inform.



NOISE CAN DAMAGE HEARING

Prolonged exposure to noise from plasma cutting/gouging can cause hearing damage.

- Use approved ear protection when operating the plasma system.
- Warn others about the dangers of noise.



FLYING SPARKS (ARC SPRAY) CAN CAUSE INJURY, FIRE OR EXPLOSION

Flying sparks are created during the metal cutting/gouging processes; the area around the cutting process should be kept free from flammables.

- Use face shield/safety glasses with side protection.
- Wear flame resistant clothing, footwear and hand protection.
- Use earplugs/defenders that are flame resistant to prevent sparks entering the ear and to reduce the noise level.

3



CUTTING CAN CAUSE FIRE OR EXPLOSION

FIRE PREVENTION

- Keep flammable items away from the work area.
- Ensure that there is a fully charged fire extinguisher in the work area
- Ventilate the work area, check for flammable/combustible gases, liquids and materials, remove prior to cutting as they present a fire risk.

EXPLOSION PREVENTION

- Do not cut in areas containing explosives, flammable gases or vapors.
- Do not place the system on, over, or near combustible surfaces.
- Do not operate the system in areas with an atmosphere containing high concentrations of dust, flammable gases or vapors.
- Do not use the system to cut pressurized containers that have not been de-pressurized, vented and cleaned.



FLYING SPARKS (ARC SPRAY) CAN CAUSE INJURY, FIRE OR EXPLOSION

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- Wear flame resistant clothing, footwear and hand protection.
- Use earplugs/defenders that are flame resistant to prevent sparks entering the ear and to reduce the noise level.

4



ELECTRIC SHOCK CAN KILL

Touching electrical parts could cause a fatal shock or severe burns.

- Do not touch live electrical components.
- Wear dry insulated gloves, shoes and protective clothing.
- Insulate yourself from the work and ground using dry insulating material large enough for the work area.
- The working area should be clean and dry.
- Switch OFF the system for cleaning and maintenance operations.
- Do not wrap cables around your body.
- Turn OFF the machine when not in use.
- Periodically check the power supply cable, to insure that the outer insulation is intact. Replace the power supply cable immediately if damaged. DO NOT use the system with bare or exposed wires, this is highly dangerous.
- Before removing the cover or handling any of the internal components of the system, wait 5 (FIVE) minutes to ensure complete discharge of the capacitors.
- Keep the system in good condition; repair or replace damaged parts immediately. Maintain the system in accordance with the manual.

5



PLASMA ARC CAN INJURE

The plasma arc is activated immediately after the torch trigger is depressed.

- Turn off the power before changing the torch consumables, the plasma arc can burn through skin and gloves.
- Do not place your hand or hold the work piece near the cutting path.
- Do not point the torch toward yourself or other persons.



HOT PARTS CAN CAUSE SEVERE BURNS

Caution! After cutting, the work piece will be HOT!

- Do not touch hot parts bare handed, wear suitable hand protection.
- Allow cooling time before handling.

6



SMOKE AND GASES CAN BE HAZARDOUS

Induction heating of certain materials, adhesives, and fluxes may cause fumes or smoke.

Breathing the fumes and smoke can be hazardous to your health

- Keep your face out of the smoke, do not breathe the fumes.
- Use local exhaust ventilation for fume removal.
- If ventilation is poor, wear an approved air-supplied respirator.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. The smoke and gases from the cutting/gouging process can displace air and lower the oxygen level causing injury or death.
- Monitor the breathable air quality as required.

7



CAUTION WHEN CUTTING AROUND GAS CYLINDERS

Gas cylinders which contain gas under high pressure can rupture and explode if damaged.

- Handle and use compressed gas cylinders in accordance with local or national codes.
- Never allow electrical contact between the plasma arc and a cylinder.
- Never expose cylinders to excessive heat, sparks, slag or flames.



MAGNETIC FIELD CAN AFFECT PACEMAKERS

- People with pacemakers/hearing aids should avoid close contact with plasma arc power supply.
- People with pacemakers/hearing aids should consult their doctor before operating plasma arc power supply.



Do not exceed the recommended duty cycle, this can lead to overheating and cause damage to the system.

- Allow a suitable cooling off period with high demand usage.
- Observe the duty cycle rating shown on the label attached to the system.



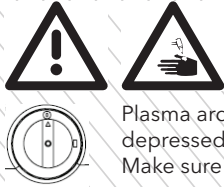
PLASMA CUTTING CAN CAUSE INTERFERENCE

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers, or computer-driven equipment.
- Ensure that all equipment in the cutting area is electromagnetically compatible.
- Ensure that the plasma arc cutting system is installed and positioned in accordance with this manual.

Plasma Arc Cutting Current	Protection glass shade number*
Up to 150A	ISO (DIN) 11
150A to 250A	ISO (DIN) 12
250A to 400A	ISO (DIN) 13
OVER 400A	ISO (DIN) 14

* According to ISO 4850:1979

Safety Sticker

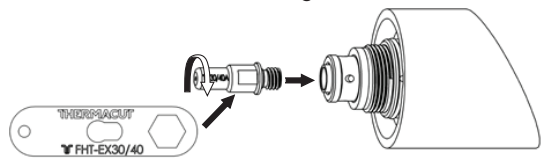
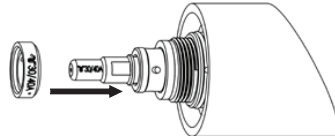
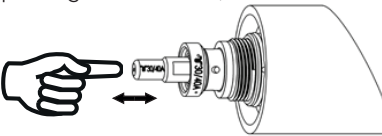
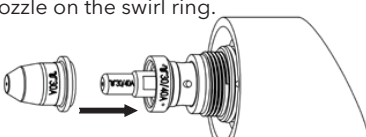
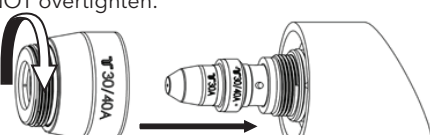
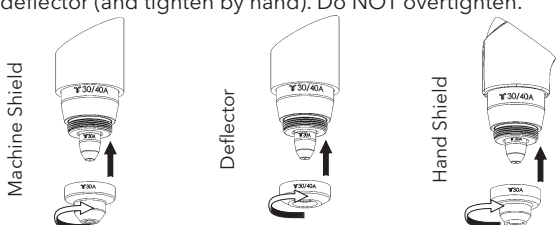


WARNING!
Plasma arc is generated immediately
when the torch trigger is depressed.




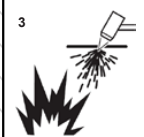

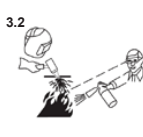


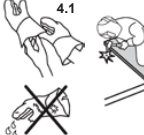



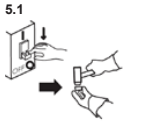
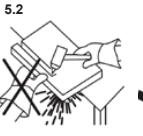






Plasma arc is generated immediately when the torch trigger is depressed. The plasma arc will cut quickly through gloves and skin. Make sure the power is switched off before changing consumables.



Torch consumable installation

1. Screw the electrode. Use the electrode wrench (EX-2-427-010). Do NOT overtighten electrode.
 
2. Insert the swirl ring. Must seated properly. CAUTION: Direction of the swirl ring is important! The tip of the laser marked arrow indicates the installation direction!
 
3. Perform free movement test of the electrode inside the swirl ring (by pushing the electrode).
 
4. Insert the nozzle on the swirl ring.
 
5. Screw in the nozzle retaining cap and tighten by hand. Do NOT overtighten.
 
6. Screw on the hand (contact) shield, machine shield or deflector (and tighten by hand). Do NOT overtighten.
 

Safety instructions

1. Read the manual and safety instructions before using the torch. 			
2. Wear eye protection. 		2.1. Use the correct PPE: safety glasses, face shield, gloves, and boots. 	
3. Do not touch the electrode or nozzle during operation. 			
3.1. Do not touch the electrode or nozzle during operation. 		3.2. Do not touch the electrode or nozzle during operation. 	
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7. Do not touch the electrode or nozzle during operation. 			

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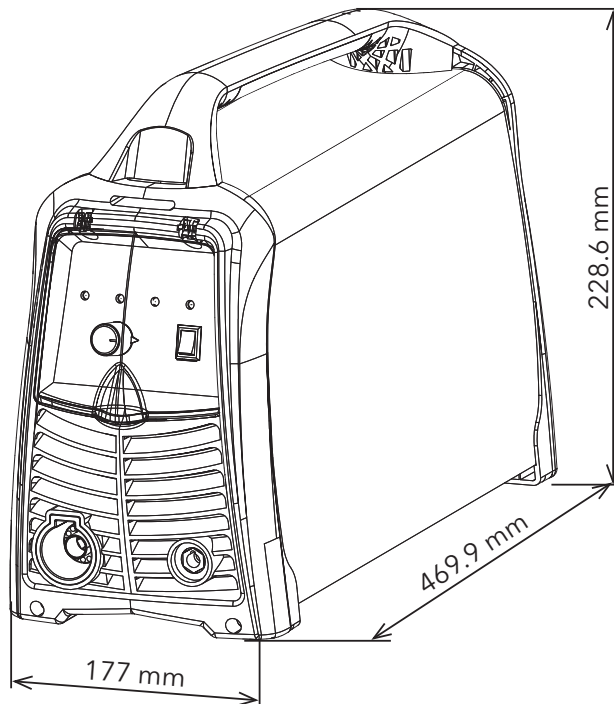
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SPECIFICATIONS

Dimensions and weight of the plasma arc power supply



* Weight of plasma arc power supply without torch.

Specifications: plasma arc power supply

Open circuit voltage (U_0)	480 VDC			
Output characteristic* * Curve is defined as the output voltage versus output current	Drooping			
Input voltage (U_1) *PFC	100 - 130 VAC (CE)	220 - 240 VAC (CE/C-TICK)		
Rated output current (I_2)	10-30 A	10-40 A		
standard rated output voltage (U_2) at $U_1 = 220 - 240$ VAC	140 VDC			
	X	40%	60%	100%
standard rated output voltage (U_2) at $U_1 = 100 - 130$ VAC	U_2	120 V	140 V	140 V
	X	35%	60%	100%
Cutting current at 35%/60%/100% duty cycle	U_2	92 V	90.4 V	88.4 V
	100 - 130 VAC (CE)		30/26/21 A	
Cutting current at 40%/60%/100% duty cycle	220 - 240 VAC (CE/C-TICK)		40/30/25 A	
Maximum input power	100 - 130 VAC (CE)		3.45 kVA	
	220 - 240 VAC (CE/C-TICK)		5.98 kVA	
Duty cycle (X^*) at 40° C at rated conditions (U_1, I_1, U_2, I_2) * $X = T_{on}/T_{base}$, T_{on} = time, minutes T_{base} = 10 minutes	U_{1rms}		X	
	100 - 130 VAC (CE)		35%	
	220 - 240 VAC (CE/C-TICK)		40%	
Operating temperature	-10° - +40° C			
Rated AC phases (PH) and line frequency (Hz) Model CE	PH	Hz		
	1	50-60		
Rated input voltage (U_1), rated input current (I_1) and effective input current (I_{1eff}^*) at rated output voltage (U_2) and rated output current (I_2) - for cutting only. * $I_{1eff} = (I_1) \sqrt{X}$ used to determine rating of power cord. eff = effective rms = root mean square	U_{1rms}		I_{1rms}	I_{1eff}
	100 - 130 VAC (CE)		28.8*A	17*A
	220 - 240 VAC (CE/C-TICK)		26*A	16.4*A
	This equipment conforms to IEC 60974-1, IEC 60974-10			
Isolation class	F			
IP Code - Degree of protection provided by enclosure	IP23S* IP - "International Protection" 2 - No ingress foreign objects ≥ 12.5 mm 3 - No harmful ingress spraying water. S - fan stationary during water test. *WARNING: ! DO NOT OPERATE IN RAIN !			
Toppling, tilting (with or without Wheel kit)	Up to 15° incline			
Gas type	Air	Nitrogen		
Gas quality specification	Recommended Air quality: ISO 8573-1 Class 1.2.2.		Purity $\geq 99.99\%$	
	Air max. particle size: 0.1 microns, class 1 ref. to ISO 8573			
	Air max. oil: 0.1 mg / m ³ , class 2 ref.: ISO 8573			
	Air max. dewpoint: +3° C, class 4 ref. to ISO 8573			
Gas quality	Clean, moisture-free, without oil			
Gas input pressure and flow	10 bar/145 psi 120 l/min			
Dimensions (l x h x w) (mm)	469.9 x 228.6 x 177			
Weight (kg)	11.8			

* **PFC** - power factor control automatically detects input voltage and adjusts output current.

Specifications: Torch FHT-EX® 40

The FHT-EX® manual cutting torch is designed for plasma cutting of metallic conductive materials.

Torch construction: torch body, handle, leadset and consumables.

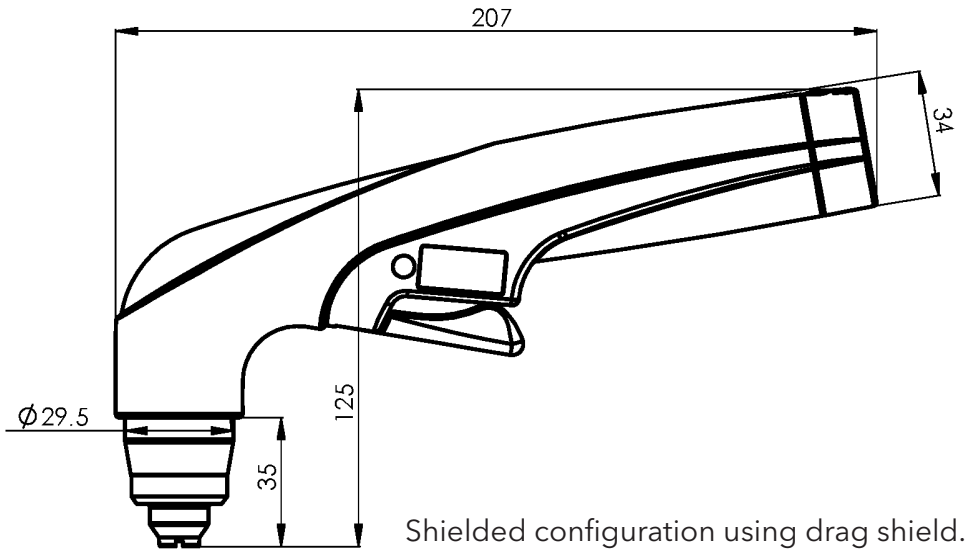
FHT-EX® torches fulfill the requirements of IEC/EN 60974-7.

Torch	Torch FHT-EX® 40H
Recommended capacity	12 mm*
Maximum capacity	20 mm*
Piercing capacity	8 mm*
Plasma cutting	- 10 °C to + 40 °C
Transport and storage	- 25 °C to + 55 °C
Relative humidity	up to 90 % at 20 °C
Application process	plasma cutting
Type of use	manual and mechanized
Pilot current	10 A -18 A
Rated current and corresponding duty cycle	40 A/100%
Type of gas	compressed air
Gas flow rate	approx. 120 l/min
Operating (dynamic) pressure	4.5 bar
Min./Max. operating pressure	3.5-5.0 bar
Gas post flow delay	≥ 20 sec.
Type of voltage	DC direct voltage
Protection type of the machine-side connections	IP3X (EN 60 529)
Type of connection	TCS (torch connection system) - 13 pin
Voltage rating	500V peak value
Rated value of control leads (trigger and cap sensor)	42 VAC / 0.1-1A
Standard length (other length available on request)	4 m / 5 m / 7.5 m / 15 m
Structure of cable	(Bikox) compact cable

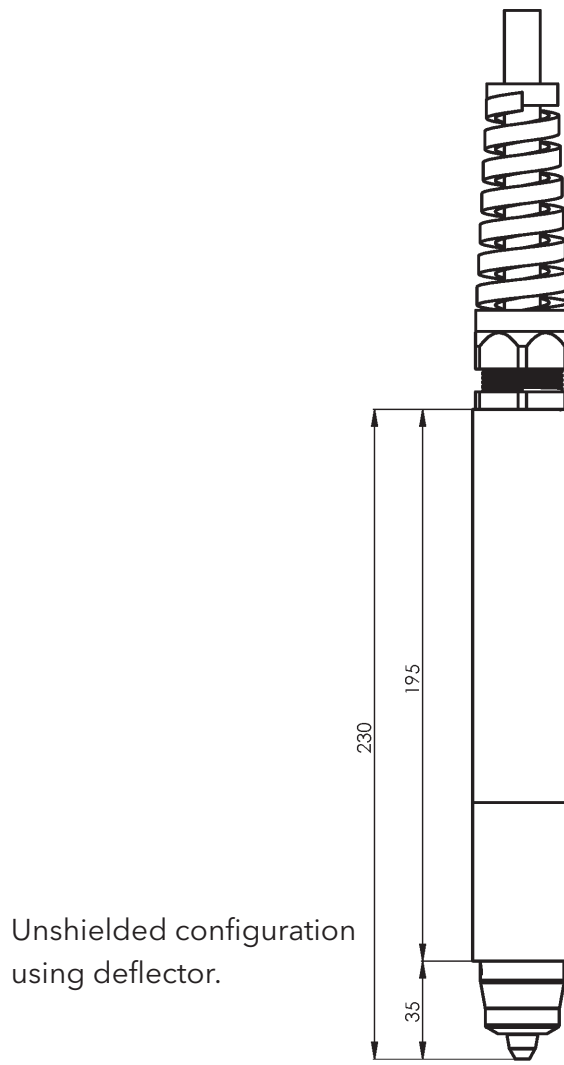
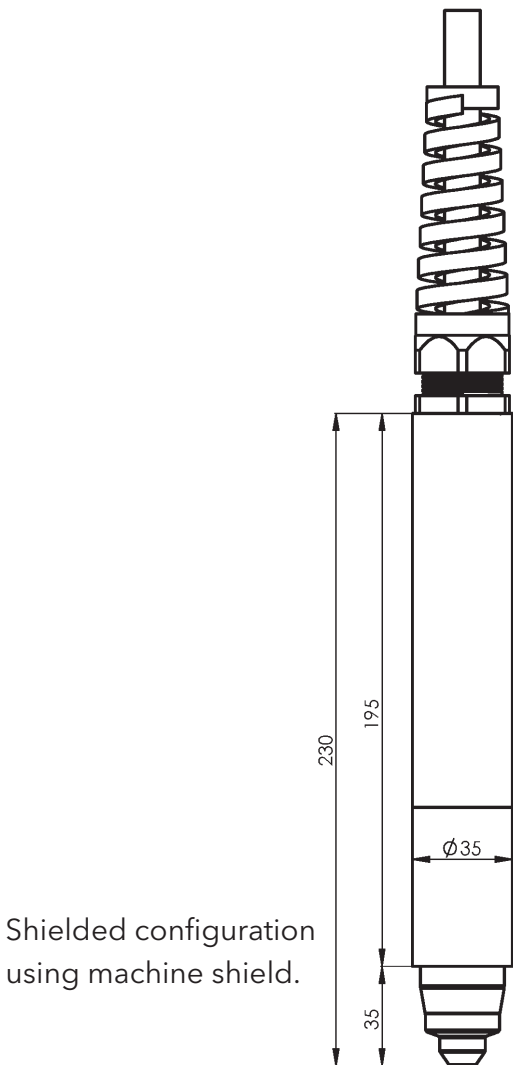
*Cutting capacity (Values for low alloyed steel, e.g. Mild Steel S235JR)

Weight	
FHT-EX® 40 Hand Torch	4 m / 1.2 kg 5 m / 1.4 kg 7.5 m / 1.8 kg 15 m / 3.2 kg
FHT-EX® 40 Machine Torch	4 m / 1.2 kg 5 m / 1.4 kg 7.5 m / 1.8 kg 15 m / 3.2 kg

Hand torch dimensions and configuration





Machine torch dimensions and configurations



Symbols and marking

S Mark;

The  mark indicates that the power supply and torch are suitable for use in environments with danger of electrocution. The hand torches must have shielded consumable parts fitted to maintain  mark compliance.

