



**EX-TRAFIRE<sup>®</sup> i25HD**

## **Plasma Cutting System**

**Operating Instructions - EX-6-902-001/N-21611 - CE**

**Revision 1, 15<sup>th</sup> June, 2023**

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

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## 1 Identification

The EX-TRAFIRE® 125HD is a portable plasma arc cutting power supply for mechanized and manual plasma cutting, gouging, and marking. The EX-TRAFIRE® 125HD uses compressed air or nitrogen to cut almost all conductive metals. The EX-TRAFIRE® 125HD may be operated only with original Thermacut® parts. This documentation describes the EX-TRAFIRE® 125HD cutting power supply only.









When used in this documentation, the term "device" always refers to the EX-TRAFIRE® 125HD cutting power supply.

### 1.1 Marking

This product fulfills the requirements that apply to the market to which it has been introduced. Corresponding marking has been affixed to the product, if required.

### 1.2 Identification plate

Fig. 1 EX-TRAFIRE® 125HD identification plate

IDENTIFICATION			
<b>THERMACUT®</b> Sokolovska 574, 686 01 Uherske Hradiste, THE CUTTING COMPANY® Czech Republic, tel.: +420 572 420 411 email: reditelstvi@thermacut.cz			
<b>EX-TRAFIRE® 125HD</b>			
 EN IEC 60974-1 EN 60974-10			
Order : EX-6-003-001			
Serial :			
OUTPUT			
	U <sub>i</sub> =400V±15%	Output 30A/92V-125A/180V	
		X	100%
	U <sub>0</sub> =400V	I <sub>2</sub>	125A
		U <sub>2</sub>	180V
	U <sub>i</sub> =400V±15%	Output 30A/112V-125A/180V	
		X	100%
	U <sub>0</sub> =400V	I <sub>2</sub>	125A
		U <sub>2</sub>	180V
ENERGY INPUT			
	U <sub>i</sub> =400V	I <sub>max</sub> =48.8A	I <sub>eff</sub> =48.8A
	3-50/60Hz	IP23	F

The EX-TRAFIRE® 125HD is labeled by means of an identification plate on the housing located under the machine.

- For inquiries, please have at hand the type and number of the EX-TRAFIRE® 125HD per the identification plate.

### 1.3 Signs and symbols used

The following signs and symbols are used:

- General instructions.
- 1 Action(s) to be carried out in succession.
- Lists.
- ⇒ Cross-reference symbol refers to detailed, supplementary or further information.
- A Caption, item description.

## 1.4 Classification of the warnings

The warnings are divided into four different categories and are indicated prior to potentially dangerous work steps. The following signal words are used depending on the type of hazard:

### **DANGER**

Describes an imminent threatening danger. If not avoided, it may cause severe injury or death.

### **WARNING**

Describes a potentially dangerous situation. If not avoided, this may result in serious injury or death.

### **CAUTION**

Describes a potentially harmful situation. If not avoided, this may result in slight or minor injury.

### **NOTICE**

Describes the risk of impairing work results or material damage and indicates irreparable damage to the device or equipment.

## 2 Safety

This chapter warns of hazards that should be kept in mind to operate the product safely. Non-observance of the safety instructions may result in risks to the life and health of personnel, environmental damage, or material damage.

- Observe the document entitled "Safety Instructions".

### 2.1 Designated use

The EX-TRAFIRE® 125HD may be used only for the purpose and manner described. It is used only for the generation and control of the output current required for plasma cutting, gouging, and marking. Any other use is considered improper. Unauthorized modifications or changes to enhance the performance are not permitted.

- Do not exceed the maximum load data as defined by the document supplied. Overloads lead to destruction.
- Do not make any modifications or changes to this product.
- Do not use the EX-TRAFIRE® 125HD to thaw pipes.
- Do not use or store the EX-TRAFIRE® 125HD outdoors where it is wet.

## 2.2 Obligations of the operator

- Ensure that only qualified personnel are permitted to work on the EX-TRAFIRE® 125HD.

Authorized personnel are:

- those who are familiar with the basic regulations on occupational safety and accident prevention;
  - those who have been instructed on how to handle the EX-TRAFIRE® 125HD;
  - those who have read and understood these operating instructions;
  - those who have been trained accordingly;
  - those who are able to recognize possible risks because of their special training, knowledge and experience.
- Keep untrained persons out of the work area.
  - Each time the EX-TRAFIRE® 125HD's cover plates are opened, have Thermacut® or another authorized specialist perform a safety inspection in accordance with DIN IEC 60974 Part 4: "Periodic inspection and testing".

The EX-TRAFIRE® 125HD can produce electromagnetic fields that could impact the proper function of cardiac pacemakers and implanted defibrillators.

- Do not use the EX-TRAFIRE® 125HD if you have a pacemaker or an implanted defibrillator.

This Class A cutting device is not intended for use in residential areas with a public low-voltage power supply system. It can potentially be difficult to guarantee electromagnetic compatibility in these areas due to both conducted and emitted interference.

- The EX-TRAFIRE® 125HD may be used only in industrial zones according to DIN EN 61000-6-3.

## 2.3 Warning and notice signs

The following warning, notice and mandatory signs can be found on the product:



- Read and observe the operating instructions.

These markings must always be legible. They may not be covered, obscured, painted over, or removed.

## 2.4 Product-specific safety instructions

- Do not use or store the EX-TRAFIRE® 125HD outdoors where it is wet.
- Do not operate the EX-TRAFIRE® 125HD if the housing is open.

## 2.5 Safety instructions for the electrical power supply

- Ensure that the input power cable is not damaged, for example, by being driven over, crushed, or torn.
- Check the input power cable for damage and wear at regular intervals.
- If it is necessary to replace the input power cable, only models indicated by the manufacturer may be used.
- Only a qualified electrician should carry out work on the input power cable and the input power plug.
- Water protection and mechanical stability must be ensured when replacing the input power plug of the input power cable.

## 2.6 Safety instructions for plasma cutting

- Plasma cutting may cause damage to the eyes, skin, and hearing. Note that other hazards may arise when the EX-TRAFIRE® 125HD is used with other cutting components. Therefore, always wear the prescribed personal protective equipment as defined by local regulations.
- All metal vapors, especially lead, cadmium, copper, and beryllium, are harmful. Ensure sufficient ventilation or extraction. Do not exceed the current occupational exposure limits (OELs).
- To prevent the formation of phosgene gas, rinse workpieces that have been degreased with chlorinated solvents using clean water. Do not place degreasing baths containing chlorine in the vicinity of the cutting area.
- Adhere to the general fire protection regulations and remove flammable materials from the vicinity of the cutting work area prior to starting work. Provide appropriate fire extinguishing equipment in the workplace.

## 2.7 Personal protective equipment

- Wear your personal protective equipment (PPE).
- Ensure that others in close proximity are also wearing personal protective equipment.

Personal protective equipment consists of protective clothing, safety goggles, face protection, ear protectors, protective gloves, and safety shoes.

## 2.8 Emergency information

- In the event of an emergency, immediately disconnect the following supplies:
  - Electrical power supply
  - Gas supply



### 3 Scope of delivery

The following components are included in the scope of supply:

- 1 × EX-TRAFIRE® 125HD cutting power supply
  - 1 × FHT-EX® 125TTH or FHT-EX® 125TTM cutting torch
  - 1 × work lead incl. work lead clamp
  - 1 × operating instructions
  - 1 × “Safety Instructions” document
  - 1 × “Warranty” document
  - 1 × operating instructions for the cutting torch
  - 1 × starter kit
- Order the equipment parts and consumables separately.
  - The order data and ID numbers for the equipment parts and consumables can be found in the product catalog.
  - For more information about points of contact, consultation, and orders, visit [www.thermacut.com](http://www.thermacut.com).

Although the items delivered are carefully checked and packaged, it is not possible to fully rule out the risk of transport damage.

#### Goods-in inspection

- Check for order completeness by checking the delivery note.
- Check the delivered goods for damage (visual inspection).

#### Claim process

- If goods are damaged, notify the final carrier.
- Keep the packaging for possible inspection by the carrier.

#### Returns

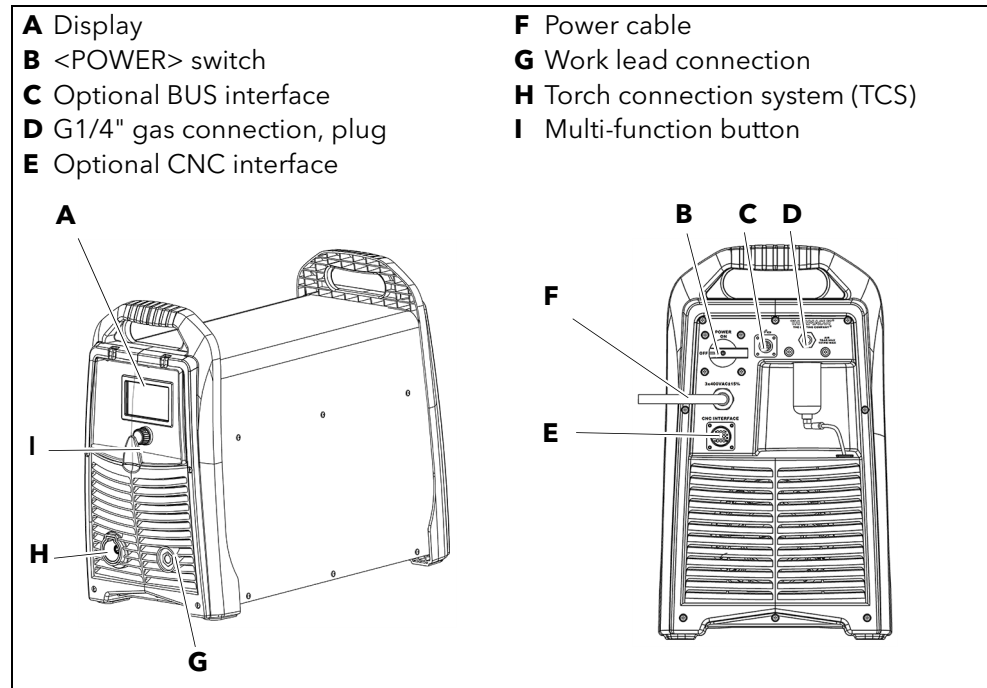
- Use original packaging and packing material for returns.
- If you have questions concerning the packaging or how to secure the device, contact your supplier, carrier, or transport company.

## 4 Product description

### 4.1 Assembly and use

The control elements are located on the control panel. The connections are on the front and rear of the EX-TRAFIRE® 125HD.

**Fig. 2** Control elements and connections



<b>Digital display (A)</b>	Displays the status of the EX-TRAFIRE® 125HD. A fault code is displayed if an error occurs.
<b>&lt;POWER&gt; switch (B)</b>	Used to switch the EX-TRAFIRE® 125HD on and off.
<b>BUS interface (C)</b>	For connecting the optional CAN BUS or RS485/422 BUS.
<b>CNC interface connection (E)</b>	This optional interface is used to connect the EX-TRAFIRE® 125HD to an optional CNC cutting table or robot.
<b>Multi-function button (I)</b>	For toggling between two menus and setting the cutting parameters.

## 4.2 Technical data

Table 1 Power supply specifications

	<b>CE</b>	
<b>Idle voltage (<math>U_0</math>)</b>	400 V DC	
<b>Characteristic curve*</b> * The curve is defined as output voltage versus output current	Drooping	
<b>Output current (<math>I_2</math>)</b>	125 A	
<b>Nominal output voltage (<math>U_2</math>)</b>	180 V DC	
<b>Output current at 100% duty cycle (<math>I_2</math>)</b>	125 A	
<b>Maximum power input</b>	34 kVA	
<b>Duty cycle (<math>X^*</math>) at 40°C at nominal conditions (<math>U_1, I_1, U_2, I_2</math>)</b> * $X = t_{on}/t_{base}$ $t_{on}$ = time, minutes $t_{base} = 10$ minutes	$U_{1rms}$	
	100%	
<b>Ambient temperature</b>	-10°C to +40°C	
<b>Input voltage (<math>U_1</math>)</b>	400 V AC $\pm$ 15% 3 PH/50-60 Hz	
<b>Rated input current (<math>I_{1rms}</math>) and effective input current (<math>I_{1eff}</math>) at rated output power</b> eff = effective rms = root mean square	$I_{1rms}$	$I_{1eff}$
	48.9 A	48.9 A
	Complies with standards IEC 60974-1, IEC 60974-10	
<b>Protection type</b>	IP23	
<b>Tilt angle</b>	Up to 15°	
<b>Dimensions (L x H x W) [mm]</b>	560x400x260	
<b>Weight (kg)</b>	35.1	

Table 2 Ambient conditions for transport and storage

<b>Ambient temperature</b>	-20°C to +55°C
<b>Relative humidity</b>	< 50 % at +40°C < 90 % at +20°C

Table 3 Ambient conditions for operation

<b>Ambient temperature</b>	-10°C to +40°C
<b>Relative humidity</b>	< 50 % at +40°C < 90 % at +20°C
<b>Installation above sea level</b>	Max. 2000 m

Table 4 Gas data

Permissible gas	Compressed air/nitrogen
Max. gas inlet pressure	10 bar
Recommended compressed air quality	ISO 8573-1 class 1.2.2. Purity: $\geq 99.99\%$ clean, and free from moisture and oil
Max. flow rate	184 l/min at 5.9 bar

#### 4.3 Technical data for cutting torches FHT-EX® 125TTH and FHT-EX® 125TTM

FHT-EX® cutting torches are used for manual and mechanical cutting, gouging, and marking. They use compressed air or nitrogen to cut mild steels, stainless steels, aluminum, and other electrically conductive metals. They are connected to the cutting power supply using the Torch Connection System (TCS).

➤ The values below refer to the torches!

