

# **THERMACUT<sup>®</sup>**

## **FHT-EX<sup>®</sup> 105RTXH**

### **PLASMA ARC HAND CUTTING TORCH**

**and**

## **FHT-EX<sup>®</sup> 105RTXM**

### **PLASMA ARC MACHINE CUTTING TORCH**

## **Operator Manual**

**Revision: T-4**  
**English**  
**2021**



**!IMPORTANT!**

**BEFORE USING THE TORCH, READ THIS MANUAL, BECOME FAMILIAR WITH THE CONTENT. KEEP THE MANUAL LOCAL TO THE JOB SITE WITH EASY ACCESS TO ALL PERSONNEL. THE TORCH IS TO BE USED FOR METAL CUTTING ONLY.**

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

[www.ex-trafire.com](http://www.ex-trafire.com)

**THERMACUT<sup>®</sup>**  
THE CUTTING COMPANY<sup>®</sup>

EX-5-900-003  
N-22237

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## SECTION 1.

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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, 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 torch.

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 cutting torch.
- 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**

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

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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 workpiece 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 INTERFERENC**

- 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.

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

\* According to ISO 4850:1979



# Safety Sticker

## Safety instructions



**WARNING!**  
**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			
2		2.1	
3	3.1	3.2	3.3
4	4.1	4.2	4.3
5	5.1	5.2	5.3
6	6.1	6.2	6.3
7			

## Torch consumables installation

Hand torch



Machine torch



EX-0-904-008  
 N-21626

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## SECTION 2.

### SPECIFICATIONS:

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# SPECIFICATIONS

## Specifications: Torches FHT-EX®105RTXM and FHT-EX®105RTXH

The FHT-EX® cutting torches have been designed for Handheld Cutting, Gouging, Marking, Mechanized Cutting & Marking. Uses air or nitrogen for cutting Mild Steel, Stainless Steel, Aluminium and other electrically conductive metals.

Torch construction: torch body, handle or mounting tube, leadset and consumables. The torch leads are connected to the power supply using the bespoke TCS (Torch Connection System).

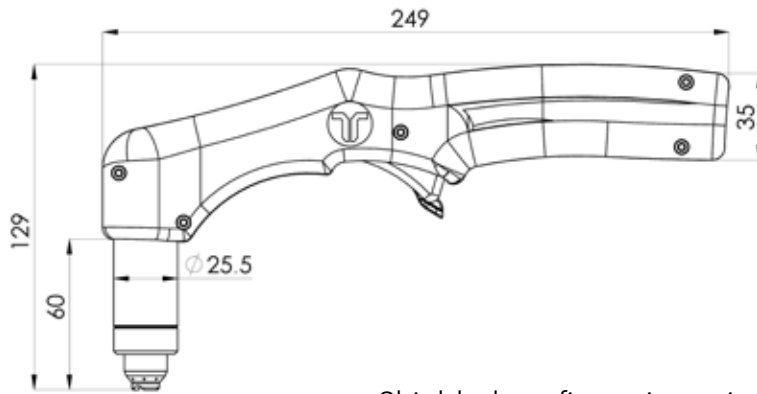
For installation: See pages 3-16 to 3-18 in this manual.

Torch		Torch FHT-EX®105RTXH/M	
Rated current and corresponding duty cycle		105 A / 100%	
Cutting capacity (Values for low alloyed steel, e.g. Mild Steel S235JR)	Recommended cutting capacity	35 mm	
	Maximum cutting capacity	50 mm	
	Piercing capacity	20 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, gouging	
Type of use		manual and mechanized	
Gas flow rate	100 A / 105 A	approx. 135 l/min @ 5.2 bar	
	75 A / 85 A	approx. 110 l/min @ 5.2 bar	
	55 A / 65 A	approx. 98 l/min @ 5.2 bar	
	45 A	approx. 87 l/min @ 5.2 bar	
Gas flow rate - gouging	100 A / 105 A	approx. 145 l/min @ 3.2 bar	
	45 - 85A	approx. 122 l/min @ 3.2 bar	
Max. inlet pressure		10 bar	
Operating (dynamic) pressure		5.2 bar	
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	
Standard length (other length available on request)		8 m / 15 m	
Structure of cable		coaxial cable	
Gas type		Air	Nitrogen
Gas quality specification	Recommended Air quality: ISO 8573-1 Class 1.2.2		Purity ≥ 99.99%
	Air max. particle size: 0.1 microns, class 1 ref. to ISO 8573		
	Air max. oil: 0.1 mg / m <sup>3</sup> , class 2 ref.: ISO 8573		
	Air max. dewpoint: +3° C, class 4 ref. to ISO 8573		
Gas quality		Clean, moisture-free, without oil	

Weight	
FHT-EX®105RTXH Hand Torch	8 m / 3.3 kg 15 m / 5.6 kg
FHT-EX®105RTXM Machine Torch	8 m / 3.4 kg 15 m / 5.9 kg

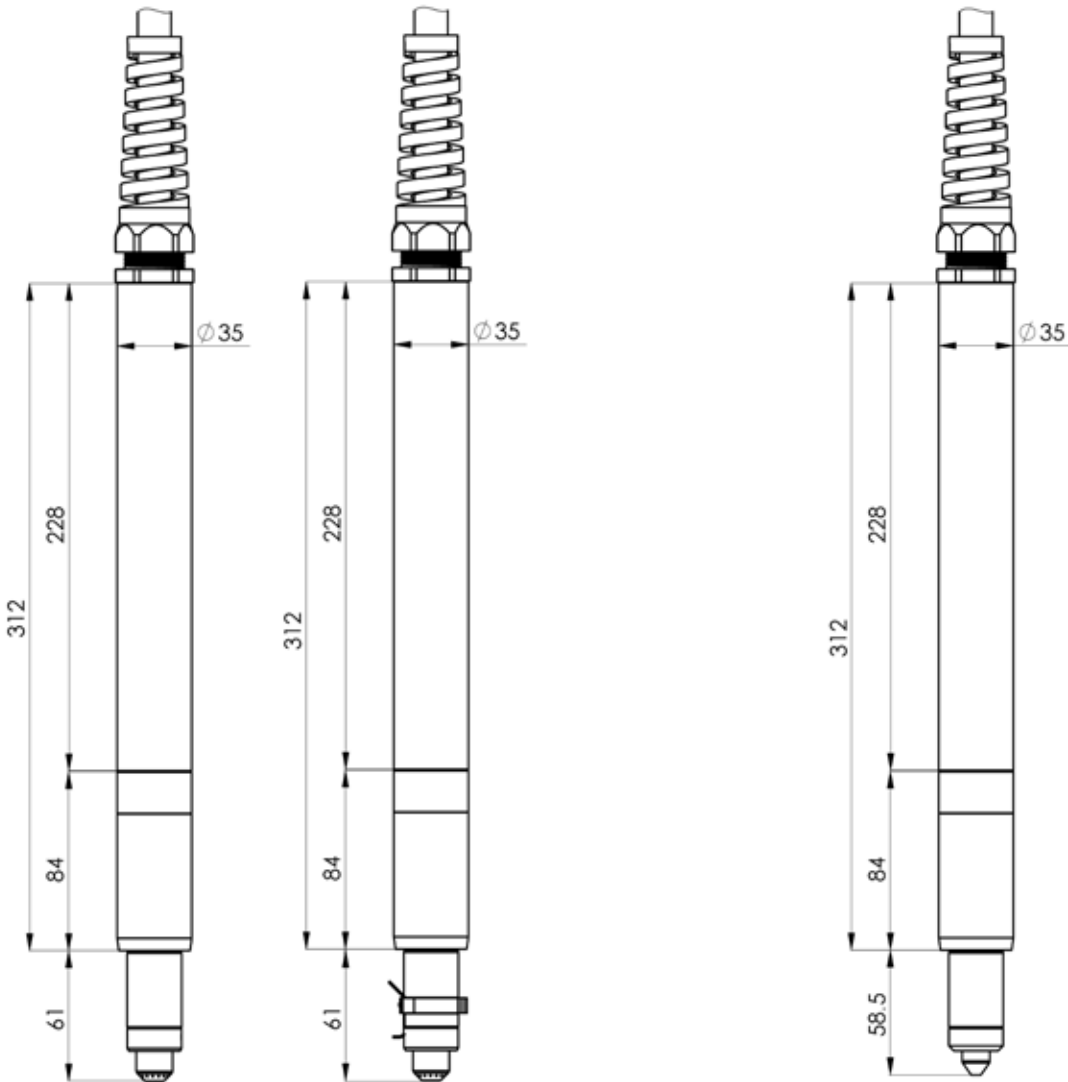
## Dimensions and configuration

### Hand torch FHT-EX®105RTXH



Shielded configuration using drag shield.

### Machine torch FHT-EX®105RTXM



Shielded configuration  
using machine shield.



Unshielded configuration  
using deflector.

## Symbols and marking



**For compliance with the European Norm, it is NOT permissible to use unshielded consumables in Hand-Held applications.**

### 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;








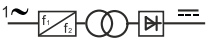
This marking signifies the manufacturer's declaration of conformity to applicable European directives and standards (EMC & LVD).

### C-Tick Mark;

This marking 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		Cutting Mode
	Over-Temperature (OT)		Gouging Mode
	(TIP/TORCH) Missing or loose nozzle/torch spare parts (consumables)	<b>ON</b>	Power is ON
	(GAS) Low inlet gas pressure alarm	<b>OFF</b>	Power is OFF
	The terminal for the external protective (earth) conductor		An inverter-based power supply

### **SECTION 3.**

#### **INSTALLATION:**

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# INSTALLATION

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## 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 torch should include the model and serial number located on the torch label of the torch body.
4. Read the information in the SAFETY section of this manual before installing and operating the torch.

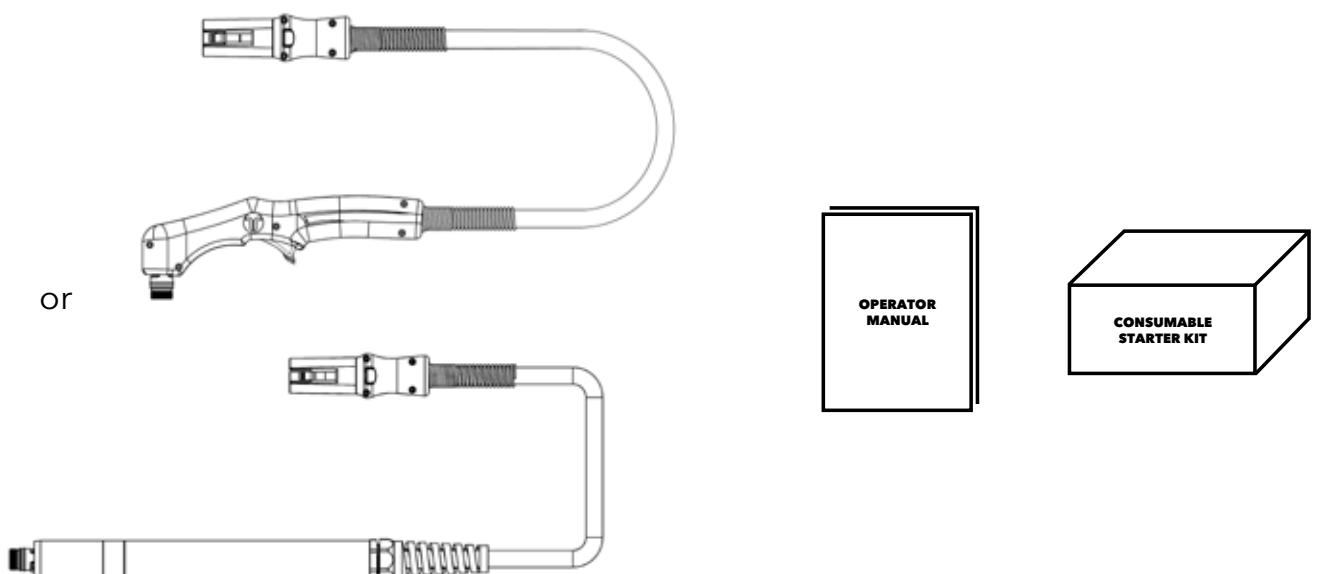
## Claims

**Claims for shipping damage;** If the torch has been damaged in transit, contact the carrier immediately, take photographs of the packaging and areas of damage on the torch. 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 items 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.

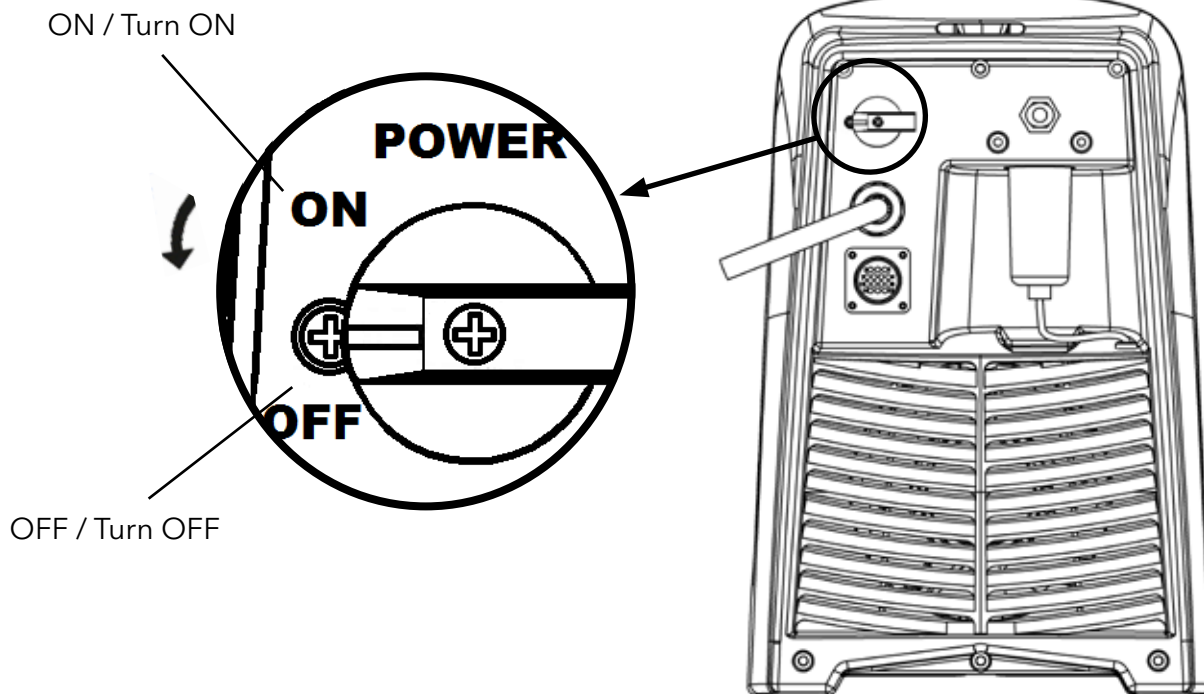
## Box contents

Check the items that are shown in the illustration below.



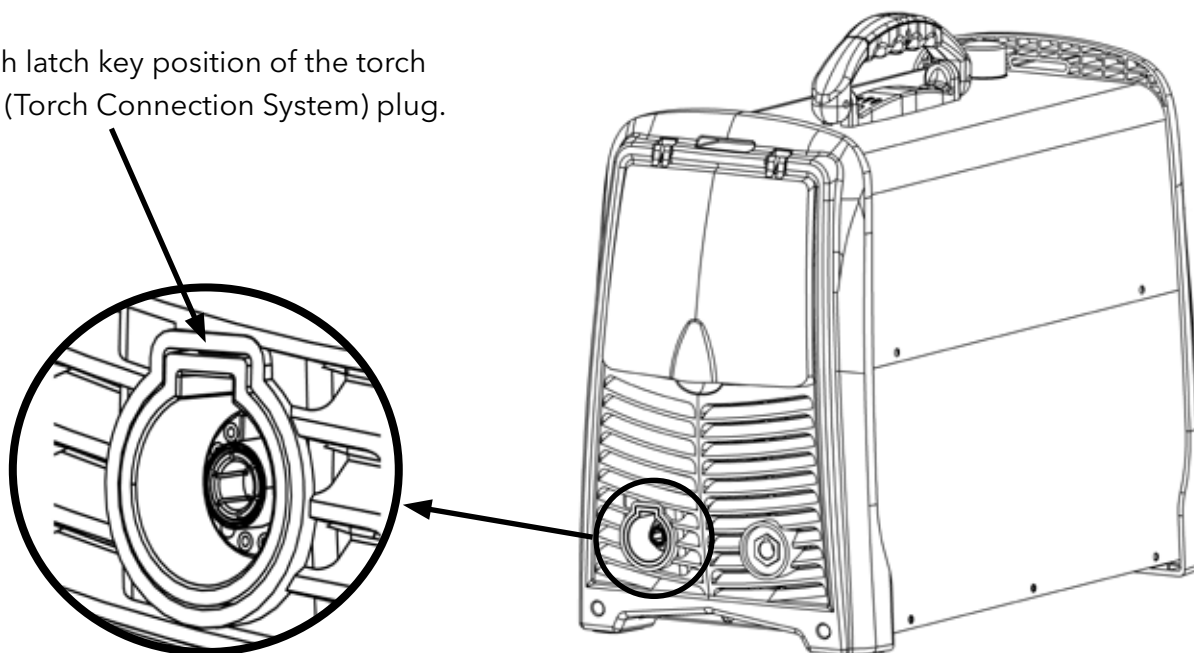
## Torch installation step by step

1. TURN "OFF" the power supply



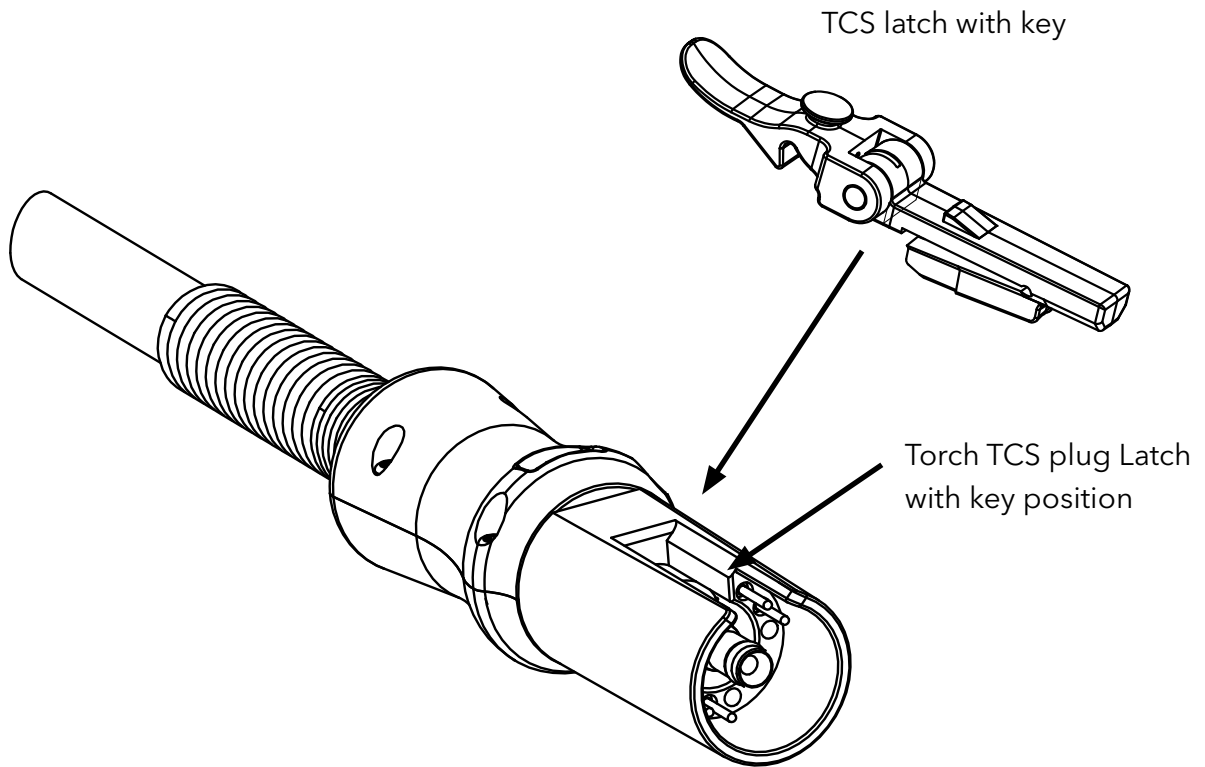
2. Torch connection - power supply location

Torch latch key position of the torch  
TCS (Torch Connection System) plug.