CE Mark;








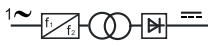

This marking signifies the manufacturer’s declaration of conformity to applicable European directives and standards (EMC & LVD).

C-Tick Mark;

This mark signifies compliance with appropriate Australian EMC standard.

IEC symbols;

The following symbols may be present on the plasma arc power supply data plate, control labels and switches.

Symbol	Description	Symbol	Description
	Alternating Current (AC) power		The terminal for the external protective (earth) conductor
	Over-Current (OC), Over-Temperature (OT)		Power is ON
	(TIP/TORCH) Missing or loose nozzle/torch spare parts (consumables)		Power is OFF
	(GAS) Low inlet gas pressure alarm		An inverter-based power supply
	Direct Current (DC) power - DC WORK	RUN	Cutting Mode
DC WORK	Torch Switch ON indicator	TEST	Gas Test Mode

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INSTALLATION

Upon receipt of goods

1. Verify that all ordered items have been received, for short shipment or damage to equipment, contact the Authorized Supplier.
2. If there is evidence of damage, see Claims, below.
3. All communication relating to this plasma arc system should include the model and serial number located on the bottom of the plasma arc power supply.
4. Read the information in the SAFETY section of this manual before installing and operating the system.

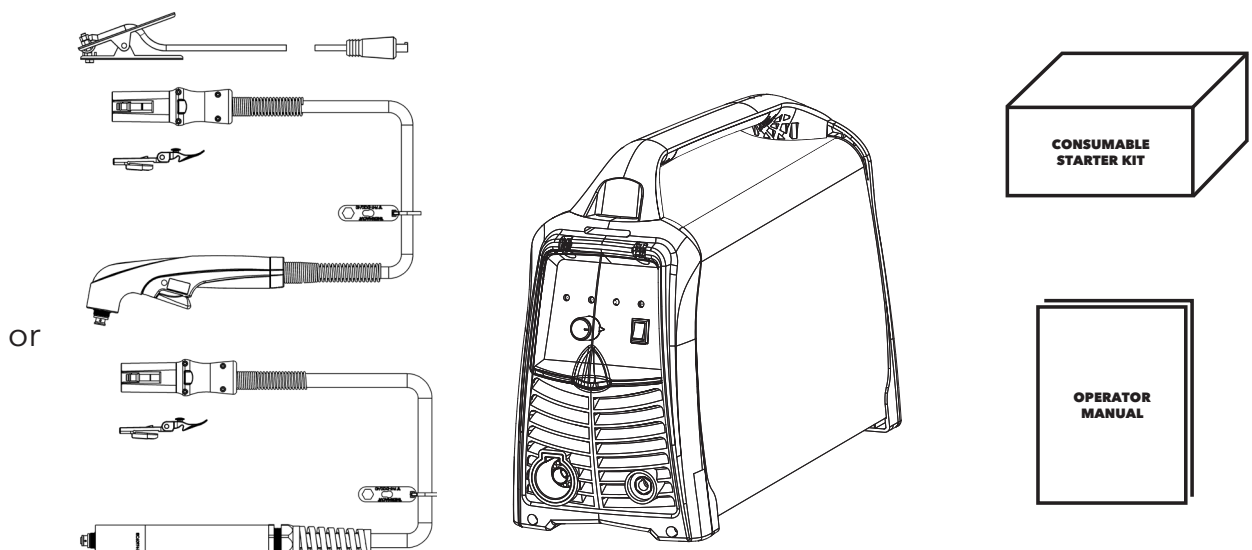
Claims

Claims for shipping damage; If the unit has been damaged in transit, contact the carrier immediately, take photographs of the packaging and areas of damage on the system. Inform Authorized Supplier, who will provide copies of relevant documentation. For further assistance, contact Customer Services, details are listed at the back of this manual.

Claims for defective or missing goods; All systems shipped from Authorized Supplier have been subjected to a rigorous quality control procedure. If any of the parts are found to be defective or missing, contact Authorized Supplier with the relevant information. For further assistance contact Customer Services, details are listed at the back of this manual.

Box contents

Check the items that are shown in the illustration below. Packaging also includes an air line connection DN7.2ES plug with male thread G1/4".



Power supply location

Place the plasma arc power supply EX-TRAFIRE®40SD on a flat even surface with a minimum distance of 0.5m of clear space all round to ensure good ventilation.

Mains power connection

The EX-TRAFIRE®40SD plasma arc power supply requires a 100 - 130 VAC (CE) - 220 -240 VAC (CE/C-TICK) single-phase mains power source. Use a circuit breaker for power line input so that the operator can turn off the power supply quickly in an emergency. Locate the switch so that it is easily accessible to the operator. The interrupt level of the switch must be equal to or exceed the continuous rating of the fuses. Use slow blow fuses with a suitable capacity in accordance with local and national electrical codes.

Connecting to an engine drive power generator

When using an engine drive generator to power the EX-TRAFIRE®40SD:

- Engine drive operation;
 1. Set engine drive output to single-phase AC.
 2. Plug the EX-TRAFIRE®40SD mains power lead in to the power outlet.
 3. Hard wire connection (No plug fitted) should be performed by a certified electrician.
 4. Set the engine drive to maximum output (see chart below).
 5. For optimum performance, do not share the engine drive with other equipment such as welding plant, lighting systems or angle grinders.

Single-phase, 50/60 Hz

Input voltage	Engine drive rating	Current output	EX-TRAFIRE®40SD Performance
100 - 130 VAC	3.45 kW	30 A	full arc stretch
220 - 240 VAC	5.98 kW	40 A	full arc stretch

Grounding

To reduce electromagnetic interference (EMI) and to ensure personal safety and correct operation, the EX-TRAFIRE®40SD must be properly grounded through the mains power lead in accordance with local and national electrical codes of practice. The single-phase service must be of the 3-wire type with a protective green-yellow wire for protective earth ground and must comply with national and local electrical codes of practice.

Mains power lead

EX-TRAFIRE® 40SD is supplied with a 3 meter length of 3 core 2.5 mm² flexo cable without plug. Use of an alternative mains power lead is at the discretion of the user. The mains power lead shall comply with local and national codes of practice. The mains power lead should be installed by a certified electrician. See the length requirements listed below.

Recommended mains power lead extension		
Input voltage	Recommended wire cross-section	Length
100 - 130 VAC (CE) / 1 phase	4 mm ²	Up to 15 m
220 - 240 VAC (CE/C-TICK) / 1 phase	2.5 mm ²	Up to 40 m

Note: The system was tested with a 3 meter mains power lead for compliance with EMC standards.

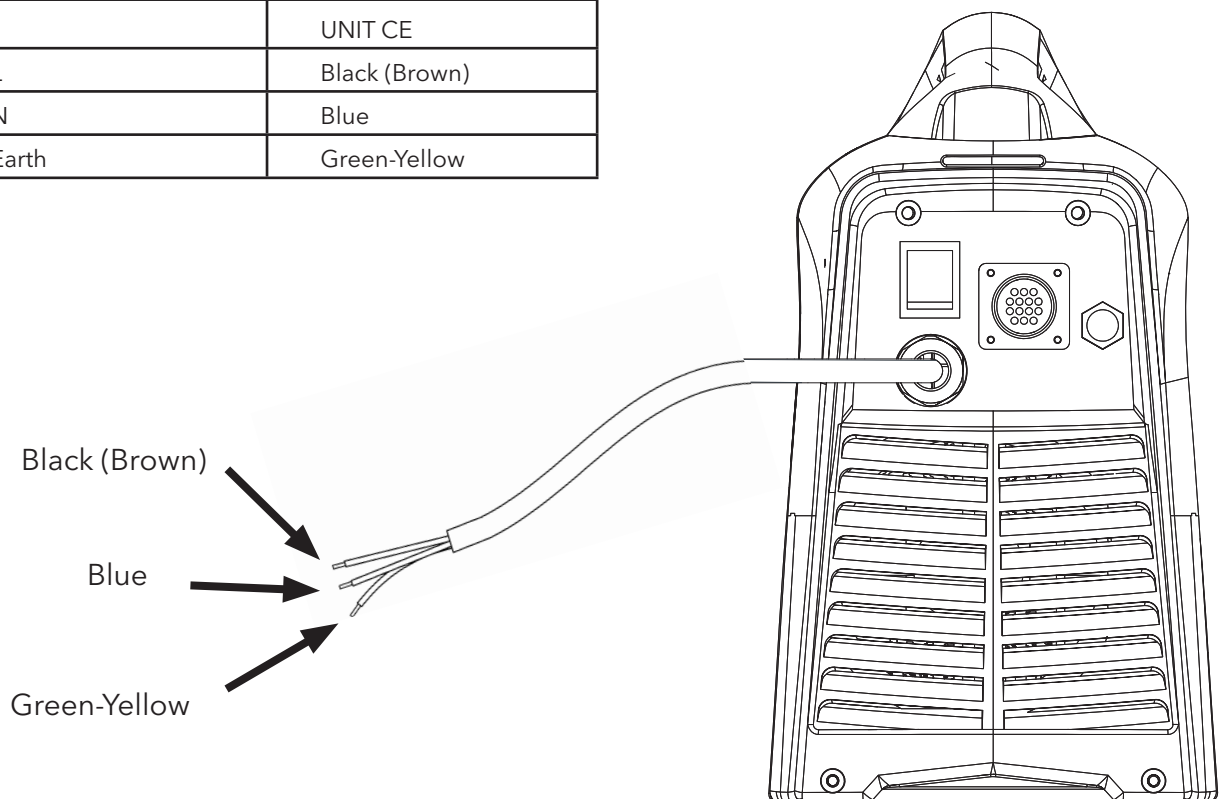
Single-phase mains power lead

CE models are fitted with a 3 wire 2.5 mm² mains power lead. To operate the EX-TRAFIRE® 40SD, use a plug that complies with national and local codes of practice. A certified electrician or electrotechnically competent person should connect the mains power lead to the plug.

Installation of single-phase mains power lead

Strip and prepare the mains power lead as show below:

	UNIT CE
L	Black (Brown)
N	Blue
Earth	Green-Yellow



The mains power lead connection



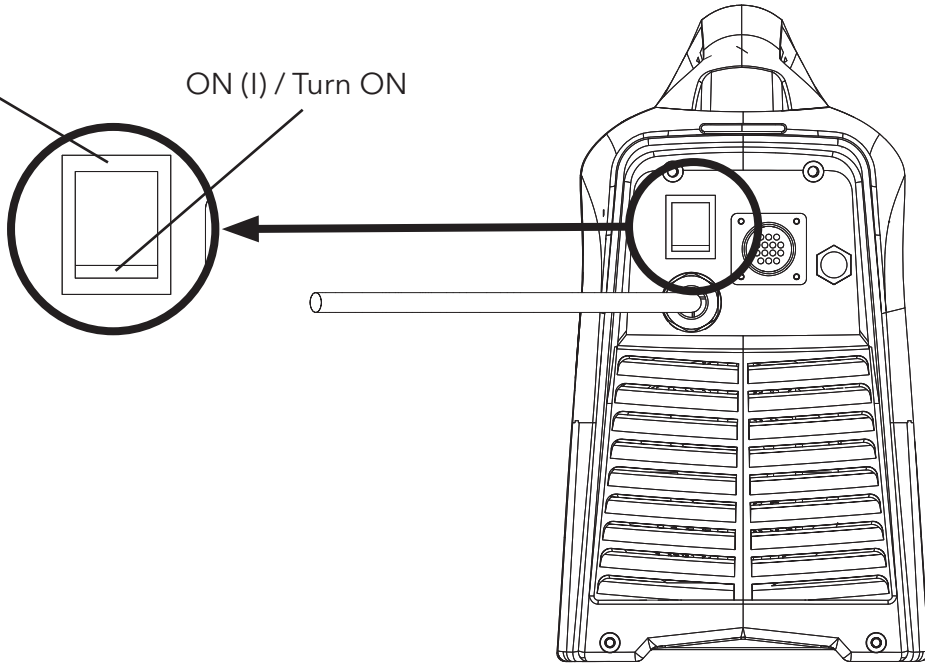
A certified electrician or competent person should connect the mains power lead to a plug or hard wire to a suitable supply according to national standards.

Torch installation step by step

1. TURN "OFF" the power supply

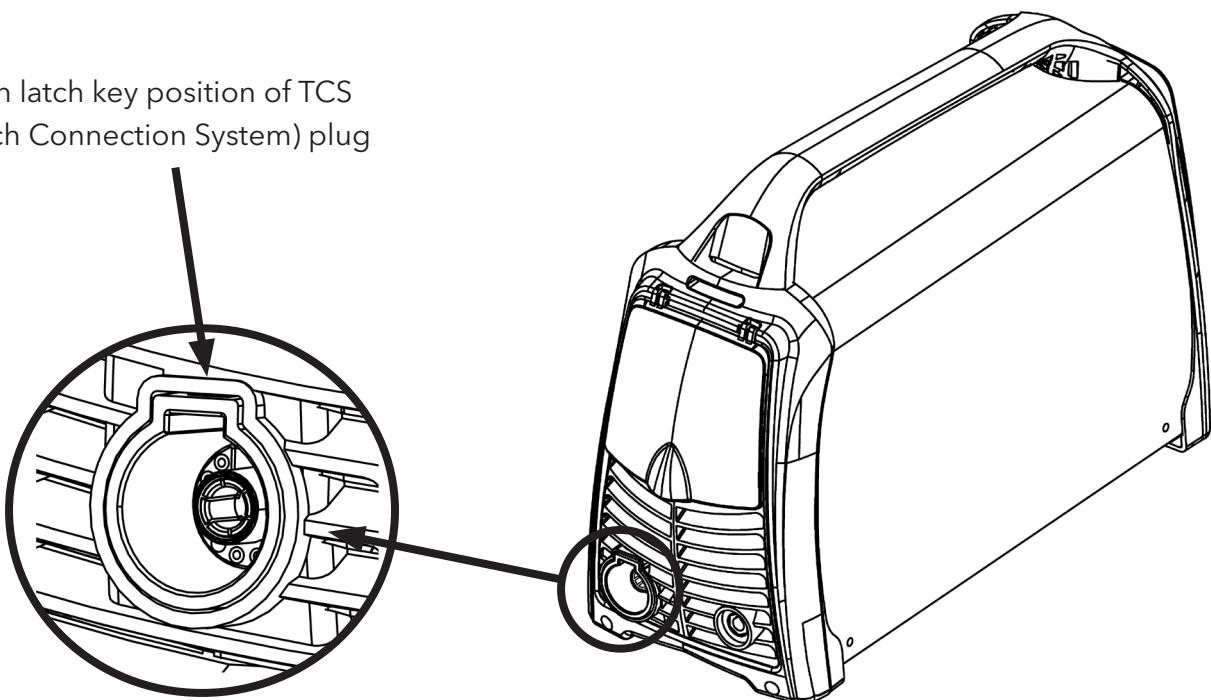
OFF (0) / Turn OFF

ON (I) / Turn ON

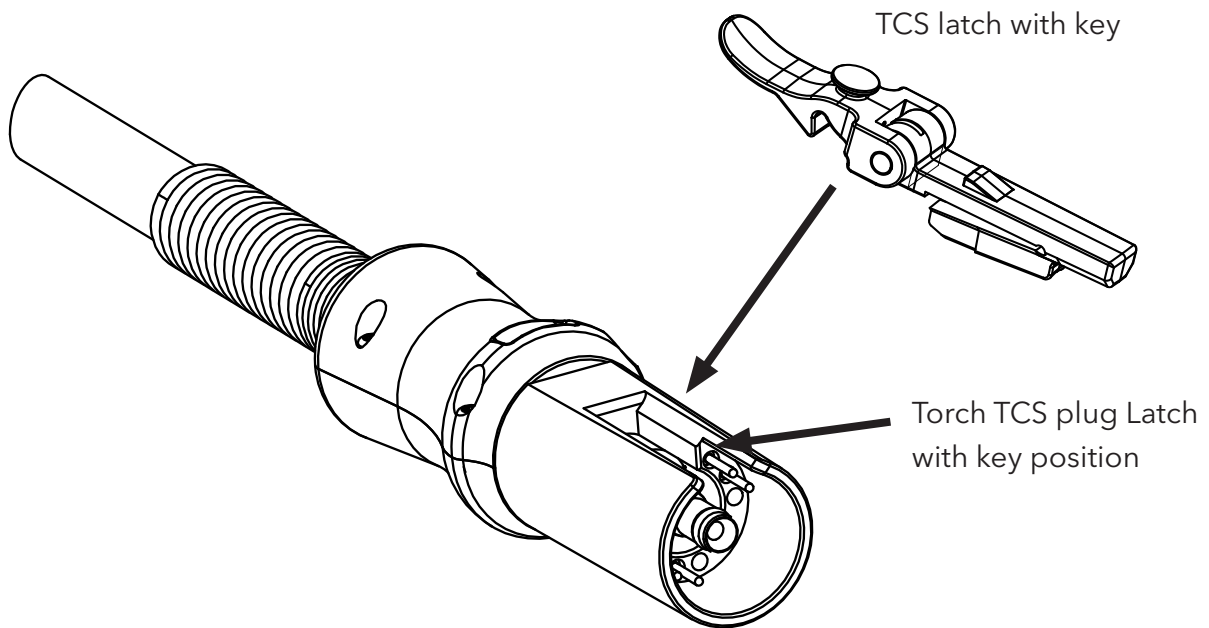


2. Torch connection - power supply location

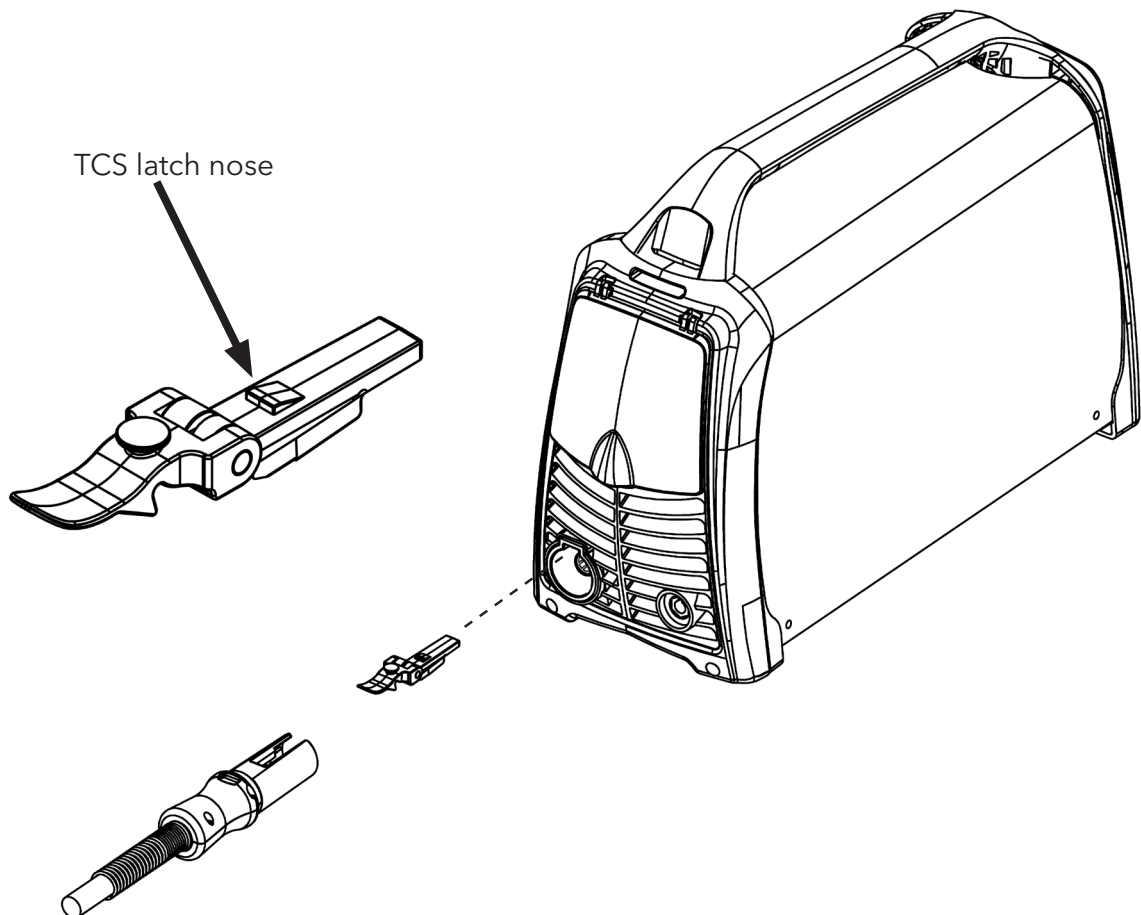
Torch latch key position of TCS
(Torch Connection System) plug