Table 5 Technical data for FHT-EX® 125TTH and FHT-EX® 125TTM cutting torches

	FHT-EX® 125TTH / FHT-EX® 125TTM
Recommended cutting capacity [mm]	40
Max. cutting capacity [mm]	60
Separating cut capacity [mm]	60
Piercing capacity [mm]	25
Permissible ambient temperature during operation	-10°C to +40°C
Permissible ambient temperature during transport and storage	-25°C to +55°C
Relative humidity	< 90 % at +20°C
Sub-menu item	Plasma cutting, gouging
Application type	Manual and mechanical
Rated current and duty cycle	125 A/100 %
Permissible gas	Compressed air/Nitrogen/Argon
Flow rate	85 A/105 A/125 A approx. 175 l/min. at 5.2 bar
	65 A approx. 110 l/min. at 4.8 bar
	45 A approx. 100 l/min. at 4.8 bar
Flow rate for gouging	65 A-125 A approx. 120 l/min. at 2.7 bar
Maximum inlet pressure	10 bar
(Dynamic) operating pressure	5.2 bar
Gas post-flow period delay	$\geq 20$ seconds
Type of voltage	DC
Protection type for EX-TRAFIRE® 125HD	IP23S (EN 60529)

**Table 5** Technical data for FHT-EX® 125TTH and FHT-EX® 125TTM cutting torches

	<b>FHT-EX® 125TTH / FHT-EX® 125TTM</b>
<b>Connection type</b>	TCS (torch connection system) - 13 pin
<b>Standard lengths (other lengths available upon request)</b>	5 m/8 m/15 m/23 m

**Table 6** Cutting torch weights and cable lengths

<b>Cutting torch</b>	<b>Weight and cable lengths</b>
<b>FHT-EX® 125TTH</b> Standard hand cutting torch	5 m / 2.15 kg 8 m / 3.0 kg 15 m / 5.0 kg 23 m / 7.1 kg
<b>FHT-EX® 125TTM STD-NR</b> Standard machine cutting torch, without rack	5 m / 2.35 kg 8 m / 3.2 kg 15 m / 5.2 kg 23 m / 7.3 kg
<b>FHT-EX® 125TTSM</b> Short machine cutting torch	5 m / 2.0 kg 8 m / 2.9 kg 15 m / 4.9 kg 23 m / 7.0 kg

## 5 Transport and positioning

### **⚠ WARNING**

#### **Risk of injury due to improper transport and installation**

Improper transport and installation can cause the EX-TRAFIRE® 125HD to tip or fall over. This may result in serious injury.

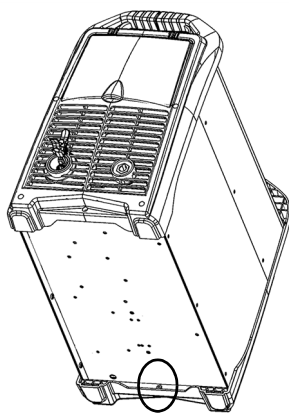
- Wear your personal protective equipment.
- Ensure that all supply lines and cables do not encroach into the area in which employees are working.
- Place the EX-TRAFIRE® 125HD on a suitable surface (flat, solid, and dry) on which it will not topple over, taking into account the max. tilt angle of 15°.
- Note the weight of the EX-TRAFIRE® 125HD when lifting it.  
⇒ 4.2 Technical data on page EN-11
- Use an appropriate lifting tool with load handling equipment for transporting and installing the EX-TRAFIRE® 125HD.
- Avoid abrupt lifting and setting down.
- Do not lift the EX-TRAFIRE® 125HD over individuals or other devices.
- Use the attachment points provided.

### **NOTICE**

#### **Risk of material damage due to improper transport and installation**

Improper transport or installation can cause the EX-TRAFIRE® 125HD to tip or fall over. This can result in material damage and irreparable damage.

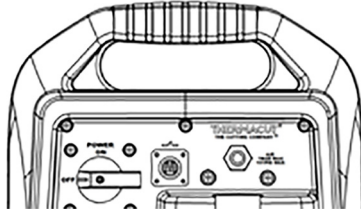
- Protect the EX-TRAFIRE® 125HD against weather conditions, such as rain and direct sunlight.
- Protect the EX-TRAFIRE® 125HD from spatter when cutting.
- Protect the EX-TRAFIRE® 125HD from direct exposure to sparks when grinding.
- Use the EX-TRAFIRE® 125HD only in dry, clean, and well-ventilated rooms.
- Maintain a minimum distance of 1 m from the wall when positioning the EX-TRAFIRE® 125HD to ensure that it has sufficient ventilation.



- When positioning the EX-TRAFIRE® 125HD, make sure that the water separator's drain opening is not covered.

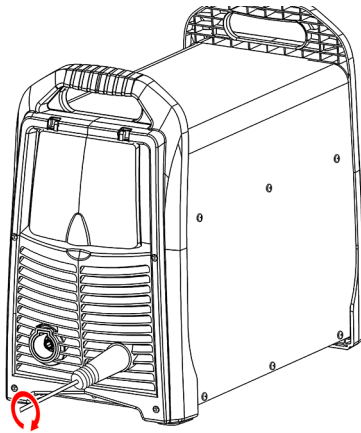
## 6 Setting up the power supply

### 6.1 Connecting to the gas supply



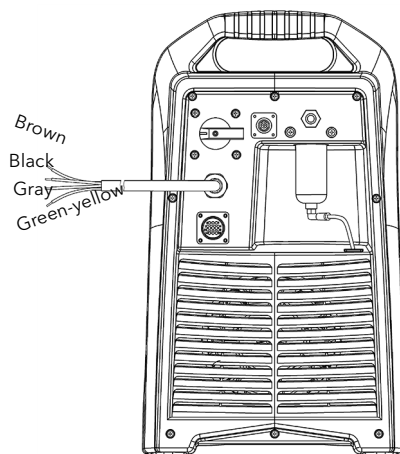
- Connect the gas hose with an inside diameter of at least 6 mm to the gas connection of the EX-TRAFIRE® 125HD.

### 6.2 Connecting the work lead



- Connect the work lead to the work lead connecting socket and secure it by rotating clockwise.

### 6.3 Connecting the power supply cable



- The power supply should be connected by a qualified electrician.
- L1 -> brown (U)
- L2 -> black (V)
- L3 -> gray (W)
- PE grounding -> green-yellow

**Table 7** Recommended cable extensions

Input voltage	Wire cross-sections	Length
400 V AC/3 phases	6 mm <sup>2</sup>	Up to 15 m
	6 mm <sup>2</sup>	15-45 m

## 6.4 Connecting the input power plug

- Note the safety instructions.
  - ⇒ 2.5 Safety instructions for the electrical power supply on page EN-8

### **⚠ WARNING**

#### **Electric shock due to improperly installed electrical power supply**

If the electrical power supply and grounding are improperly installed, fatal electric shock may occur.

- If you want to operate the EX-TRAFIRE® 125HD in a very humid environment or on conductive material, install a ground fault circuit interrupter (GFCI) in the power supply.
- Use a slow-blow GFCI fuse.
- Protect the power supply line to the EX-TRAFIRE® 125HD with suitable fuses that comply with regulations.
- Ground the EX-TRAFIRE® 125HD according to the applicable regulations.
- Do not ground the EX-TRAFIRE® 125HD together with other devices or machines.

### **⚠ WARNING**

#### **Risk of electric shock due to improperly installed or defective cables**

Damaged or improperly installed cables can lead to fatal electric shock.

- Check all live cables and connections for proper installation or damage.
- Damaged, deformed or worn parts should only be replaced by a qualified electrician.

### **⚠ WARNING**

#### **Risk of injury due to fire**

Improper use or connection can result in fire. This may result in serious injury.

- Ensure that the operating voltage specified on the identification plate is suitable for the input voltage.

For the input voltage and the fuse protection, please refer to:

⇒ 4.2 Technical data on page EN-11

- If necessary, have a qualified electrician connect the input power cable extension in accordance with local regulations.
- Ensure that the power supply is adequately protected by a safety switch.
- Insert the input power plug of the power cable into the corresponding socket.

### 6.4.1 Connection to a generator (optional)

- Set the generator to three-phase alternating current.
- Plug the input power plug into the socket.
- Set the motor rating as shown in the following table.

**Table 8** Connection to a generator

<b>Generator motor rating</b>	<b>Output current (I<sub>2</sub>)</b>	<b>Arc voltage</b>
≥ 30 kW	125 A	U <sub>2</sub> = 180 V DC



## 6.5 Connecting the cutting torch

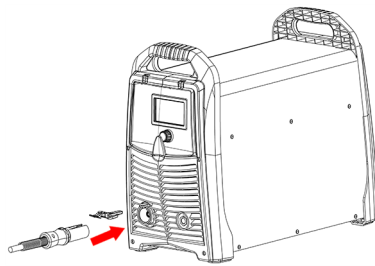
### NOTICE

#### Risk of material damage if used without TCS Latch with Key Assembly

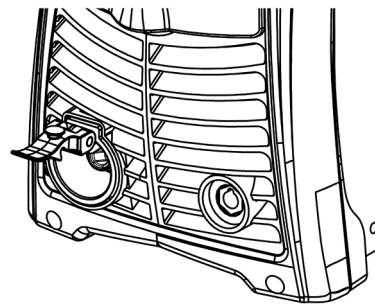
The TCS Latch with Key Assembly is important for the proper working of the machine. If used without, the EX-TRAFIRE® 125HD may be irreparably damaged.

- Do not use the EX-TRAFIRE® 125HD without the TCS Latch with Key assembly installed and properly secured.

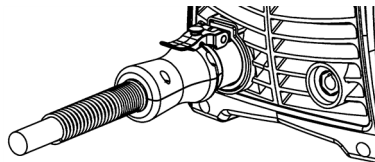
➤ Switch off the power supply.



- 1 Insert the TCS Latch with Key Assembly into the TCS socket.



➤ The TCS Latch with Key Assembly must sit firmly in the TCS socket.



- 2 Push the cutting torch into the TCS and ensure the Latch with Key Assembly locks in place.

## 6.6 Connecting the CNC interface

The CNC interface is on the rear of the EX-TRAFIRE® 125HD. Control signals can be transmitted via the CNC interface. The signal types can be found in the table. The control elements are located on the control panel. The connections are on the front and rear of the EX-TRAFIRE® 125HD.

⇒ 4.1 Assembly and use on page EN-10

### ⚠ WARNING

#### Electric shock due to live parts

Live parts are exposed when the housing is open. This can result in fatal electric shock.

- Set the <POWER> switch to <OFF> and disconnect the input power plug before opening the housing.

Fig. 3 Pin assignment for CNC interface

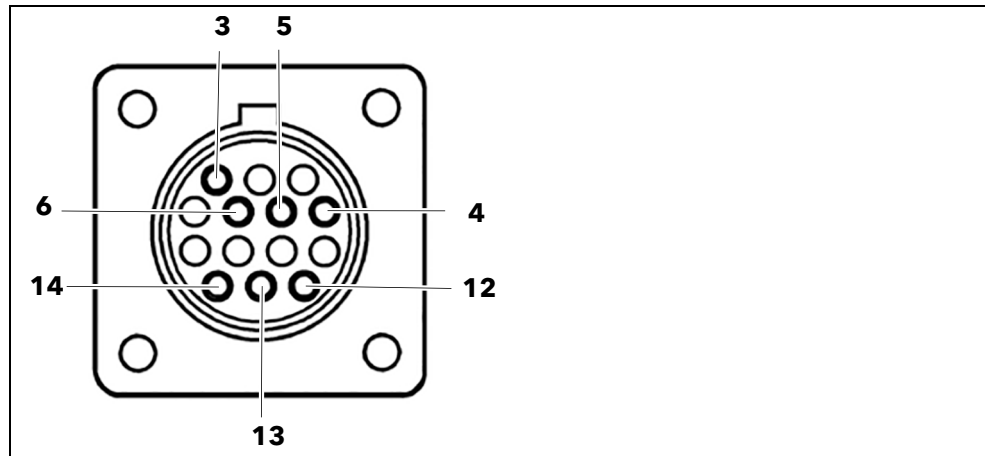


Table 9 Pin assignment for CNC interface

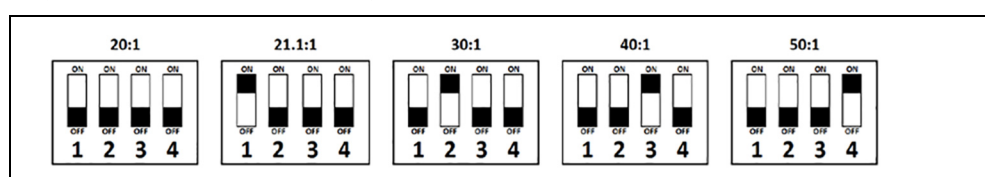
Signal	START Start plasma cutting	Arc Start feeding	PE	Voltage divider
Type	Input	Output	PE	Output
Notice	Open by default. Requires potential-free contact to close.	Open by default. Potential-free with max. capacity of: 120 V AC/1 A		Reduced arc signal: 20:1 21.1:1 30:1 40:1 50:1 (supplies max. 10 V)
PIN	3, 4	12, 14	13	6 (+), 5 (-)
Internal cable color	Yellow, yellow	White, white	Green/yellow	6 (red), 5 (white)

### 6.6.1 Setting the DIP switches

The DIP switches are preset to 50:1.

- 1 The housing must be opened only by a qualified electrician.
- 2 The DIP switches must be set only by a qualified electrician.  
⇒ Fig. 4 DIP switch settings on page EN-18
- 3 The housing must be closed only by a qualified electrician.
- 4 Have a safety inspection performed in accordance with DIN IEC 60974 Part 4: "Periodic inspection and testing" by Thermacut® or another authorized specialist.