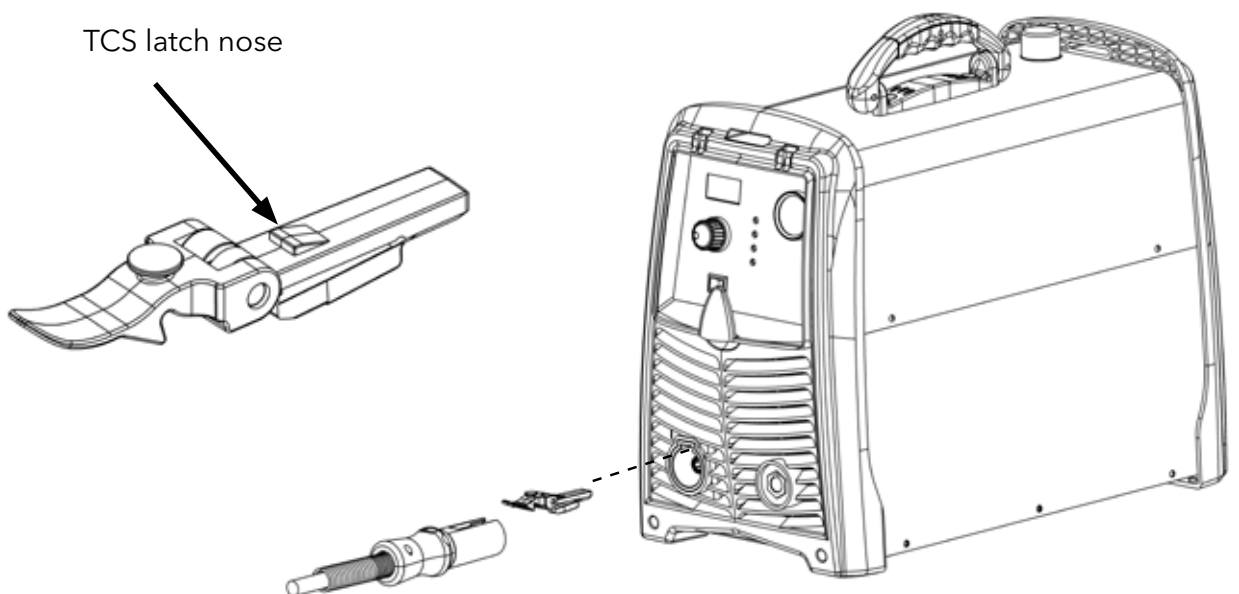




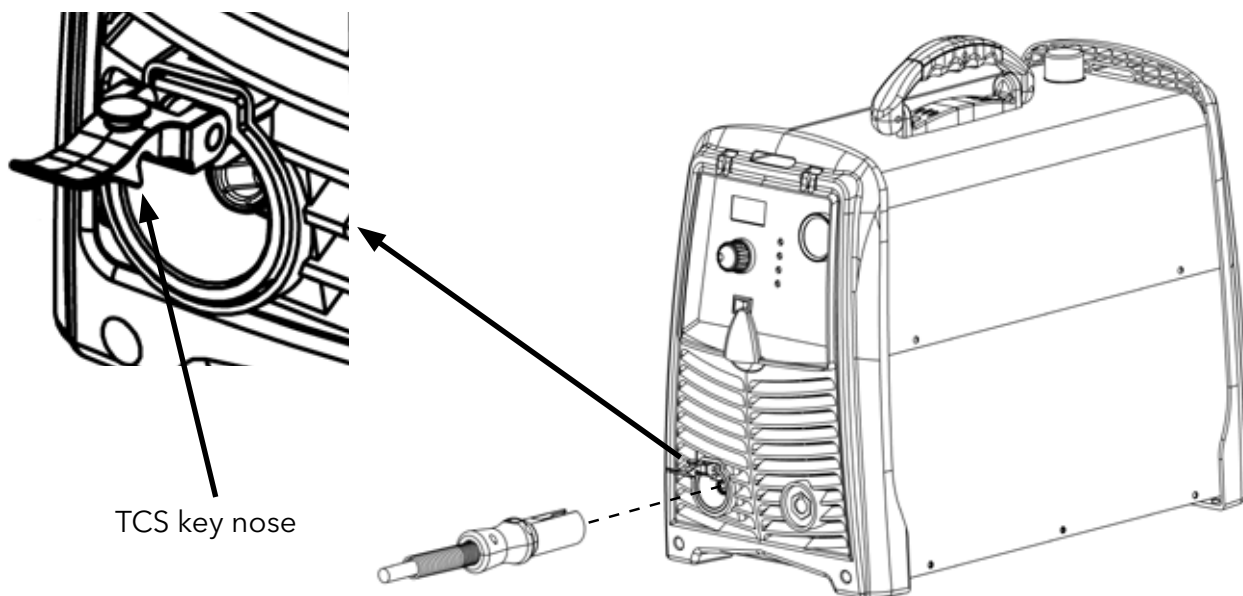
3. Torch connection - torch location



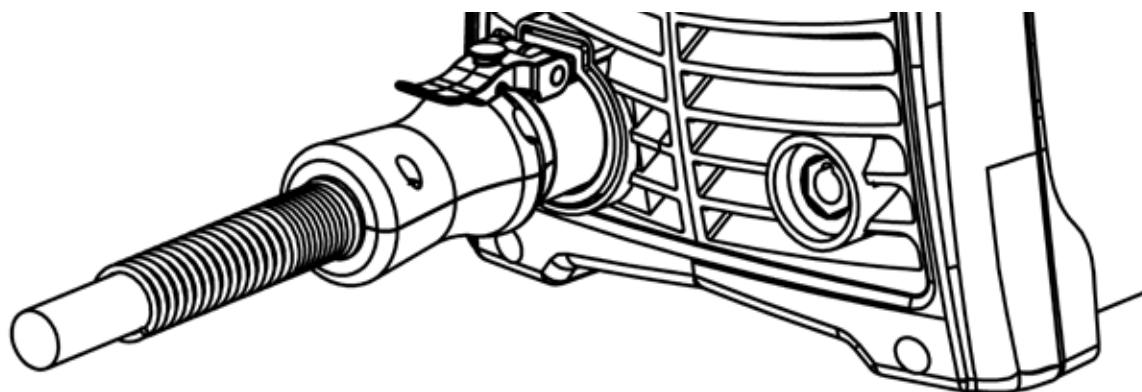
4. Torch connection - 1st step - place the TCS latch with key into the TCS power supply socket. The TCS latch with key must be locked in the TCS socket properly with the latch nose.



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.

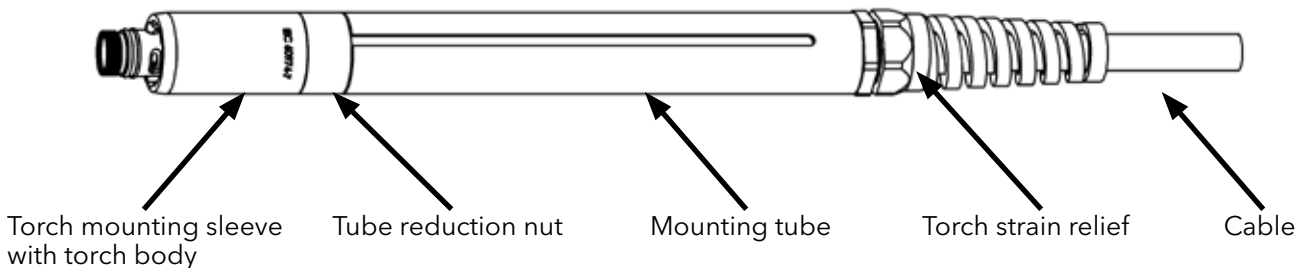


6. Torch connection - proper position of the TCS plug in the TCS socket.

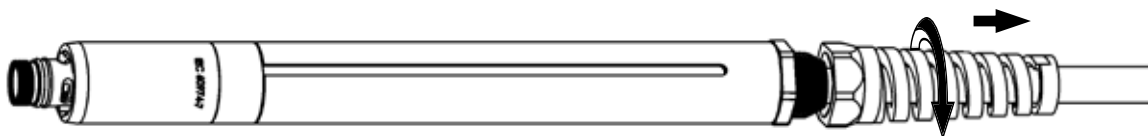


## Machine Torch Gear Rack installation step by step

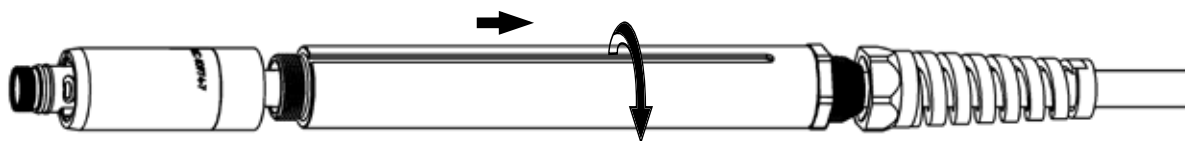
1. Disconnect the torch from the plasma power supply.
2. Before disassembly place the torch on a flat surface.



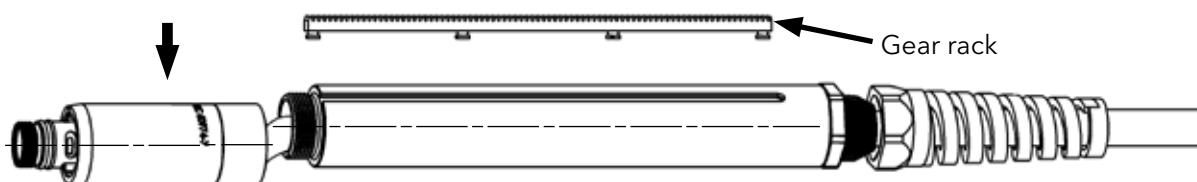
3. Loosen and unscrew the machine torch strain relief, so that the torch strain relief can move freely along the cable.



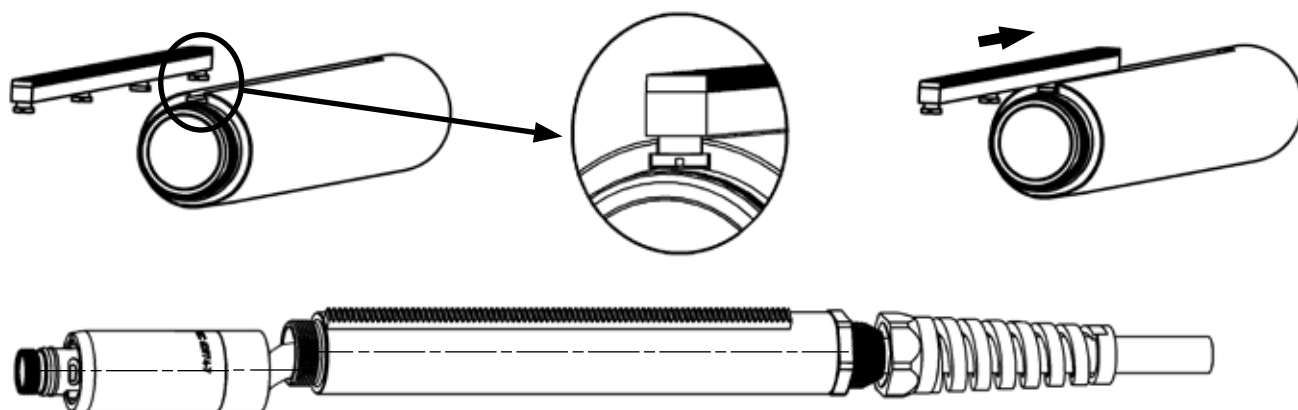
4. Unscrew the mounting tube from tube reduction nut.  
When removing the mounting tube, hold firmly the tube reduction nut and torch mounting sleeve with torch body during disassembly so that they do not rotate and the wiring is not damaged by twisting.



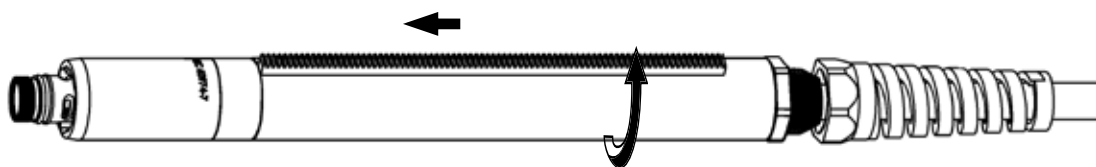
5. Carefully tilt the tube reduction nut and torch mounting sleeve with torch body from the coaxial position to the mounting tube so that to create the space for the insertion of the gear rack into the mounting tube groove.



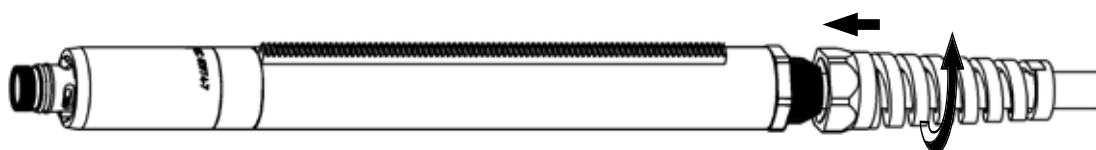
6. Set the gear rack into the mounting tube groove and slide.



7. Screw in the mounting tube with gear rack into the tube reduction nut. Hold firmly the tube reduction nut and torch mounting sleeve with torch body during assembly so not to damage the wiring. Tighten the mounting tube firmly by hand.



8. Screw in the machine torch strain relief into the mounting tube. Hold firmly the mounting tube during assembly so not to damage the wiring inside the tube. Tighten the machine torch strain relief firmly by hand.

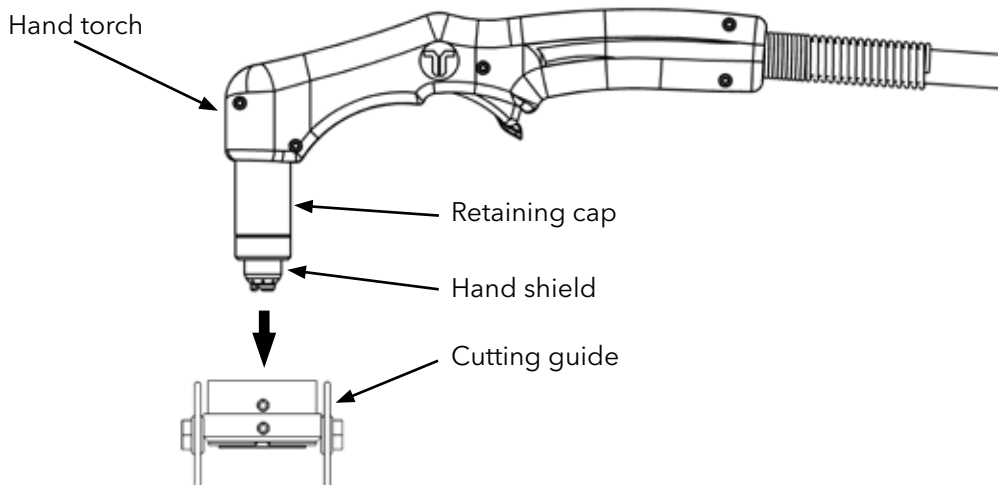


9. Now the installation of the gear rack is complete.

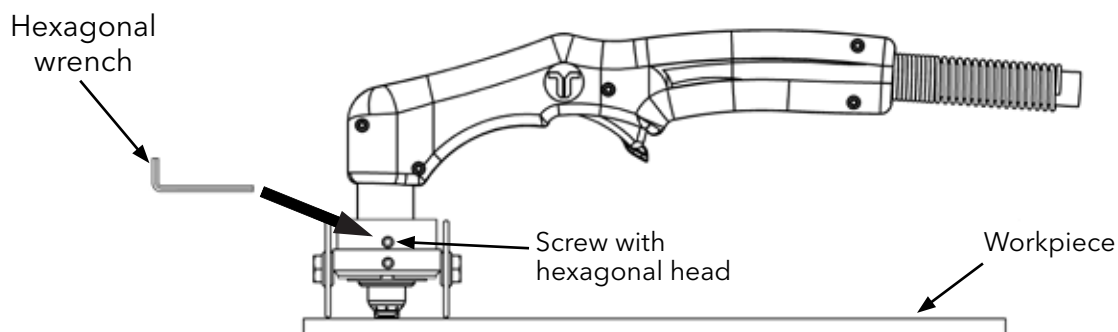


## The circle cutting guide installation - for the FHT-EX®105RTXH/105TTH/45TTH

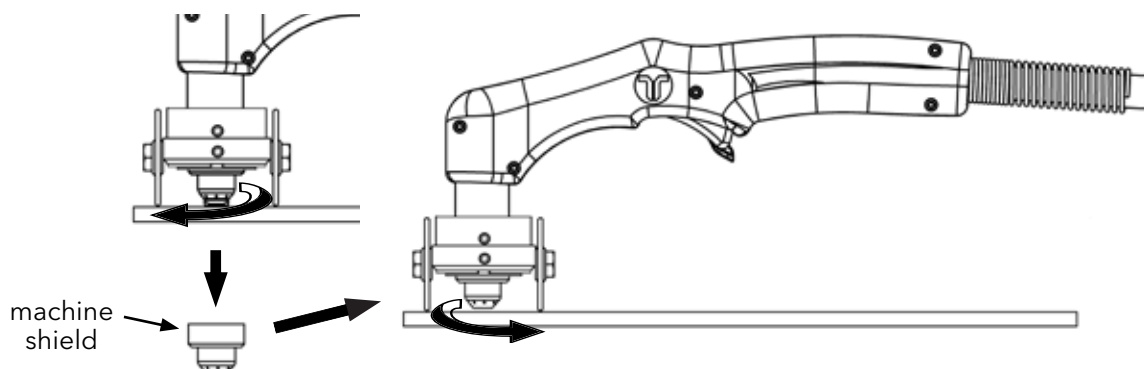
1. Disconnect the torch from the plasma power supply.
2. Insert the hand torch into the cutting guide.