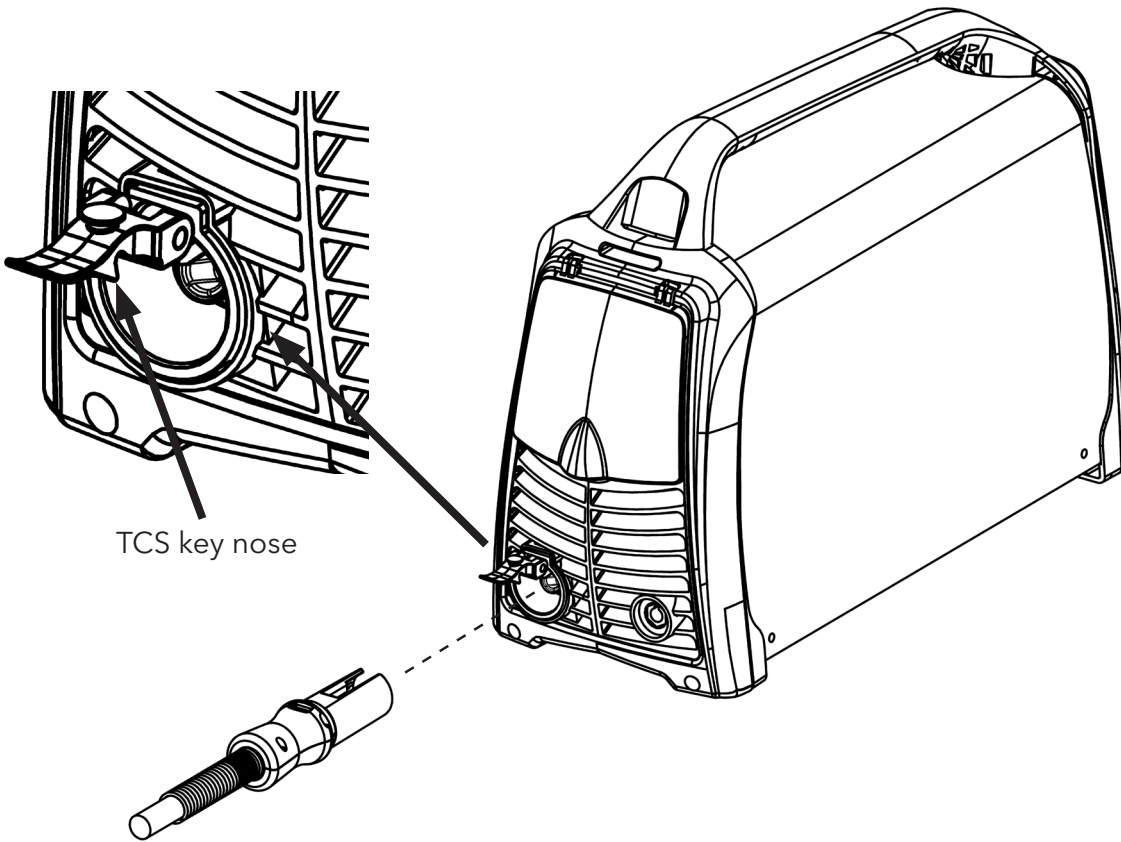
3. Torch connection - torch location



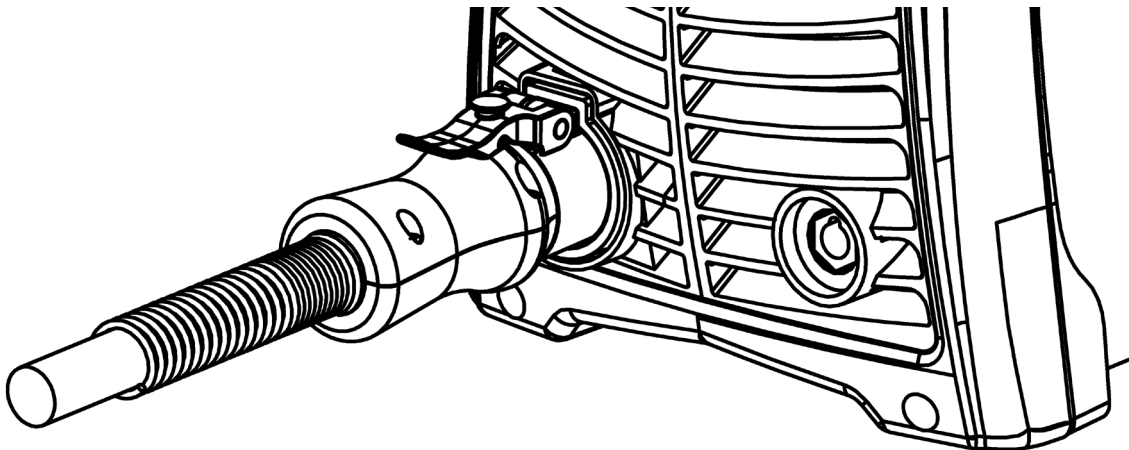
4. Torch connection - 1st step - place the TCS latch with key into the TCS power supply socket. The TCS latch with key must be locked in the TCS socket properly with the latch nose.



5. Torch connection - 2nd step - put TCS plug into the TCS socket.
The torch TCS plug must be locked in the TCS socket properly with the key nose.



6. Torch connection - proper position of the TCS plug in the TCS socket.



WARNING



FHT-EX®40 torches are only for use with
EX-TRAFIRE®30SC and EX-TRAFIRE®40SD power supplies.




Plasma gas supply

The EX-TRAFIRE® 40SD requires a compressed air supply from a compressor or cylinders, a high pressure regulator should be fitted to either form of supply and be capable of delivering gas to the filter on the system at a flow rate of 120 l/min at a pressure of 4.5 bar.


Gas type	Air	Nitrogen
Gas quality specification	Recommended Air quality: ISO 8573-1 Class 1.2.2. Air max. particle size: 0.1 microns, class 1 ref. to ISO 8573, Air max. oil: 0.1 mg / m3, class 2 ref.: ISO 8573, Air max. dewpoint: +3° C, class 4 ref. to ISO 8573	Purity ≥ 99.99%
Gas quality	Clean, moisture-free, without oil	

Note: A poor quality gas supply has a detrimental effect on cut speeds, cut quality, reduced thickness of material that can be cut and shorter consumable parts life.



WARNING

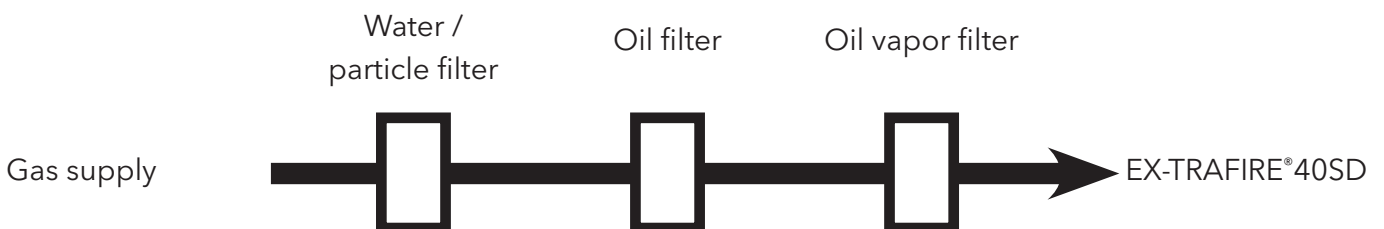
Do not allow the input gas pressure to exceed 10 bar/145 psi.
The filter bowl could explode if the pressure is exceeded.



Note: EX-TRAFIRE® 40SD is equipped with a built-in filtration system.

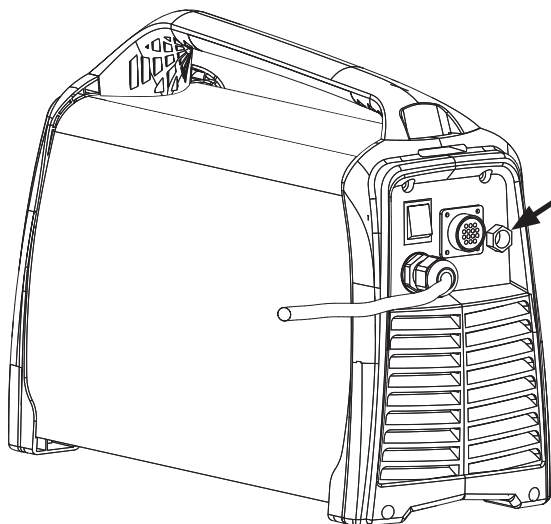
Additional gas filtration

The Thermancut filtration system should be used when oil, moisture or other contaminants are found in the air supply. In more severe cases the 3-stage filtration system should be used.



Gas supply installation

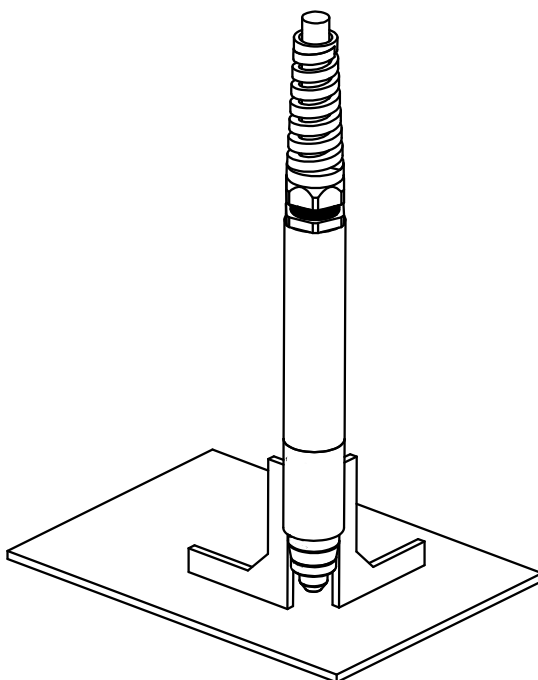
Connect the air-line hose as follows:



1. Air-line hose connection.
 - Female G1/4" thread adapter.
2. Air-line hose.
 - Use an inert gas hose with a minimum internal diameter of 6 mm, make a direct attachment or use a quick disconnect fitting.

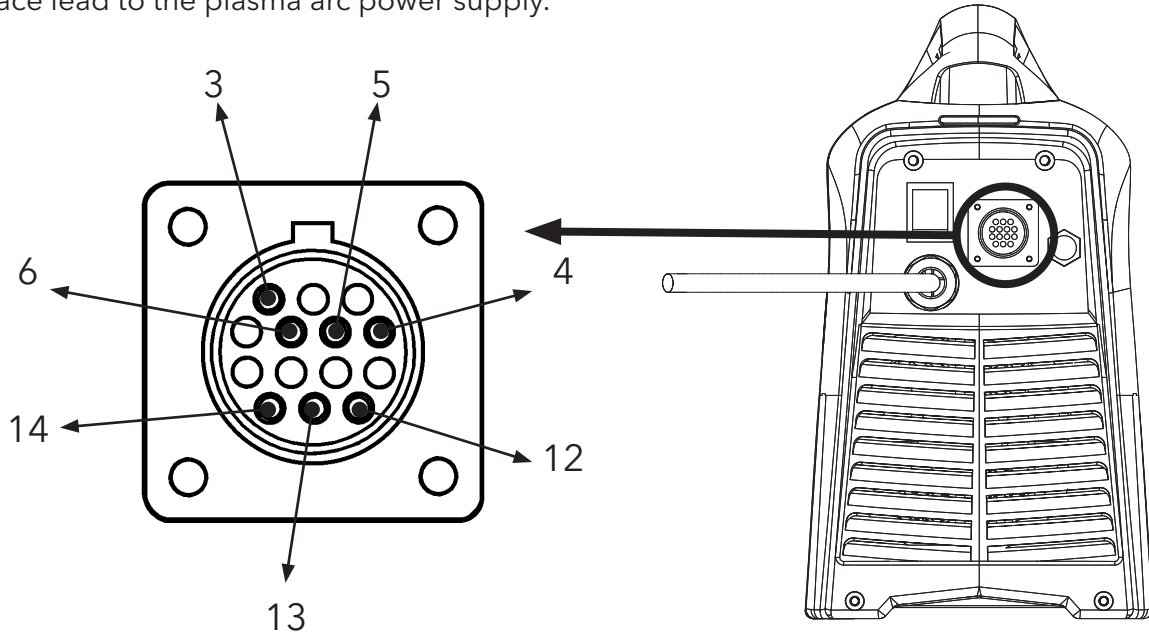
Alignment of the machine torch FHT-EX® 40M

Mount the machine torch perpendicular to the material to be cut, use a square to align the torch at 0 ° and 90 °, if torch alignment is not possible, check the cutting table for level to obtain a true vertical cut.



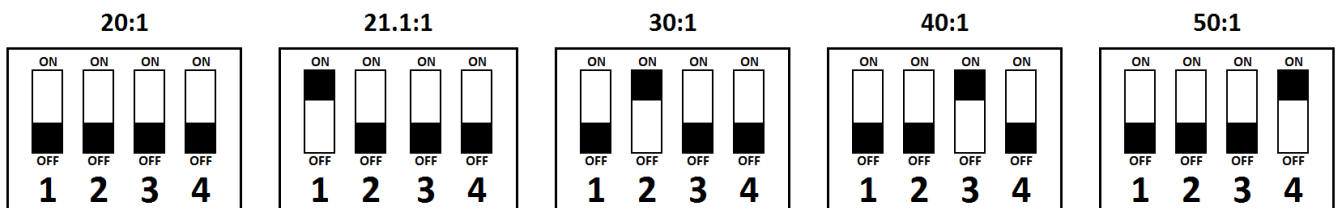
System CNC interface connection

Each type of signal is available through the system CNC interface connector located on the rear control panel. Use the chart with details of each signal type below when connecting the system interface lead to the plasma arc power supply.



Signal:	START (start plasma cutting)	Arc transfer (start system motion)	Ground	Voltage divider
Type	Input	Output	Ground	Output
Note	Normally open. Open circuit voltage 12 VDC in the START terminals. Requires a dry contact to close it.	Normally open. Dry contact with maximum capacity of: 125VAC/10A 250VAC/5A 30VDC/5A		Divider arc voltage signal of: 20:1 21.1:1 30:1 40:1 50:1 (provides a maximum 18V)
Rear socket connection	3, 4	12, 14	13	6 (+), 5 (-)
Internal wire colours	white, white	yellow, yellow	green/ yellow	6 (red), 5 (black)

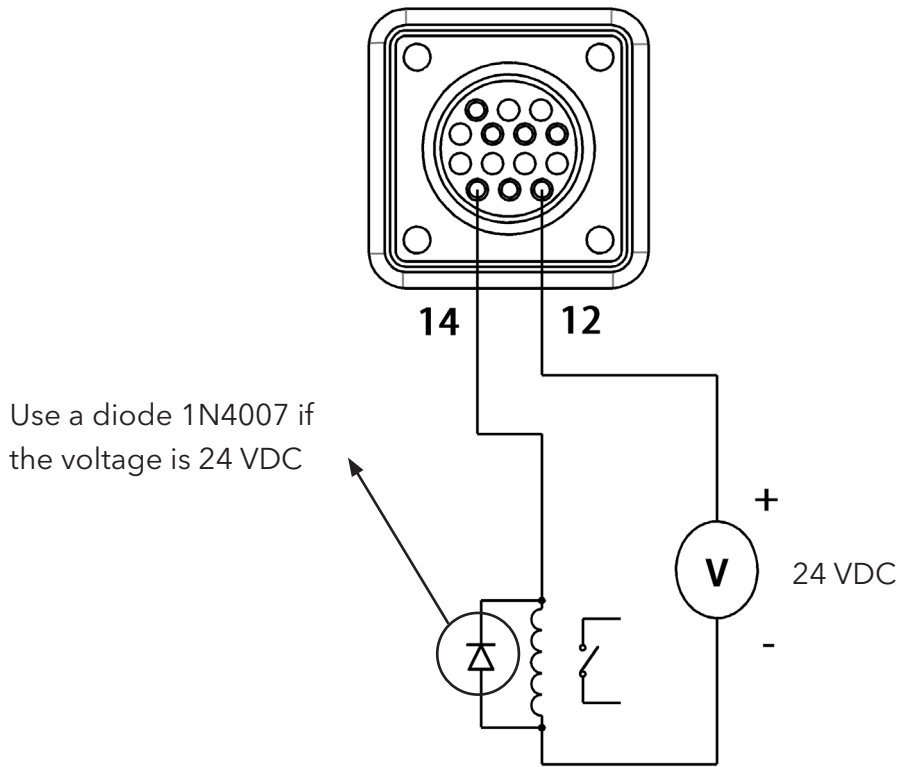
Set the DIP switches to one of the following settings.