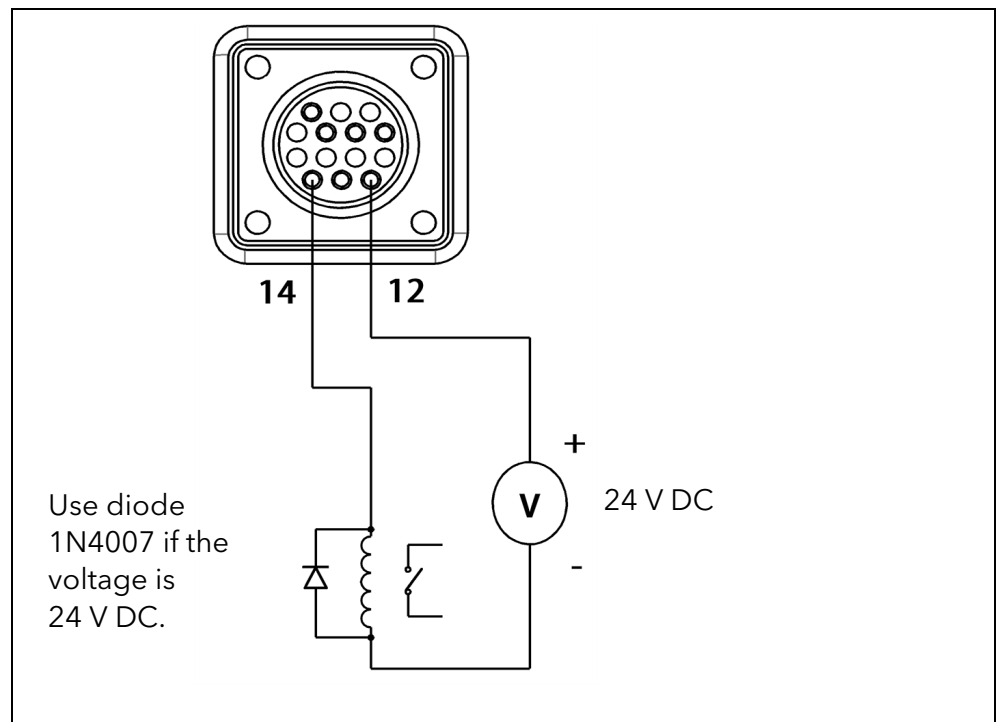
Fig. 4 DIP switch settings



### 6.6.2 Enabling the external DC coil with an external power supply

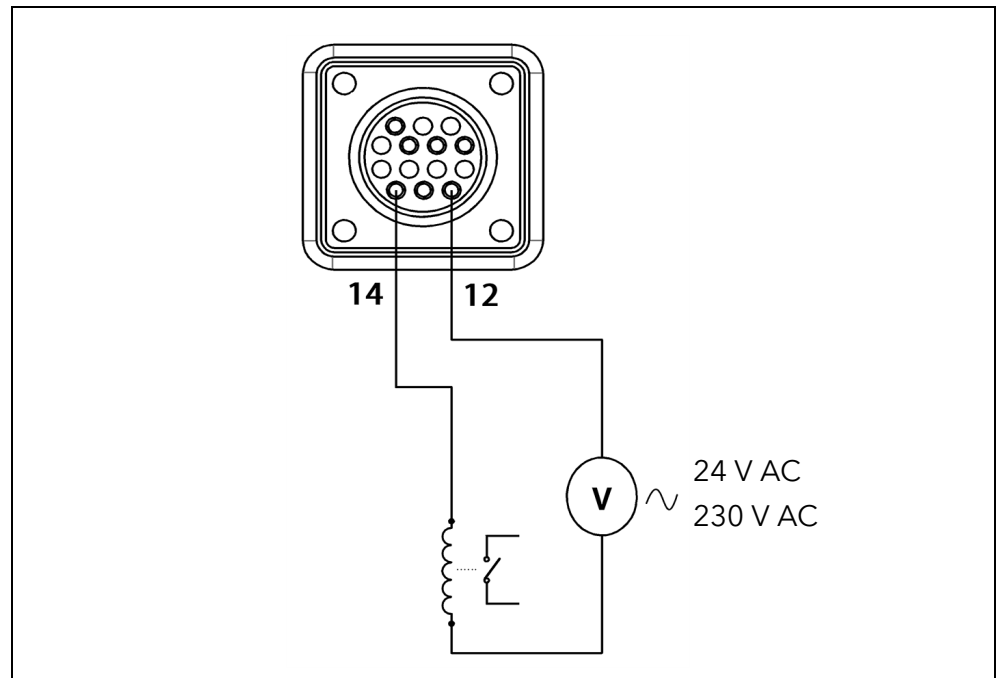
➤ For 24 V DC, use a 1N4007 diode.

**Fig. 5** Enable the external DC coil with an external power supply.



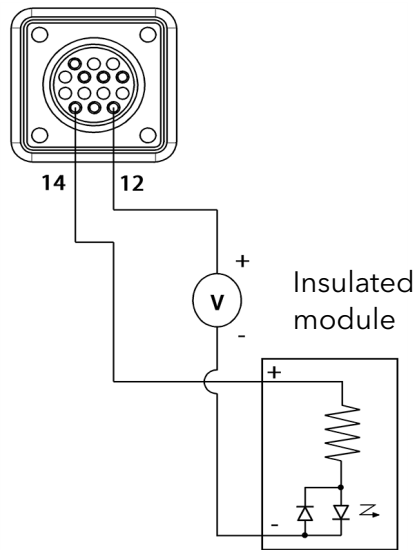
### 6.6.3 Enabling the external AC coil with an external power supply

**Fig. 6** Enable the external AC coil with an external power supply.



### 6.6.4 Enabling the industrially insulated module with an external power supply

Industrial insulated user module with 24 V DC power supply.



- 1 Switch off the EX-TRAFIRE® 125HD.
- 2 Remove the interface cover.
- 3 Connect the interface cable with the cutting power supply.

### 6.7 Installing consumables for the hand and machine cutting torches

#### **⚠ WARNING**

#### **Risk of injury due to unexpected ignition of the plasma arc**

##### **Hand cutting torch:**

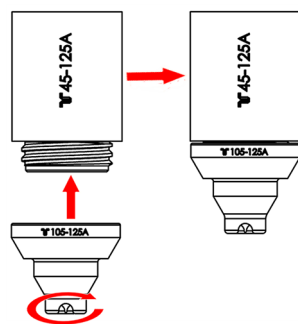
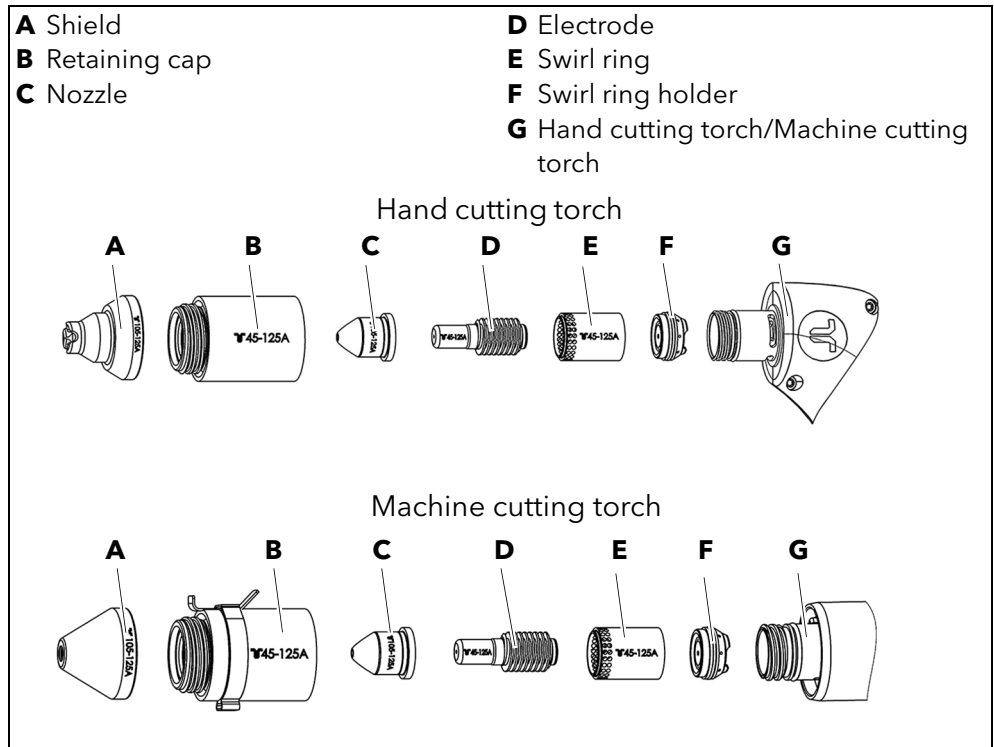
When the input powerplug is plugged in, the plasma arc ignites immediately when the torch trigger is pressed. Individuals can be seriously injured if the arc ignites unexpectedly.

##### **Machine cutting torch:**

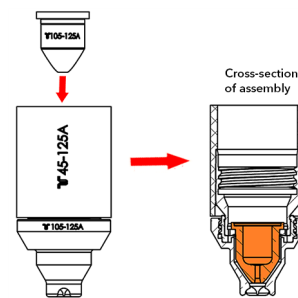
When the input power plug is plugged in, the plasma arc ignites immediately when the CNC start signal is ON. Individuals can be seriously injured if the arc ignites unexpectedly.

- Hold the tip of the torch away from you.
- Do not hold the workpiece to be cut tightly and keep your hands away from the cutting surface.
- Do not point the cutting torch at yourself or other individuals.
- Wear your personal protective equipment.

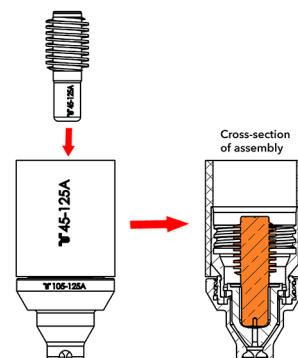
- The procedure shown below applies to both the equipment of hand and machine cutting torch.



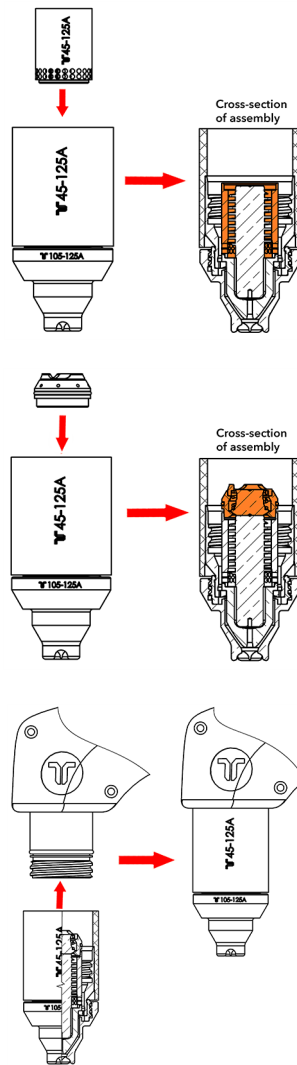
**1** Screw shield onto retaining cap and tighten by hand.



**2** Insert nozzle into retaining cap with shield.



**3** Insert electrode into retaining cap with shield and nozzle.



**4** Insert swirl ring into the entire assembly.

**5** Insert swirl ring holder.

➤ Apply silicon to the O-ring of the swirl ring holder.

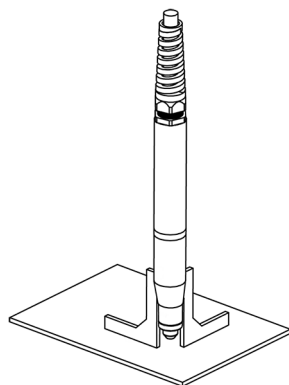
**6** Screw entire assembly onto the hand cutting torch.

➤ Do not overtighten!

## 6.8 Aligning FHT-EX® 125TTM machine cutting torch

For information on the cutting process

⇒ 6 Setting up the power supply on page EN-15



**1** Position the cutting torch perpendicular to the workpiece.

**2** Use an angle gauge to align the machine cutting torch at 0° and 90°.

## 7 Operation of the power supply

### WARNING

#### **Risk of injury due to unexpected ignition of the plasma arc**

##### **Hand cutting torch:**

When the input power plug is plugged in, the plasma arc ignites immediately when the torch trigger is pressed. Individuals can be seriously injured if the arc ignites unexpectedly.

##### **Machine cutting torch:**

When the input power plug is plugged in, the plasma arc ignites immediately when the CNC start signal is ON. Individuals can be seriously injured if the arc ignites unexpectedly.

- Hold the tip of the cutting torch away from you.
- Do not hold the workpiece to be cut tightly and keep your hands away from the cutting surface.
- Do not point the cutting torch at yourself or other individuals.
- Wear your personal protective equipment.

### CAUTION

#### **Risk of burns due to flying sparks when angling the cutting torch**

When the cutting torch is angled during cutting or piercing, molten metal (sparks) will escape in the direction in which the cutting torch is pointed. This may result in burns.

- Do not point the cutting torch at yourself or other individuals when angling it.
- Wear your personal protective equipment.

### NOTICE

#### **Material damage due to exceeding the maximum duty cycle**

If the EX-TRAFIRE® 125HD is operated for longer than the maximum duty cycle, it may be overloaded and irreparably damaged.

- Only operate the EX-TRAFIRE® 125HD up to the maximum permissible duty cycle.  
⇒ 4.2 Technical data on page EN-11
- Observe the maximum duty cycle for cutting components.

### NOTICE

#### **Material damage caused by unplugging the input power plug during operation**

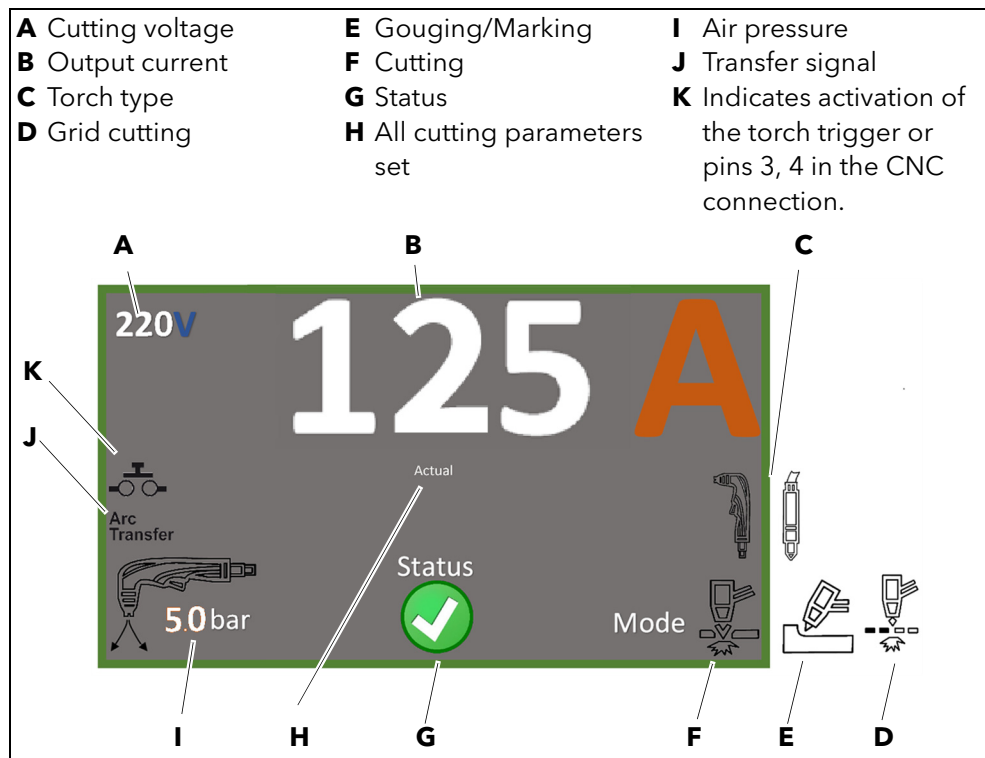
If the input power plug is unplugged during operation, the EX-TRAFIRE® 125HD may be irreparably damaged.