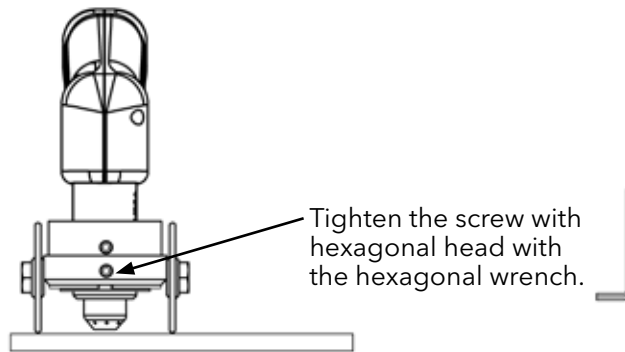
3. Secure the hand torch in the cutting guide with help of the screw with hexagonal head. Use the hexagonal wrench. Tighten by hand. The hand shield defines the required torch to workpiece distance.



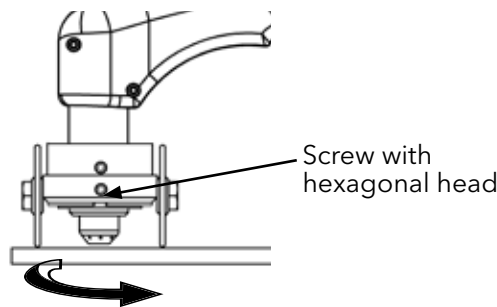
4. It's strictly recommended to use the machine shield in order to keep smooth cutting operation. Unscrew the hand shield and replace with the machine shield. The torch to workpiece distance remains the same because the hand torch is clamped in the cutting guide in the place of the retaining cap.



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.

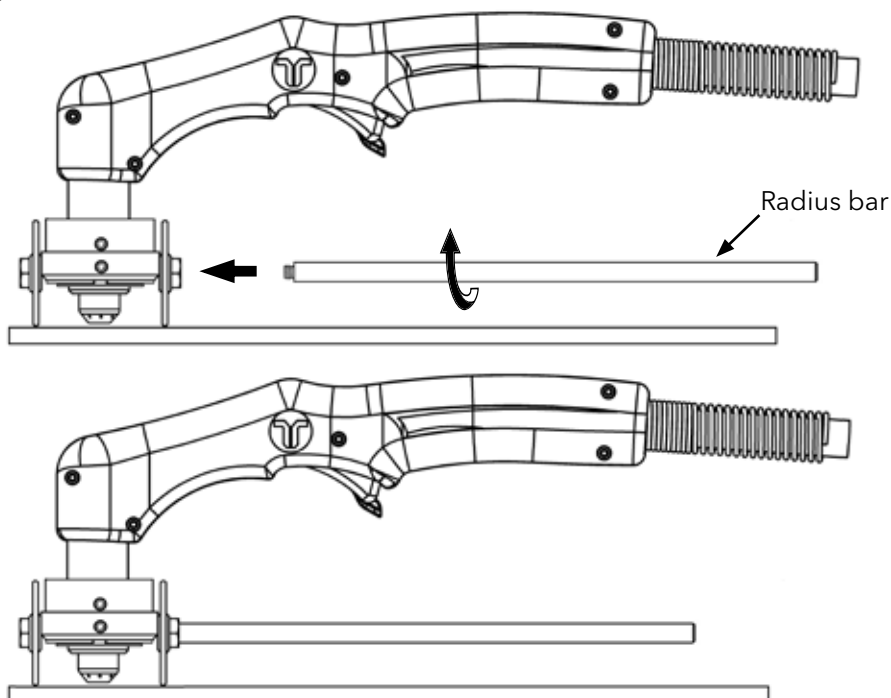


6. If you want use the radius bar, make sure the screw with hexagonal head isn't tightened so that the cutting guide can rotate freely.

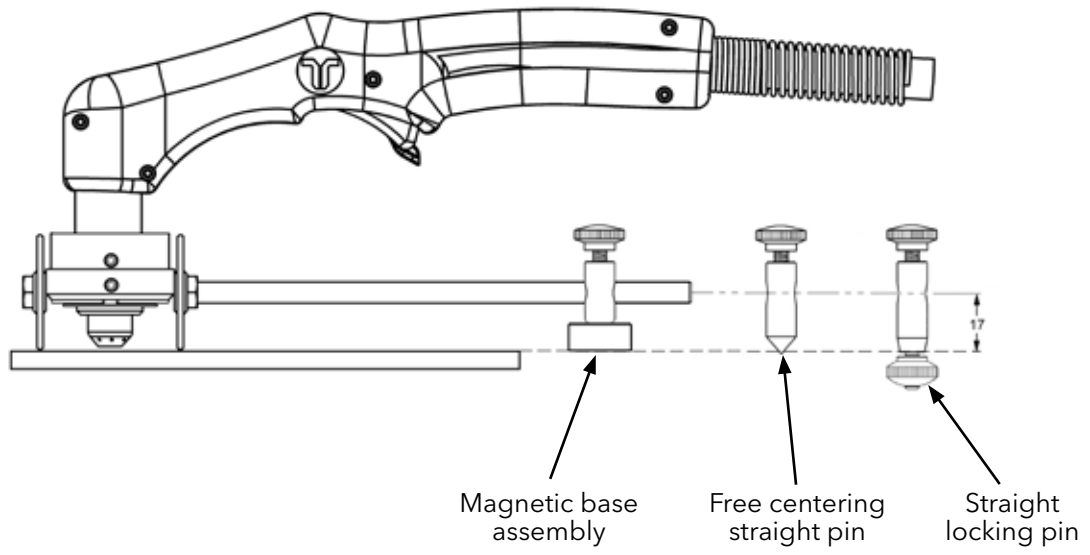


7. Screw in the radius bar\* into the threaded hole in the cutting guide.

\* 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:

---

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# OPERATION

---

The FHT-EX®105RTXM Machine Torch or the FHT-EX®105RTXH Hand Torch operate with various plasma arc cutting Power Supplies.

It is a requirement that the appropriate consumables for the application are installed.

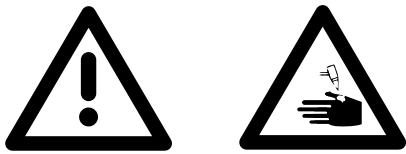
- Turn off the power supply before changing consumables.
- Never point the torch toward yourself or toward others.
- Choose the appropriate consumables for cutting or gouging.
- Complete the assembly of the torch with correct consumables, follow the instructions on page 4-27 for the hand torch or 4-35 for the machine torch.

For the cutting of stainless steel with Nitrogen could be necessary to decrease the cutting speed about 10-20% (depends on thickness of material).

For the cutting of Aluminium with Nitrogen use standard parameters according to the cut charts of mild steel with compressed air.

## Hand torch FHT-EX®105RTXH

### Operating the hand torch



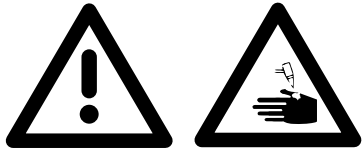
**WARNING**  
**Plasma arc is generated immediately when the torch trigger is depressed**

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.

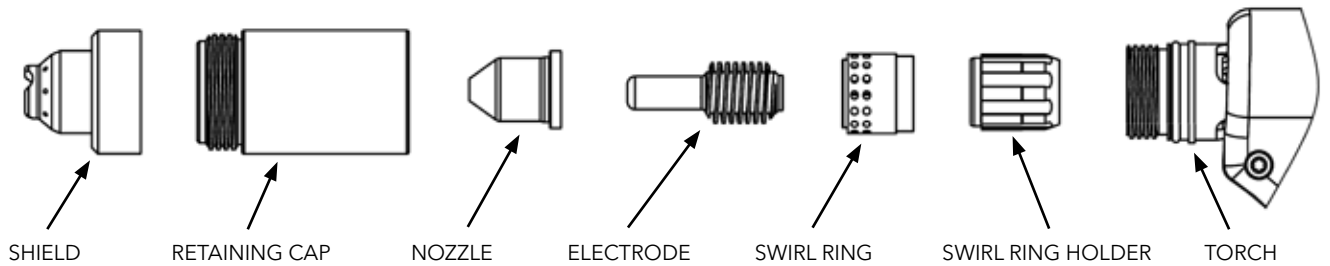
## Hand torch consumables installation



**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.**



<p>1. Insert the nozzle into the retaining cap.</p> <p>Cross - section of assembly.</p>	<p>2. Insert the electrode into the assembly (retaining cap + nozzle).</p> <p>Cross - section of assembly.</p>	<p>3. Insert the swirl ring assy into the assembly (retaining cap + nozzle + electrode).</p> <p>Cross - section of assembly.</p>
<p>4. Screw on this whole assembly (retaining cap + nozzle + electrode + swirl ring) to the seat bottom of the torch and tighten by hand. Do NOT overtighten. The nozzle must seat properly without any movement. If not, reassemble it and put these parts together again.</p>	<p>5. Screw on the shield and tighten by hand. Do NOT overtighten.</p>	

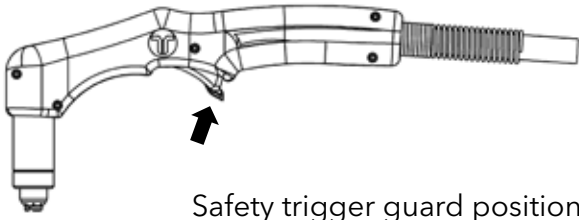
## Fit the work clamp


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

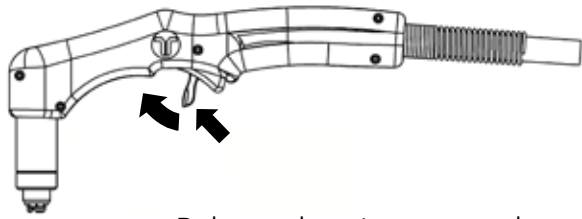
Fit the work clamp as close as possible to the cutting area to minimise exposure to electromagnetic fields (EMF).


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

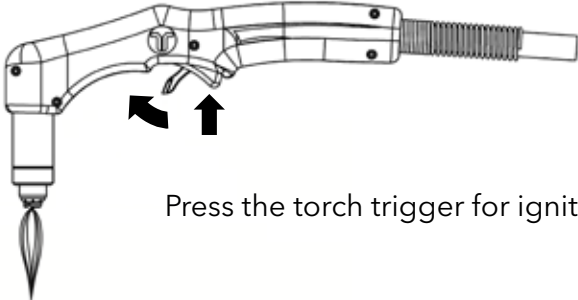
## Operating the torch safety trigger


- 

1.  Safety trigger guard position.

This diagram shows the torch handle with the safety trigger guard in its closed position. An arrow points to the guard.
- 

2.  Release the trigger guard.

This diagram shows the torch handle with the safety trigger guard being moved away from the trigger. Two arrows indicate the direction of movement.
- 

3.  Press the torch trigger for ignition of the arc.

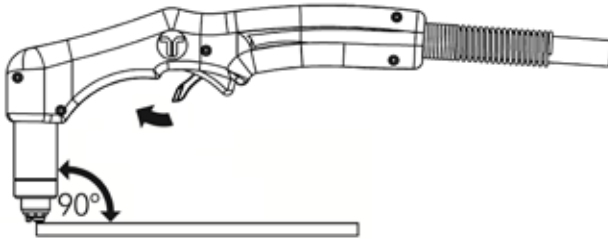
This diagram shows the torch handle with the trigger being pressed. An arrow points to the trigger. The torch tip is shown with an arc.
4. Release the torch trigger to stop cutting.



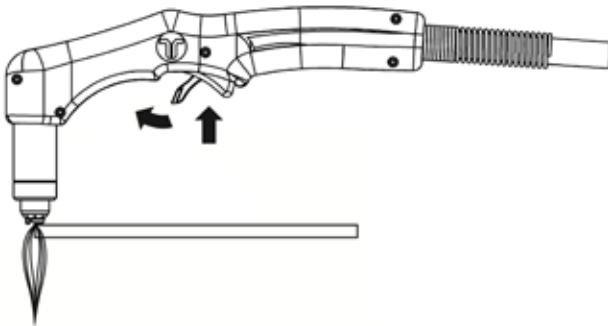
**WARNING**  
**SPARKS AND HOT METAL CAN**  
**BURN THE SKIN AND EYES**

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.

**Edge start cutting**

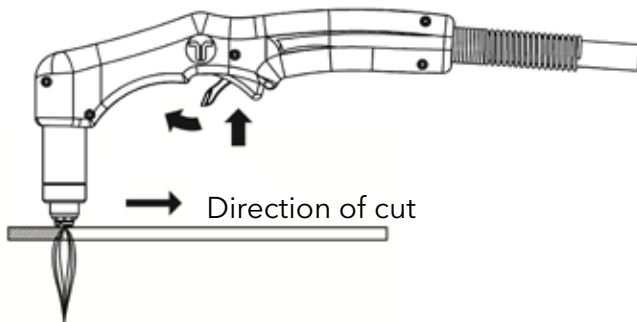


Keep the nozzle of the torch upright at the edge of the workpiece.



Start cutting from the edge of the workpiece.

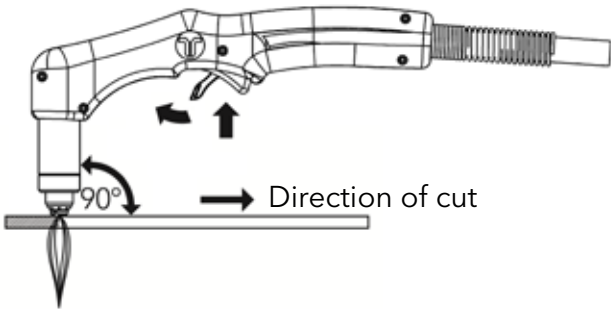
DO NOT start the travel motion until the material has been completely cut through.



Then continue with the cut.

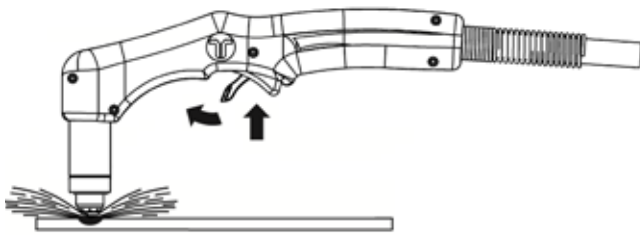
## Hand torch cutting technique

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

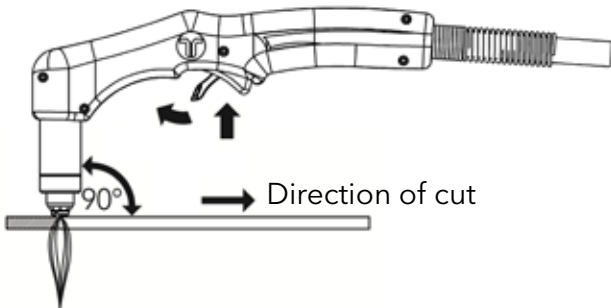


When cutting, ensure the arc spray exits the underside of the workpiece.

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 workpiece, 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
- **Gas Post flow** - After the torch trigger is released, the gas will continue to flow up to 100 seconds (according to adjusted cutting current and used power supply) 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.

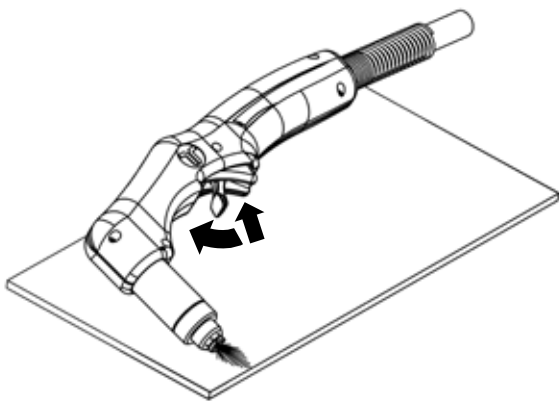
### Piercing



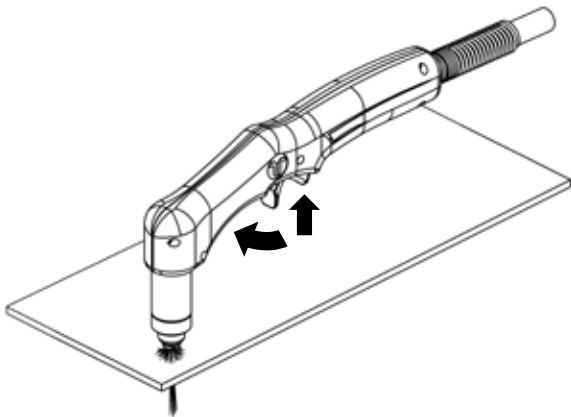
**WARNING**  
**SPARKS AND HOT METAL CAN**  
**BURN THE SKIN AND EYES**

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.