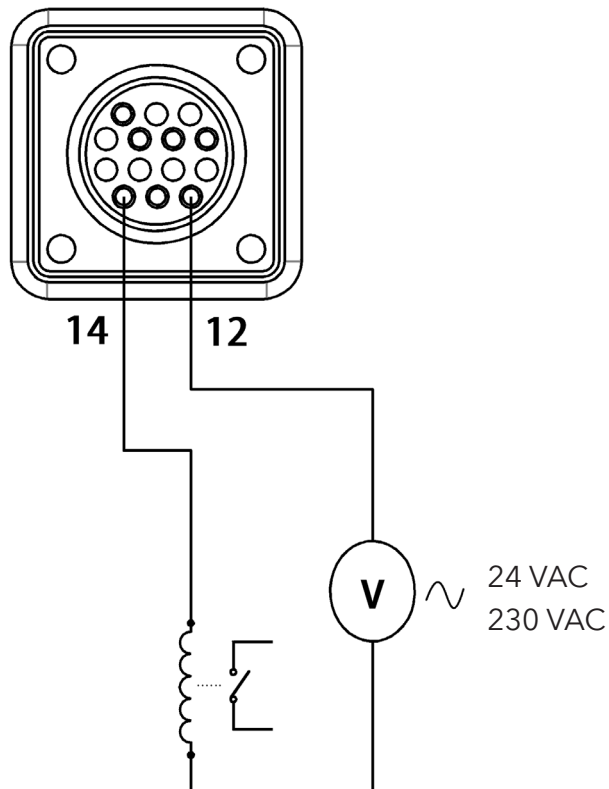
Turn OFF the power supply and disconnect the power lead prior opening the enclose.



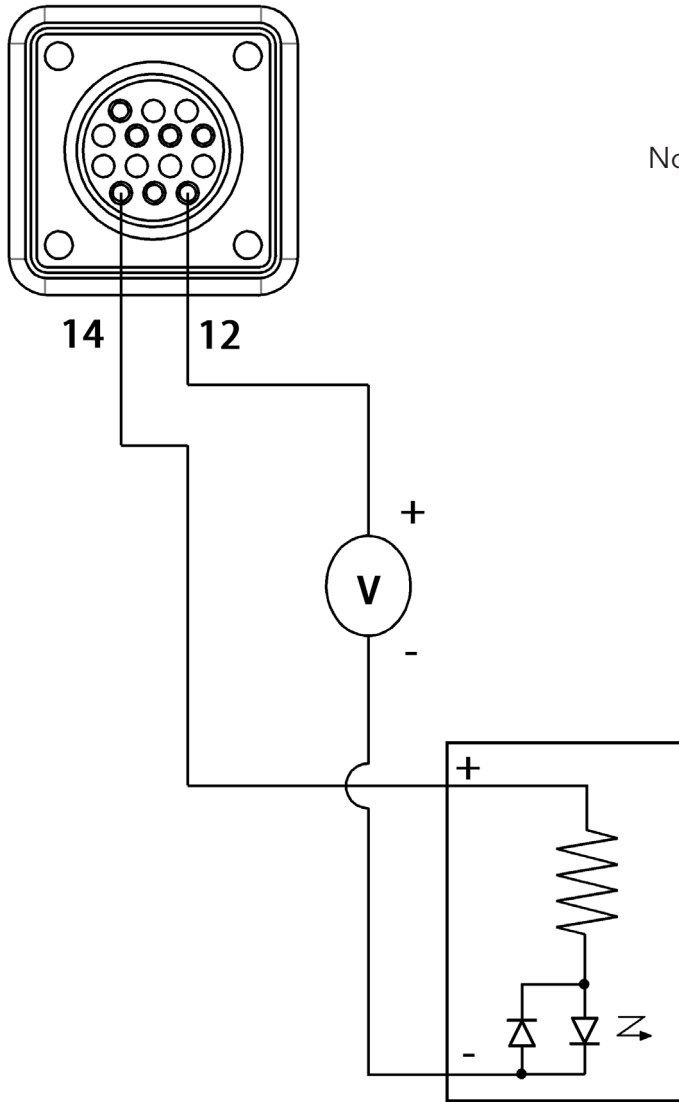
Activating an external DC coil with an external power supply



Activating an external AC coil with an external power supply



Activating an industrial isolated module with an external power supply



Notes:

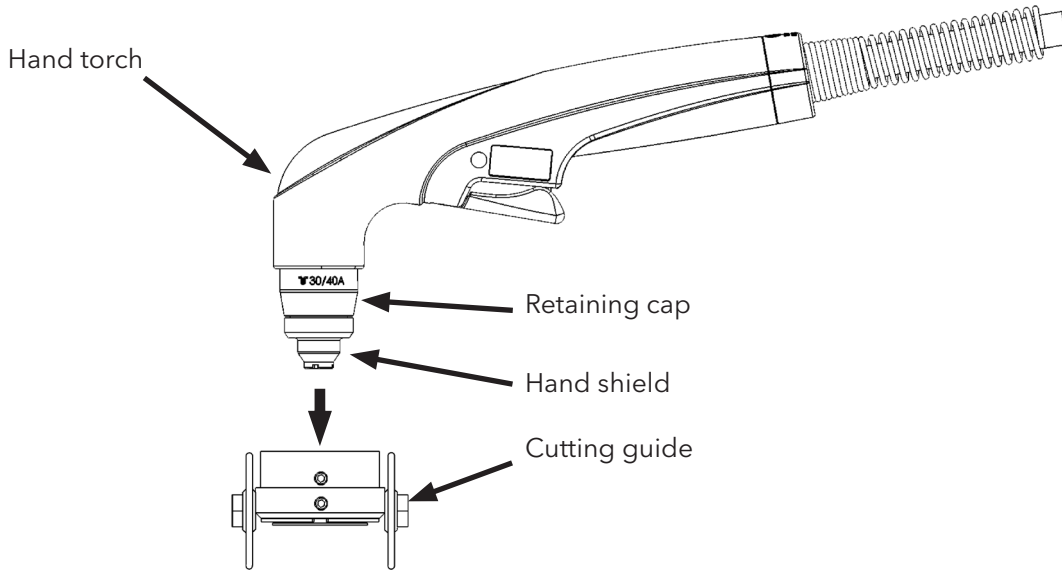
1. Isolated input module, provided by the user.
2. 24 VDC power supply to be provided by the user.



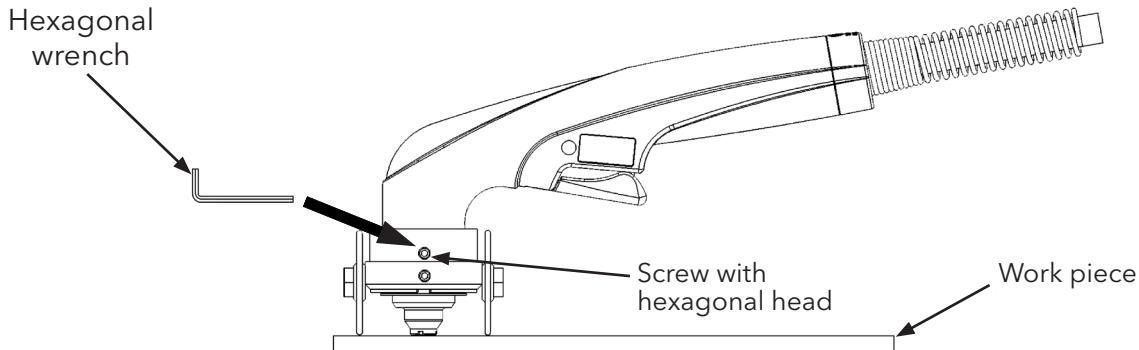
Installation of the machine interface cable must be performed by a certified electrician or competent person.

The circle cutting guide installation - for the FHT-EX® 30/40H

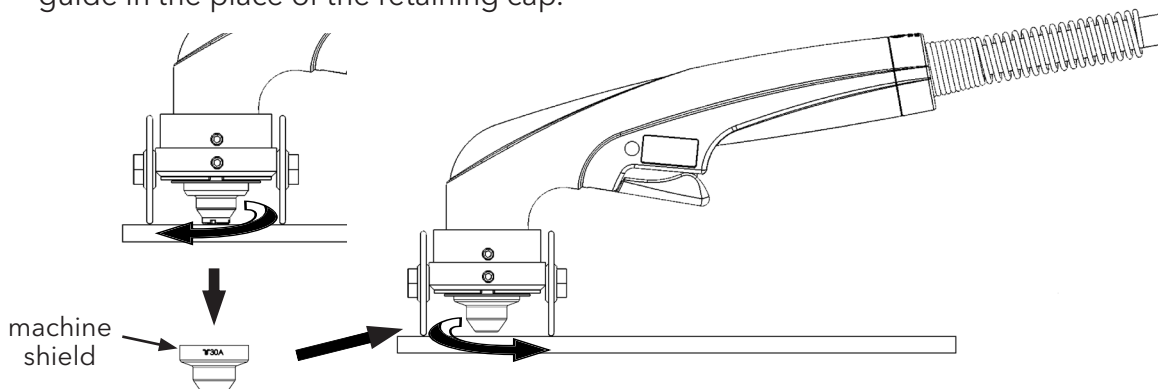
1. Disconnect the torch from the plasma power supply.
2. Insert the hand torch into the cutting guide.



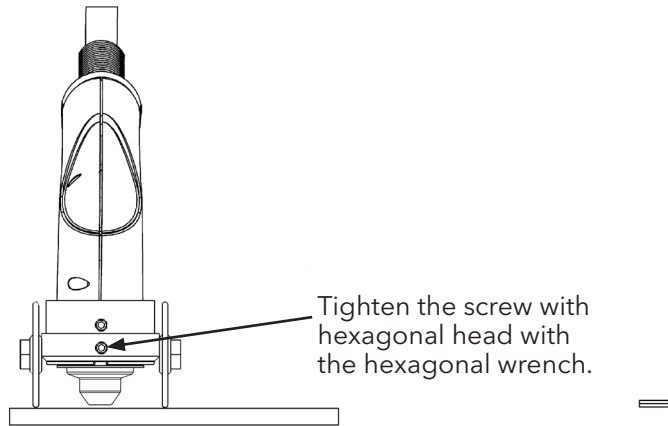
3. Secure the hand torch in the cutting guide with help of the screw with hexagonal head. Use the hexagonal wrench. Tighten by hand. The hand shield defines the required torch to workpiece distance.



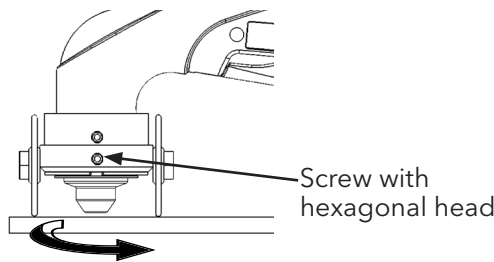
4. It's strictly recommended to use the machine shield in order to keep smooth cutting operation. Unscrew the hand shield and replace with the machine shield. The torch to workpiece distance remains the same because the hand torch is clamped in the cutting guide in the place of the retaining cap.



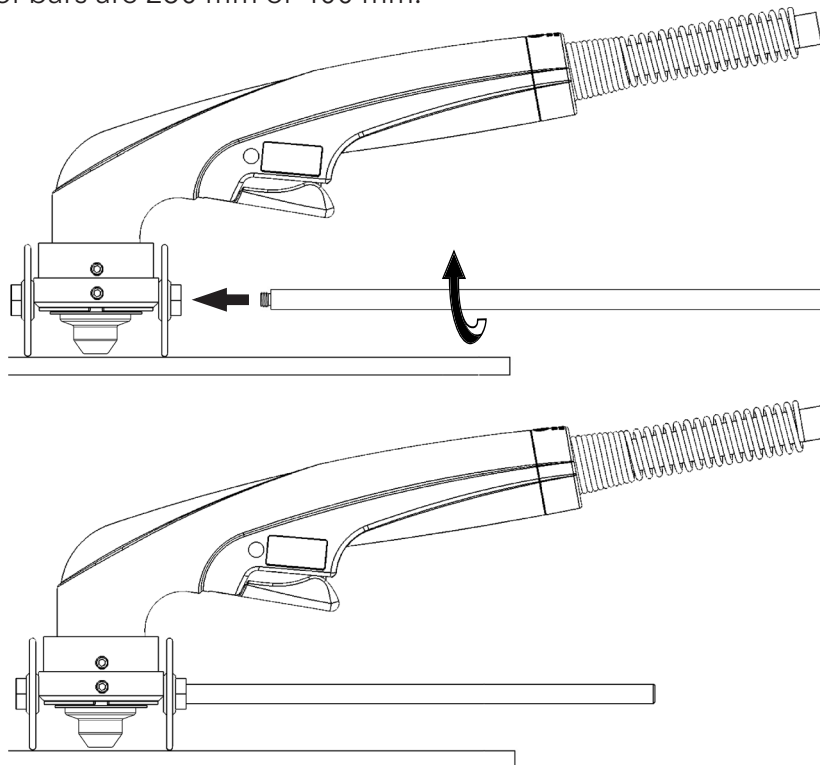
5. The hand torch clamped in the cutting guide can be used alone or with a radius bar. If you don't want use the radius bar, lock the cutting guide in a fixed position by using of the screw with hexagonal head so that the wheels of the cutting guide point in the same direction as the torch handle - see picture below. Now the torch with the cutting guide is ready to cut.



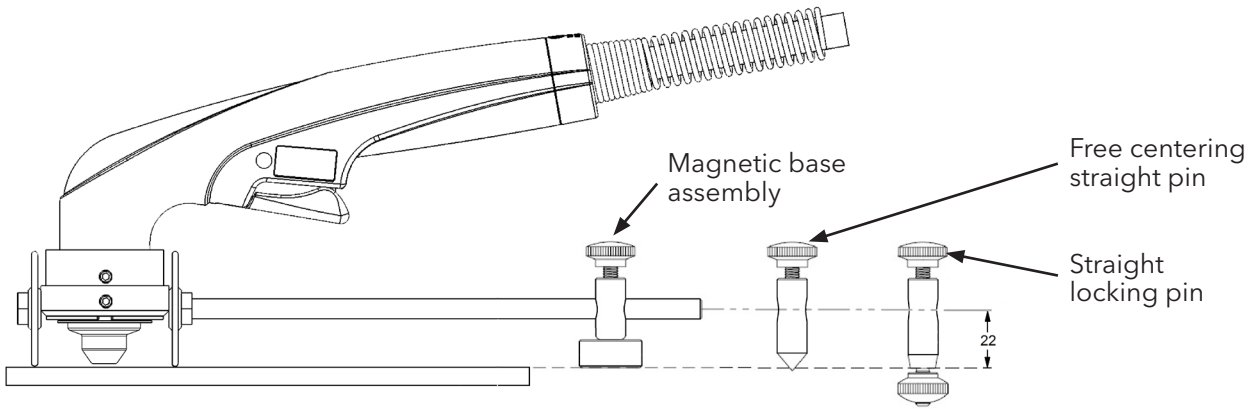
6. If you want use the radius bar, make sure the screw with hexagonal head isn't tightened so that the cutting guide can rotate freely.



7. Screw in the radius bar into the threaded hole in the cutting guide.
* Lengths of bars are 250 mm or 400 mm.



8. Use the following fasteners to anchor the radius bar to the center of the circle:



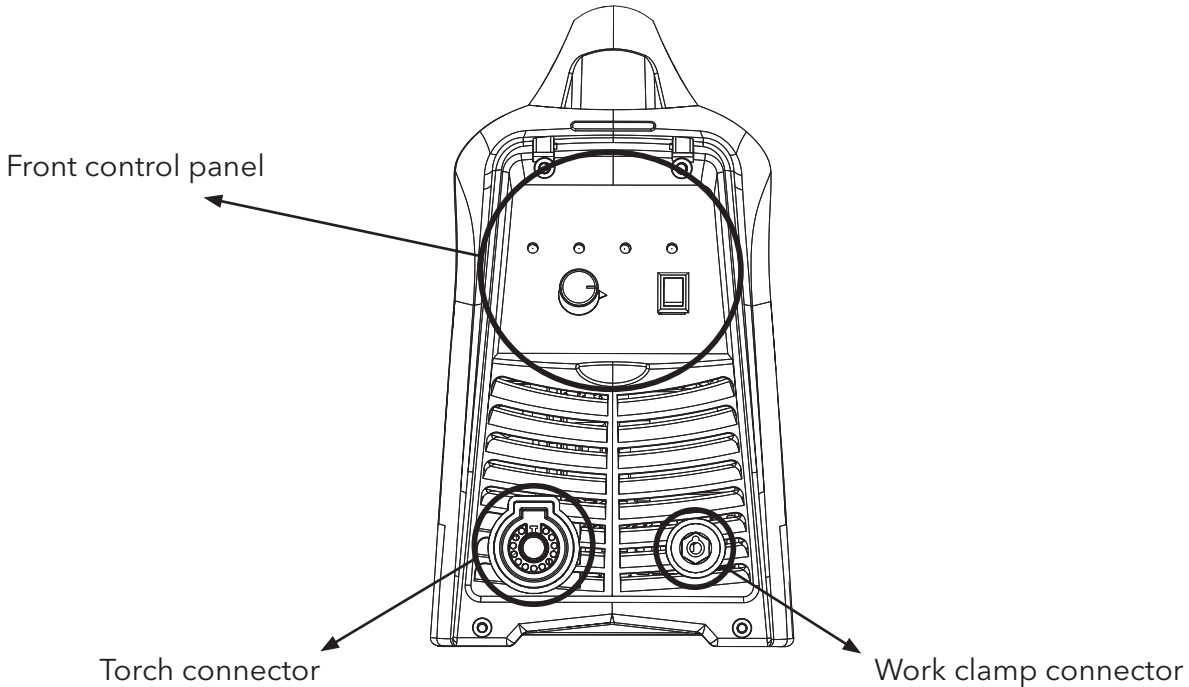
SECTION 4.