- Do not unplug the input power plug during operation and ensure a constant power supply.

**NOTICE****Material damage due to switching the output current strength during operation**

If the output current strength is switched during operation, the unit may be damaged.

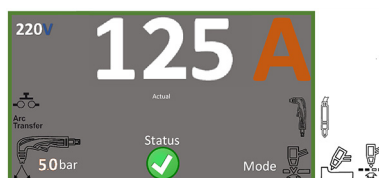
- Set the output current strength before starting operation and do not switch it during the cutting process.

**7.1 LCD description****7.1.1 Setting the parameters**

The LCD menu is used to set the output current (amps), cutting modes, and pressure in bar, MPa, or psi.

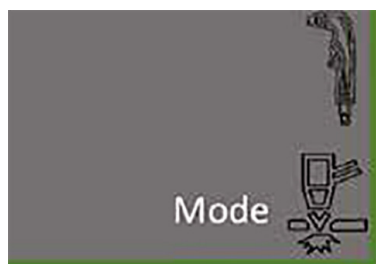


- 1 Press the multi-function button for one second.
  - The adjustable values as well as the word "Set" flash in red.
- 2 Press the multi-function button briefly to switch between the values.
- 3 Turn the multi-function button to the left or right to increase or decrease the values.
- 4 Press the multi-function button briefly to accept the set values.
  - Once all values are set, they are displayed in white and the word "Status" appears.





### 7.1.2 Selecting the cutting mode



#### Cutting

The current is 30-125 A.  
The pressure of the cutting gas is 4.8 to 5.2 bar.



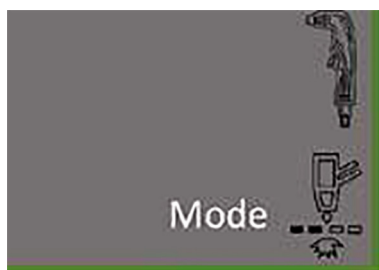
#### Gouging

The current is 30-125 A.  
The pressure of the cutting gas is 2.7 bar.

#### Marking

The current is 15\*-20 A.  
The pressure of the cutting gas is 2.4 bar.

\* Optional light marking



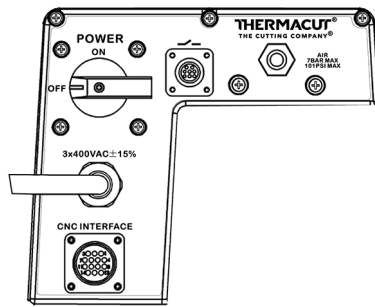
#### Grid cutting

The current is 30-125 A.  
The pressure of the cutting gas is 4.8 to 5.2 bar.

### 7.1.3 Connecting the work lead with the work lead clamp

- 1 Remove contamination from the workpiece.
- 2 Clamp the work lead with the work lead clamp to the workpiece in order to allow maximum electrical conduction.
- 3 Do not clamp the work lead clamp to the material to be cut off.
- 4 Clamp the work lead with the work lead clamp as close as possible to the cutting area in order to minimize electromagnetic fields.

## 7.2 Powering on the machine



➤ Set the <POWER> switch to <ON>.



➤ The following is displayed immediately after switching on:

- Type of power supply (85HD)
- Length of torch cable (5, 8, 15, 23 m)
- Type of cutting torch (hand or machine)
- Current firmware

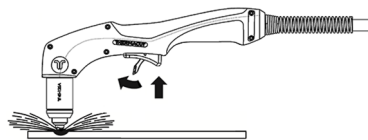
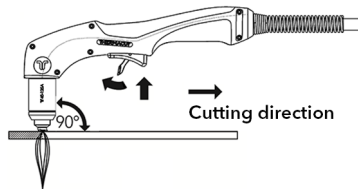
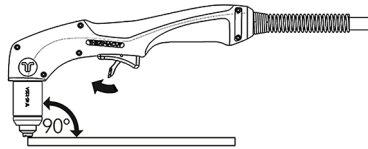
## 7.3 Manual cutting process

- 1 Switch on the power supply.
- 2 Automatic gas test (five seconds).
- 3 Automatic system test (five seconds).
- 4 Press torch trigger.
- 5 Generate a pilot arc.
- 6 Once the workpiece is detected, the pilot arc switches to a cutting arc.
- 7 The cutting process starts.
- 8 Extinguish the arc by releasing the torch trigger.
- 9 Gas post-flow period 10 to 105 seconds depending on the output current.

## 7.4 Manual grid cutting and gouging process

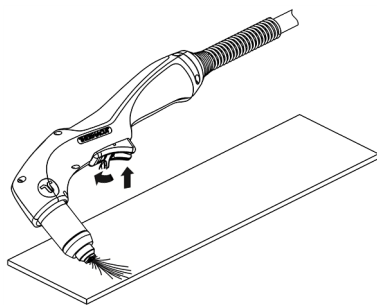
- 1 Switch on the power supply.
- 2 Automatic gas test (five seconds)
- 3 Automatic system test (five seconds)
- 4 Press torch trigger.
- 5 Generate a pilot arc.
- 6 Once the workpiece is detected, the pilot arc switches to a cutting arc.
- 7 Grid cutting, gouging, or marking starts depending on the selected process.
- 8 Extinguish the arc by releasing the torch trigger.
- 9 Gas post-flow period 10 to 105 seconds depending on the output current.

## 7.5 Cutting



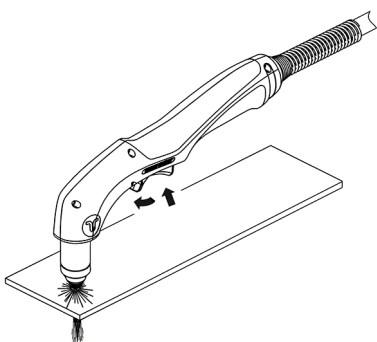
- 1** Start the cutting process at the edge of the workpiece.
  - 2** Do not move the cutting torch until the material has been cut through completely.
  - 3** Place the cutting torch upright on the edge of the workpiece.
  - 4** Pull the cutting torch in the cutting direction. Sparks must emerge from the underside of the workpiece.
  - 5** Pay attention to the following when cutting:
    - Hold the cutting torch vertically and observe the arc while cutting.
    - Make light contact between the shield and the workpiece and pull the cutting torch in the cutting direction at a constant speed.
    - For cutting thin workpieces, reduce output current strength to a minimum to achieve the highest cutting quality.
    - For cutting straight lines/bevels, use a straight edge as a guide.
    - For cutting circles, use a template or circle cutting device.
- If sparks escape upwards during cutting, the material has not yet been completely severed. Proceed as follows:
- Reduce the speed at which the cutting torch is pulled.
  - Check the setting for the output current.
  - Check the compressed air settings.
  - Check consumables for wear/damage.

## 7.6 Piercing



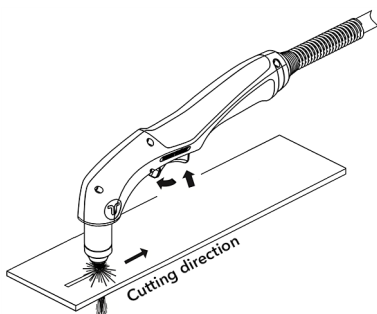
**1** Hold the cutting torch at an angle to the workpiece with a max. distance of 3 mm from the nozzle to the workpiece.

**2** Press the torch trigger to ignite the arc.



**3** Turn the cutting torch slowly in a vertical direction.

**4** Hold the cutting torch until the arc emerge from the underside of the workpiece. This indicates the material is completely pierced through.

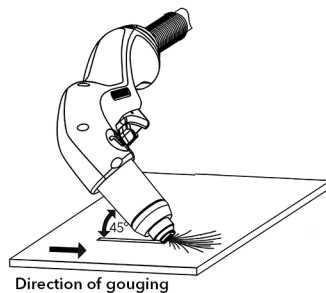
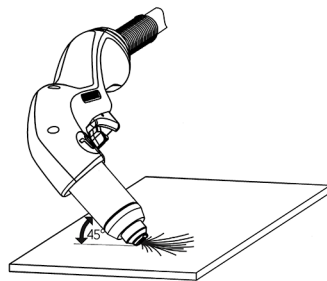


**5** Pull the cutting torch in the cutting direction. Sparks must emerge from the underside of the workpiece.

## 7.7 Gouging

Gouging can remove welding seams and achieve a controlled gouge profile. The gouge profile can be influenced by the actions in the following table:

Gouge profile	Actions
Narrower and flatter	➤ Reduce current or increase speed.
Narrower and deeper	➤ Reduce the distance between the torch and workpiece or hold the cutting torch at larger angle to workpiece.
Wider and deeper	➤ Increase current or reduce the speed.
Wider and shallower	➤ Increase the distance between the cutting torch and workpiece or hold the cutting torch at flatter angle to the workpiece.



- 1 Use gouging consumables suitable to the cutting torch being used.
- 2 Hold the cutting torch at an angle of 30 to 35° inclined to the workpiece.
- 3 Hold the nozzle close enough to the workpiece so that it touches the workpiece.
- 4 Press the torch trigger to ignite the arc.
- 5 Continue to hold the cutting torch at an angle of 30 to 35° to the workpiece and move it in the direction of the material to be removed.

### 7.7.1 Table for FHT-EX® 125TT material removal

Table 10 Table for FHT-EX® 125TT material removal

Gouging parameters				
(Dynamic) air pressure	2.7 bar			
Distance between cutting torch and workpiece	As close as possible			
Angle of cutting torch to workpiece	30-35 °			
Speed	0.6 m/min.			
Current	65 A	85 A	105 A	125 A
Removal rate for mild steels	Approx. 0.6 kg/hr	Approx. 2.8 kg/hr	Approx. 4.2 kg/hr	Approx. 8.0 kg/hr
Width of gouge	Approx. 5.8 mm	Approx. 6.0 mm	Approx. 6.3 mm	Approx. 6.9 mm
Depth of gouge	Approx. 1.2 mm	Approx. 3.8 mm	Approx. 5.0 mm	Approx. 6.2 mm

## 7.8 Stopping the cutting process

### **⚠ CAUTION**

#### **Risk of injury due to hot parts**

Parts may still be hot after the gas post-flow period ends. People are at a risk of burns.

- Wear your personal protective equipment.
- Allow the cutting torch to cool down for 5 - 10 minutes before touching the parts.

➤ Release the torch rigger to end the cutting process.

After releasing the torch trigger, the gas continues to flow for up to 125 seconds, depending on the set output current, in order to cool the cutting torch and the consumables.

- To end the gas post-flow period prematurely, briefly press and release the torch trigger.
- Press the torch trigger again to ignite the pilot arc.

## 8 Disconnecting the unit

- 1 Set the <POWER> switch to <OFF>.
- 2 Disconnect the EX-TRAFIRE® 125HD from the input power supply.
- 3 Disconnect the EX-TRAFIRE® 125HD from the gas supply.

## 9 Maintenance and cleaning

Scheduled maintenance and cleaning are prerequisites for a long service life and trouble-free operation. The maintenance cycle is determined by the work environment and the EX-TRAFIRE® 125HD's maintenance intervals. If it is operated for more than eight hours a day, the maintenance intervals should be changed as needed. When using plasma arc cutting equipment, always observe the provisions of EN 60974-4 Inspection and testing, as well as any local laws and regulations.

### **⚠ WARNING**

#### **Electric shock due to missing grounding**

If the cover plates are improperly mounted, the grounding may not be properly established. There is a risk of life-threatening electric shock.

- The cover plates may be disassembled and assembled only by a qualified electrician for maintenance and cleaning work.
- Each time the cover plates are opened, have a safety inspection performed in accordance with DIN IEC 60974 Part 4: "Periodic inspection and testing" by Thermacut® or another authorized specialist.

### **⚠ WARNING**

#### **Electric shock due to live parts**

Fatal electric shock can occur if components are live during maintenance and cleaning work.

- Set the <POWER> switch to <OFF> before maintenance and cleaning work.
- Disconnect the input power supply.

**⚠ WARNING****Electric shock due to defective cables**

Damaged or improperly installed cables can lead to fatal electric shock.

- Check all live cables and connections for proper installation and damage.
- Damaged, deformed or worn parts should only be replaced by a qualified electrician.

**⚠ CAUTION****Fire hazard due to contamination**

Dust deposits inside the EX-TRAFIRE® 125HD can lead to a reduction in insulation. This can cause short circuits or fires.

- Clean the EX-TRAFIRE® 125HD annually with dried compressed air to remove dust and cutting fume residue.

### 9.1 Maintenance and cleaning intervals

The specified intervals are standard values and refer to single-shift operation. We recommend recording the inspections. The date of the inspection, the detected defects and the name of the inspector should be documented.

<b>Daily/every 6 hours of cutting</b>	➤ Check the gas settings.
	➤ Check cables, connector hoses, and connections for tight fit and damage, and replace, if necessary.
	➤ Check the work lead clamp for contamination.
	➤ Check the cutting torch's consumables for wear.
<b>Weekly</b>	➤ Check the cap sensor.
<b>Every 3 months</b>	➤ Check the cutting torch for signs of cracks in the torch body and exposed wires.
	➤ Check the gas hose, filter elements and connections for leaks.
	➤ Open the EX-TRAFIRE® 125HD body and have the inside cleaned with a vacuum cleaner or dry, clean compressed air by Thermacut® or a different authorized specialist.
<b>Annually and after each time the housing is opened</b>	➤ Have a safety inspection performed in accordance with DIN IEC 60974 Part 4: "Periodic inspection and testing" by Thermacut® or another authorized specialist.