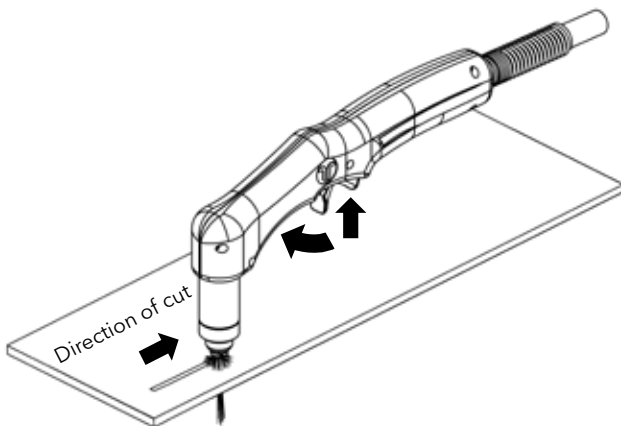
Hold the torch so that the nozzle is within 3 mm of the workpiece before firing.



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



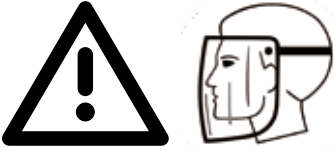
Arc spray exits the underside of the workpiece when the cut has achieved full thickness.



After the pierce, proceed with cutting.

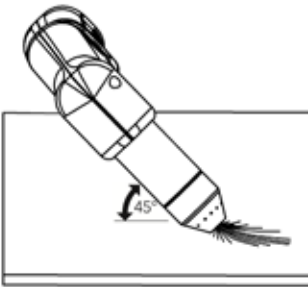
## Gouging



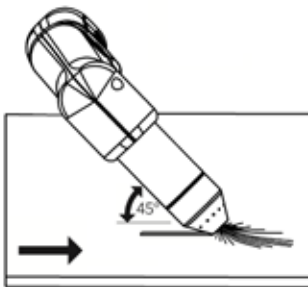
	<p><b>WARNING</b>  <b>SPARKS AND HOT METAL CAN</b>  <b>BURN THE SKIN AND EYES</b></p>
<p>When angling the torch for cutting, piercing or gouging, molten metal (Arc Spray) will occur in the direction that the torch is aimed. Aim the torch away from yourself and others.</p>	

For gouging application must be set the gouging mode on the power supply.  
 Please use gouging consumables according to used plasma torch and according to set gouging amperage. See the section Torches and Torch parts - Hand Torch Consumables - pages 6-56, 57.

Hold the torch orifice as close as possible to the workpiece before firing.



Hold the torch at an angle of 35° - 45° to the workpiece.  
 Depress the trigger to start the pilot arc.  
 Transfer the arc to the workpiece.



Maintain an approximate angle of 35° - 45° to the workpiece.  
 Maintain travel in the direction of the material to be removed.

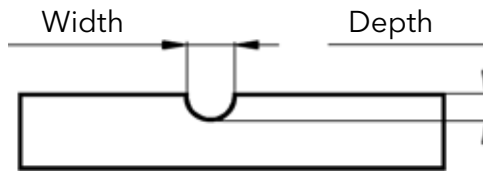
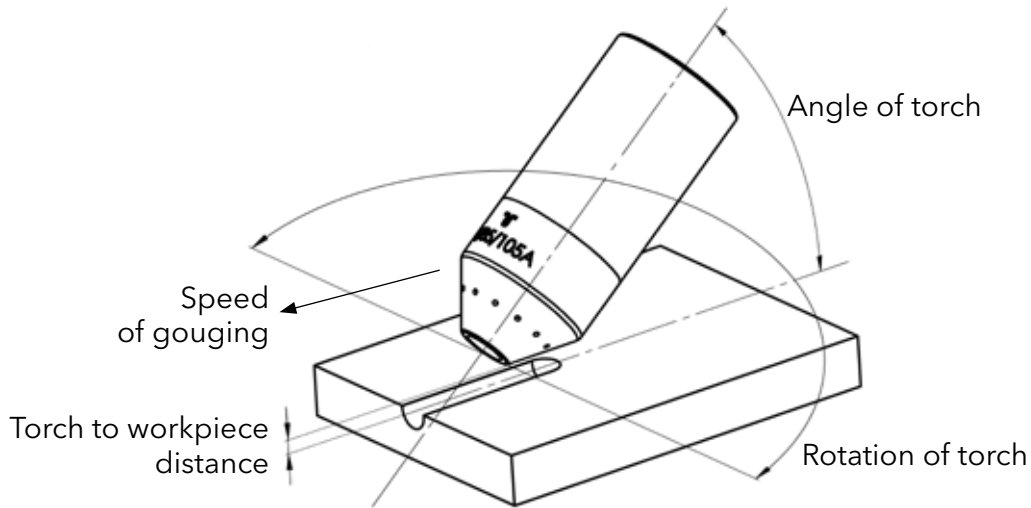
Direction of gouging

<b>Operating parameters of gouging</b>	
Operating (dynamic) air pressure	3.5 - 4.1 bar
Torch to workpiece distance	as close as possible (touch)
Torch to workpiece angle	35° - 45°
Gouging speed	0.6 m/min
Gouging amperage	45 - 105 A



## Gouge profile

The gouge profile can be modified by changing the speed of moving of the torch over the workpiece, changing the angle of the torch to the workpiece, changing the torch to workpiece distance or changing the gouging amperage (the output power) of the power supply.

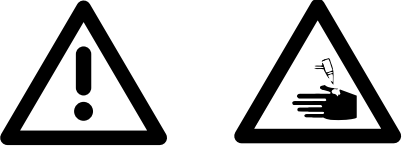


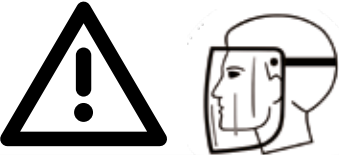
## Modification of the gouge profile

The gouge profile		The actions which affected the gouge profile			
Width	Depth	Gouging amperage of the power supply	Gouging speed of the torch	Torch to workpiece distance	Torch to workpiece angle
decreasing ↓	decreasing ↓	decreasing ↓			
decreasing ↓	decreasing ↓		increasing ↑		
decreasing ↓	increasing ↑			decreasing ↓	
decreasing ↓	increasing ↑				increasing ↑
increasing ↑	increasing ↑	increasing ↑			
increasing ↑	increasing ↑		decreasing ↓		
increasing ↑	decreasing ↓			increasing ↑	
increasing ↑	decreasing ↓				decreasing ↓

## Machine torch FHT-EX®105RTXM

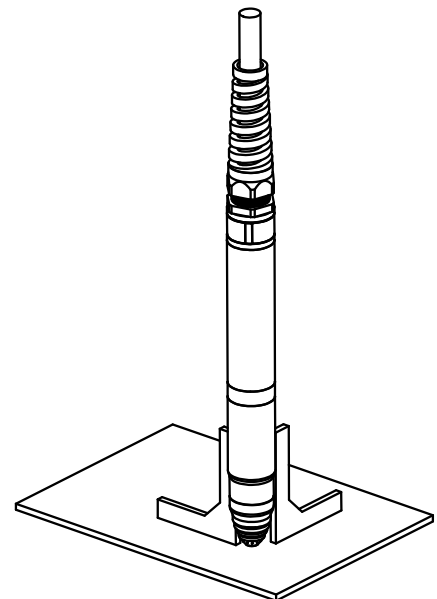
### Operating the machine torch

	<p style="text-align: center;"><b>WARNING</b> <b>Plasma arc is generated immediately when the CNC start signal is ON.</b></p>
<p>The plasma arc will cut quickly through gloves and skin. Make sure the power supply is switched off before changing consumables.</p> <ul style="list-style-type: none"><li>• Keep away from the torch tip.</li><li>• Do not hold the piece that is to be cut and keep your hands away from the cutting path.</li><li>• Never point the torch toward yourself or toward others.</li><li>• Never use with the pendant control switch.</li></ul>	

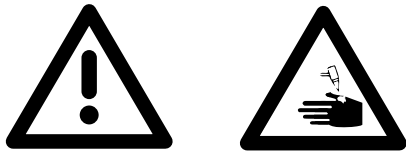
	<p style="text-align: center;"><b>WARNING</b> <b>SPARKS AND HOT METAL CAN BURN THE SKIN AND EYES</b></p>
<p>When angling the torch for cutting, molten metal (Arc Spray) will occur in the direction that the torch is aimed.</p>	

### Alignment of the machine torch FHT-EX®105RTXM

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.



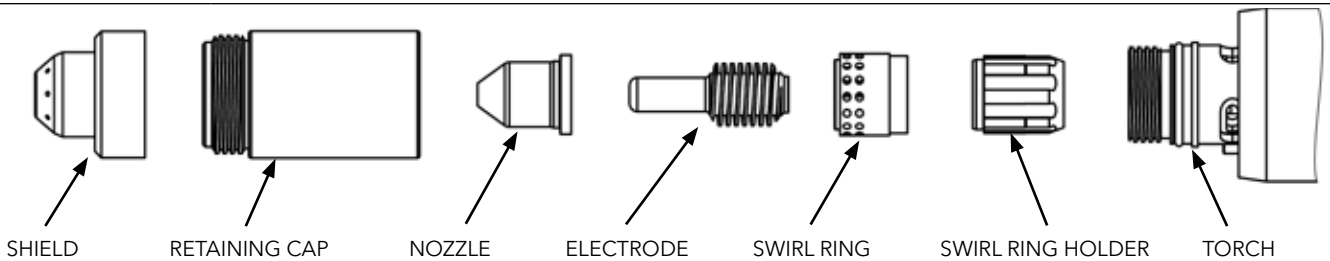
## Machine torch consumables installation



**WARNING**  
**Plasma arc is generated immediately when the CNC start signal is ON**

Plasma arc is generated immediately when the CNC start signal is ON.  
 The plasma arc will cut quickly through gloves and skin.

**Make sure the power supply is switched off before changing consumables.**



<p>1. Insert the nozzle into the retaining cap.</p> <p>Cross - section of assembly.</p>	<p>2. Insert the electrode into the assembly (retaining cap + nozzle).</p> <p>Cross - section of assembly.</p>	<p>3. Insert the swirl ring assy into the assembly (retaining cap + nozzle + electrode).</p> <p>Cross - section of assembly.</p>
<p>4. Screw on this whole assembly (retaining cap + nozzle + electrode + swirl ring) to the seat bottom of the torch and tighten by hand. Do NOT overtighten. The nozzle must seat properly without any movement. If not, reassemble it and put these parts together again.</p>		<p>5. Screw on the shield and tighten by hand. Do NOT overtighten.</p>

# Mechanized Cutting Charts

## 45 A Cutting, Shielded Configuration; using compressed air



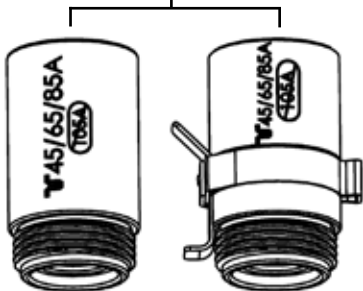
EX-5-402-030



EX-5-404-031



EX-5-410-036



EX-5-415-030

EX-5-415-031



EX-5-421-031

### Mild Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
0.5	1,5	3,8	0	9000	128	12500	126	1.1
1			0	9000	128	10800	128	1.1
1.5			0.1	9000	130	10200	129	
2			0.3	6600	130	7800	129	1.4
3			0.4	3850	133	4900	131	1.5
4			0.4	2200	134	3560	131	
6			0.5	1350	137	2050	132	1.7

### Stainless Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
0.5	1.5	3.8	0	9000	130	12500	129	0.9
1			0	9000	130	10800	130	1.1
1.5			0.1	9000	130	10200	130	
2			0.3	6000	132	8660	131	1.5
3			0.4	3100	132	4400	132	1.6
4			0.4	2000	134	2600	134	
6			0.5	900	140	1020	139	1.8

### Aluminium

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
1	1.5	3.8	0	8250	136	11000	130	1.5
2			0.1	6600	136	9200	131	1.5
3			0.2	3100	139	6250	132	1.6
4			0.4	2200	141	4850	134	
6			0.5	1500	142	2800	139	1.5

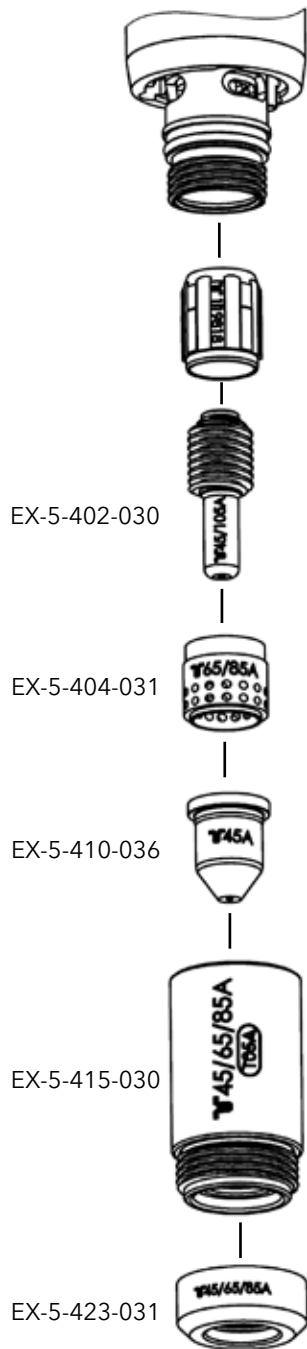
### Note:

\* Recommended cutting speeds provide the best cut angle, minimal dross and best cut quality surface. Each plasma cutting system requires "fine tuning" for each cutting application and each type and/or thickness of the material to be cut in order to reach the desired quality of the cut.

\*\* Maximum cutting speeds are the fastest possible cutting speeds for the material to be cut regardless of the of the cut quality..

# Mechanized Cutting Charts

## 45 A Cutting, Unshielded Configuration; using compressed air



### Mild Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width
				Best Quality Settings		Standard Quality Settings		
				Cut Speed	Voltage	Cut Speed	Voltage	
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]
0.5	1.5	3.8	0	9000	120	12500	120	0.5
1			0	9000	120	10800	121	0.9
1.5			0.1	7700	120	10200	121	
2			0.3	6150	119	7800	122	1.3
3			0.4	3950	121	4900	123	1.3
4			0.4	2350	123	3560	124	
6			0.5	1400	126	2050	124	

### Stainless Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width
				Best Quality Settings		Standard Quality Settings		
				Cut Speed	Voltage	Cut Speed	Voltage	
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]
0.5	1.5	3.8	0	9000	121	12500	119	0.5
1			0	9000	121	10800	119	1
1.5			0.1	9000	121	10200	120	
2			0.3	6000	122	9600	120	1.3
3			0.4	3250	123	4750	120	1.5
4			0.4	1900	128	3000	122	
6			0.5	700	130	1450	124	1.5

### Aluminium

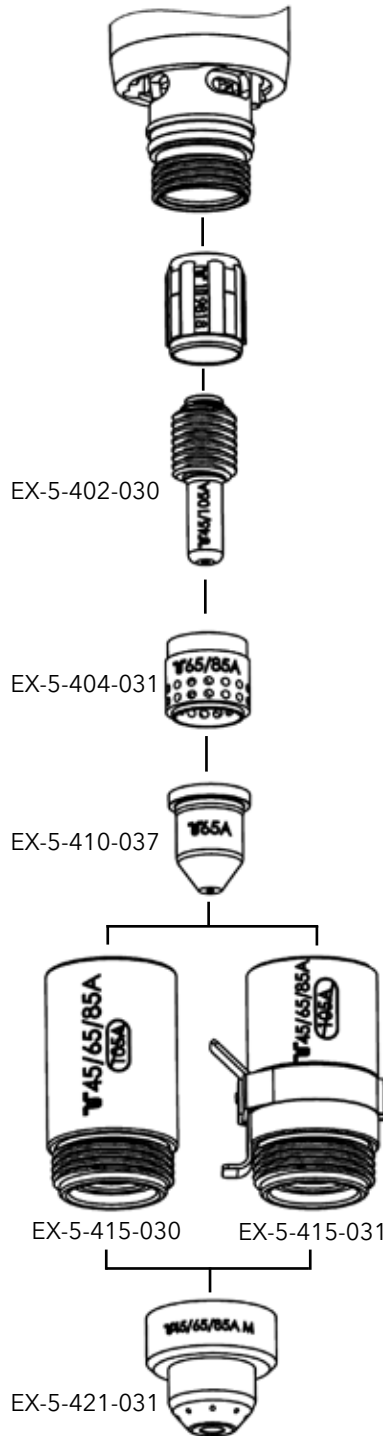
Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width
				Best Quality Settings		Standard Quality Settings		
				Cut Speed	Voltage	Cut Speed	Voltage	
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]
1	1.5	3.8	0	7400	126	11000	121	1.6
2			0.1	4400	127	9200	122	1.5
3			0.2	2800	129	6250	124	1.4
4			0.4	2100	132	4700	125	
6			0.5	1050	135	2250	127	1.5

**Note:**  
**Unshielded configuration;**

When using unshielded consumables, adjust the torch to work height manually or adjust the Arc Voltage Control (AVC) settings to produce the desired cut quality.

# Mechanized Cutting Charts

## 55 A Cutting, Shielded Configuration; using compressed air



### Mild Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
2	1.5	3.8	0.1	5324	122	6160	119	1.5	
3			0.2	4576	123	5368	121	1.5	
4			0.5	3740	123	4488	122		
6			0.5	2244	125	2851	125	1.7	
8			0.5	1496	127	1962	126	1.8	
10		4.5	0.7	968	129	1320	127	1.9	
12		4.5	1.2	748	132	1003	129	2.1	
16		6	2	493	136	572	134	2.2	
20		Edge start			308	140	396	140	
25		Edge start			185	143	238	143	

### Stainless Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
2	1.5	3.8	0.1	6966	123	8600	119	1.3	
3			0.2	5762	123	7104	121	1.4	
4			0.5	4472	123	5289	122		
6			0.5	2107	124	2451	124	1.7	
8			0.7	1290	127	1600	127	1.8	
10		4.5	0.7	826	130	1075	130	1.9	
12		4.5	1.2	645	133	791	132	2.1	
16		Edge start			430	137	430	137	2.3
20		Edge start			258	141	318	141	

### Aluminium

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
2	1.5	3.8	0.1	7656	119	8961	120	1.8	
3			0.2	6438	122	7656	122	1.8	
4			0.5	5220	124	6375	123		
6			0.5	2784	128	3828	126	1.8	
8			0.7	1697	131	2393	128	1.9	
10		4.5	0.7	1044	134	1436	130	2.0	
12		4.5	1.2	870	136	1157	134	2.2	
16		Edge start			566	141	696	139	2.4
20		Edge start			331	145	487	143	

#### Note:

\* Recommended cutting speeds provide the best cut angle, minimal dross and best cut quality surface. Each plasma cutting system requires "fine tuning" for each cutting application and each type and/or thickness of the material to be cut in order to reach the desired quality of the cut.