OPERATION:

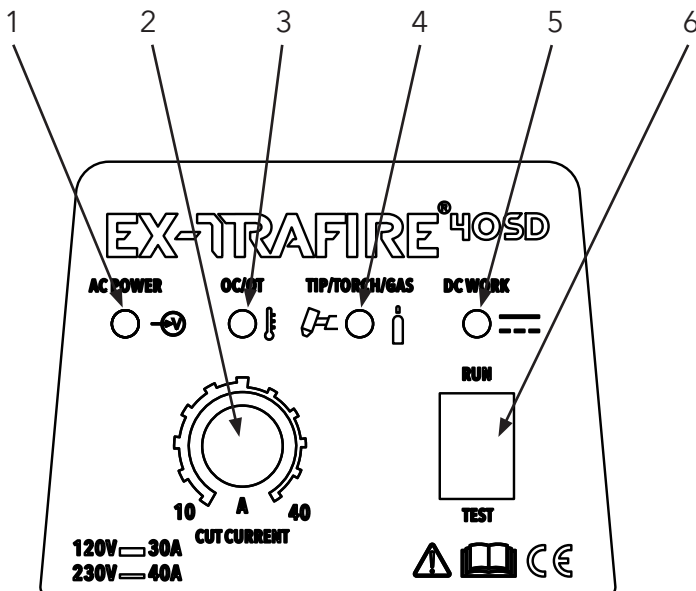
Front view.....	4-32
Front control panel	4-32
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Rear control panel detail.....	4-33
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OPERATION

Front view

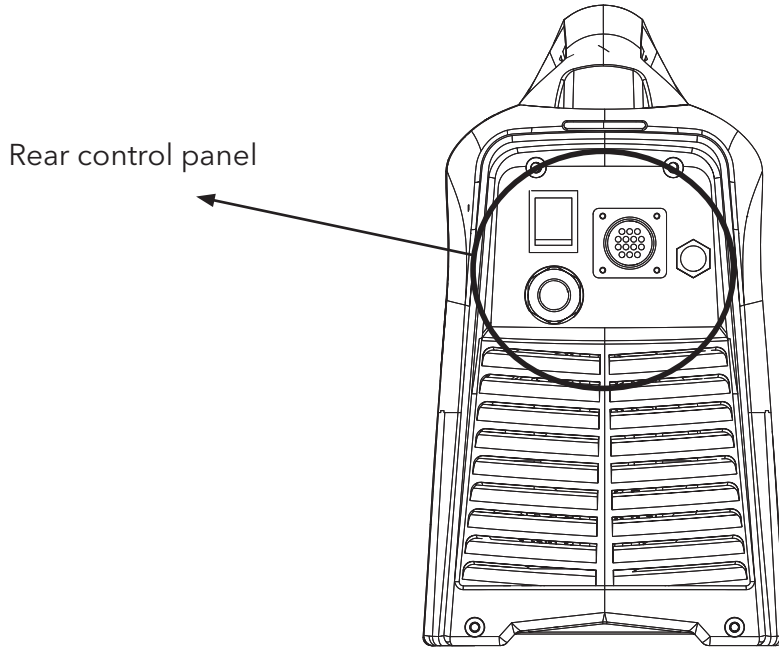


Front control panel

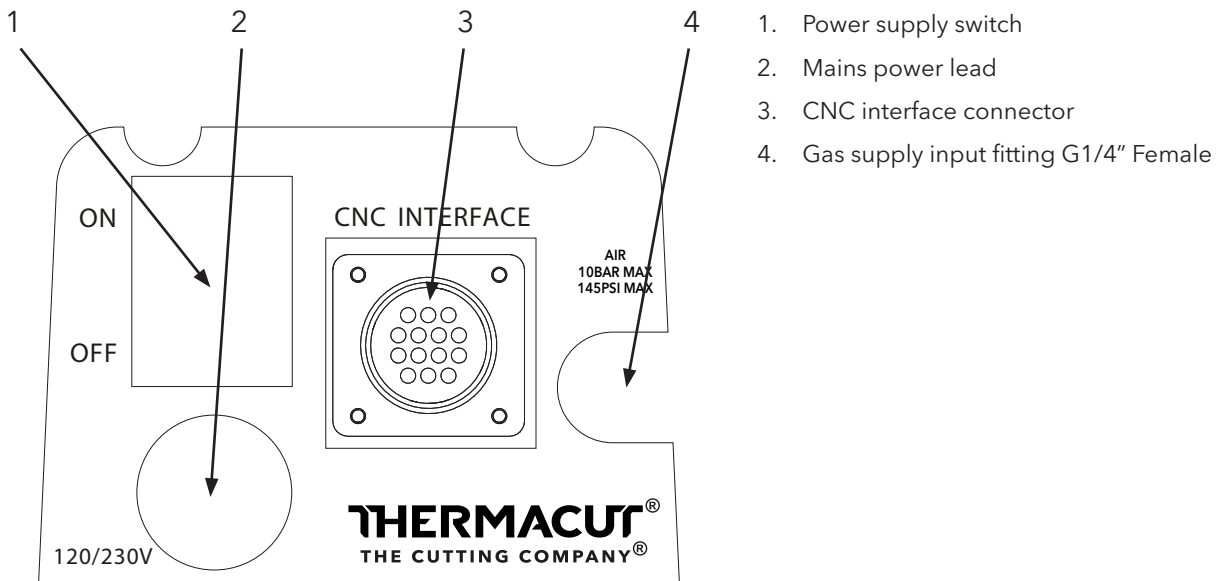


1. Power ON/OFF indicator. LED1 illuminates when the power supply is turned ON.
2. Cutting current regulator knob
3. Over-Current (OC), Over-Temperature (OT) alarm indicator
4. Multifunctional indicator
TIP - LED blinks when the consumables are loose, improperly installed, or missing (this indication can be accompanied with the gas pulsing sound)
TORCH - LED blinks when the retaining cap is loose, improperly installed, or missing
GAS - LED illuminates when the gas pressure is lower than 3 bar.
5. DC WORK - pilot and main plasma arc ON indicator
6. RUN/TEST - mode switch

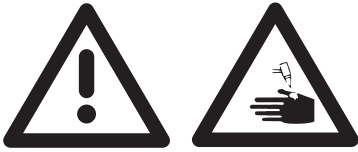
Rear view



Rear control panel detail



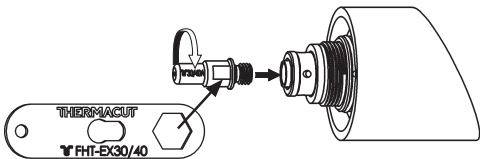
Torch consumables installation



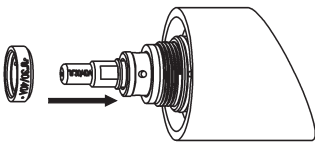
WARNING
Plasma arc is generated immediately
when the torch trigger is depressed

Plasma arc is generated immediately when the torch trigger is depressed. The plasma arc will cut quickly through gloves and skin. Make sure the power is switched off before changing consumables.

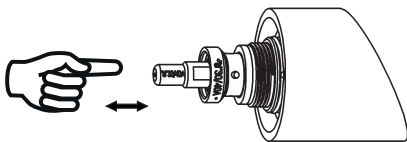
1. Screw the electrode. Use the electrode wrench (EX-2-427-010). Do NOT overtighten electrode.



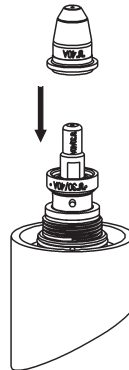
2. Insert the swirl ring with beveled edge in the torch body. Must seated properly.



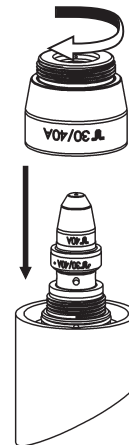
3. Perform free movement test of the electrode inside the swirl ring (by pushing the electrode).



4. Fit the nozzle on to the swirl ring.

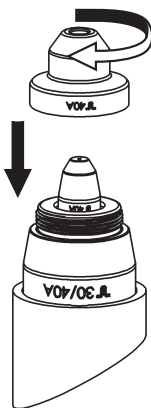


5. Screw on the nozzle retaining cap and tighten by hand. Do NOT overtighten.

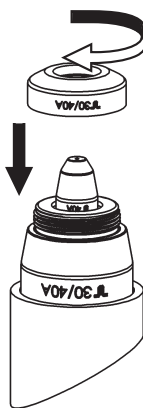


6. Screw on the hand (contact) shield (tighten by hand). Do NOT overtighten.

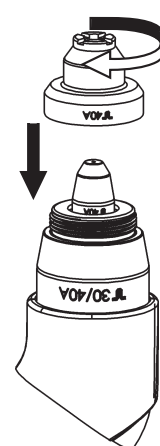
Machine Shield



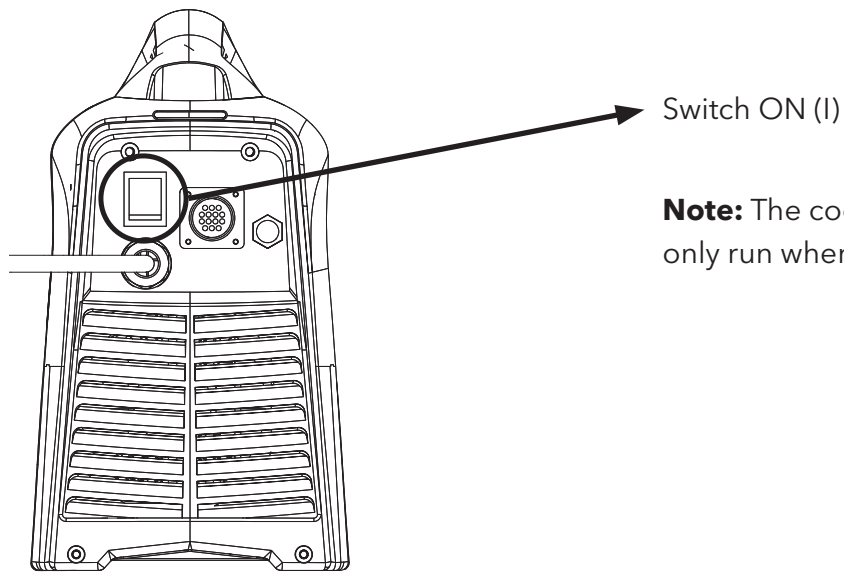
Deflector



Hand Shield




Turn ON



Note: The cooling fan will only run when needed.

Check the LED indicators

Check that LED1  is illuminated and LED2, LED3 and LED4 are not illuminated before cutting.

Operating the hand torch




WARNING
**Plasma arc is generated immediately
when the torch trigger is depressed**

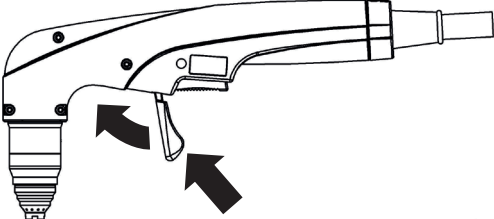
Plasma arc is generated immediately when the torch trigger is depressed.

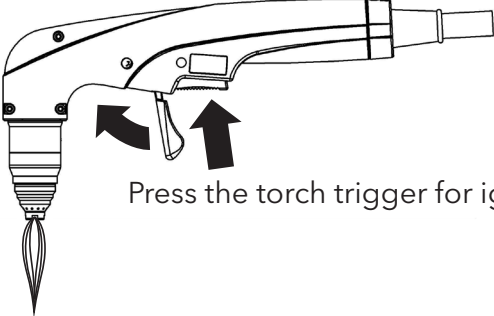
The plasma arc will cut quickly through gloves and skin. Make sure the power supply is switched off before changing consumables.

- Keep away from the torch tip.
- Do not hold the piece that is to be cut and keep your hands away from the cutting path.
- Never point the torch toward yourself or toward others.
- Never use with the pendant control switch.


Operating the torch safety trigger

- 

1. Safety trigger guard position.
- 

2. Release the trigger guard.
- 

3. Press the torch trigger for ignition of the arc.
4. Release the torch trigger to stop cutting.

	<p>WARNING SPARKS AND HOT METAL CAN BURN THE SKIN AND EYES</p>
<p>When angling the torch for cutting or piercing, molten metal (Arc Spray) will occur in the direction that the torch is aimed. Aim the torch away from yourself and others.</p>	

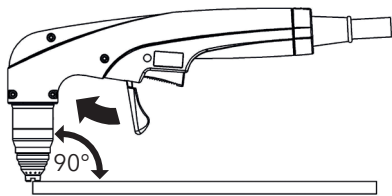
Fit the work clamp

Secure the work clamp to the work piece, ensure good contact, and remove surface contaminants. DO NOT fit the work clamp to the material that will be severed/scrap.

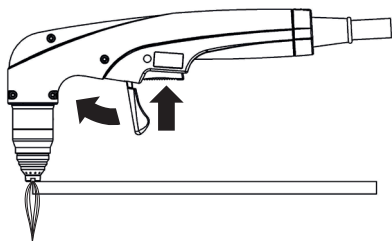
Fit the work clamp as close as possible to the cutting area to minimise exposure to electromagnetic fields (EMF).

Do not hold the material that is to be severed/scrap.

Edge start cutting

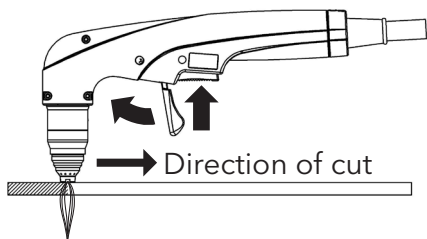


Keep the nozzle of the torch upright at the edge of the work piece.



Start cutting from the edge of the work piece.

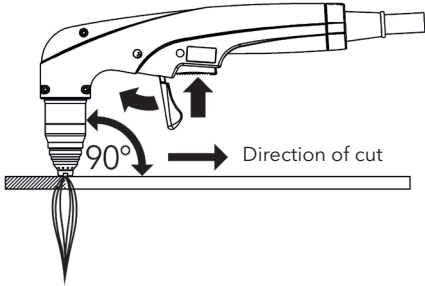
DO NOT start the travel motion until the material has been completely cut through.



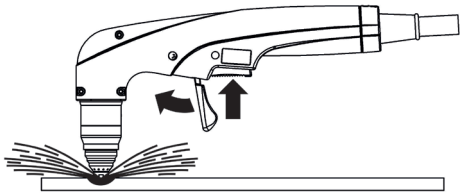
Then continue with the cut.

Hand torch cutting technique

Avoid unnecessary firing of the torch, each firing of the torch reduces the lifetime of the electrode and nozzle.

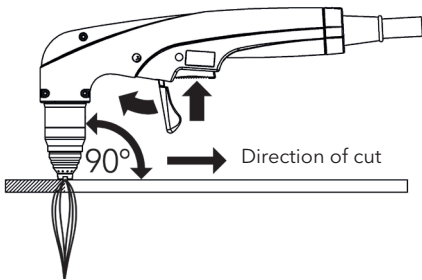


When cutting, ensure the arc spray exits the underside of the work piece.



Incomplete severance is indicated by an upward arc spray. This can be caused by the following:

- Excessive travel speed
- Incorrect power settings
- Incorrect gas pressure settings
- Worn/damaged consumables
- or by combination of any of the above



Hold the torch vertically and watch the arc while cutting along the line.

Shielded consumables. Make light contact between the shield and the work piece, pull the torch at a steady travel speed.

- Pulling the torch gives better control compared to pushing.
- For cutting thin material, reduce the amperage to the optimum to achieve the highest cut quality.
- For straight line/bevel cutting, use a straight edge as a guide. To cut circles, use a template or a circle cutting attachment.
- **Gas Post flow** - After the torch trigger is released, the gas will continue to flow up to 30 seconds (according to adjusted cutting current) to cool the torch and consumables.

Note: The torch will be ready to restart by depressing the torch trigger during the post flow period. To stop the post flow, depress the torch trigger quickly and release.



DANGER! Consumables can remain hot after the post-flow period.

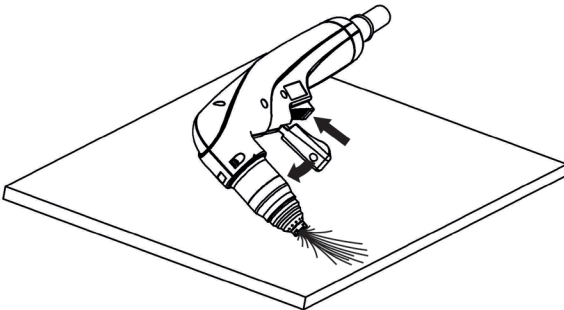
Piercing



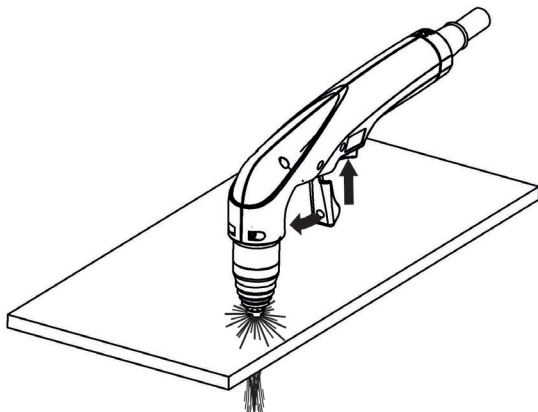
WARNING
SPARKS AND HOT METAL CAN
BURN THE SKIN AND EYES

When angling the torch for cutting or piercing, molten metal (Arc Spray) will occur in the direction that the torch is aimed. Aim the torch away from yourself and others.

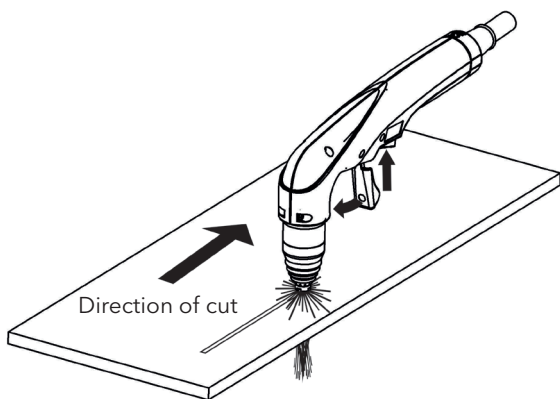
Hold the torch so that the nozzle is within 3 mm of the work piece before firing.



Hold the torch at an angle to the work piece, depress the torch trigger and slowly rotate the torch to a vertical position.



Arc spray exits the underside of the work piece when the cut has achieved full thickness.



After the pierce, proceed with cutting.

Mechanized Cutting Charts

30 A Mild steel, Mechanized Cutting, Shielded Configuration.....	4-41
40 A Mild steel, Mechanized Cutting, Shielded Configuration.....	4-42

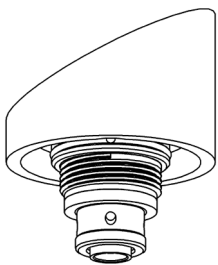
30 A Mild steel, Mechanized Cutting, Shielded Configuration

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width
				Best Quality Settings		Production Settings		
				Cut Speed	Voltage	Cut Speed	Voltage	
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]
0.5	2	3	0	-	-	8000	92	1
1			0	-	-	7000	100	1.05
1.5			0	3000	106	5000	106	1.08
2			0.2	2500	110	4200	110	1.1
3				1900		2800		1.3
4			0.4	1000	114	1800	114	1.4
5				750	115	1200	115	
6				450	116	900	116	
10			Edge Start	0.6	250	126	-	-

* Cut capacity speeds are not necessarily maximum speeds. They are the speeds that must be achieved to be rated at that thickness.

** Maximum cut speeds are the results of intensive laboratory testing. Actual cutting speeds may vary based on different cutting applications. Cut charts are a guide for mechanized cutting, individual systems can be "fine tuned" to achieve optimum cut quality.

*** Unshielded configuration, as Thermancut might offers so called unshielded consumables that could be used for mechanised cutting and for handheld cutting outside CE conformity country's be aware of some facts: If mechanised cutting; Increase the torch to work distance when mechanised cutting, as thumbs rule increase the TTWD (Torch To Work Distance) distance by min. of 1mm over the recommended shielded version. Increase the piercing height about 1.2 mm for material thickness up to 8mm and over 8mm about 1.5 mm. Adjust the cutting speed as thumbs rule by reduction of 10% versus the shield configuration. Adjust the AVC settings to new distance and speed. (Normally reduce the AVC setting by 5 - 7 Volts.) Thermancut NOT recommends and or promotes operating handheld cutting when not using the shielded consumables.