Table 11 Parts inspection

Consumable	Check for	Action
Shield	➤ Orifice is not round.	➤ Replace the shield.
	➤ Spatter in the gap between the shield and the nozzle.	➤ Clean the shield and nozzle surface.
Retaining cap	➤ Heat damage, cracks, breaks, damaged threaded connections, clogged gas holes.	➤ Replace the retaining cap.
Nozzle	➤ Orifice is not round.	➤ Replace the nozzle.
Swirl ring	➤ Outer surface is damaged or dirty.	➤ Clean or replace the swirl ring.
	➤ Electrode restriction due to dirt, debris, or damage on interior surfaces.	
	➤ Clogged or damaged gas holes.	
Electrode	➤ Pit depth of hafnium is deeper than 1.6 mm.	➤ Replace the electrode.
Cutting torch	➤ Fire or arc damage inside.	➤ Replace the cutting torch.
	➤ Worn or damaged threaded connections.	
	➤ Burned or missing material.	
	➤ Cutting torch is damaged or dirty.	
	➤ Damaged O-ring.	➤ Replace the O-ring.
	➤ Dry O-ring.	➤ Apply a thin layer of silicone grease.



## 10 Faults and troubleshooting

Verify consumables selection according to:

⇒ 17 FHT-EX® 125TTH consumables for hand cutting torch on page EN-43

⇒ 19 FHT-EX® 125TTM consumables for machine cutting torch on page EN-47

➤ Contact your retailer or Thermacut® in the event of questions or problems.

**Table 12** Fault messages in the display

Error code	Cause	Troubleshooting
H01	➤ Input power voltage is too low.	➤ Check the input power voltage.
H02	➤ Input power voltage is too high.	➤ Check the input power voltage.
H03	➤ No arc or current if the trigger is pressed.	➤ Check inverter, transformer, and FRD.
H04 <Arc does not ignite when torch trigger is pressed or the CNC start signal is on>	➤ Missing nozzle or electrode.	➤ Check that the consumable is installed correctly and, if necessary, re-install it correctly or replace it.
	➤ Dirt or short circuit in the cutting torch.	➤ Dismantle all consumables, clean the inside of the cutting torch and install correctly.
	➤ Consumables are not Thermacut® original parts.	➤ Use Thermacut® original consumables.
	➤ Consumable part is loose, incorrectly installed or defective.	➤ Verify that the consumables are installed correctly and, if necessary, re-install correctly or replace them.
H05	➤ The electrode is not separated from the nozzle during the pilot arc.	➤ Check for free movement of the electrode and clean or replace parts, if necessary.
H06 <Excess temperature>	➤ Fan is defective.	➤ Ensure that the fan is running freely. ➤ Replace the fan or fan motor.
	➤ Duty cycle has been exceeded.	➤ Switch off the EX-TRAFIRE® 125HD and allow it to cool down. ➤ Do not exceed the duty cycle.
	➤ Components defective.	➤ Contact service or your retailer.

Table 12 Fault messages in the display

Error code	Cause	Troubleshooting
H07 <Excess current>	<ul style="list-style-type: none"> <li>➤ Inverter overcurrent.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Have the output diodes, main transformer, and IGBT on the inverter board checked by an authorized professional.</li> </ul>
H08 <Arc does not ignite when torch trigger is pressed or the CNC start signal is on>	<ul style="list-style-type: none"> <li>➤ The cutting torch is missing or not connected.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Verify the proper cutting torch is connected.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Consumables are loose, incorrectly installed or missing.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Verify that the consumables are installed correctly and, if necessary re-install them correctly or replace them.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Retaining cap is incorrectly installed or has been tightened too tightly.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Verify that the retaining cap is correctly installed, re-install correctly and tighten, if needed.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Consumables used are not Thermacut® original parts.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Use only Thermacut® original consumables.</li> </ul>
H11	<ul style="list-style-type: none"> <li>➤ Missing phase.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Have the issue checked by Thermacut® or a qualified electrician.</li> </ul>
H14	<ul style="list-style-type: none"> <li>➤ Incorrect cutting torch.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Verify the proper cutting torch is connected.</li> </ul>
H15	<ul style="list-style-type: none"> <li>➤ No data communication at the BUS.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Check the cable.</li> <li>➤ Replace the CAN and BUS PCB.</li> <li>➤ Replace the control PCB.</li> </ul>
H16	<ul style="list-style-type: none"> <li>➤ Data recording failed.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Check the cable.</li> <li>➤ Replace the CAN and BUS PCB.</li> <li>➤ Replace the control PCB.</li> </ul>
H17 <GAS>	<ul style="list-style-type: none"> <li>➤ Gas inlet pressure is below 72.5 psi (5 bar).</li> <li>➤ Insufficient plasma gas flow.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Check the inlet gas pressure (85-125 psi).</li> <li>➤ Check the gas pressure and flow.</li> <li>➤ Verify the gas settings are correct.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Defective torch cable.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Replace the torch cable.</li> </ul>
	<ul style="list-style-type: none"> <li>➤ Pressure sensor is defective.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Have the pressure switch checked and, if necessary, replaced by an authorized professional.</li> </ul>
H18	<ul style="list-style-type: none"> <li>➤ Watchdog fault.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Replace the control PCB.</li> </ul>

Table 12 Fault messages in the display

<b>Error code</b>	<b>Cause</b>	<b>Troubleshooting</b>
H19	➤ Incorrect current setting.	➤ Verify the cutting power settings.
H20	➤ Incorrect cutting mode.	➤ Verify the cutting mode.
H21	➤ Gas pressure fault.	➤ Check the gas supply.
H23	➤ Torch trigger is pressed before starting or during initialization.	➤ Verify that the trigger is not pressed when the power supply is switched on, and during initialization.

Table 13 General faults

<b>Fault</b>	<b>Description</b>	<b>Cause</b>	<b>Troubleshooting</b>
<b>Switch is set to ON, LCD does not illuminate.</b>	➤ No/low input power voltage.	➤ Power supply is insufficient.	➤ Check the input power voltage.
		➤ Power cable is not connected.	➤ Plug the input power plug into the socket.
		➤ Switch is defective.	➤ Switch must be replaced by an authorized professional.
<b>Gas does not flow when the torch trigger is pressed or the CNC start signal is switched on.</b>	➤ Gas valve defective or missing power supply.	➤ Cable to gas valve loose or not connected.	➤ Contact your retailer.
		➤ Gas valve is defective.	➤ Contact your retailer.
<b>Arc does not ignite and there is no fault code when torch trigger is pressed or the CNC start signal is on.</b>	➤ Incorrect cutting torch type is connected.	➤ Cutting torch type is incorrect.	➤ Verify the proper cutting torch is connected.
	➤ Incorrect gas pressure.	➤ Consumables are defective or improperly installed.	➤ Check consumables and replace, if necessary.
<b>No transfer between pilot arc and workpiece.</b>	➤ Poor contact between work lead clamp and workpiece.	➤ No contact between work lead clamp and workpiece.	➤ Remove contamination and/or oxidation from the workpiece and the work lead clamp. ➤ Attach the work lead clamp to the workpiece in order to allow maximum electrical conduction.
		➤ Distance between cutting torch and workpiece is too great.	➤ Decrease the distance between cutting torch and workpiece.
		➤ Work lead is defective.	➤ Have the work lead checked and, if necessary, replaced by an authorized professional.

Table 13 General faults

Fault	Description	Cause	Troubleshooting
Output current too low, cannot be controlled	➤ Poor contact between work lead clamp and workpiece.	➤ Connection fault in work lead or cutting torch cable.	➤ Ensure that all cable connections are correctly installed.
		➤ No contact between work lead clamp and workpiece.	➤ Remove contamination and/or oxidation from the workpiece and the work lead clamp. ➤ Attach the work lead clamp to the workpiece in order to allow maximum electrical conduction.
		➤ Distance between cutting torch and workpiece is too great.	➤ Decrease the distance between cutting torch and workpiece.
	➤ Voltage fault	➤ Faulty input voltage.	➤ Verify the correct input voltage according to the identification plate. ➤ Check consumables and replace, if necessary.
Pilot arc ignites with difficulty and switches off.	➤ Consumables are defective.	➤ Consumables are worn or damaged.	➤ Check consumables and replace, if necessary.
	➤ Faulty gas flow.	➤ Gas flow too high. ➤ Gas flow too low.	➤ Check gas flow settings.
Output current cannot be controlled.	➤ Poor contact between work lead clamp and workpiece.	➤ Connection fault. ➤ Faulty cable connections.	➤ Ensure that all cable connections are properly secured.
		➤ Attach the work lead clamp to the workpiece in order to allow maximum electrical conduction.	

Table 13 General faults

Fault	Description	Cause	Troubleshooting
Insufficient cutting quality.	➤ Incorrect setting for output current.	➤ Output current (amps) too low/material too thick.	➤ Adjust the output current strength to the thickness of the workpiece.
	➤ Consumables are defective.	➤ Consumables are worn.	➤ Inspect consumables in the cutting torch and replace, if necessary.
	➤ Poor cutting quality.	➤ Incorrect cutting technology.	➤ Adjust the output current strength to the speed at which the cutting torch is pulled and thickness of the workpiece. ➤ Verify the distance between cutting torch and workpiece. ⇨ 7.5 Cutting on page EN-27
	➤ Poor contact between work lead clamp and workpiece.	➤ Workpiece is dirty.	➤ Remove contamination and/or oxidation from the workpiece and the work lead clamp. ➤ Attach the work lead clamp to the workpiece in order to allow maximum electrical conduction.

## 11 Disassembly

### WARNING

#### Electric shock due to live parts

Fatal electric shock can occur if components are live during maintenance and cleaning work.

- Set the <POWER> switch to <OFF> before maintenance and cleaning work.
- Disconnect the power supply.

- 1 Disconnect the power supply.
- 2 Disconnect all supply connections.
- 3 Remove the work lead.
- 4 Disassemble the cutting torch cable assembly.

## 12 Disposal



Equipment marked with this symbol is covered by European Directive 2012/19/EU on waste electrical and electronic equipment (WEEE).

- Do not dispose of electrical and electronic equipment with household waste.
- Disassemble electrical equipment prior to proper disposal.
  - ⇒ 11 Disassembly on page EN-38
- Collect electrical components separately and recycle in an environmentally responsible manner.
- Observe local regulations, laws, provisions, standards, and guidelines.
- Please consult the responsible local authority for information about collection and return of electrical devices.

### 12.1 Disposal of materials

This product is mainly made of metallic materials that can be melted in steel and iron works and are thus almost infinitely recyclable. The plastic materials used are labeled in preparation for their sorting and separation for later recycling.

### 12.2 Disposal of consumables

Oil, greases and cleaning agents must not contaminate the ground or enter the sewage system. These substances must be stored, transported, and disposed of in suitable containers. Observe the relevant local regulations and disposal instructions in the safety data sheets specified by the manufacturer of the consumables. Contaminated cleaning tools (brushes, rags, etc.) must also be disposed of in accordance with the information provided by the consumables' manufacturer.

- Observe the relevant local regulations and disposal instructions in the safety data sheets specified by the manufacturer of the consumables.

### 12.3 Packaging

Thermacut® has reduced the packaging to the necessary minimum. The ability to recycle packaging materials is always considered during their selection.

## 13 Warranty

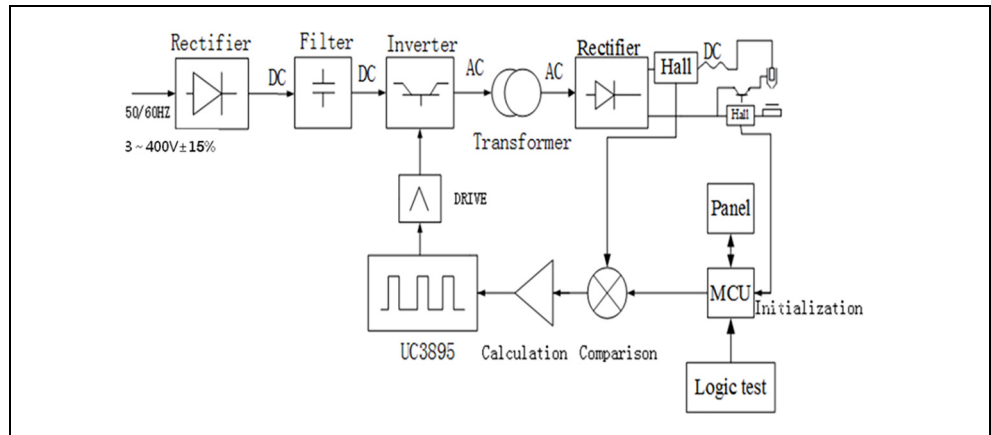
This warranty statement is an integral part of the Terms and Conditions ("T&C") of ThermoCut® (hereinafter "Seller") and applies to deliveries of goods under the contract concluded between the Seller and the other party to the contract as the recipient of the goods (hereinafter "Buyer"); the terms used herein have the same meaning as attributed to them in the T&C.

- 1** The Seller warrants to the Buyer that during the warranty period specified below, the goods delivered under the contract shall retain the properties specified in the technical data sheet for the goods available on the Seller's websites at the time the binding offer is sent (Section 2.2 of the T&C), otherwise in the quality and design suitable for the purpose resulting from the contract, otherwise for the usual purpose.
- 2** The period begins on the day of delivery of the goods to the buyer (Section 5.1, 5.2 of the T&C).
- 3** For the notification (claim) of warranty defects, the assertion of rights arising from the defective performance and other rights and obligations of the Seller and the Buyer, Section 3.4 ff and the following provisions of the T&C apply.
- 4** The warranty period is:
  - Three (3) years for EX-TRAFIRE® brand power supplies.
  - One (1) year for cutting torches and cable assemblies
- 5** The warranty does not cover normal wear and tear of the goods or their parts as a result of their use, such as nozzles, electrodes, shields, O-rings, vortex rings, etc.
- 6** The Seller shall not be liable for damage to the goods caused by the Buyer or third parties as a result of incorrect or improper handling of the goods (in particular repair or modification by persons not authorized by the Seller) or their installation, improper use of the goods or insufficient maintenance, in particular use of the goods for a purpose other than the specified purpose or other non-compliance with the operating instructions, use of excessive force or use of unauthorized goods.