\*\* Maximum cutting speeds are the fastest possible cutting speeds for the material to be cut regardless of the of the cut quality..

# Mechanized Cutting Charts

## 55 A Cutting, Unshielded Configuration; using compressed air



EX-5-402-030



EX-5-404-031



EX-5-410-037



EX-5-415-030



EX-5-423-031



### Mild Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
2	2	5	0.1	5324	115	6459	115	1.5	
3			0.2	4576	116	5570	116	1.5	
4			0.5	3740	116	4620	116		
6			0.5	2244	118	3133	118	1.6	
8			0.5	1426	121	1962	119	1.7	
10		6	0.7	854	125	1320	120	1.8	
12		Edge start			669	127	1003	122	1.9
16					425	132	553	127	
20					238	136	340	131	

### Stainless Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
2	2	5	0.1	6996	115	9064	114	1.5	
3			0.2	5808	116	7480	115	1.5	
4			0.5	4444	117	5720	117		
6			0.5	2024	119	2702	119	1.7	
8			0.7	1232	121	1672	120	1.7	
10		6	0.7	810	124	1100	121	1.8	
12		Edge start			625	128	814	125	1.9
16					378	133	440	131	

### Aluminium

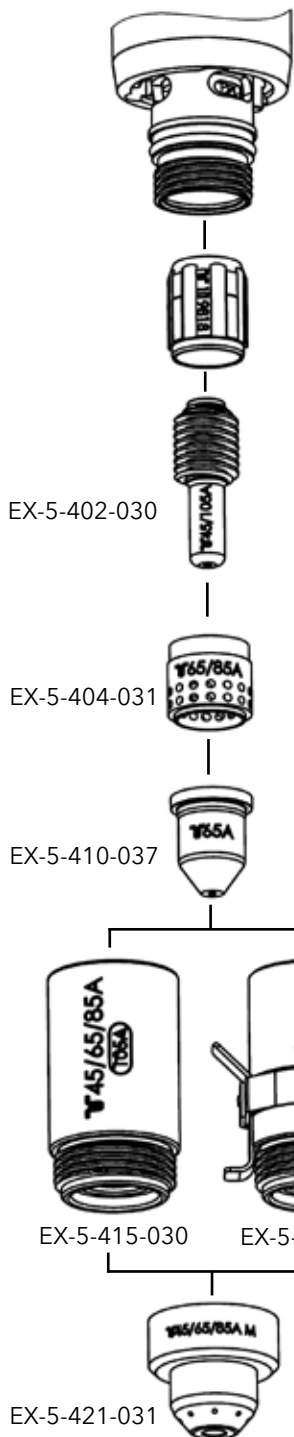
Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
2	2	5	0.1	6045	121	8814	120	1.7	
3			0.2	5109	122	7410	121	1.7	
4			0.5	4212	123	5959	122		
6			0.5	2340	125	3042	124	1.7	
8			0.7	1404	128	1919	125	1.7	
10		6	0.7	858	131	1279	127	1.8	
12		Edge start			702	133	975	131	1.9
16					546	137	637	134	

**Note:**  
Unshielded configuration;

When using unshielded consumables, adjust the torch to work height manually or adjust the Arc Voltage Control (AVC) settings to produce the desired cut quality.

# Mechanized Cutting Charts

## 65 A Cutting, Shielded Configuration; using compressed air



### Mild Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
2	1.5	3.8	0.1	6050	124	7000	121	1.6	
3			0.2	5200	125	6100	123	1.6	
4			0.5	4250	125	5100	124		
6			0.5	2550	127	3240	127	1.8	
8			0.5	1700	129	2230	128	1.9	
10		4.5	0.7	1100	131	1500	129	2	
12		4.5	1.2	850	134	1140	131	2.2	
16		6	2	560	138	650	136	2.3	
20		Edge start			350	142	450	142	
25		Edge start			210	145	270	145	

### Stainless Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
2	1.5	3.8	0.1	8100	125	10000	121	1.4	
3			0.2	6700	125	8260	123	1.5	
4			0.5	5200	125	6150	124		
6			0.5	2450	126	2850	126	1.8	
8			0.7	1500	129	1860	129	1.9	
10		4.5	0.7	960	132	1250	132	2.0	
12		4.5	1.2	750	135	920	134	2.2	
16		Edge start			500	139	500	139	2.4
20		Edge start			300	143	370	143	

### Aluminium

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
2	1.5	3.8	0.1	8800	121	10300	122	1.9	
3			0.2	7400	124	8800	124	1.9	
4			0.5	6000	126	7350	125		
6			0.5	3200	130	4400	128	1.9	
8			0.7	1950	133	2750	130	2.0	
10		4.5	0.7	1200	136	1650	132	2.1	
12		4.5	1.2	1000	138	1330	136	2.3	
16		Edge start			650	143	800	141	2.5
20		Edge start			380	147	560	145	

### Note:

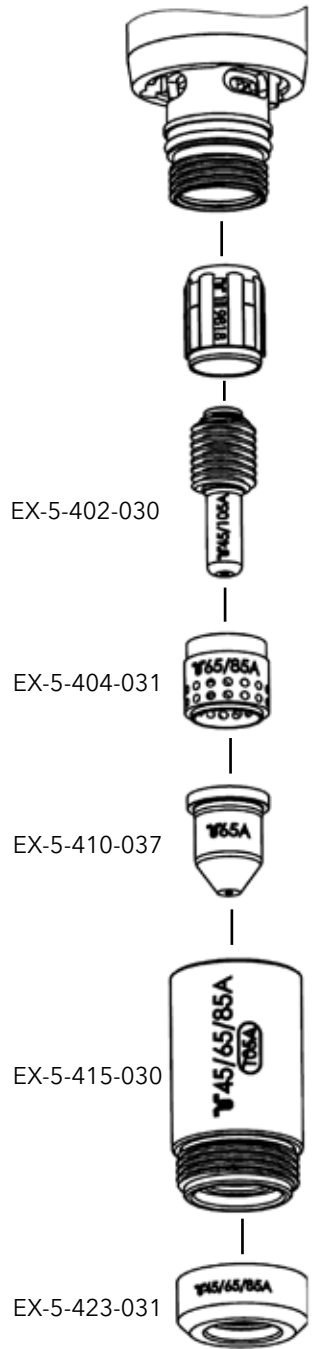
\* Recommended cutting speeds provide the best cut angle, minimal dross and best cut quality surface. Each plasma cutting system requires "fine tuning" for each cutting application and each type and/or thickness of the material to be cut in order to reach the desired quality of the cut.

\*\* Maximum cutting speeds are the fastest possible cutting speeds for the material to be cut regardless of the of the cut quality..



# Mechanized Cutting Charts

## 65 A Cutting, Unshielded Configuration; using compressed air



### Mild Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]		
				Best Quality Settings		Standard Quality Settings				
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]			
2	2	5	0.1	6050	117	7340	117	1.6		
3			0.2	5200	118	6330	118	1.6		
4			0.5	4250	118	5250	118			
6			0.5	2550	120	3560	120	1.7		
8			0.5	1620	123	2230	121	1.8		
10		6	0.7	970	127	1500	122	1.9		
12		Edge start			760	129	1140	124	2.0	
16					500	134	650	129		
						280	138	400	133	
20										

### Stainless Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]		
2	2	5	0.1	7950	117	10300	116	1.6	
3			0.2	6600	118	8500	117	1.6	
4			0.5	5050	119	6500	119		
6			0.5	2300	121	3070	121	1.8	
8			0.7	1400	123	1900	122	1.8	
10		6	0.7	920	126	1250	123	1.9	
12		Edge start			710	130	925	127	2.0
16					430	135	500	133	

### Aluminium

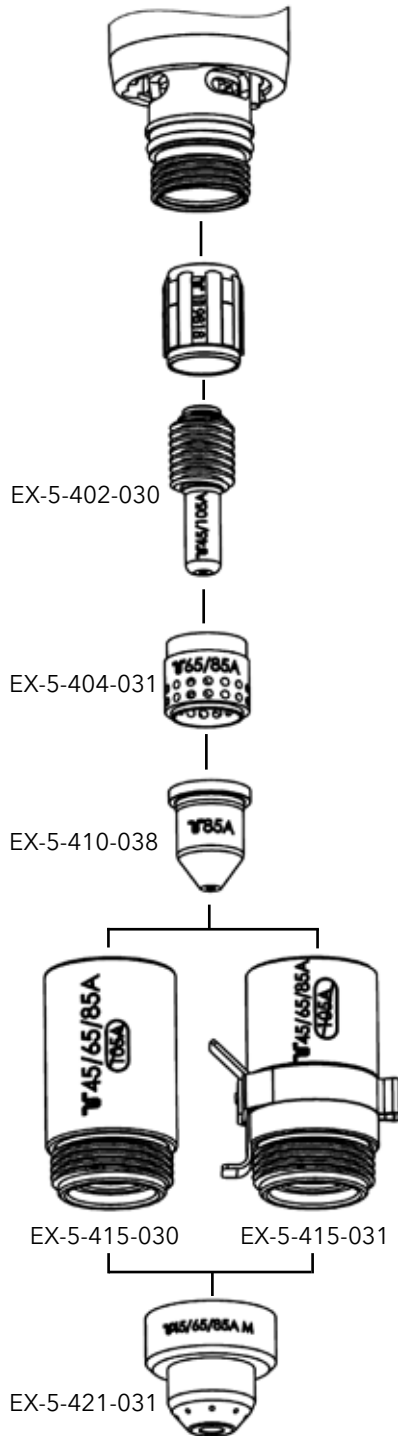
Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]		
2	2	5	0.1	7750	123	11300	122	1.8	
3			0.2	6550	124	9500	123	1.8	
4			0.5	5400	125	7640	124		
6			0.5	3000	127	3900	126	1.8	
8			0.7	1800	130	2460	127	1.8	
10		6	0.7	1100	133	1640	129	1.9	
12		Edge start			900	135	1250	133	2.0
16					600	139	700	136	

**Note:**  
Unshielded configuration;

When using unshielded consumables, adjust the torch to work height manually or adjust the Arc Voltage Control (AVC) settings to produce the desired cut quality.

# Mechanized Cutting Charts

## 75 A Cutting, Shielded Configuration; using compressed air



### Mild Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
3	1.5	3.8	0.1	5984	120	8096	118	1.6	
4			0.2	4972	120	6424	120		
6			0.5	3168	121	3872	123	1.7	
8			0.5	2200	123	2728	125	1.8	
10		0.5	1478	125	1822	126	1.9		
12		4.5	0.7	1126	128	1408	128	2.1	
16		4.5	1	766	132	818	131	2.3	
20		6	1.5	502	135	598	134	2.5	
25		Edge start			308	140	396	139	
30		Edge start			176	144	264	142	

### Stainless Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
3	1.5	3.8	0.1	6450	120	7912	118	1.5	
4			0.2	5246	120	6450	118		
6			0.5	3182	120	3956	120	1.7	
8			0.5	2107	122	2623	122	1.8	
10		4.5	0.5	1333	125	1634	124	2.0	
12		4.5	0.7	946	129	1204	128	2.2	
16		4.5	1	602	133	654	132	2.3	
20		Edge start			413	136	490	135	2.4
25		Edge start			258	141	318	139	

### Aluminium

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
3	1.5	3.8	0.1	6960	120	8178	119	1.9	
4			0.2	5655	121	6960	121		
6			0.5	3306	124	4263	124	1.8	
8			0.5	2306	128	3019	127	1.9	
10		4.5	0.5	1670	130	2175	129	2.0	
12		4.5	0.7	1262	132	1679	131	2.1	
16		4.5	1	846	137	1068	135	2.3	
20		Edge start			534	141	783	139	2.5
25		Edge start			338	144	481	142	

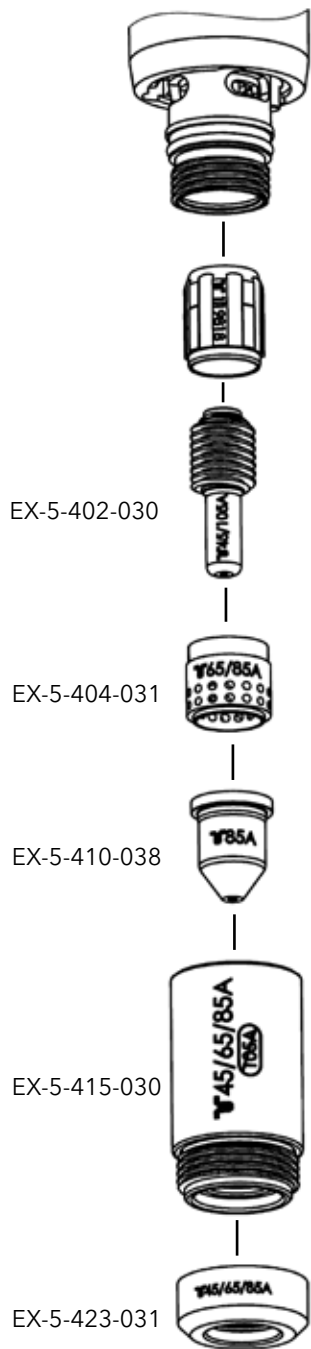
#### Note:

\* Recommended cutting speeds provide the best cut angle, minimal dross and best cut quality surface. Each plasma cutting system requires "fine tuning" for each cutting application and each type and/or thickness of the material to be cut in order to reach the desired quality of the cut.

\*\* Maximum cutting speeds are the fastest possible cutting speeds for the material to be cut regardless of the of the cut quality..

# Mechanized Cutting Charts

## 75 A Cutting, Unshielded Configuration; using compressed air



### Mild Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]		
3	2	5	0.1	5491	116	7920	115	1.7	
4			0.2	4620	116	6336	115		
6			0.5	3036	118	3872	117	1.8	
8			0.5	2112	119	2728	119	1.9	
10			0.5	1373	121	1822	120	2.0	
12		6	0.7	1056	124	1408	122	2.0	
16		Edge start			697	130	791	126	2.2
20					459	135	544	130	
25					272	141	340	135	

### Stainless Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]		
3	2	5	0.1	6160	116	8501	115	1.6	
4			0.2	4928	116	6864	116		
6			0.5	2992	118	4022	119	1.7	
8			0.5	1980	119	2614	120	1.8	
10			0.5	1258	121	1619	122	2.0	
12		6	0.7	880	127	1179	126	2.1	
16		Edge start			572	132	642	131	2.3
20					317	136	502	135	

### Aluminium

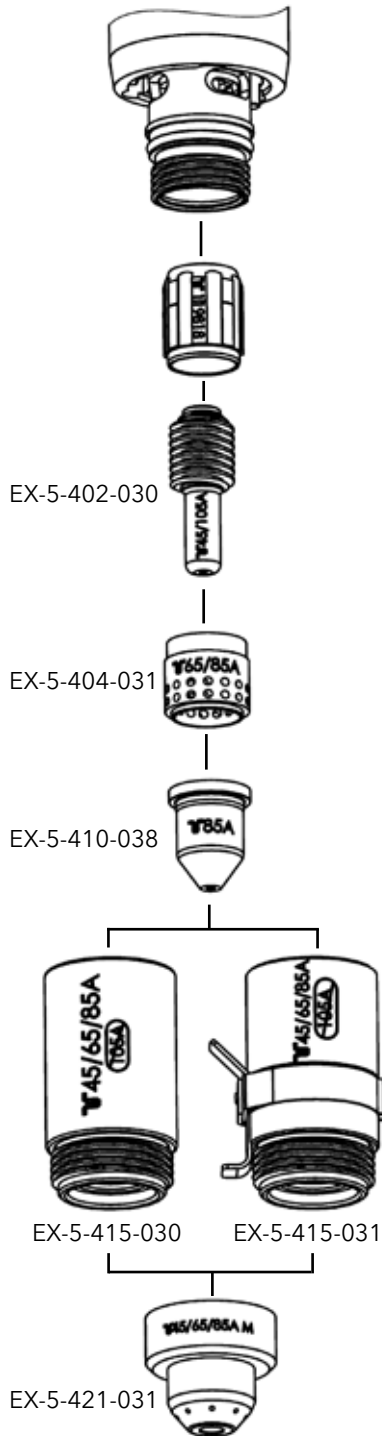
Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]		
3	2	5	0.1	5733	118	7488	117	1.8	
4			0.2	5680	120	6318	118		
6			0.5	2574	123	3845	120	1.8	
8			0.5	1833	125	2535	122	1.9	
10			6	0.5	1404	126	1669	125	1.9
12		6	0.7	1014	131	1342	128	2.0	
16		Edge start			764	137	1028	132	2.1
20					428	142	637	136	

**Note:**  
**Unshielded configuration;**

When using unshielded consumables, adjust the torch to work height manually or adjust the Arc Voltage Control (AVC) settings to produce the desired cut quality.