EX-2-401-001



EX-2-404-002



EX-2-409-003



EX-2-415-004



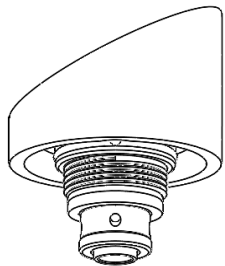
EX-2-421-006



EX-2-423-007

40 A Mild steel, Mechanized Cutting, Shielded Configuration

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width
				Best Quality Settings		Production Settings		
				Cut Speed	Voltage	Cut Speed	Voltage	
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]
0,5	2	3	0	-	-	-	-	-
1				-	-	-	-	-
1,5				6300	136	-	-	-
2			0,1	5200	140	8000	142	1,1
3			0,2	3500	139	5300	139	1,3
4				2530	144	3650		
5		2050		136	2700	137	1,4	
6		3,5	0,3	1300	137	2050	130	1,5
10		4	0,6	700	146	860	140	1,7
12		-	-	350	153	630	148	1,9
15		-	-	180	159	400	152	2,3



EX-2-401-001



EX-2-404-002



EX-2-409-001



EX-2-415-004



EX-2-421-001



EX-2-423-007



* Cut capacity speeds are not necessarily maximum speeds. They are the speeds that must be achieved to be rated at that thickness.

** Maximum cut speeds are the results of intensive laboratory testing. Actual cutting speeds may vary based on different cutting applications. Cut charts are a guide for mechanized cutting, individual systems can be "fine tuned" to achieve optimum cut quality.

*** Unshielded configuration, as Thermacut might offers so called unshielded consumables that could be used for mechanised cutting and for handheld cutting outside CE conformity country's be aware of some facts: If mechanised cutting; Increase the torch to work distance when mechanised cutting, as thumbs rule increase the TTWD (Torch To Work Distance) distance by min. of 1mm over the recommended shielded version. Increase the piercing height about 1.2 mm for material thickness up to 8mm and over 8mm about 1.5 mm. Adjust the cutting speed as thumbs rule by reduction of 10% versus the shield configuration. Adjust the AVC settings to new distance and speed. (Normally reduce the AVC setting by 5 - 7 Volts.) Thermacut NOT recommends and or promotes operating handheld cutting when not using the shielded consumables.

SECTION 5.

MAINTENANCE:

Routine maintenance 5-44
Consumable parts inspection 5-45
Purging/draining of the built-in filter..... 5-46

MAINTENANCE

Routine maintenance



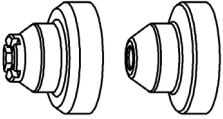
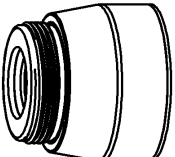
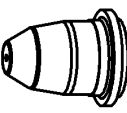






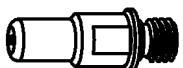
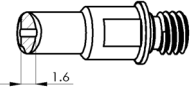
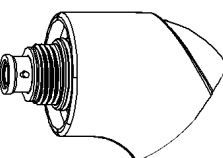
WARNING ELECTRIC SHOCK CAN KILL



Disconnect mains power lead before servicing; Qualified technicians only should perform any work that requires removal of the system cover. Allow a period (minimum 5 min.) for electrical discharge before handling internal parts.

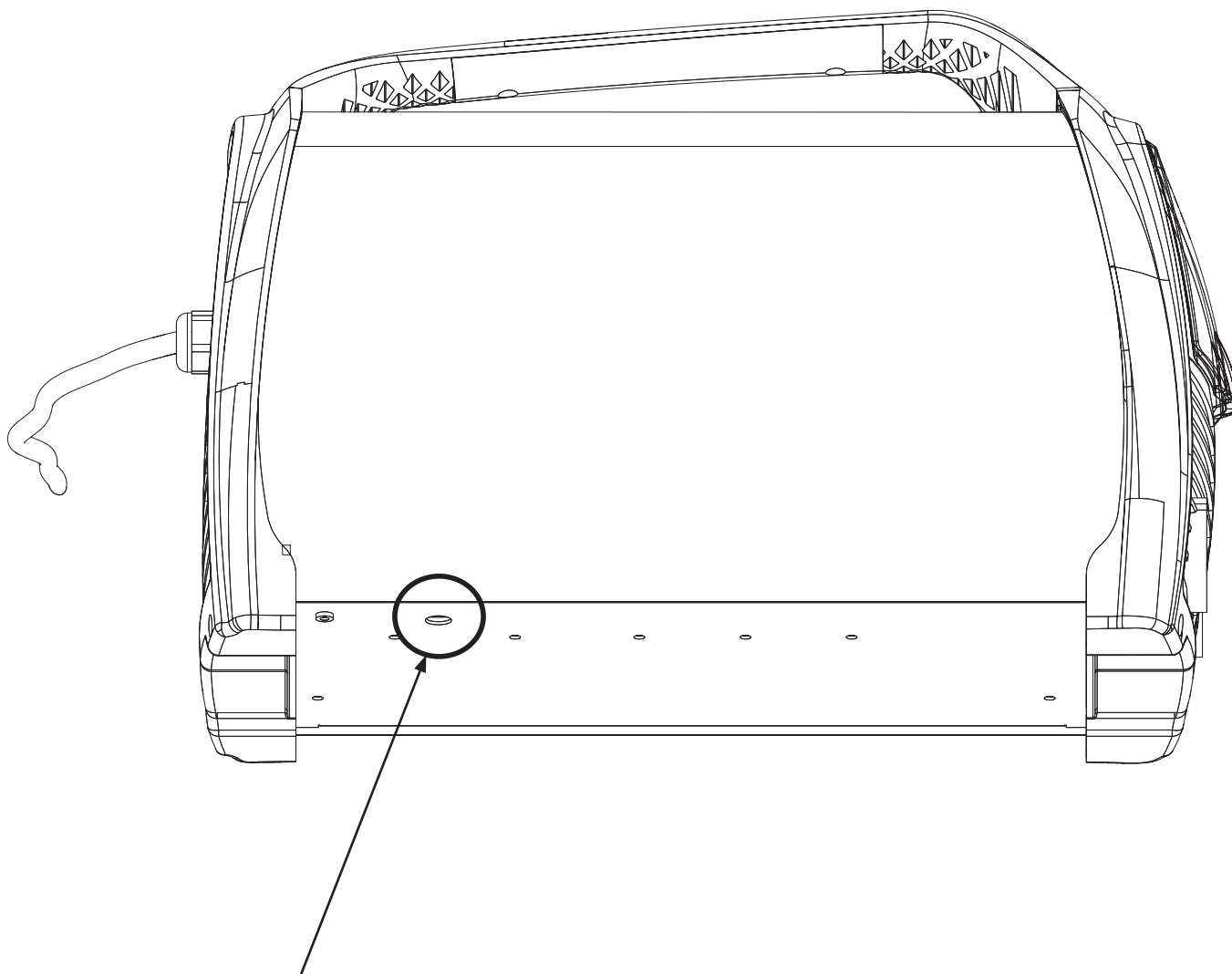
Every usage	Check the gas pressure. Check the consumables. Check the work clamp.	Ensure that consumables are installed correctly and are not worn.
Every week	Examine and check the torch retaining cap safety switch pins, ensure that the LED3 safety indicator which indicates a loose retaining cap is fully functional.	
Every 3 months	Clean the dust from inside of the power supply using clean dry compressed air.	Full examination of the torch, check the torch trigger safety mechanism, check for signs of cracking in the torch body or exposed wires.
Immediately replace the mains power lead/plug if damaged.	Immediately replace the torch lead if damaged.	Check air-line hose, filter elements, and connections for leaks.
Every 6 months	Vacuum clean or use clean dry compressed air to blow clean the inside of the plasma arc power supply. Advisory note: The dust can be harmful to health!	

Consumable parts inspection

Part		Inspect	Operation	
Shield		Out of round orifice or worn cruciform indicates worn condition	Replace shield	
		Accumulated spatter in the gap between the shield and the nozzle	Clean away any material from the shield and nozzle surface	
Nozzle Retaining Cap		Heat damage, cracks / fractures, damaged threads, blocked gas holes	Replace nozzle Retaining Cap	
Nozzle		Out of round orifice indicates worn condition	Replace nozzle	
		<table border="1" style="width: 100%; text-align: center;"> <tr> <td></td> <td></td> </tr> <tr> <td>Good orifice</td> <td>Worn orifice</td> </tr> </table>		
				
Good orifice	Worn orifice			
Swirl Ring		Damage or contamination of external surface	Replace swirl ring	
		Internal hole diameter / condition: Electrode doesn't slide easily / binding on the electrode.		
		blocked/damaged gas holes		
Electrode		Hafnium pit depth greater than 1.6mm	Replace electrode	
				
Torch		Internal burn or arcing marks	Replace torch	
		Worn or damaged threads		
		Pitted or missing material		
		Damaged, cracked or contaminated	Replace O-ring	
		Damaged O-ring	Apply a thin coat of silicone grease part No. T-0994	
		Dry O-ring		

Purging/draining the built-in filter

This power supply is equipped with built-in float type auto drain filter. Do not cover outflow drain hole located on the bottom of the power supply (see the picture below).



Position of the outflow drain hole

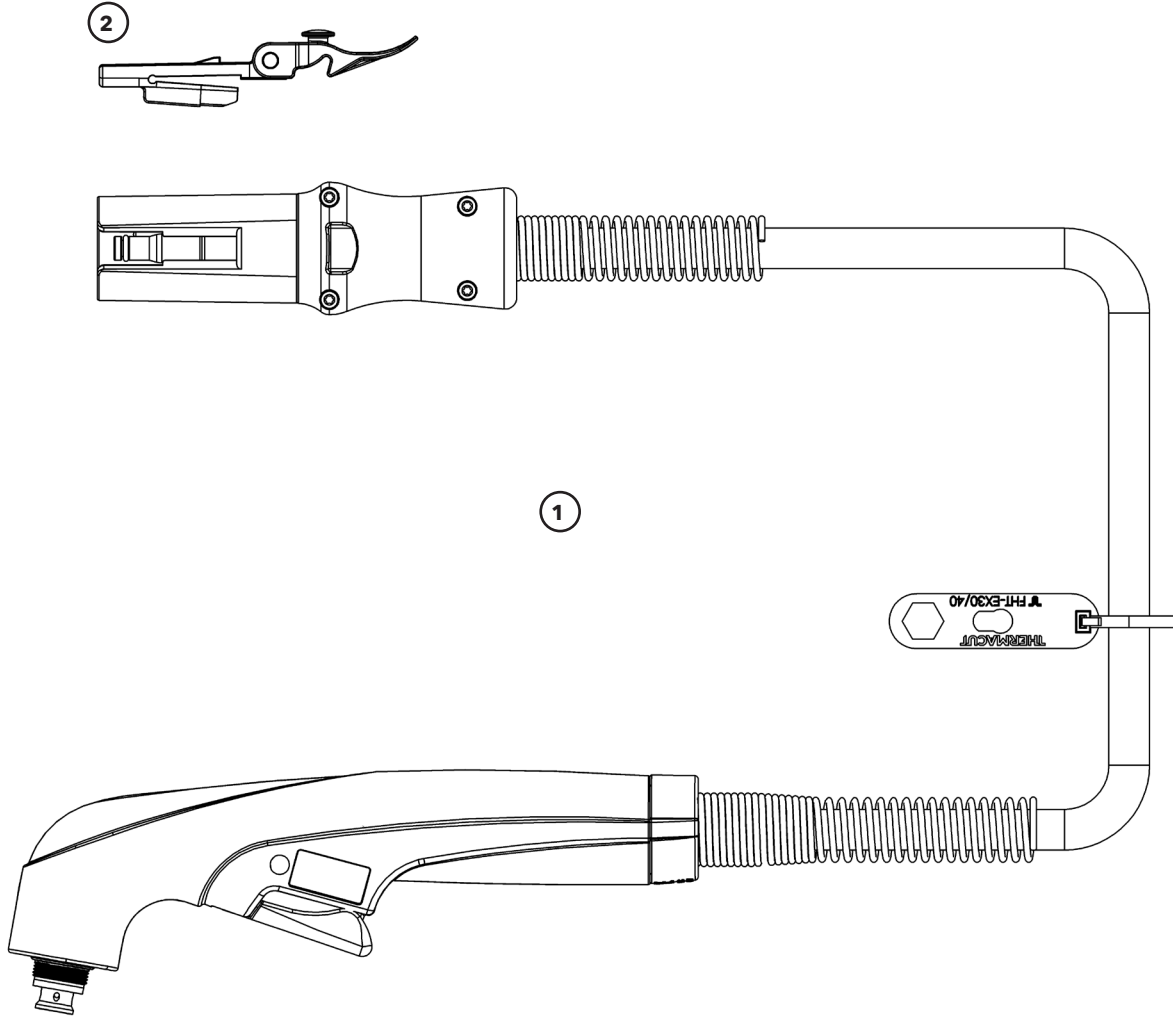
SECTION 6.

TORCHES AND TORCH PARTS:

FHT-EX® 40H Hand Torch Assembly	6-48
FHT-EX® 40H Hand Torch Components	6-49
FHT-EX® 40H Hand Torch Consumables	6-50
FHT-EX® 40M Machine Torch Assembly	6-51
FHT-EX® 40M Machine Torch Components	6-52
FHT-EX® 40M Machine Torch Consumables	6-53
FHT-EX® 40M Machine Torch Consumables	6-54

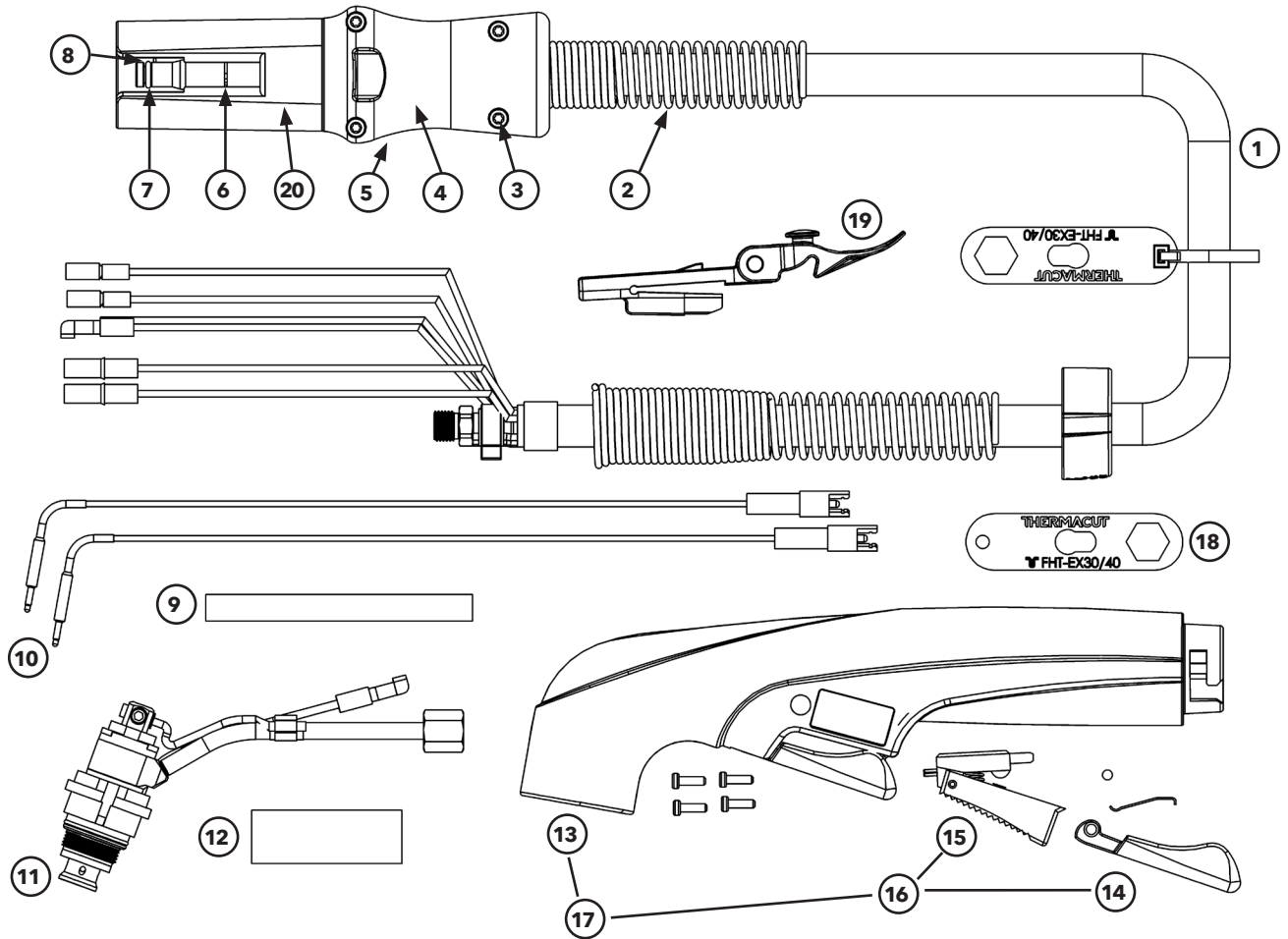
TORCHES AND TORCH PARTS

FHT-EX® 40H Hand Torch Assembly



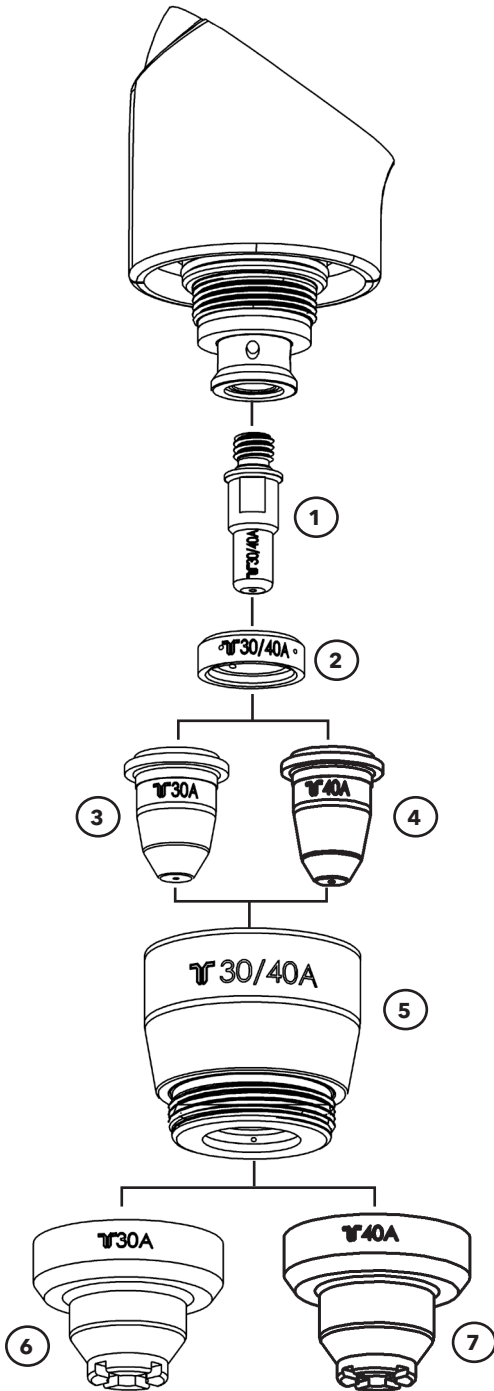
Item	Part No.	DESCRIPTION
1	EX-2-133-000	DEMO FHT-EX® 40H Hand Torch Assembly/TCS13
1	EX-2-130-001	FHT-EX® 40H Hand Torch Assembly w/o consumables w/4m Lead/TCS13
1	EX-2-101-003	FHT-EX® 40H Hand Torch Assembly w/o consumables w/5m Lead/TCS13
1	EX-2-131-005	FHT-EX® 40H Hand Torch Assembly w/o consumables w/7.5m Lead/TCS13
1	EX-2-106-007	FHT-EX® 40H Hand Torch Assembly w/o consumables w/15m Lead/TCS13
2	EX-0-321-003	Latch w/Key Assembly