## 14 Block diagram

Fig. 7 Block diagram



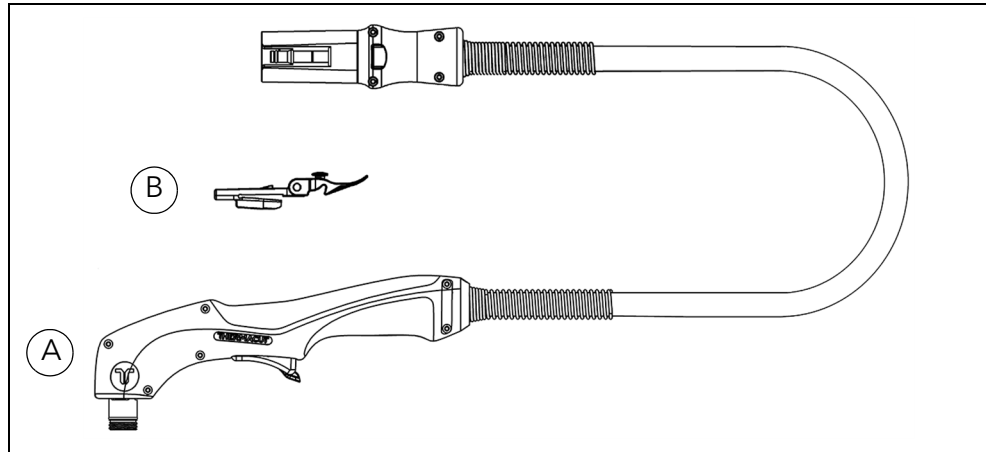
## 15 Accessories

Table 14 Accessories

Accessories	Part number	Description
	EX-0-802-001	DN 7.2 ES Quick-connect plug with male thread G 1/4"
	EX-0-802-002	DN 7.2 ES Quick-connect socket with male thread G 1/4"
	EX-0-803-001	CNC interface plug 14-pin kit, incl. 7 pins
	EX-0-803-003	CNC interface connection cable 3 m
	EX-0-803-004	CNC interface connection cable 6 m
	EX-0-805-001	Grease, 25 ml

For more information about accessories, visit our website:  
[www.thermacut.com](http://www.thermacut.com).

**16 FHT-EX® 125TTH hand cutting torch unit**

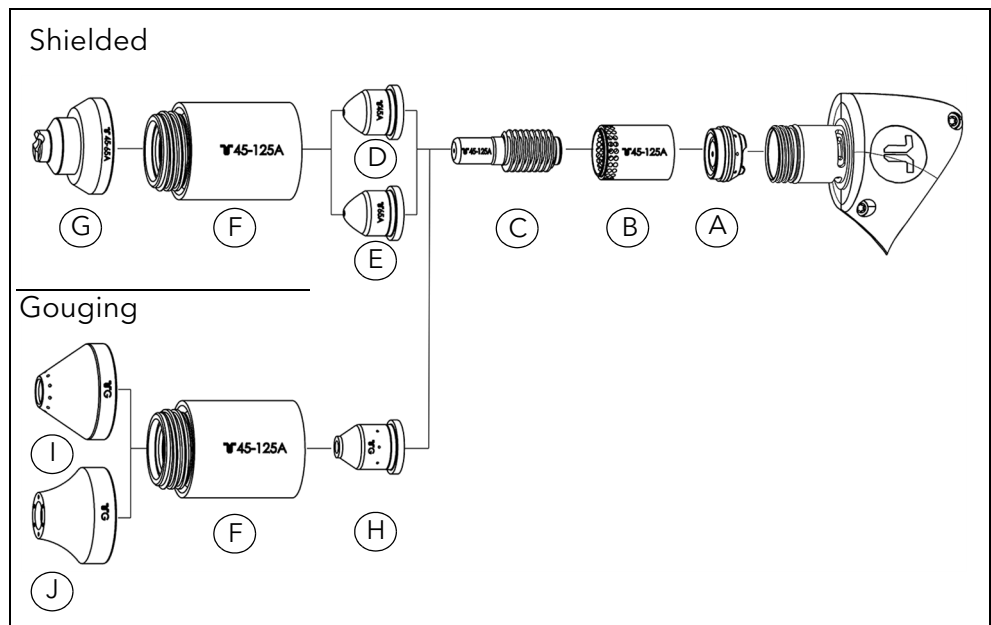


**Table 15** FHT-EX® 125TTH hand cutting torch

Number	Part number	Description
A	EX-6-139-001	FHT-EX® 125TTH hand cutting torch without consumables with 5 m (16.5') cable/TCS13
	EX-6-139-002	FHT-EX® 125TTH hand cutting torch without consumables with 8 m (26.2') cable/TCS13
	EX-6-139-003	FHT-EX® 125TTH hand cutting torch without consumables with 15 m (49.2') cable/TCS13
	EX-6-139-004	FHT-EX® 125TTH hand cutting torch without consumables with 23 m (75.5') cable/TCS13
B	EX-0-321-003	Latch with Key Assembly

## 17 FHT-EX® 125TTH consumables for hand cutting torch

### 17.1 FHT-EX® 125TTH consumables for hand cutting torch 45-65 A



**Table 16** Consumables for hand cutting torch 45-65 A

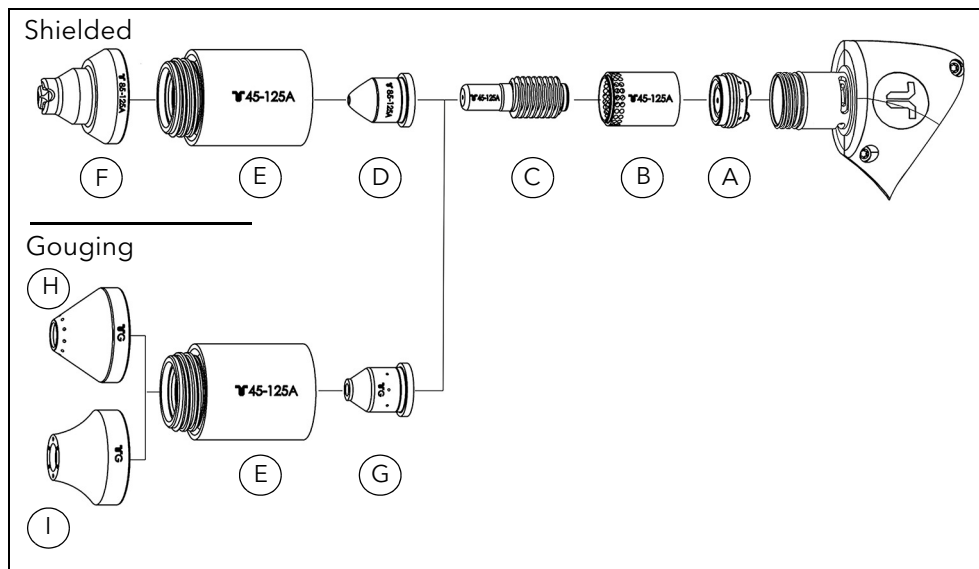
Item	Part number	Description
A	See item no. 3	Swirl ring holder
B	EX-6-404-021	Swirl ring 45-125 A
C	EX-6-401-021	Electrode 45-105 A part is only available in a 5 piece set, including 1 swirl ring holder
D	EX-6-409-024	Nozzle 45 A
E	EX-6-409-023	Nozzle 65 A
F	EX-6-415-021	Retaining cap 45-125 A
G	EX-6-419-022	Shield 45-65 A, hand
H	EX-6-440-020	Nozzle, gouging
I	EX-6-440-023	Shield, gouging, standard
J	EX-6-440-024	Shield, gouging, high removal

#### 17.1.1 Ordering information

**Table 17** Ordering information

Part number	Description
EX-6-441-003	H125 A Consumables kit for assembly of FHT-EX® 125TTH

## 17.2 FHT-EX® 125TTH consumables for hand cutting torch 85-125 A

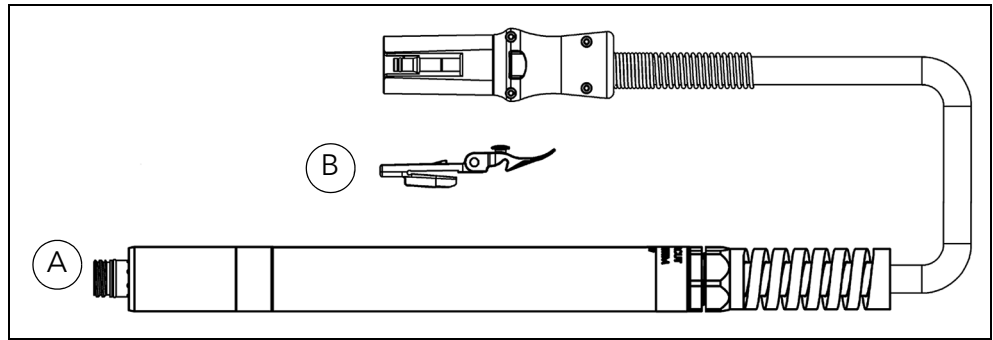


**Table 18** FHT-EX® 125TTH consumables for hand cutting torch 85-125 A

Item	Part number	Description
A	See item no. 3	Swirl ring holder
B	EX-6-404-021	Swirl ring 45-125 A
C	EX-6-401-021	Electrode 45-125 A part is only available in a 5 piece set, including 1 swirl ring holder
D	EX-6-409-021	Nozzle, 85-125 A
E	EX-6-415-021	Retaining cap 45-125 A
F	EX-6-419-021	Shield 85-125 A, hand
G	EX-6-440-020	Nozzle, gouging
H	EX-6-440-023	Shield, gouging, standard
I	EX-6-440-024	Shield, gouging, high removal

## 18 FHT-EX® 125TTM machine cutting torch unit

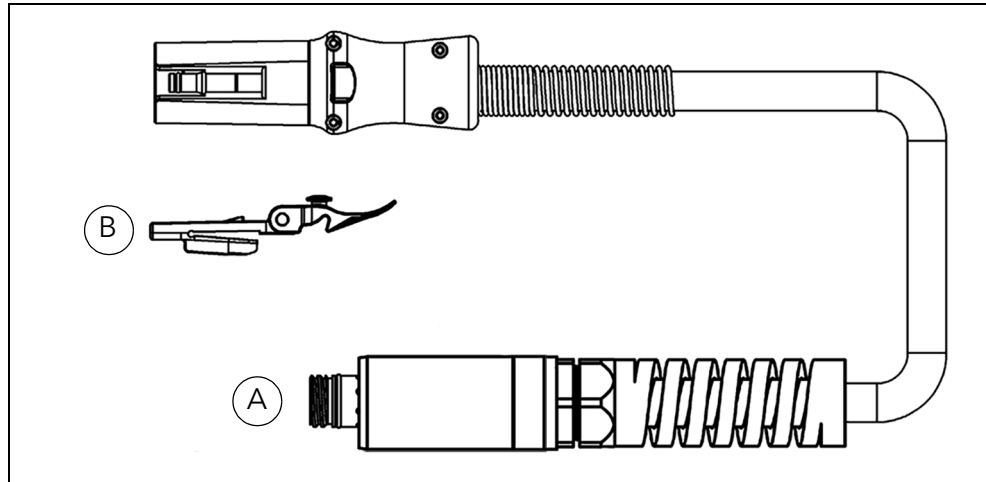
### 18.1 FHT-EX® 125TTM machine cutting torch



**Table 19** FHT-EX® 125TTM machine cutting torch

Number	Part number	Description
A	EX-6-270-001	FHT-EX® 125TTM machine torch without consumables, with 5 m (16.5') cable/ TCS13
	EX-6-270-002	FHT-EX® 125TTM machine torch without consumables, with 8 m (26.2') cable/ TCS13
	EX-6-270-003	FHT-EX® 125TTM machine torch without consumables, with 15 m (49.2') cable/ TCS13
	EX-6-270-004	FHT-EX® 125TTM machine torch without consumables, with 23 m (75.5') cable/ TCS13
B	EX-0-321-003	Latch with Key Assembly

18.2 FHT-EX® 125TTSM short machine cutting torch

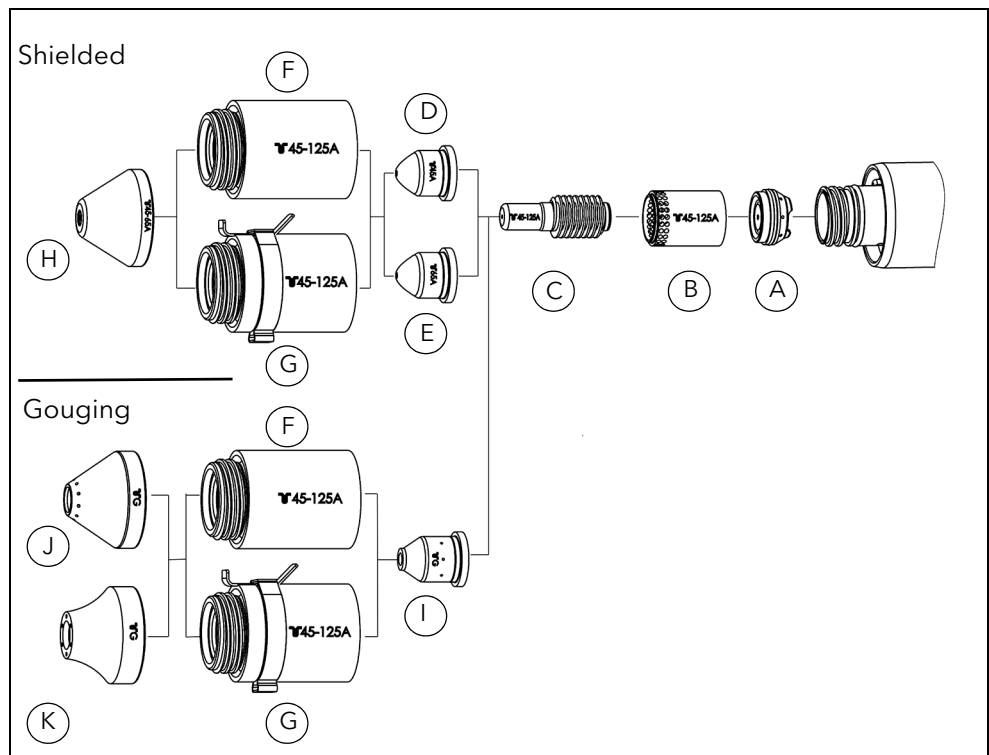


**Table 20** FHT-EX® 125TTSM short machine cutting torch

Number	Part number	Description
A	EX-6-272-001	FHT-EX® 125TTSM short machine cutting torch, without consumables, with 5 m (16.5') cable/ TCS13
	EX-6-272-002	FHT-EX® 125TTSM short machine cutting torch, without consumables, with 8 m (26.2') cable/ TCS13
	EX-6-272-003	FHT-EX® 125TTSM short machine cutting torch, without consumables, with 15 m (49.2') cable/ TCS13
	EX-6-272-004	FHT-EX® 125TTSM short machine cutting torch, without consumables, with 23 m (75.5') cable/ TCS13
B	EX-0-321-003	Latch with Key Assembly