# Mechanized Cutting Charts

## 85 A Cutting, Shielded Configuration; using compressed air



### Mild Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
3	1.5	3.8	0.1	6800	122	9200	120	1.7	
4			0.2	5650	122	7300	122		
6			0.5	3600	123	4400	125	1.8	
8			0.5	2500	125	3100	127	1.9	
10		4.5	0.5	1680	127	2070	128	2.0	
12			0.7	1280	130	1600	130	2.2	
16		4.5	1	870	134	930	133	2.4	
20		6	1.5	570	137	680	136	2.6	
25		Edge start			350	142	450	141	
30					200	146	300	144	

### Stainless Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
3	1.5	3.8	0.1	7500	122	9200	120	1.6	
4			0.2	6100	122	7500	120		
6			0.5	3700	122	4600	122	1.8	
8			0.5	2450	124	3050	124	1.9	
10		4.5	0.5	1550	127	1900	126	2.1	
12			0.7	1100	131	1400	130	2.3	
16		4.5	1	700	135	760	134	2.4	
20		Edge start			480	138	570	137	2.5
25					300	143	370	141	

### Aluminium

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed	Voltage	Cut Speed	Voltage		
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
3	1.5	3.8	0.1	8000	122	9400	121	2.0	
4			0.2	6500	123	8000	123		
6			0.5	3800	126	4900	126	1.9	
8			0.5	2650	130	3470	129	2.0	
10		4.5	0.5	1920	132	2500	131	2.1	
12			0.7	1450	134	1930	133	2.2	
16		4.5	1	950	139	1200	137	2.4	
20		Edge start			600	143	880	141	2.6
25					380	146	540	144	

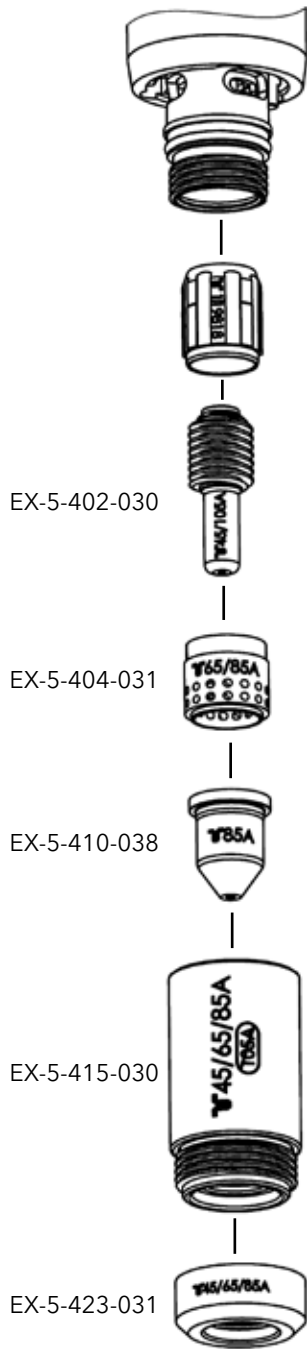
#### Note:

\* Recommended cutting speeds provide the best cut angle, minimal dross and best cut quality surface. Each plasma cutting system requires "fine tuning" for each cutting application and each type and/or thickness of the material to be cut in order to reach the desired quality of the cut.

\*\* Maximum cutting speeds are the fastest possible cutting speeds for the material to be cut regardless of the of the cut quality..

# Mechanized Cutting Charts

## 85 A Cutting, Unshielded Configuration; using compressed air



### Mild Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
2	2	5	0	7150	117	10400	116	1.7
3			0.1	6240	118	9000	117	1.8
4			0.2	5250	118	7200	117	
6			0.5	3450	120	4400	119	1.9
8			0.5	2400	121	3100	121	2.0
10		0.5	1560	123	2070	122	2.1	
12		6	0.7	1200	126	1600	124	2.1
16		Edge start		820	132	930	128	2.3
20				540	137	640	132	
25				320	143	400	137	

### Stainless Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
2	2	5	0.1	8550	117	11300	116	1.7
3			0.1	7000	118	9660	117	1.7
4			0.2	5600	118	7800	118	
6			0.5	3400	120	4570	121	1.8
8			0.5	2250	121	2970	122	1.9
10		6	0.5	1430	123	1840	124	2.1
12		6	0.7	1000	129	1340	128	2.2
16		Edge start		650	134	730	133	2.4
20				360	138	570	137	

### Aluminium

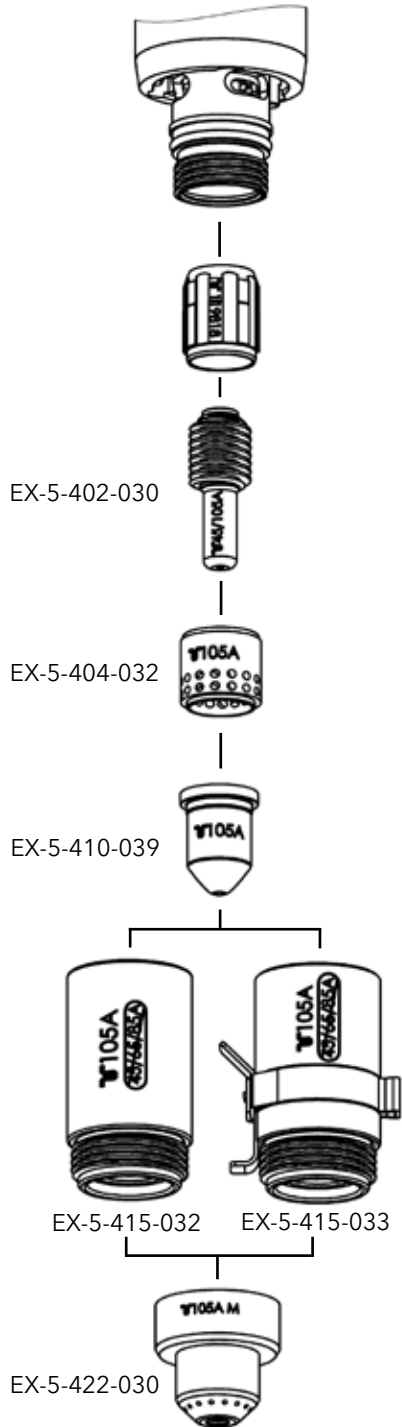
Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
2	2	5	0.1	8700	118	11200	118	1.9
3			0.1	7350	120	9600	119	1.9
4			0.2	6000	122	8100	120	
6			0.5	3300	125	4930	122	1.9
8			0.5	2350	127	3250	124	2.0
10		6	0.5	1800	128	2140	127	2.0
12		6	0.7	1300	133	1720	130	2.1
16		Edge start		840	139	1130	134	2.2
20				470	144	700	138	

**Note:**  
Unshielded configuration;

When using unshielded consumables, adjust the torch to work height manually or adjust the Arc Voltage Control (AVC) settings to produce the desired cut quality.

# Mechanized Cutting Charts

## 100 A Cutting, Shielded Configuration; using compressed air



### Mild Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]		
6	3.2	6.4	0.5	3892	142	4785	143	2	
8			0.75	2952	143	3638	143	2.1	
10			0.75	2124	143	2623	143	2.1	
12			0.75	1589	143	1936	146	2.1	
16			1	996	147	1231	147	2.4	
20			1	733	150	884	150	2.6	
25		Edge start			517	157	545	156	3.2
30					348	160	385	159	
32					329	164	348	159	
35					273	166	301	163	
40				179	171	197	168		

### Stainless Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]		
6	3.2	6.4	0.5	4529	137	5580	139	1.8	
8			0.5	3218	139	3915	140	2.0	
10			0.5	2083	142	2483	140	2.2	
12			0.6	1386	146	1730	142	2.2	
16			0.75	884	147	1004	147	2.2	
20			8	1.25	614	152	753	150	2.5
25		Edge start			409	156	493	154	2.8
30					316	162	335	158	
32					279	164	298	161	

### Aluminium

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]	
				Best Quality Settings		Standard Quality Settings			
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]		
6	3.2	6.4	0.5	5442	143	6452	142	2.2	
8			0.75	3795	147	4568	146	2.2	
10			0.75	2402	150	2985	149	2.3	
12			1	1738	154	2230	152	2.5	
16			1	1174	155	1511	153	2.6	
20			1.25	918	161	1071	160	2.9	
25		Edge start			594	164	711	163	3.4
30					387	171	513	169	
32					306	173	441	171	

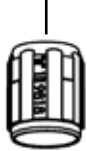
#### Note:

\* Recommended cutting speeds provide the best cut angle, minimal dross and best cut quality surface. Each plasma cutting system requires "fine tuning" for each cutting application and each type and/or thickness of the material to be cut in order to reach the desired quality of the cut.

\*\* Maximum cutting speeds are the fastest possible cutting speeds for the material to be cut regardless of the of the cut quality..

# Mechanized Cutting Charts

## 100 A Cutting, Unshielded Configuration; using compressed air



EX-5-402-030



EX-5-404-032



EX-5-410-039



EX-5-415-032



EX-5-423-031

### Mild Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width
				Best Quality Settings		Standard Quality Settings		
				Cut Speed	Voltage	Cut Speed	Voltage	
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]
6	4.6	9.2	0.5	3798	146	4681	143	2
8			0.5	2970	147	3544	143	2.2
10			0.5	2209	148	2538	143	2.4
12			0.5	1598	151	1955	145	2.3
16			0.6	921	153	1128	150	2.6
20			1	697	153	884	152	2.8
25		Edge start		470	157	545	157	3.1
30				282	159	348	158	
32				244	167	254	165	
35				301	162	329	161	
40			150	174	179	170		

### Stainless Steel

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width
				Best Quality Settings		Standard Quality Settings		
				Cut Speed	Voltage	Cut Speed	Voltage	
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]
6	4.6	9.2	0.5	4572	143	5630	140	1.9
8			0.5	3146	145	3833	142	2.1
10			0.5	1923	147	2364	144	2.3
12			0.6	1297	149	1601	147	2.4
16			0.75	827	151	1015	149	2.6
20			1	620	154	752	153	2.6
25		Edge start		395	157	470	157	3.0
30				310	160	348	159	
32				282	161	301	160	

### Aluminium

Material Thickness	Torch (Shield) to Workpiece Distance	Initial Pierce Height (Shield)	Pierce Delay Time	Recommended Speed*		Maximum Speed**		Kerf Width
				Best Quality Settings		Standard Quality Settings		
				Cut Speed	Voltage	Cut Speed	Voltage	
[mm]	[mm]	[mm]	[seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]
6	4.6	9.2	0.5	5198	146	6381	147	2.0
8			0.75	3658	150	4503	149	2.2
10			0.75	2376	152	3186	151	2.4
12			1	1860	153	2181	152	2.3
16			1	1264	158	1577	156	2.6
20			Edge start		931	161	1131	160
25		627		165	732	165	3.1	
30		475		168	561	167		
32		428		169	494	168		

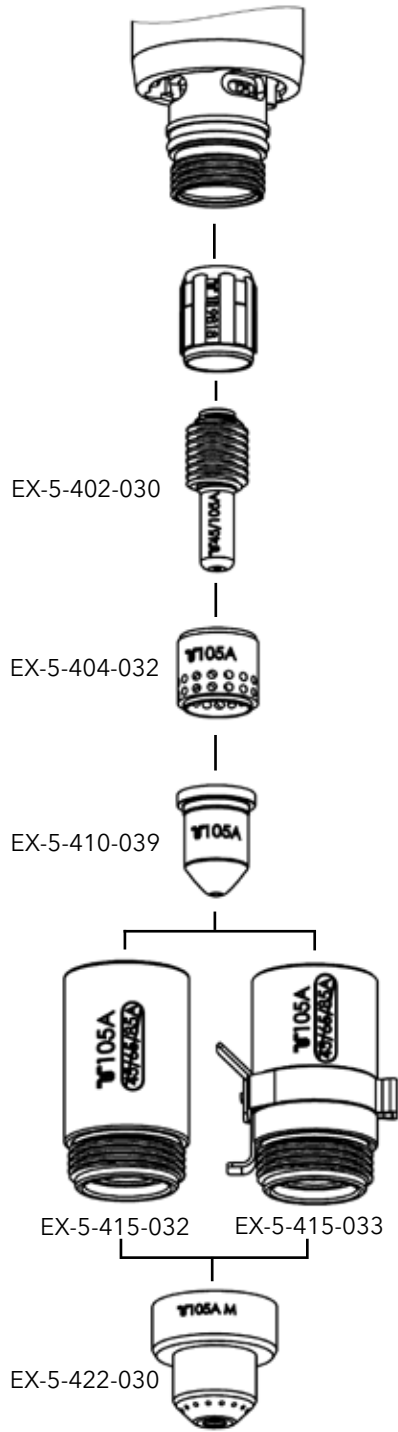
**Note:**  
Unshielded configuration;

When using unshielded consumables, adjust the torch to work height manually or adjust the Arc Voltage Control (AVC) settings to produce the desired cut quality.



# Mechanized Cutting Charts

## 105 A Cutting, Shielded Configuration; using compressed air



### Mild Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
6	3.2	6.4	0.5	4140	144	5090	145	2.1
8			0.75	3140	145	3870	145	2.2
10			0.75	2260	145	2790	145	2.2
12			0.75	1690	145	2060	148	2.2
16			1	1060	149	1310	149	2.5
20			1	780	152	940	152	2.7
25	Edge start	Edge start		550	159	580	158	3.3
30				370	162	410	161	
32				350	166	370	161	
35				290	168	320	165	
40				190	173	210	170	

### Stainless Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
6	3.2	6.4	0.5	4870	139	6000	141	1.9
8			0.5	3460	141	4210	142	2.1
10			0.5	2240	144	2670	142	2.3
12			0.6	1490	148	1860	144	2.3
16			0.75	950	149	1080	149	2.3
20			8	1.25	660	154	810	152
25	Edge start	Edge start		440	158	530	156	2.9
30				340	164	360	160	
32				300	166	320	163	

### Aluminium

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
6	3.2	6.4	0.5	5980	145	7090	144	2.3
8			0.75	4170	149	5020	148	2.3
10			0.75	2640	152	3280	151	2.4
12			1	1910	156	2450	154	2.6
16			1	1290	157	1660	155	2.7
20			1.25	1020	163	1190	162	3.0
25	Edge start	Edge start		660	166	790	165	3.5
30				430	173	570	171	
32				340	175	490	173	

#### Note:

\* Recommended cutting speeds provide the best cut angle, minimal dross and best cut quality surface. Each plasma cutting system requires "fine tuning" for each cutting application and each type and/or thickness of the material to be cut in order to reach the desired quality of the cut.

\*\* Maximum cutting speeds are the fastest possible cutting speeds for the material to be cut regardless of the of the cut quality..



# Mechanized Cutting Charts

## 105 A Cutting, Unshielded Configuration; using compressed air



EX-5-402-030



EX-5-404-032



EX-5-410-039



EX-5-415-032



EX-5-423-031

### Mild Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
6	4.6	9.2	0.5	4040	148	4980	145	2.1
8			0.5	3160	149	3770	145	2.3
10			0.5	2350	150	2700	145	2.5
12			0.5	1700	153	2080	147	2.4
16			0.6	980	155	1200	152	2.7
20			1	742	155	940	154	2.9
25		Edge start		500	159	580	159	3.2
30				300	161	370	160	
32				260	169	270	167	
35				320	164	350	163	
40			160	176	190	172		

### Stainless Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
6	4.6	9.2	0.5	4970	145	6120	142	2.0
8			0.5	3420	147	4210	144	2.2
10			0.5	2090	149	2570	146	2.4
12			0.5	1410	151	1740	149	2.5
16			0.75	880	153	1080	151	2.7
20			1	660	156	800	155	2.7
25		Edge start		420	159	500	159	3.1
30				330	162	370	161	
32				300	163	320	162	

### Aluminium

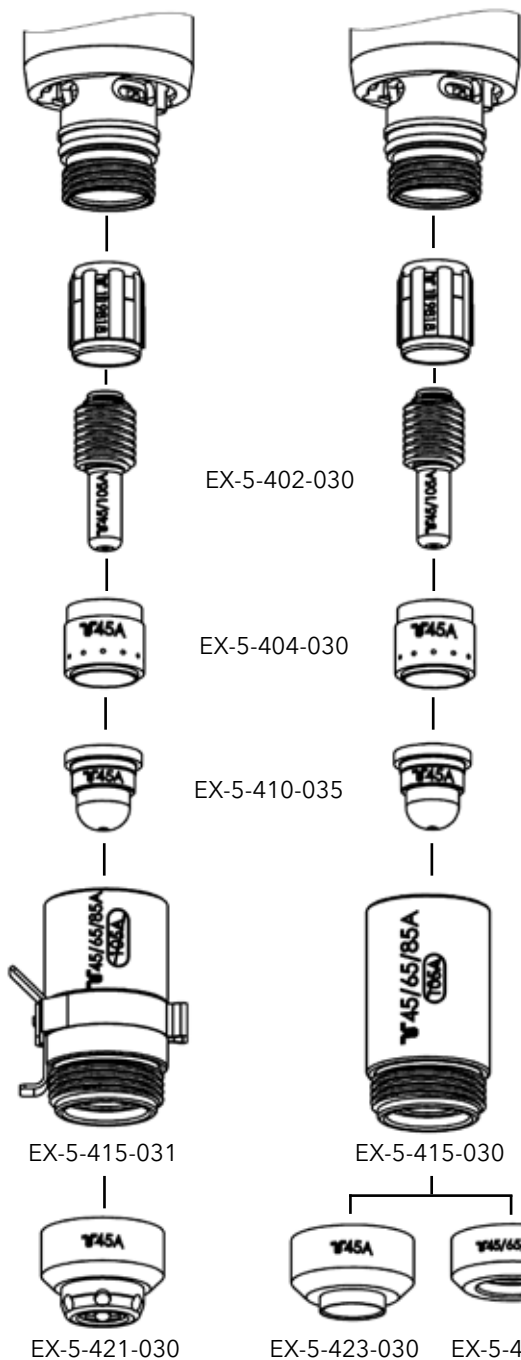
Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Recommended Speed*		Maximum Speed**		Kerf Width [mm]
				Best Quality Settings		Standard Quality Settings		
				Cut Speed [mm/min]	Voltage [Volts]	Cut Speed [mm/min]	Voltage [Volts]	
6	4.6	9.2	0.5	5840	148	7170	149	2.1
8			0.75	4110	152	5060	151	2.3
10			0.75	2670	154	3580	153	2.5
12			1	2090	155	2450	154	2.4
16			1	1330	160	1660	158	2.7
20			Edge start		980	163	1190	162
25				660	167	770	167	3.2
30				500	170	590	169	
32				450	171	520	170	

**Note:**  
**Unshielded configuration;**

When using unshielded consumables, adjust the torch to work height manually or adjust the Arc Voltage Control (AVC) settings to produce the desired cut quality.

## Mechanized Cutting Charts

### SmoothCut, Shielded Configuration; using compressed air



### Mild Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Aproximate Travel Speed			Kerf Width [mm]
				Cut Speed [mm/min]	Voltage [Volts]	Arc current [Amperes]	
0.5	1.5	2.25	0	8250	78	40	0.9
0.6			0	8250	78		
0.8			0.1	8250	78		
1			0.2	8250	78	45	0.7
1.5			0.4	6400	78		
2			0.4	4800	78		0.5
3			0.5	2750	78		0.6
4			0.6	1900	78		

### Stainless Steel

Material Thickness [mm]	Torch (Shield) to Workpiece Distance [mm]	Initial Pierce Height (Shield) [mm]	Pierce Delay Time [seconds]	Aproximate Travel Speed			Kerf Width [mm]
				Cut Speed [mm/min]	Voltage [Volts]	Arc current [Amperes]	
0.5	0.5	2	0	8250	68	40	0.9
0.6			0	8250	68		
0.8			0.1	8250	68		
1			0.15	8250	68	45	0.9
1.5			0.4	6400	70		
2			0.4	4800	71		0.9
3			0.5	2550	80		0.9
4			0.6	1050	80		

### Cut Charts for Shielded Configuration only

**Shielded Configuration**

**Unshielded Configuration**

**Note:**

\* Recommended cutting speeds provide the best cut angle, minimal dross and best cut quality surface. Each plasma cutting system requires "fine tuning" for each cutting application and each type and/or thickness of the material to be cut in order to reach the desired quality of the cut.