FHT-EX® 40H Hand Torch Components



Item	Part No.	DESCRIPTION
1	EX-2-328-001	Hand Torch Lead Replacement Kit 4m Lead/TCS13
1	EX-2-331-002	Hand Torch Lead Replacement Kit 5m Lead/TCS13
1	EX-2-329-003	Hand Torch Lead Replacement Kit 7.5m Lead/TCS13
1	EX-2-336-004	Hand Torch Lead Replacement Kit 15m Lead/TCS13
2	EX-5-318-001	TCS Plug Spring Stain Relief
3	EX-0-325-015	TCS Clam Shell Screw
4	EX-0-325-002	TCS Clam Shell Upper
5	EX-0-325-001	TCS Clam Shell Lower
6	EX-0-325-010	Retaining Ring (Outer circlip ring)
7	EX-0-325-009	O-Ring (fitted in the TCS plug)
8	EX-0-325-005	Male Crimp Pin for TCS Plug
9	EX-0-319-021	Insulating Teflon Tube
10	EX-2-304-020	Hand Torch PIP Pins Replacement Kit (w/Wires)
11	EX-2-302-009	Hand Torch Body FHT-EX®40H
12	EX-0-319-011	Shrink Tube
13	EX-2-308-012	Hand Torch Handle Kit
14	EX-5-310-014	Trigger Guard
15	EX-5-309-013	Trigger
16	EX-5-313-018	Safety Trigger Replacement Kit
17	EX-2-314-015	Hand Torch Handle Replacement Kit
18	EX-2-427-010	Electrode Wrench FHT-EX®30/40
19	EX-0-321-003	Latch w/Key Assembly
20	EX-0-323-001	TCS13 Plug Body

FHT-EX® 40H Hand Torch Consumables

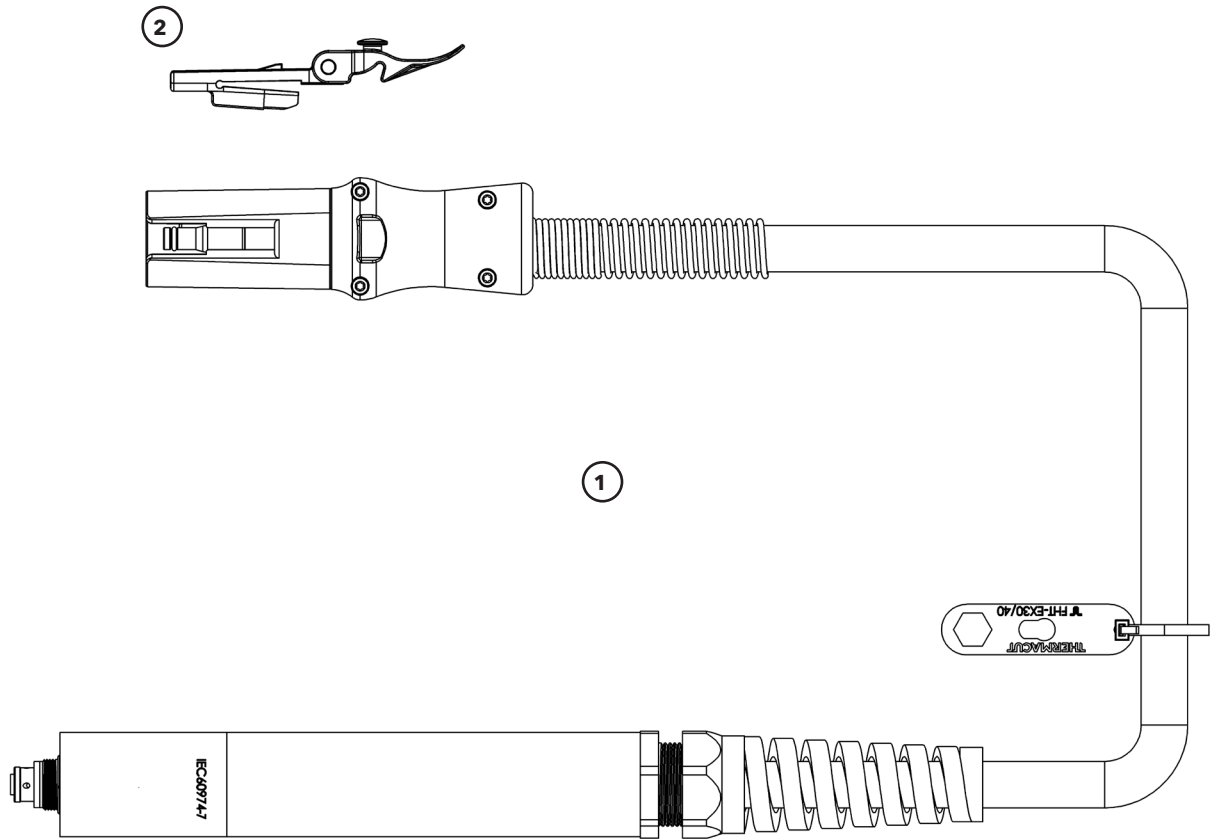


Hand Torch Consumables Configuration 30/40A		
Item	Part No.	DESCRIPTION
1	EX-2-401-001	Electrode
2	EX-2-404-002	Swirl Ring
3	EX-2-409-003	Nozzle 30A, 0.8mm
4	EX-2-409-001	Nozzle 40A, 0.9mm
5	EX-2-415-004	Nozzle Retaining Cap (Protection Cap)
6	EX-5-419-005	Hand (contact) Shield 30A
7	EX-2-419-001	Hand (contact) Shield 40A



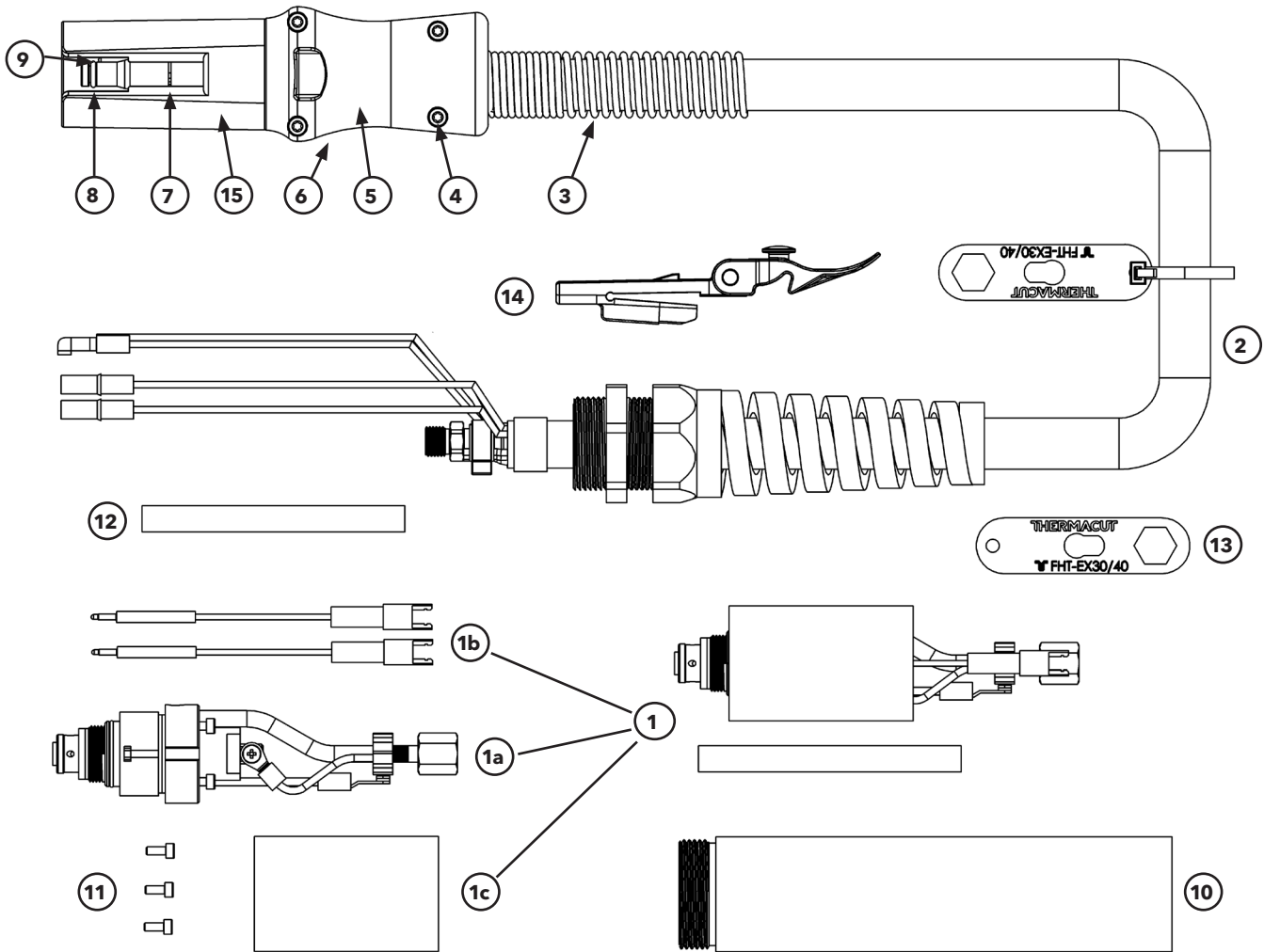
For use in countries that requires CE conformity, the hand torch must be only operated with shielded configuration consumables.

FHT-EX® 40M Machine Torch Assembly



Item	Part No.	DESCRIPTION
1	EX-2-233-000	DEMO FHT-EX® 40M Machine Torch Assembly/TCS13
1	EX-2-235-001	FHT-EX® 40M Machine Torch Assembly w/o consumables w/4m Lead/TCS13
1	EX-2-202-003	FHT-EX® 40M Machine Torch Assembly w/o consumables w/5m Lead/TCS13
1	EX-2-236-005	FHT-EX® 40M Machine Torch Assembly w/o consumables w/7.5m Lead/TCS13
1	EX-2-207-007	FHT-EX® 40M Machine Torch Assembly w/o consumables w/15m Lead/TCS13
2	EX-0-321-003	Latch w/Key Assembly

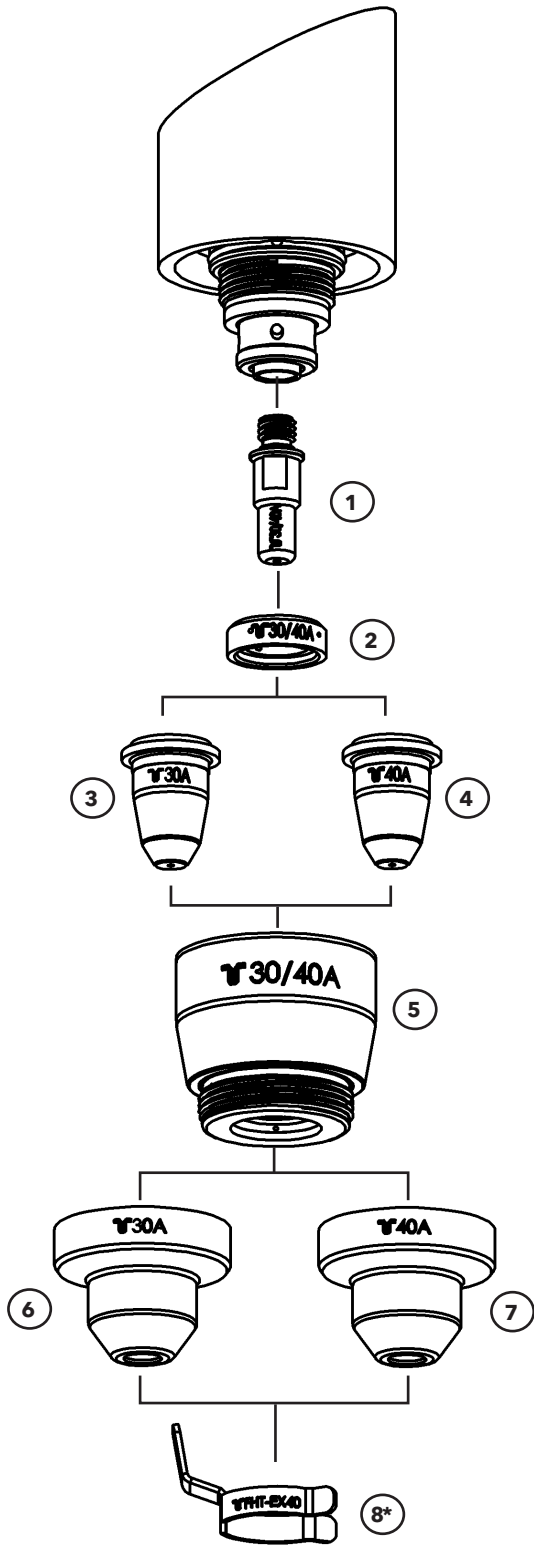
FHT-EX® 40M Machine Torch Components



Item	Part No.	DESCRIPTION
1	EX-2-301-010	Machine Torch Body Assembly FHT-EX®40M
1a	EX-2-301-011	Machine Torch Body FHT-EX®40M
1b	EX-2-304-021	Machine Torch PIP Pins Replacement Kit (w/Wires)
1c	EX-2-306-022	Torch Mounting Sleeve (incl. screws)
2	EX-2-326-005	Machine Torch Lead Replacement Kit 4m Lead/TCS13
2	EX-2-352-006	Machine Torch Lead Replacement Kit 5m Lead/TCS13
2	EX-2-327-007	Machine Torch Lead Replacement Kit 7.5m Lead/TCS13
2	EX-2-357-008	Machine Torch Lead Replacement Kit 15m Lead/TCS13
3	EX-5-318-001	TCS Plug Spring Stain Relief
4	EX-0-325-015	TCS Clam Shell Screw
5	EX-0-325-002	TCS Clam Shell Upper
6	EX-0-325-001	TCS Clam Shell Lower
7	EX-0-325-010	Retaining Ring (Outer circlip ring)
8	EX-0-325-009	O-Ring (fitted in the TCS plug)
9	EX-0-325-005	Male Crimp Pin for TCS Plug
10	EX-2-306-023	Torch Positioning Sleeve
11	EX-0-372-001	Torch Mounting Screw
12	EX-0-319-021	Insulating Teflon Tube
13	EX-2-427-010	Electrode Wrench FHT-EX®40
14	EX-0-321-003	Latch w/Key Assembly
15	EX-0-323-001	TCS13 Plug Body

FHT-EX® 40M Machine Torch Consumables

Shielded Configuration



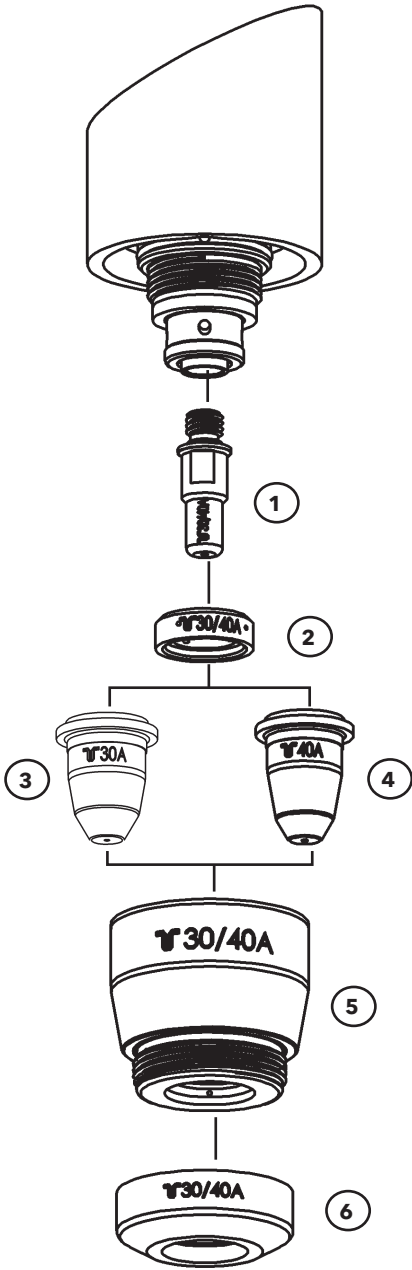
Machine Torch Consumables Configuration 30/40A		
Item	Part No.	DESCRIPTION
1	EX-2-401-001	Electrode
2	EX-2-404-002	Swirl Ring
3	EX-2-409-003	Nozzle 30A, 0.8mm
4	EX-2-409-001	Nozzle 40A, 0.9mm
5	EX-2-415-004	Nozzle Retaining Cap (Protection Cap)
6	EX-2-421-006	Machine Shield 30A
7	EX-2-421-001	Machine Shield 40A
8	EX-2-428-011	IHS Ohmic Clip



* When a torch height controller installed and applying ohmic sensing use a IHS (Initial Height Sensing) ohmic clip.

FHT-EX® 40M Machine Torch Consumables

Unshielded Configuration



Machine Torch Consumables Configuration 30/40A		
Item	Part No.	DESCRIPTION
1	EX-2-401-001	Electrode
2	EX-2-404-002	Swirl Ring
3	EX-2-409-003	Nozzle 30A, 0.8mm
4	EX-2-409-001	Nozzle 40A, 0.9mm
5	EX-2-415-004	Nozzle Retaining Cap (Protection Cap)
6	EX-2-423-007	Deflector

SECTION 7.**ADDITIONAL ORDERING INFORMATION:**

EX-TRAFIRE® 40SD Power Supply	
Part No.	DESCRIPTION
EX-2-001-007	EX-TRAFIRE® 40SD/CE/1x100-240V Power Supply Unit (fully-equipped)

EX-TRAFIRE® 40SD Manual Plasma Cutting Systems		
Part No.	DESCRIPTION	Length
EX-2-010-001	EX-TRAFIRE® 40SD/CE/1x100-240V Hand System/FHTEX40H 4m/H Starter Kit	4 m
EX-2-010-002	EX-TRAFIRE® 40SD/CE/1x100-240V Hand System/FHTEX40H 5m/H Starter Kit	5 m
EX-2-010-003	EX-TRAFIRE® 40SD/CE/1x100-240V Hand System/FHTEX40H 7.5m/H Starter Kit	7.5 m
EX-2-010-004	EX-TRAFIRE® 40SD/CE/1x100-240V Hand System/FHTEX40H 15m/H Starter Kit	15 m

EX-TRAFIRE® 40SD Mechanized Plasma Cutting Systems		
Part No.	DESCRIPTION	Length
EX-2-011-001	EX-TRAFIRE® 40SD/CE/1x100-240V Machine System/FHT-EX40M 4m/M Starter Kit	4 m
EX-2-011-002	EX-TRAFIRE® 40SD/CE/1x100-240V Machine System/FHT-EX40M 5m/M Starter Kit	5 m
EX-2-011-003	EX-TRAFIRE® 40SD/CE/1x100-240V Machine System/FHT-EX40M 7.5m/M Starter Kit	7.5 m
EX-2-011-004	EX-TRAFIRE® 40SD/CE/1x100-240V Machine System/FHT-EX40M 15m/M Starter Kit	15 m

Available Bulk Packs		
Part No.	DESCRIPTION	Pcs
EX-2-434-014	Bulk Pack - Electrode - 25pcs	1
EX-2-435-015	Bulk Pack - Nozzle 30A 0.8mm - 25pcs	1
EX-2-436-016	Bulk Pack - Hand (contact) Shield 30A - 18pcs	1
EX-2-437-017	Bulk Pack - Machine Shield 30A - 18pcs	1
EX-2-435-001	Bulk Pack - Nozzle 40A 0.9mm - 25pcs	1
EX-2-436-001	Bulk Pack - Hand (contact) Shield 40A - 18pcs	1
EX-2-437-001	Bulk Pack - Machine Shield 40A - 18pcs	1

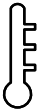
SECTION 8.