## 19 FHT-EX® 125TTM consumables for machine cutting torch

### 19.1 FHT-EX® 125TTM consumables for standard machine cutting torch 45-65 A

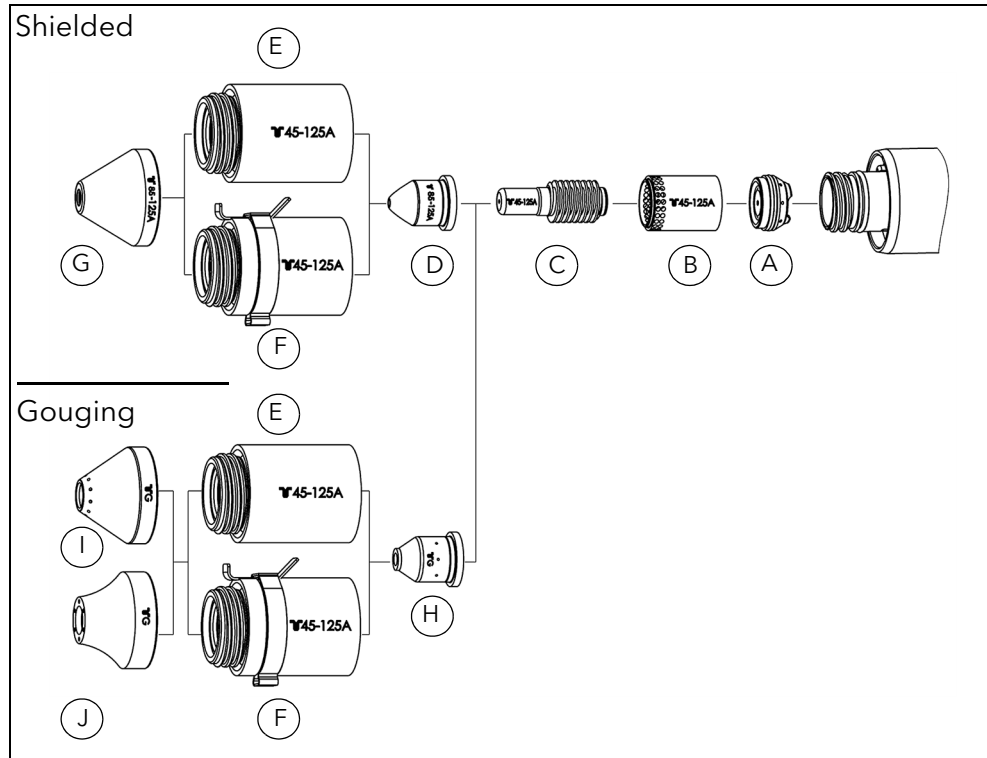


**Table 21** FHT-EX® 125TTM consumables for standard machine cutting torch 45-65 A

Item	Part number	Description
A	See item no. 3	Swirl ring holder
B	EX-6-404-021	Swirl ring 45-125 A
C	EX-6-401-021	Electrode 45-125 A part is only available in a 5 piece set, including 1 swirl ring holder
D	EX-6-409-024	Nozzle 45 A
E	EX-6-409-023	Nozzle 65 A
F	EX-6-415-021	Retaining cap 45-125 A
G	EX-6-415-022	Retaining cap 45-125 A with IHS tab
H	EX-6-421-022	Shield 45-65 A, machine
I	EX-6-440-020	Nozzle, gouging
J	EX-6-440-023	Shield, gouging, standard
K	EX-6-440-024	Shield, gouging, high removal

- If a torch height controller is used, a retaining cap with IHS (initial height sensing) must be used.

19.2 FHT-EX® 125TTM consumables for standard machine cutting torch 85-125 A



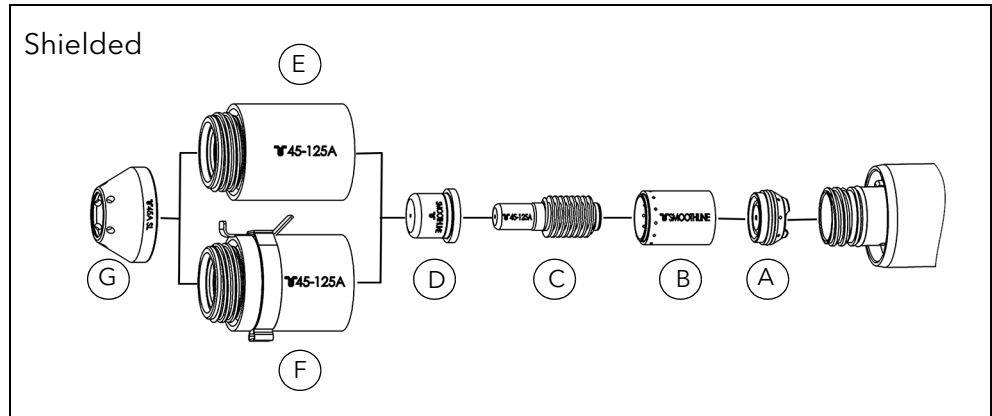
**Table 22** FHT-EX® 125TTM consumables for standard machine cutting torch 85-125 A

Item	Part number	Description
A	See item no. 3	Swirl ring holder
B	EX-6-404-021	Swirl ring 45-125 A
C	EX-6-401-021	Electrode 45-125 A part is only available in a 5 piece set, including 1 swirl ring holder
D	EX-6-409-021	Nozzle 85-125 A
E	EX-6-415-021	Retaining cap 45-125 A
F	EX-6-415-022	Retaining cap 45-125 A with IHS tab
G	EX-6-421-021	Shield 85-125 A, machine
H	EX-6-440-020	Nozzle, gouging
I	EX-6-440-023	Shield, gouging, standard
J	EX-6-440-024	Shield, gouging, high removal

➤ If a torch height controller is used, a retaining cap with IHS (initial height sensing) must be used.



### 19.3 FHT-EX® 125TTM consumables for SmoothLine machine cutting torch



**Table 23** FHT-EX® 125TTM consumables for SmoothLine machine cutting torch

Item	Part number	Description
A	See item no. 3	Swirl ring holder
B	EX-6-440-021	Swirl ring, SmoothLine
C	EX-6-401-021	Electrode 45-125 A part is only available in a 5 piece set, including 1 swirl ring holder
D	EX-6-414-021	Nozzle, SmoothLine
E	EX-6-415-021	Retaining cap 45-125 A
F	EX-6-415-022	Retaining cap 45-125 A with IHS tab
G	EX-6-414-022	Shield 40/45 A, SmoothLine

➤ If a torch height controller is used, a retaining cap with IHS (initial height sensing) must be used.

#### 19.3.1 Ordering information

**Table 24** Ordering information

Part number	Description
EX-6-442-003	M125 A Consumables kit for assembly of FHT-EX® 125TTM/SM

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## 20 Cutting tables for mechanical cutting

Cutting tables serve as a guideline for mechanical cutting. Individual systems can be “fine tuned” to achieve optimum cutting quality.

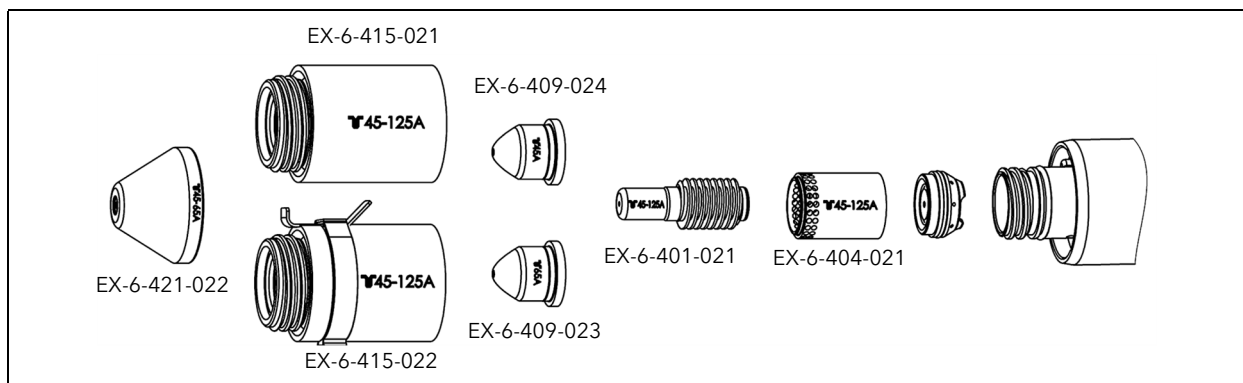
➤ Recommended speed:

Speeds adjusted for cutting capacity do not necessarily represent maximum speeds. They are the speeds that must be achieved for the specified material thickness.

➤ Maximum speed:

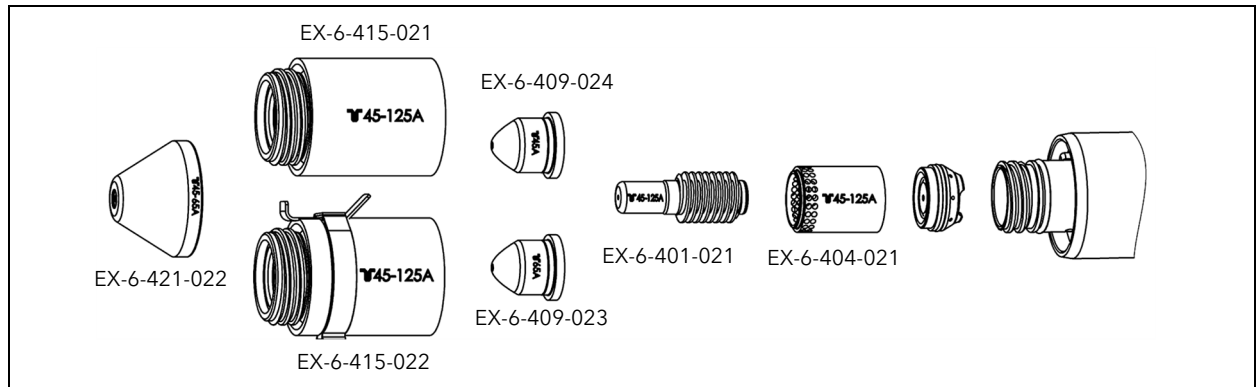
The maximum cutting speeds are the result of in-depth laboratory testing. Actual cutting speeds may vary due to different cutting applications.

## 20.1 45 A cutting, shielded, with compressed air



Material thickness	Torch (shield) to workpiece distance	Pierce height (shield) to workpiece distance	Pierce delay time	Recommended speed		Maximum speed		Kerf width
				Settings for highest quality		Standard quality settings		
				Cutting speed	Voltage	Cutting speed	Voltage	
[mm]	[mm]	[mm]	[Seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]
<b>Mild steel</b>								
0.5	0.5	2	0	8890	104	12510	104	1.6
1				8890	104	10760	104	1.4
1.5				8040	106	10160	106	1.4
2	1.5	3.8	0.3	6565	106	7770	106	1.4
3				3725	108	5375	108	1.5
4				2250	113	3550	113	1.5
6				1265	122	2050	122	1.6
<b>Stainless steel</b>								
0.5	0.5	2	0	8890	103	12510	103	1.4
1				8890	103	10760	103	1.2
1.5				7825	110	10160	110	1.2
2	1.5	3.8	0.3	6095	110	8615	110	1.2
3				3585	110	4405	110	1.5
4				2185	127	2810	127	1.6
6				975	127	1250	127	1.7
<b>Aluminum</b>								
1	1.5	3.8	0	9145	126	11100	124	1.5
2				7470	125	9210	124	1.5
3				4675	125	7400	125	1.6
4				3700	129	5800	127	1.6
6				1740	135	2795	132	1.8

## 20.2 65 A cutting, shielded, with compressed air

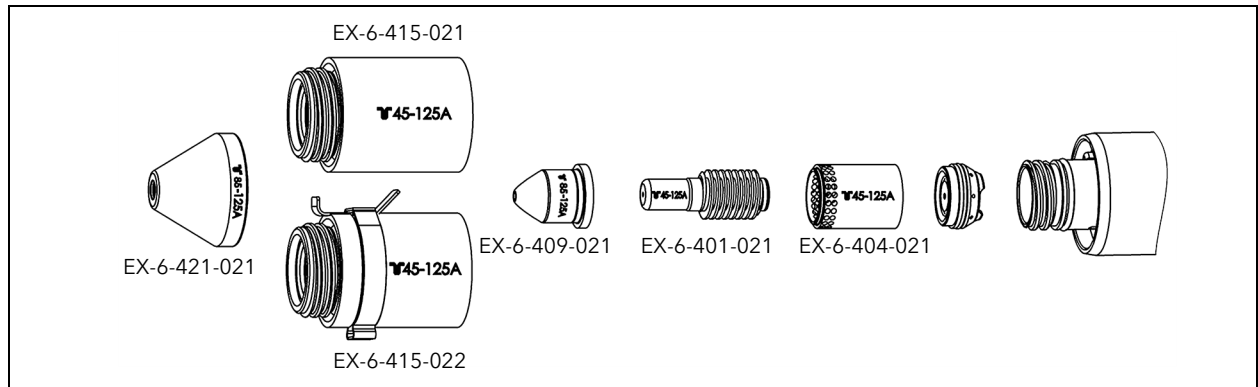


Material thickness [mm]	Torch (shield) to workpiece distance [mm]	Pierce height (shield) to workpiece distance [mm]	Pierce delay time [Seconds]	Recommended speed		Maximum speed		Kerf width [mm]	
				Settings for highest quality		Standard quality settings			
				Cutting speed [mm/min]	Voltage [Volts]	Cutting speed [mm/min]	Voltage [Volts]		
<b>Mild steel</b>									
2	1.5	3.8	0.1	5930	105	7015	105	1.6	
3			0.2	5150	106	6080	106	1.6	
4			0.5	4370	112	5645	112	1.7	
6				2815	115	3275	115	1.8	
8				1815	115	2235	115	1.9	
10		4.5	0.7	1085	117	1490	117	2	
12			1.2	930	120	1250	120	2.2	
16		6	1.5	565	131	666	131	2.7	
20		Edge start			355	128	450	128	3.2
25		Edge start			215	130	270	130	3.7
<b>Stainless steel</b>									
2	1.5	3.8	0.1	7405	103	9970	104	1.4	
3			0.2	6730	103	10000	104	1.5	
4			0.5	4840	113	6110	113	1.6	
6				2275	113	2840	113	1.8	
8				1505	116	1670	116	1.8	
10		4.5	0.7	1115	120	1245	120	1.9	
12			1.2	720	120	925	120	1.9	
16		Edge start			465	122	505	122	2.1
20		Edge start			320	126	380	126	2.3
<b>Aluminum</b>									
2	1.5	3.8	0.1	7805	110	10265	112	1.9	
3			0.2	6565	112	8790	112	1.9	
4			0.5	5320	112	7320	112	1.9	
6				2845	112	4375	115	1.9	
8				2015	115	2750	118	1.9	
10		4.5	0.7	1535	117	1980	120	2	
12			1.2	1055	120	1600	120	2	
16		Edge start		0.7	640	120	965	123	2.1
20		Edge start		0.7	335	131	660	135	2.2

### 20.3 85 A cutting, shielded, with compressed air

- Recommended speed:  
Speeds adjusted for cutting capacity do not necessarily represent maximum speeds. They are the speeds that must be achieved for the specified material thickness.
- Maximum speed:  
The maximum cutting speeds are the result of in-depth laboratory testing. Actual cutting speeds may vary due to different cutting applications.