\*\* Maximum cutting speeds are the fastest possible cutting speeds for the material to be cut regardless of the of the cut quality..


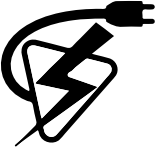
**SECTION 5.**

**MAINTENANCE:**

Routine maintenance ..... 5-51  
 Consumable parts inspection ..... 5-52

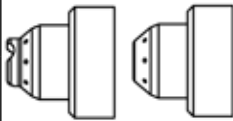









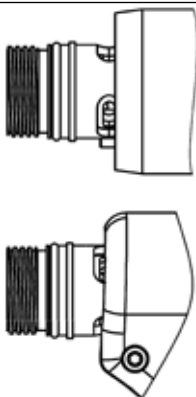
**MAINTENANCE**

**Routine maintenance**

	<b>WARNING ELECTRIC SHOCK CAN KILL</b>
	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.

<b>Every usage</b>	Check the gas pressure. Check the consumables. Ensure that consumables are installed correctly and are not worn. Check the work clamp.
<b>Every week</b>	Examine and check the cap sensor. Ensure that the LED safety indicator which indicates a loose retaining cap is fully functional.
<b>Every 3 months</b>	Full examination of the torch, check for signs of cracking in the torch body or exposed wires.
<b>Immediately replace the torch lead if damaged.</b>	

## 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	
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 assy		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		
	Damaged O-ring	Replace O-ring		
		Dry O-ring	Apply a thin coat of silicone grease part No. EX-0-805-001	

## **SECTION 6.**

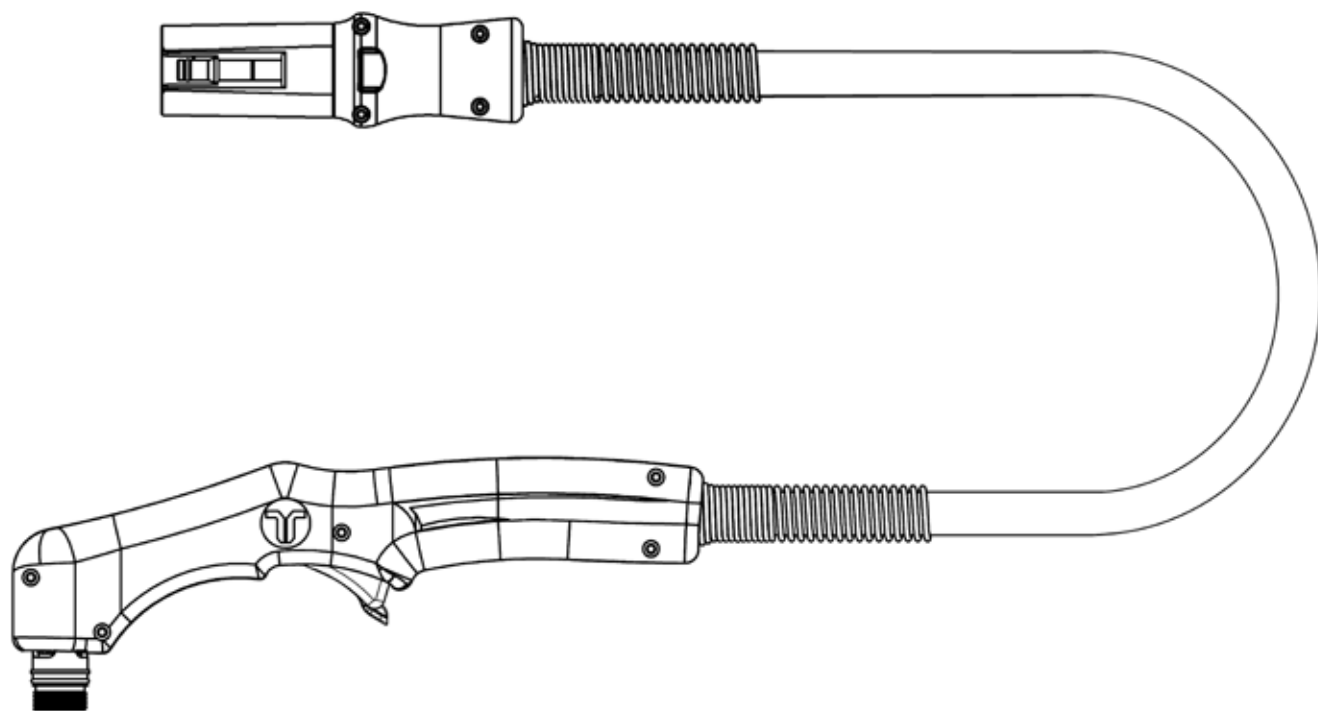
### **TORCH AND TORCH PARTS:**

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FHT-EX®105RTXH Hand Torch Assembly .....	6-54
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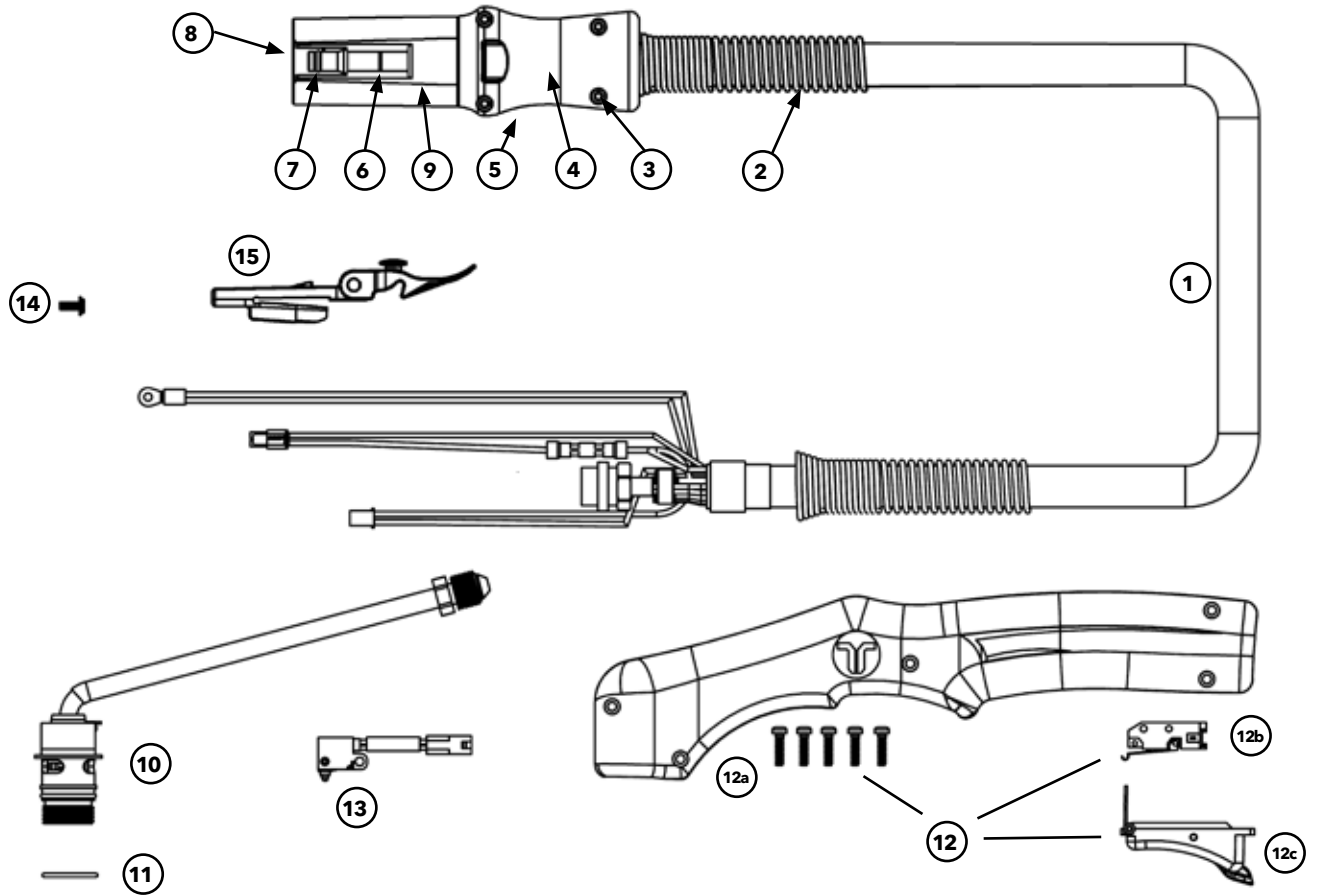
# TORCHES AND TORCH PARTS

## FHT-EX® 105RTXH Hand Torch Assembly



Part No.	DESCRIPTION
EX-5-140-002	FHT-EX105RTXH Hand Torch w/o Rack Assy-w/o consumables w/8m Lead/TCS13
EX-5-140-003	FHT-EX105RTXH Hand Torch w/o Rack Assy-w/o consumables w/15m Lead/TCS13

## FHT-EX®105RTXH Hand Torch Components



Item	Part No.	DESCRIPTION
1	EX-5-374-005	FHT-EX®105RTXH Hand Torch Lead Replacement 8m (26')/TCS13
1	EX-5-374-006	FHT-EX®105RTXH Hand Torch Lead Replacement 15m (50')/TCS13
2	EX-5-318-001	TCS Plug Spring Stain Relief
3	EX-0-325-015	TCS Clam Shell Screw Kit (incl. 4 screws)
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-0-323-001	TCS13 Plug Body
10	EX-5-302-030	Hand Torch Body Replacement Kit
11	EX-5-431-050	Torch Body O-Ring
12	EX-5-314-030	Hand Torch Handle Replacement Kit
12a	EX-5-308-030	Hand Torch Handle with Screws
12b	EX-5-313-030	Safety Trigger Micro-Switch
12c	EX-5-313-031	Safety Trigger
13	EX-5-305-001	Cap Sensor Microswitch Assembly / Hand Torch
14	EX-5-372-030	Pilot Cable Screw
15	EX-0-321-003	Latch w/Key Assembly

## FHT-EX®105RTXH Hand Torch Consumables



1



2



3



4



5



6



7

Shielded configuration



8



\* Unshielded configuration



9



6



10

Gouging configuration

**Hand Torch Consumables Configuration 45 - 85 A**

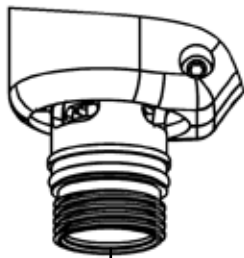
Item	Part No.	DESCRIPTION
1	EX-5-402-030	Electrode 45-105A
2	EX-5-404-031	Swirl Ring 45-85A
3	EX-5-410-036	Nozzle 45A
4	EX-5-410-037	Nozzle 55/65A
5	EX-5-410-038	Nozzle 75/85A
6	EX-5-415-030	Retaining Cap 45-85A
7	EX-5-419-030	Shield 45-85A, Hand
8	EX-5-423-031	Deflector 45-105A
9	EX-5-440-031	Nozzle 45-85A, Gouging
10	EX-5-440-030	Shield 45-105A, Gouging



\* For use in countries that require CE conformity, the torch must only be operated with shielded configuration consumables.



## FHT-EX®105RTXH Hand Torch Consumables



1



2



3



4



5

Shielded configuration



6



\* Unshielded configuration



8

Gouging configuration

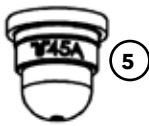
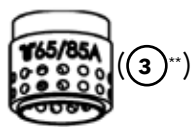
**Hand Torch Consumables Configuration 100 - 105 A**

Item	Part No.	DESCRIPTION
1	EX-5-402-030	Electrode 45-105A
2	EX-5-404-032	Swirl Ring 100/105A
3	EX-5-410-039	Nozzle 100/105A
4	EX-5-415-032	Retaining Cap 100/105A
5	EX-5-420-030	Shield 100/105A, Hand
6	EX-5-423-031	Deflector 45-105A
7	EX-5-440-032	Nozzle 100/105A, Gouging
8	EX-5-440-030	Shield 45-105A, Gouging



\* For use in countries that require CE conformity, the torch must only be operated with shielded configuration consumables.

## FHT-EX®105RTXH / SmoothCut Consumables



**Hand Torch Consumables Configuration SmoothCut**

Item	Part No.	DESCRIPTION
1	EX-5-402-030	Electrode 45-105A
2	EX-5-404-030	Swirl Ring 45A/AE105/ SmoothCut
3**	EX-5-404-031	Swirl Ring 45-85A
4**	EX-5-404-032	Swirl Ring 100/105A
5	EX-5-410-035	Nozzle 45A/ SmoothCut
6	EX-5-415-030	Retaining Cap 45-85A
7	EX-5-423-030	Deflector 45A/ SmoothCut
8	EX-5-423-031	Deflector 45-105A



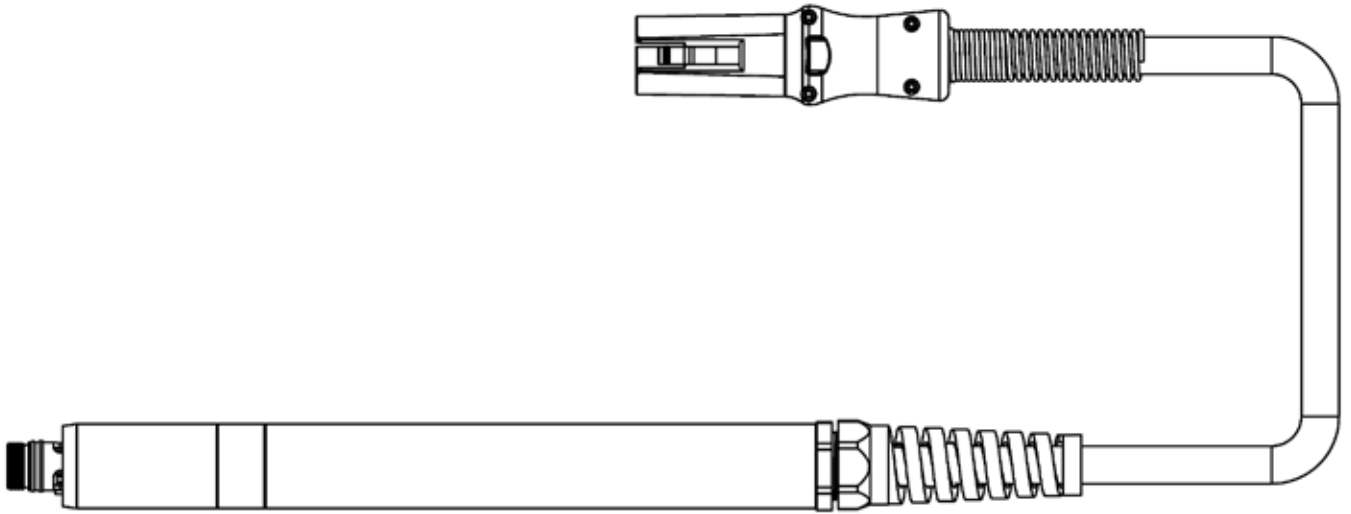
\* For use in countries that require CE conformity, the torch must only be operated with shielded configuration consumables.

\*\* Also possible to use with SmoothCut configuration, but for best cut quality results use EX-5-404-030.