TROUBLESHOOTING:


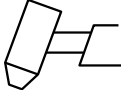
Fault	This may mean	Cause	Solution
Main switch is ON and the AC power LED1 fails to illuminate	<ul style="list-style-type: none"> No / low voltage of mains power source. 	<ul style="list-style-type: none"> Insufficient mains power source. 	<ul style="list-style-type: none"> Check the mains input voltage 100 - 130 VAC (CE) / 210 - 240 VAC (CE/C-TICK) Check internal control board supply.
		<ul style="list-style-type: none"> The mains power lead is not plugged in to a live socket. 	<ul style="list-style-type: none"> Plug the mains power lead in to a live socket.
		<ul style="list-style-type: none"> Main power switch is defective. 	<ul style="list-style-type: none"> Replace the main power switch.

Note: The fan turns ON and OFF automatically. The fan may not run when the plasma arc power supply is switched on.

The LED2 illuminates.



<ul style="list-style-type: none"> Over-temperature (OT) 	<ul style="list-style-type: none"> Fan fault. 	<ul style="list-style-type: none"> Ensure fan is free running, correct condition.
	<ul style="list-style-type: none"> Duty cycle over limit. 	<ul style="list-style-type: none"> Allow the power supply to cool down and reset. Do not exceed the rated duty cycle.
	<ul style="list-style-type: none"> Over-current (OC) 	<ul style="list-style-type: none"> Some of power supply inside component is over lifetime or burned out.

Fault	This may mean	Cause	Solution
<p>The LED3 illuminates.</p> 	<ul style="list-style-type: none"> Gas pressure fault. Pressure switch fault. 	<ul style="list-style-type: none"> The gas input pressure is lower than 3 bar/43 psi. Damaged torch lead. Incorrect pressure. 	<ul style="list-style-type: none"> Check gas supply input pressure. Replace the torch lead. Change the pressure switch inside the power supply.
<p>The LED3 blinks no arc output when the trigger is depressed.</p> 	<ul style="list-style-type: none"> Consumables fault. Short circuit inside the torch. 	<ul style="list-style-type: none"> Consumables are loose, improperly installed or missing. The retaining cap is not installed or tightened correctly. Non original consumables. Consumables are incorrectly installed. Dirt inside the torch. 	<ul style="list-style-type: none"> Install the consumables and fit the retaining cap. Fit the retaining cap and correctly tighten. Use original new consumables. Install the consumables correctly. Remove all consumables, clean the inside of the torch. Reassemble in correct order.
<p>RUN/TEST switch set to TEST or press the torch trigger but no gas output.</p>	<ul style="list-style-type: none"> Gas valve or power supply fault. 	<ul style="list-style-type: none"> Cable to the gas valve disconnected. Gas valve malfunction. Switch or trigger malfunctioning. 	<ul style="list-style-type: none"> Contact your distributor. Contact your distributor. Contact your distributor.

Fault	This may mean	Cause	Solution
No arc output but no alarm light when torch trigger is depressed.	• RUN/TEST switch positioning.	• Switch is not in correct position.	• Select "RUN" position.
	• Torch fault.	• Incorrect type of the torch.	• Use the correct torch type which is suitable for the machine.
		• Torch components.	• Check torch components, change parts if necessary.
	• Input gas pressure fault.	• Input gas pressure is too high.	• Decrease input static pressure to 6 bar / 87 psi.
No transfer between pilot arc and workpiece.	• Status of the power supply.	• Test mode is activated.	• Change the status to "RUN" mode.
	• Work clamp connection fault.	• Fluctuating connection between the clamp and work piece.	• Clean the surface of the clamp and material.
	• No connection to work piece.	• Incorrect distance between the torch and work piece.	• Maintain correct distance between the torch and work piece.
The output is too low, unstable or inadequate.		• Work cable is broken.	• Replace the work cable.
	• Connection fault.	• Input and output connection leads.	• Check all input and output connection leads.
		• Fluctuating connection between the clamp and work piece.	• Make sure that work lead has a good connection to a clean and dry area of work piece.
		• Incorrect distance between the torch and the work piece.	• Maintain correct distance between the torch and the work piece.
	• Voltage fault.	• Incorrect input voltage.	• Use the correct input voltage, in accordance with specification.

Fault	This may mean	Cause	Solution
The pilot arc is difficult to ignite and cuts out.	<ul style="list-style-type: none"> • Consumables fault. • Air pressure fault. 	<ul style="list-style-type: none"> • Check for worn consumables. • The air pressure is too high. 	<ul style="list-style-type: none"> • Change the consumable which may be worn. • Adjust the air pressure output.
Output is restricted and can not be controlled.	<ul style="list-style-type: none"> • Connection failure. 	<ul style="list-style-type: none"> • Input or output connection leads. • Fluctuating connection between the clamp and work piece. 	<ul style="list-style-type: none"> • Check all input and output connection cables. • Ensure that the work lead has a good connection to a clean and dry area of work piece.
Cut quality issues.	<ul style="list-style-type: none"> • Incorrect current setting. • Consumables fault. • Incorrect cutting technique. • Poor connection. 	<ul style="list-style-type: none"> • Poor quality. • Consumables are worn. • Poor cut quality. • Work piece is dirty / contaminated. 	<ul style="list-style-type: none"> • Adjust the current to suit the thickness of material to be cut. • Inspect consumables - see section FHT-EX® 40 Consumable part inspection. • Adjust the current to suite the cutting speed and torch-to-workpiece distance according to the thickness of material to be cut. • Clean the surface of the work piece.

For more detailed information see Service Manual

SECTION 9.

ACCESSORIES:

Filter-EX Compressed Air Filter with replacement filter cartridge

EX-0-804-001
Filter-EX Compressed Air Filter
(Standard package 1 piece)



EX-0-804-002
Filter-EX Air Filter Cartridge
(Standard package 8 pieces)



Technical specification

Filtering Degree:	0.01 µinch - 0.25 µm
Maximum Pressure:	125 PSI - 8.5 bar
Maximum Flow @ 80%:	2700 SCFH - 1250 l/min.
Temperature Range:	15 - 140F / -10 +60 °C
Size Pipe:	¼ NPT
Dimension:	Ø 5.2" × 7.9" - Ø 132 × 200 mm

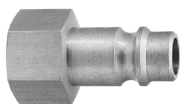
This filter does not fall under the specification of pressure equipment and requires no revision.

Advantages of using the Filter-EX Compressed Air Filter:

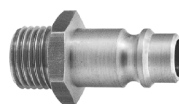
- Removes solid particles, aerosols, and moisture from the compressed air.
- Elimination of the negative effects caused by humidity during cutting.
- Extends the service life time of the torch, leads and consumables.
- Reduces the risk of torch and power supply damage.
- Positive effect on the quality of the cut.

Filter-EX Quick Connect Couplings

EX-0-802-000
DN 7.2 ES Quick Connect Plug
with female thread G 1/4"



EX-0-802-001
DN 7.2 ES Quick Connect Plug
with male thread G 1/4"



EX-0-802-002
DN 7.2 ES Quick Connect Coupling
with male thread G 1/4"



CNC interface

EX-0-803-001

CNC Interface 14-pin Plug Kit, incl. 7 pins



EX-0-803-004

CNC Interface connection lead 6 m



O-Ring lubricant



EX-0-805-001

Grease 25ml

Circle cutting guide kit for FHT-EX® 30/40H

EX-2-801-001

This Circle cutting guide kit for hand-held cutting obtains:

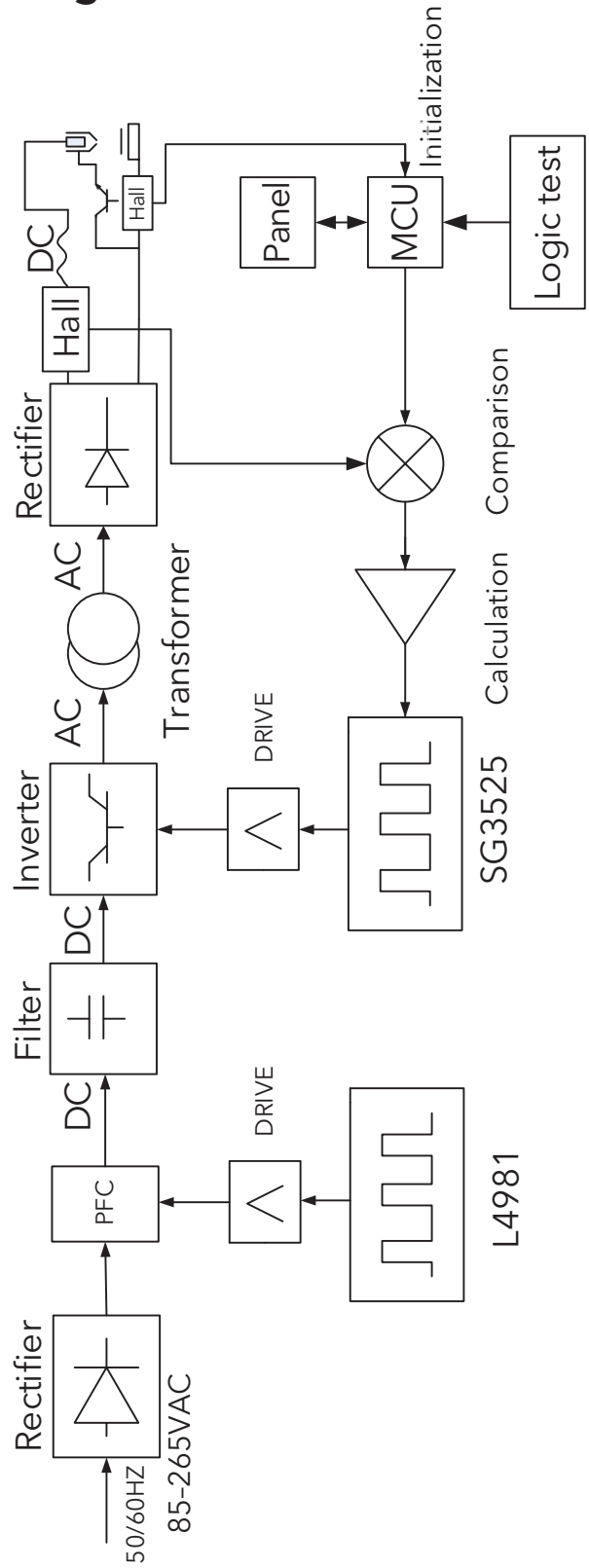
- Circle cutting attachment
- Cutting guide
- Radius bar mm. 250
- Radius bar mm. 400
- Magnetic base assembly
- Free centering straight pin
- Straight locking pin



SECTION 10.

POWER SUPPLY BLOCK DIAGRAM:

Power supply block diagram



SECTION 11.

END OF LIFETIME PRODUCT DISPOSAL

Use and disposal of waste

Wrapping paper and corrugated paperboard – place in paper recycling containers. Packing foil, PE bags, plastic elements – place in plastic recycling containers.

End of lifetime product disposal

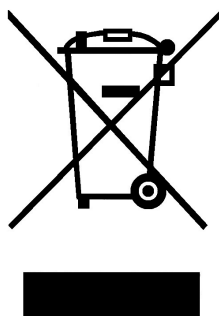
Disposal of electric and electronic equipment (valid in EU member countries and other European countries with an implemented recycling system).

It is not allowed to treat this product as domestic waste. Hand over the product to the specified location for recycling electric and electronic equipment. Prevent negative impact on human health and the environment by correctly recycling your product.

Recycling contributes to preserving natural resources. For more information on the recycling of this product, refer to manufacturer, who will be able to handle the disposal for you or refer to your local authority, domestic waste processing organization or store, where you purchased the product.

For local disposal, the local regulations for the disposal of electrical and electronic scrap as well as materials must be observed.

This product complies with EU directive requirements on electromagnetic compatibility and electrical safety.



RoHS statement

Hereby Thermacut, k.s. confirms that to its knowledge all Plasma Power supply models **EX-TRAFIRE H, SC, SD** and **HD** (unless otherwise expressly stated) sold by Thermacut, k.s. fulfill the requirements of the EU directive 2011/65/EU. These products are compatible with the current RoHS requirements for the 7 substances (max 0.1% by weight in homogeneous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB), polybrominated diphenyl ethers (PBDE), Deca-BDE and max 0.01% for cadmium).

SECTION 12.

WARRANTY:

WARRANTY

This Warranty Certificate forms an integral part of General Business Conditions ("GBC") of THERMACUT, k.s. (the "Seller") and shall apply to supplies of Goods under Contract concluded between the Seller and the other contracting party as the recipient of the Goods (the "Buyer"); terms used herein have the same meaning as is ascribed to them in the GBC

1. The Seller hereby provides to the Buyer a quality warranty (hereinafter referred to as the "Warranty") affirming that the below specified goods delivered under the Contract will, for the below specified warranty period, retain the characteristics stipulated in technical data sheet of the Goods available on Seller's webpages (www.thermacut.cz, www.ex-trafire.com) at the time of sending of Binding Offer (par. 2.2 of the GBC), otherwise in the quality and design suitable for the purpose arising out of the Contract, otherwise for usual purpose.
2. The warranty period is valid from the date the goods are delivered to the buyer (par. 5.1, 5.2 of the GBC).
3. Par. 3.4 and the following of the GBC shall apply to reporting (claiming) of Warranty defect, asserting rights from defective performance and other rights and obligation of the Seller and Buyer.
4. The warranty period is:
 - o Three (3) years for EX-TRAFIRE® brand power supplies
 - o One (1) year for torches and lead sets
5. The Warranty does not cover reasonable wear and tear of the Goods or associated parts, which include consumables such as: Electrodes, Nozzles, Swirl Rings, Retaining Caps, Shields and O-rings.
6. The Seller is not liable for damage of the Goods caused by the Buyer or third party by incorrect or unprofessional treatment of the Goods (in particular repair or alteration by persons not authorized by the Seller) or its installation, unprofessional usage of the Goods or insufficient maintenance, in particular using the Goods for other than the specified purpose or other failure to comply with operating instructions, application of excessive force or using unapproved consumables parts with the Goods.

Warranty terms and conditions vary to suit diverse markets and country directives.

Revision history:

1. **Revision T-1/2018 - 03/2018** Official release
2. **Revision T-2/2018 - 04/2018**
Page 3-22 - new warning table
3. **Revision T-3/2018 - 05/2018**
 - a) Page 6-49 - new graphics and table of FHT-EX®40M Machine Torch Components
 - b) Page 8-57 - new item **EX-2-801-001 - Circle cutting guide kit for FHT-EX®30/40H**
4. **Revision T-4/2018 - 05/2018**
Page 6-46 - new Part No. of items 2, 5, 7, 8, 9, 10:

Item 2	- from: EX-2-319-021 - Insulating Teflon Tube	to: EX-0-319-021
Item 5	- from: EX-2-319-011 - Shrink Tube	to: EX-0-319-011
Item 7	- from: EX-2-314-011 - Hand Torch Handle Kit	to: EX-2-308-012
Item 8	- from: EX-2-309-012 - Trigger	to: EX-5-309-013
Item 9	- from: EX-2-311-013 - Trigger Guard	to: EX-5-310-014
Item 10	- from: EX-2-313-014 - Safety trigger Replacement Kit	to: EX-5-313-018
5. **Revision T-5/2018 - 07/2018**
 - a) Page 3-25 - System CNC interface connection - new table of wiring
 - b) Page 6-46 - FHT-EX®40H Hand Torch Components - new graphics and table
 - c) Page 6-49 - FHT-EX®40H Machine Torch Components - new graphics and table
6. **Revision T-6/2018 - 08/2018**
New Part No. for ordering:

a)	Page 8-56 - Filter-EX Compressed Air Filter	from: T-12452	to: EX-0-804-001
	Filter-EX Air Filter Cartridge	from: T-12453	to: EX-0-804-002
b)	Page 8-57 - O-Ring lubricant	from: T-0994	to: EX-0-805-001
7. **Revision T-7/2018 - 09/2018**
 - a) Page 6-45 - FHT-EX®40H Hand Torches Assembly - new graphics and table
 - b) Page 6-46 - New Part No. of item 19: from: EX-0-325-006 to: **EX-0-321-003**
New item **No. 20, EX-0-323-001, TCS13 Plug Body**
 - c) Page 6-48 - FHT-EX®40M Machine Torches Assembly - new graphics and table
 - d) Page 6-49 - New Part No. of item 14: from: EX-0-325-006 to: **EX-0-321-003**
New item **No. 15, EX-0-323-001, TCS13 Plug Body**
8. **Revision T-8/2018 - 10/2018**
Page 6-50 - FHT-EX®40M Machine Torches Consumables
- new item **EX-2-428-011, IHS Ohmic Clip**
9. **Revision T-9/2018 - 12/2018**
Page 6-47, 50 - There was edited note with warning sign
Page 6-51 - There was deleted note with warning sign
10. **Revision T-10/2019 - 02/2019**
Page 10-59 - new paragraph: **RoHS statement**
11. **Revision T-11/2019 - 04/2019**
Page 3-25 - new picture of DIP switches settings
12. **Revision T-12/2020 - 04/2020**
 - a) Pages 2-12, 3-18, 19, 7-52 - **specification of voltage:** from: 120VAC ± 20% to: **100 - 130 VAC**
from: 230VAC ± 20% to: **220 - 240 VAC**
 - b) Page 4-29 - new **front control label** (new symbols)
 - c) Page 11-60 - new page of **Warranty**
13. **Revision T-13/2020 - 07/2020**
Page 1 - the latest version of manual link added
14. **Revision T-14/2020 - 09/2020**
 - a) Pages 3-28 - 30 - new pages - **The circle cutting guide installation - for the FHT-EX®30/40H** added
 - b) Page 7-55 - new section - **Additional ordering information** added
 - c) Pages 9-60, 61 - new items of accessories - **EX-0-802-000, EX-0-803-001** and **EX-0-803-004** added
15. **Revision T-15/2020 - 11/2020**
 - a) Page 2-12 - note about **PFC** added
 - b) Page 3-29 - point No. 7 - note about **lengths of bars** added

Revision history:

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