## 20.3.1 85 A cutting, shielded, with compressed air



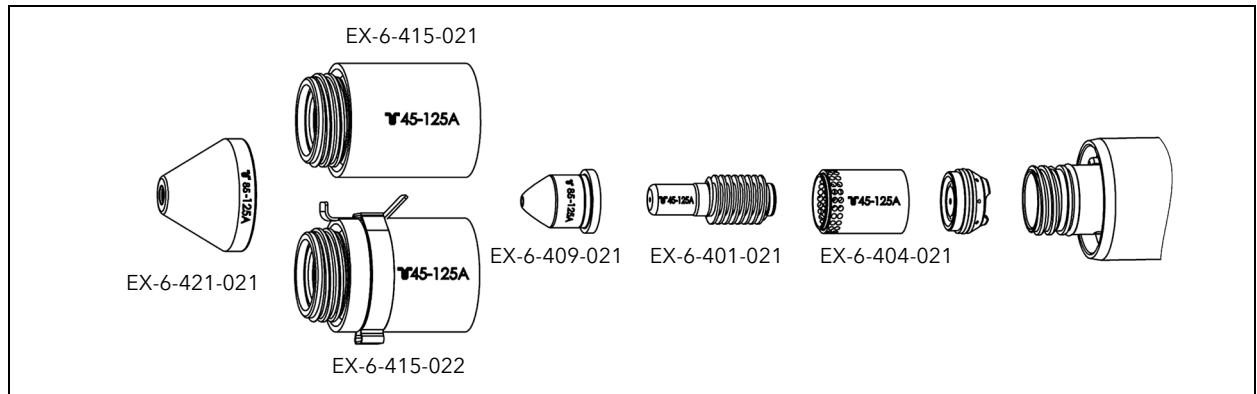
Material thickness	Torch (shield) to workpiece distance	Pierce height (shield) to workpiece distance	Pierce delay time	Recommended speed		Maximum speed		Kerf width	
				Settings for highest quality		Standard quality settings			
				Cutting speed	Voltage	Cutting speed	Voltage		
[mm]	[mm]	[mm]	[Seconds]	[mm/min]	[Volts]	[mm/min]	[Volts]	[mm]	
<b>Mild steel</b>									
3	4.6	7.2	0.1	6800	134	9200	136	1.6	
4			0.2	5650	138	6570	141	1.6	
6			0.5	3600	143	4400	146	1.9	
8				2500	145	3100	148	2	
10				1680	150	1810	153	2.1	
12				1280	152	1460	153	2	
16		1	870	154	840	155	2.4		
20		Edge start		570	161	680	163	2.5	
25		Edge start		350	165	405	164	2.7	
30		Edge start		200	173	240	169	3	
<b>Stainless steel</b>									
3	4.6	7.2	0.1	7500	146	7900	149	1.4	
4			0.2	6100	146	7500	150	1.5	
6			0.5	3700	148	3700	152	1.7	
8				2450	151	2450	153	1.9	
10				1550	151	1900	153	2.1	
12				1100	158	1250	162	2.2	
16		1	700	153	760	155	2.3		
20			Edge start		480	158	550	160	2.4
25			Edge start		300	165	350	168	2.5
			Edge start						
<b>Aluminum</b>									
3	4.6	7.2	0.1	8000	144	7900	146	1.9	
4			0.2	6500	145	7500	148	1.9	
6			0.5	3800	148	4900	150	1.9	
8				2650	148	4050	150	2	
10				1920	150	3000	152	2	
12				1450	154	2300	157	2.1	
16		1	950	156	1440	160	2.1		
20		Edge start		600	160	1050	165	2.1	
25		Edge start		380	161	640	166	2.1	

## 20.4 105 A cutting, shielded with compressed air

- Recommended speed:  
Speeds adjusted for cutting capacity do not necessarily represent maximum speeds. They are the speeds that must be achieved for the specified material thickness.
- Maximum speed:  
The maximum cutting speeds are the result of in-depth laboratory testing. Actual cutting speeds may vary due to different cutting applications.



20.4.1 105 A cutting, shielded with compressed air

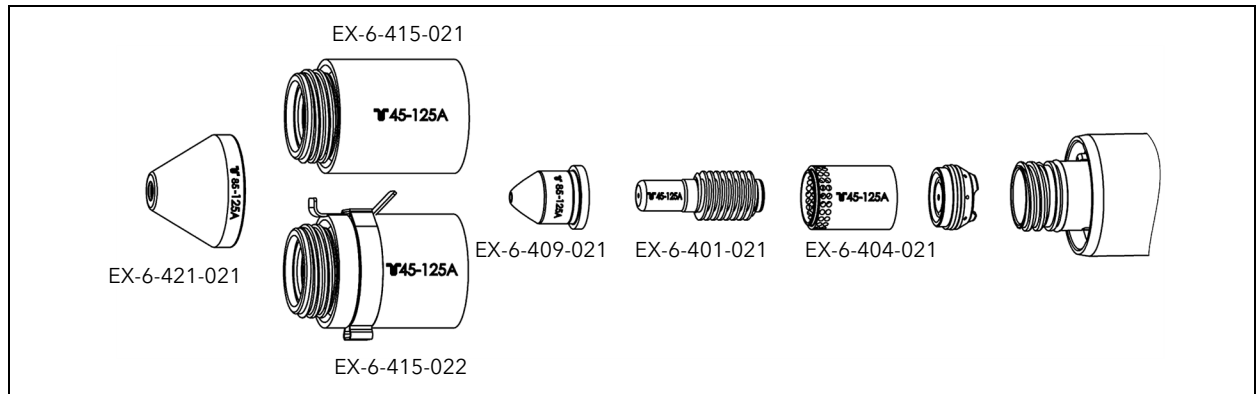


Material thickness [mm]	Torch (shield) to workpiece distance [mm]	Pierce height (shield) to workpiece distance [mm]	Pierce delay time [Seconds]	Recommended speed		Maximum speed		Kerf width [mm]	
				Settings for highest quality		Standard quality settings			
				Cutting speed [mm/min]	Voltage [Volts]	Cutting speed [mm/min]	Voltage [Volts]		
<b>Mild steel</b>									
6	4.6	7.2	0.5	3700	143	5400	143	2	
8			0.6	3220	143	4570	143	2.1	
10			0.8	2170	145	3000	145	2.2	
12			0.7	1810	146	2180	146	2.3	
16			1	1050	150	1430	150	2.4	
20			1	780	153	940	153	2.5	
25		Edge start	1	540	156	700	156	2.7	
30				420	160	440	160	3	
32				370	162	400	162	3.2	
<b>Stainless steel</b>									
6	4.6	7.2	0.5	5320	143	6900	145	1.6	
8				3650	147	4300	150	1.9	
10				2230	147	2420	150	2.2	
12				1490	160	2300	160	2.3	
16				1	950	155	1230	155	2.4
20				1.5	660	158	855	158	2.5
25		Edge start	1	440	160	570	160	2.9	
30				330	161	450	161	2.9	
32				290	162	420	162	2.9	
<b>Aluminum</b>									
6	4.6	7.2	0.5	6340	152	6390	154	1.9	
8			0.6	4330	152	4690	154	2	
10			0.8	2660	152	3900	154	2.2	
12			0.7	2020	154	3100	155	2.2	
16			1	1350	155	1860	156	2.1	
20				970	156	1220	158	2.1	
25		Edge start	1	660	155	960	157	2.5	
30				460	168	700	176	2.5	
32				390	170	490	178	2.5	

## 20.5 125 A cutting, shielded, with compressed air

- Recommended speed:  
Speeds adjusted for cutting capacity do not necessarily represent maximum speeds. They are the speeds that must be achieved for the specified material thickness.
- Maximum speed:  
The maximum cutting speeds are the result of in-depth laboratory testing. Actual cutting speeds may vary due to different cutting applications.

20.5.1 125 A cutting, shielded, with compressed air

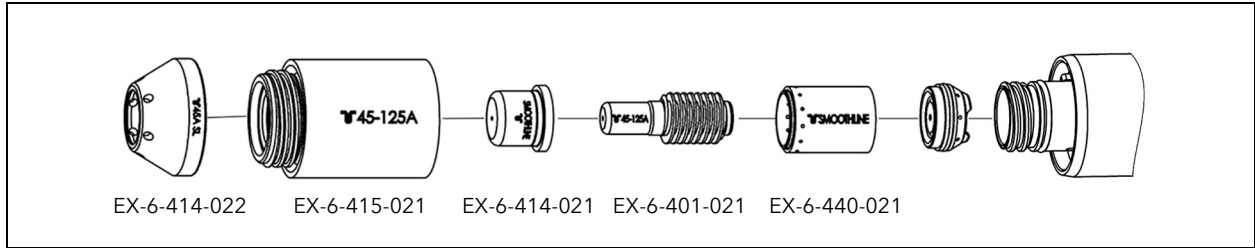


Material thickness [mm]	Torch (shield) to workpiece distance [mm]	Pierce height (shield) to workpiece distance [mm]	Pierce delay time [Seconds]	Recommended speed		Maximum speed		Kerf width [mm]	
				Settings for highest quality		Standard quality settings			
				Cutting speed [mm/min]	Voltage [Volts]	Cutting speed [mm/min]	Voltage [Volts]		
<b>Mild steel</b>									
6	4.6	7.2	0.2	4980	141	6555	141	2.2	
8			0.3	3800	143	4570	143	2.3	
10			0.4	2750	154	3330	154	2.4	
12	4		0.5	1230	157	2760	157	2.4	
16	4.6		Edge start	0.6	1010	154	1660	154	2.6
20				0.9	980	154	1140	154	2.8
25		1		590	154	935	154	3.1	
30		460		156	580	156	3.6		
32		400		157	500	157	3.8		
35		340		160	430	160	3.9		
40	240	162	310	162	4.1				
<b>Stainless steel</b>									
6	4.6	7.2	0.5	5910	143	9200	146	1.9	
8				4060	148	6100	150	2.2	
10				2540	152	3700	154	2.4	
12				2170	152	3300	154	2.6	
16			0.7	1140	155	1600	156	2.6	
20			1.2	940	156	1130	158	2.7	
25		Edge start	1	540	160	800	161	3.1	
30				430	163	640	167	3	
32				1.1	400	166	600	168	3
35				1.2	320	170	540	172	3.2
40					180	175	210	177	3.6
<b>Aluminum</b>									
6	4.6	7.2	0.2	7660	153	8560	155	2.3	
8			0.3	5100	153	3100	155	2.5	
10			0.4	2980	155	4400	157	2.6	
12			0.5	2140	157	3620	158	2.6	
16			0.6	1540	157	2500	158	2.8	
20			1.5	1260	158	1950	162	2.9	
25				850	162	1250	166	2.8	
30			Edge start	1	540	166	1075	170	2.9
32		1.1			430	170	750	172	3
35		1.2			370	172	580	174	3.3
40					270	174	300	176	3.7

## 20.6 30-45 A cutting, SmoothLine, shielded, with compressed air

- Recommended speed:  
Speeds adjusted for cutting capacity do not necessarily represent maximum speeds. They are the speeds that must be achieved for the specified material thickness.
- Maximum speed:  
The maximum cutting speeds are the result of in-depth laboratory testing. Actual cutting speeds may vary due to different cutting applications.

20.6.1 30-45 A cutting, SmoothLine, shielded, with compressed air



Material thickness [mm]	Torch (shield) to workpiece distance [mm]	Pierce height (shield) to workpiece distance [mm]	Pierce delay time [Seconds]	Recommended speed Settings for highest quality		Kerf width [mm]	Power supply [A]
				Cutting speed	Voltage		
				[mm/min]	[Volts]		
<b>Mild steel</b>							
0.5	1.5	2.25	0	4330	83	1.2	30
0.6				4080	85	1.2	
0.8				4065	85	1.2	
1			0.4	4825	81	1.2	40
1.5				4825	79	1.2	
2	2.0	2.25	0.5	4740	78	1.2	45
3				3445	80	1.2	
4			2100	80	1.3		
<b>Stainless steel</b>							
0.5	1.2	2	0	4825	77	1.2	30
0.6				4825	77	1.2	
0.8				4825	73	1.2	
1			0.4	4825	86	1.2	40
1.5				4825	72	1.2	
2			0.5	4550	72	1	45
3				2920	70	1	
4				1520	72	1	



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## **Revision history**

You can find the latest version of the operator manual on our website:  
[www.thermacut.com](http://www.thermacut.com).

Revision R1/05\_2023





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