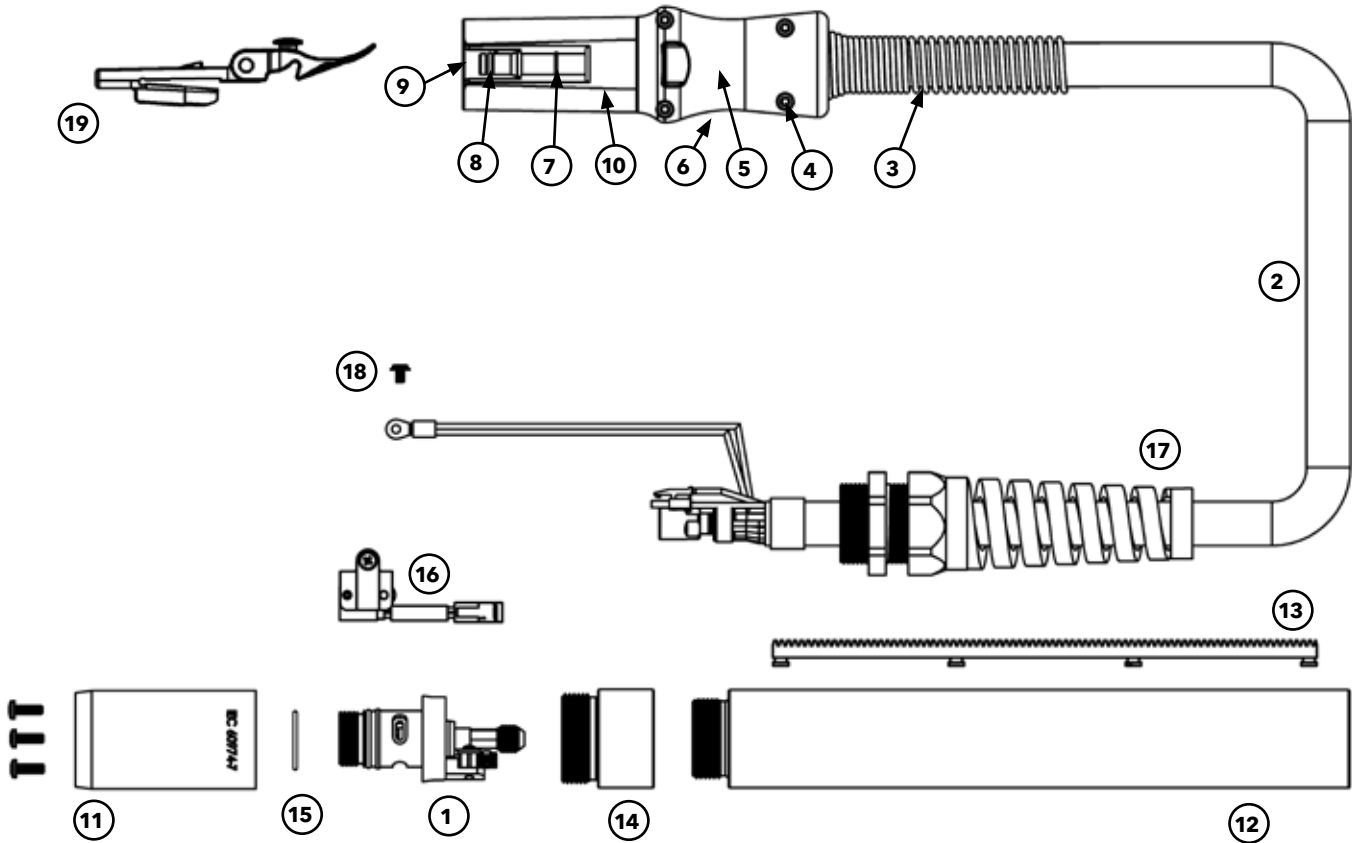
\* Unshielded configuration

## FHT-EX®105RTXM Machine Torch Assembly



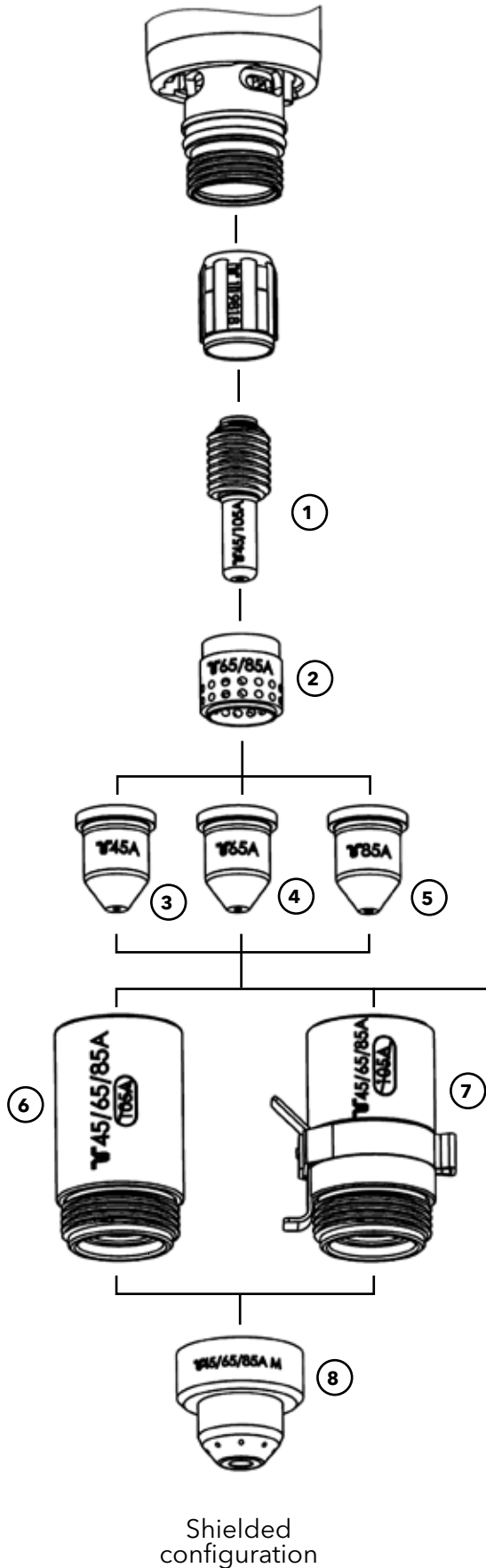
Part No.	DESCRIPTION
EX-5-240-001	FHT-EX®105RTXM Machine Torch w/o Rack Assy-w/o consumables w/8m Lead/ TCS13
EX-5-240-005	FHT-EX®105RTXM Machine Torch w/o Rack Assy-w/o consumables w/15m Lead/ TCS13

## FHT-EX®105RTXM Machine Torch Components



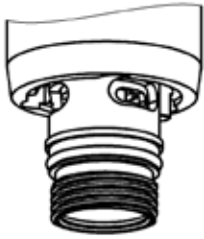
Item	Part No.	DESCRIPTION
1	EX-5-303-030	Machine Torch Body Replacement Kit
2	EX-5-375-001	FHT-EX®105RTXM Machine Torch Lead Replacement 8m (26')/TCS13
2	EX-5-375-002	FHT-EX®105RTXM Machine Torch Lead Replacement 15m (50')/TCS13
3	EX-5-318-001	TCS Plug Spring Strain Relief
4	EX-0-325-015	TCS Clam Shell Screw Kit (incl. 4 screws)
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-0-323-001	TCS13 Plug Body
11	EX-5-306-030	Torch Mounting Sleeve (incl. 3 screws)
12	EX-5-306-032	Standard Mounting Tube w/o Rack
13	EX-5-306-033	Gear Rack
14	EX-5-306-031	Standard Mounting Tube Reduction Nut
15	EX-5-431-050	Torch Body O-Ring
16	EX-5-304-030	Cap Sensor Replacement Kit with Screws
17	EX-5-317-021	Machine Torch Strain Relief
18	EX-5-372-030	Pilot Cable Screw
19	EX-0-321-003	Latch w/Key Assembly

## FHT-EX®105RTXM Machine Torch Consumables



Machine Torch Consumables Configuration 45 - 85 A		
Item	Part No.	DESCRIPTION
1	EX-5-402-030	Electrode 45-105A
2	EX-5-404-031	Swirl Ring 45-85A
3	EX-5-410-036	Nozzle 45A
4	EX-5-410-037	Nozzle 55/65A
5	EX-5-410-038	Nozzle 75/85A
6	EX-5-415-030	Retaining Cap 45-85A
7	EX-5-415-031	Retaining Cap 45-85A, IHS Tab
8	EX-5-421-031	Shield 45-85A, Machine
9	EX-5-423-031	Deflector 45-105A

## FHT-EX® 105RTXM Machine Torch Consumables



1



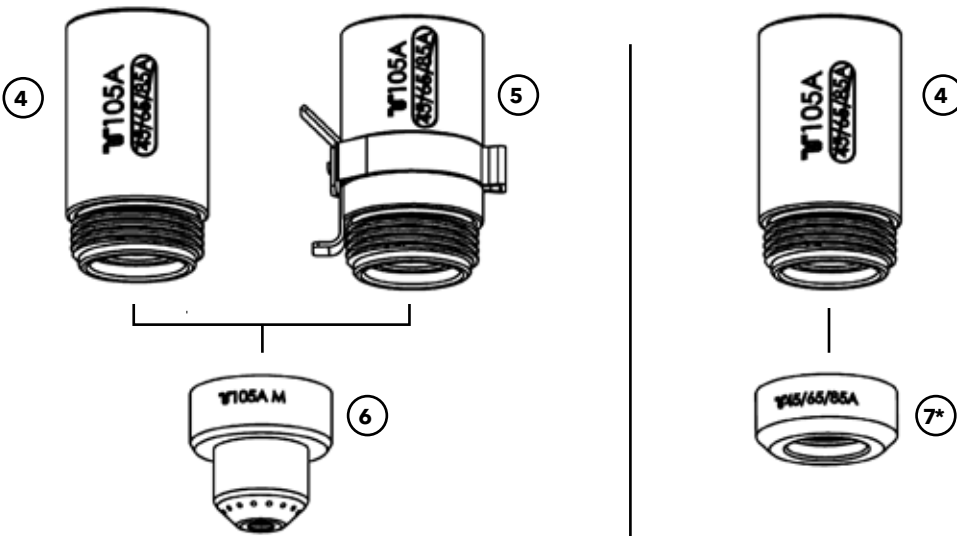
2



3

**Machine Torch Consumables Configuration 100 - 105 A**

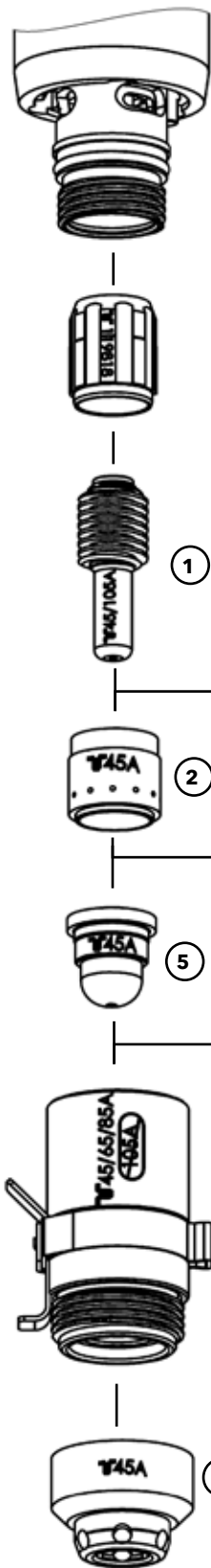
Item	Part No.	DESCRIPTION
1	EX-5-402-030	Electrode 45-105A
2	EX-5-404-032	Swirl Ring 100/105A
3	EX-5-410-039	Nozzle 100/105A
4	EX-5-415-032	Retaining Cap 100/105A
5	EX-5-415-033	Retaining Cap 100/105A, IHS Tab
6	EX-5-422-030	Shield 100/105A, Machine
7	EX-5-423-031	Deflector 45-105A



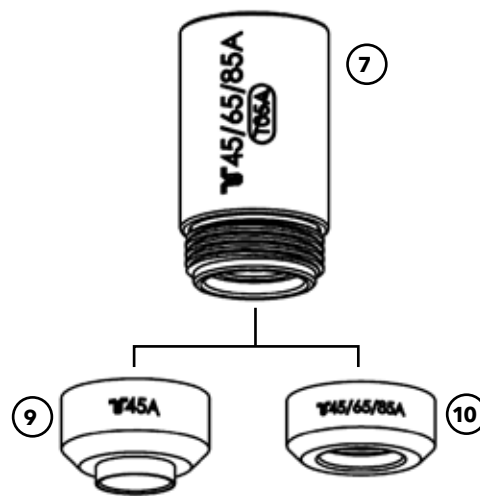
Shielded configuration

Unshielded configuration

## FHT-EX®105RTXM / SmoothCut Consumables



Shielded configuration



Unshielded configuration

**Machine Torch Consumables Configuration SmoothCut**

Item	Part No.	DESCRIPTION
1	EX-5-402-030	Electrode 45-105A
2	EX-5-404-030	Swirl Ring 45A/AE105/ SmoothCut
3*	EX-5-404-031	Swirl Ring 45-85A
4*	EX-5-404-032	Swirl Ring 100/105A
5	EX-5-410-035	Nozzle 45A, SmoothCut
6	EX-5-415-031	Retaining Cap 45-85A, IHS Tab
7	EX-5-415-030	Retaining Cap 45-85A
8	EX-5-421-030	Shield 45A, IHS, SmoothCut
9	EX-5-423-030	Deflector 45A/ SmoothCut
10	EX-5-423-031	Deflector 45-105A



\* Also possible to use with SmoothCut configuration, but for best cut quality results use EX-5-404-030.

## Additional ordering information

<b>FHT-EX®105RTXM Starter Kit</b>	
<b>Part No.</b>	<b>DESCRIPTION</b>
EX-5-432-030	Starter Kit 55/65A for Hand Torch FHT-EX®105RTXH
EX-5-433-030	Starter Kit 55/65A for Machine Torch FHT-EX®105RTXM
EX-5-432-031	Starter Kit 75/85A for Hand Torch FHT-EX®105RTXH
EX-5-433-031	Starter Kit 75/85A for Machine Torch FHT-EX®105RTXM
EX-5-432-032	Starter Kit 100/105A for Hand Torch FHT-EX®105RTXH
EX-5-433-032	Starter Kit 100/105A for Machine Torch FHT-EX®105RTXM




### Each starter kit contents:

4x Hand or Machine shield, 4x Nozzle, 4x Electrode, 1x Swirl ring, 1x Torch body O-ring



## SECTION 7.

### TROUBLESHOOTING:

Fault	This may mean	Cause	Solution
<p><b>The LED2 illuminates.</b></p> 	<ul style="list-style-type: none"> <li>• Gas pressure fault.</li> </ul>	<ul style="list-style-type: none"> <li>• The gas input pressure is lower than 2.4 bar/35 psi.</li> <li>• Damaged torch lead.</li> </ul>	<ul style="list-style-type: none"> <li>• Check gas supply input pressure.</li> <li>• Replace the torch lead.</li> </ul>
<p><b>The LED3 blinks no arc output when the CNC start signal is ON or the trigger is depressed.</b></p> 	<ul style="list-style-type: none"> <li>• Consumables fault.</li> <li>• Short circuit inside the torch.</li> </ul>	<ul style="list-style-type: none"> <li>• Consumables are loose, improperly installed or missing.</li> <li>• The retaining cap is not installed or tightened correctly.</li> <li>• Non original consumables.</li> <li>• Consumables are loose, improperly installed or missing.</li> <li>• Dirt inside the torch.</li> </ul>	<ul style="list-style-type: none"> <li>• Install the consumables and fit the retaining cap.</li> <li>• Fit the retaining cap and correctly tighten.</li> <li>• Use original new consumables.</li> <li>• Install the consumables correctly.</li> <li>• Remove all consumables, clean the inside of the torch. Reassemble in correct order.</li> </ul>
<p><b>The LED3 illuminates</b></p> 	<ul style="list-style-type: none"> <li>• Torch connection fault.</li> </ul>	<ul style="list-style-type: none"> <li>• Improperly installed torch or retaining cup is loose.</li> </ul>	<ul style="list-style-type: none"> <li>• Install torch properly or tighten retaining cup.</li> </ul>

Fault	This may mean	Cause	Solution
<p><b>No arc output but no alarm light when the CNC start signal is ON.</b></p>	<ul style="list-style-type: none"> <li>• Torch fault.</li> <li>• Input gas pressure fault.</li> </ul>	<ul style="list-style-type: none"> <li>• Incorrect torch type.</li> <li>• Torch components.</li> <li>• Input gas pressure is too high.</li> </ul>	<ul style="list-style-type: none"> <li>• Use the specific torch for the machine.</li> <li>• Check torch components, change parts if necessary.</li> <li>• Decrease input static pressure to 7 bar/101 psi.</li> </ul>
<p><b>No transfer between pilot arc and workpiece.</b></p>	<ul style="list-style-type: none"> <li>• Work clamp connection fault.</li> <li>• No connection to workpiece.</li> </ul>	<ul style="list-style-type: none"> <li>• Fluctuating connection between the clamp and workpiece.</li> <li>• Incorrect distance between the torch and workpiece.</li> <li>• Work cable is broken.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean the surface of the clamp and material.</li> <li>• Maintain correct distance between the torch and workpiece.</li> <li>• Replace the work cable.</li> </ul>
<p><b>The output power is too low, unstable or inadequate.</b></p>	<ul style="list-style-type: none"> <li>• Connection fault.</li> <li>• Voltage fault.</li> </ul>	<ul style="list-style-type: none"> <li>• Input and output connection leads.</li> <li>• Fluctuating connection between the clamp and workpiece.</li> <li>• Incorrect distance between the torch and the workpiece.</li> <li>• Incorrect input voltage.</li> </ul>	<ul style="list-style-type: none"> <li>• Check all input and output connection leads.</li> <li>• Make sure that work lead has a good connection to a clean and dry area of workpiece.</li> <li>• Maintain correct distance between the torch and the workpiece.</li> <li>• Use the correct input voltage, in accordance with specification.</li> </ul>
<p><b>The pilot arc is difficult to ignite and cuts out.</b></p>	<ul style="list-style-type: none"> <li>• Consumables fault.</li> <li>• Air pressure fault.</li> </ul>	<ul style="list-style-type: none"> <li>• Check for worn consumables.</li> <li>• The air pressure is too high.</li> </ul>	<ul style="list-style-type: none"> <li>• Change the consumable which may be worn.</li> <li>• Adjust the air pressure output.</li> </ul>

<b>Fault</b>	<b>This may mean</b>	<b>Cause</b>	<b>Solution</b>
<p><b>Cut quality issues.</b></p>	<ul style="list-style-type: none"> <li>• Incorrect current setting.</li> <li>• Consumables fault.</li> <li>• Incorrect cutting technique.</li> <li>• Poor connection.</li> </ul>	<ul style="list-style-type: none"> <li>• Low current or high material thickness.</li> <li>• Consumables are worn.</li> <li>• Poor cut quality.</li> <li>• Workpiece is dirty / contaminated.</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust the current to suit the thickness of material to be cut.</li> <li>• Inspect consumables - see section Consumable part inspection.</li> <li>• Adjust the current to suit the cutting speed and torch-to-workpiece distance according to the thickness of material to be cut.</li> <li>• Clean the surface of the workpiece.</li> </ul>

**For more detailed information see Service Manual**

## SECTION 8.

### ACCESSORIES:

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#### O-Ring lubricant



EX-0-805-001  
Grease 25ml

#### Circle cutting guide kit for FHT-EX® 105RTXH/105TTH/45TTH

EX-5-801-002

#### 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 9.

### END OF LIFETIME PRODUCT DISPOSAL

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#### 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 10.

### WARRANTY:

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#### 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](http://www.thermacut.cz), [www.ex-trafire.com](http://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-1/2020 - 02/2020 Official release

### 2. Revision T-2/2020 - 05/2020

- a) Page 2-11
  - Max. inlet pressure from 9.5 bar to 10 bar
  - Added new values of gas flow rate and gas flow rate - gouging
  - New graphics
- b) Pages 6-55, 56, 57

### 3. Revision T-3/2020 - 09/2020

- a) Page 1
  - The **latest version of manual link** added
- b) Page 2-11
  - New value of **piercing capacity** - from: 25 mm to: **20** mm
- c) Pages 3-19, 20
  - New pages with **Gear Rack Installation** added
- d) Pages 3-21 - 23
  - New pages -**The circle cutting guide installation - for the FHT-EX®105RTXH/105TTH/45TTH** added
- e) Pages 4-33 - 47, 6-52 - 55, 6-58 - 62
  - Replacement T-numbers with **EX-numbers**
- f) Page 8-66
  - New item of accessories **EX-5-801-002** added

### 4. Revision T-4/2021 - 07/2021

- a) Page 4-32
  - More info about gouging added
- b) Page 4-33
  - New page of **Gouge profile** added
- c) Page 6-56
  - New EX- number of Nozzle 45-85, Gouging - from: EX-5-410-031 to: **EX-5-440-031**

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