HYPERTHERM®
A Hypertherm Associates Brand

Duramax™ LT Machine Torch

Powermax30® XP

Application Note

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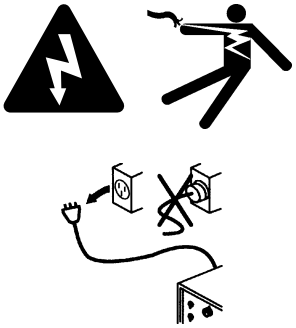
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Introduction

⚠ WARNING



ELECTRIC SHOCK CAN KILL

Disconnect electric power before doing installation or maintenance. You can get a serious electric shock if electric power is not disconnected. Electric shock can seriously injure or kill you.

All work that requires removal of the plasma power supply outer cover or panels must be done by a qualified technician.

Refer to the *Safety and Compliance Manual* (80669C) for more safety information.

Purpose

The Powermax30 XP plasma power supply (088230) supports the Duramax LT machine torch. This torch uses air to cut electrically conductive metals, such as mild steel, stainless steel, or aluminum. With it you can cut thicknesses up to 6 mm (1/4 inch).

This document gives you information about:

- Machine torch setup
- Cut charts (for use with standard consumables and a 240 V electric power source only)
- Things to know if you use a 120 V power source
- Machine torch replacement parts
- Troubleshooting common issues with the machine torch

Related documents

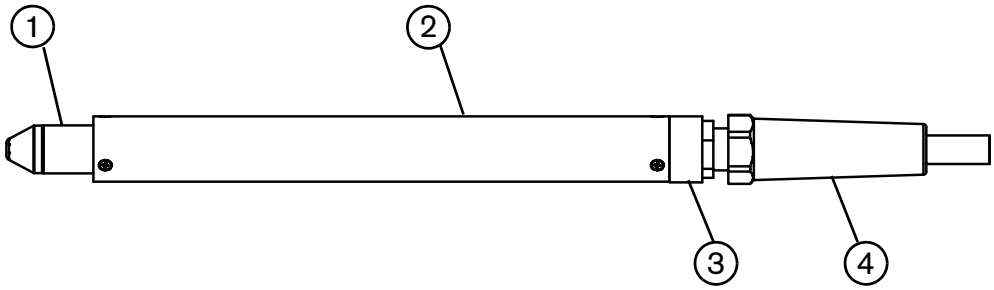
For information about your plasma power supply, refer to these documents:

- *Powermax30 XP Operator Manual* (811470)
- *Powermax30 XP Service Manual* (808150)
- *Safety and Compliance Manual* (80669C)

Technical documentation is available at www.hypertherm.com/docs.

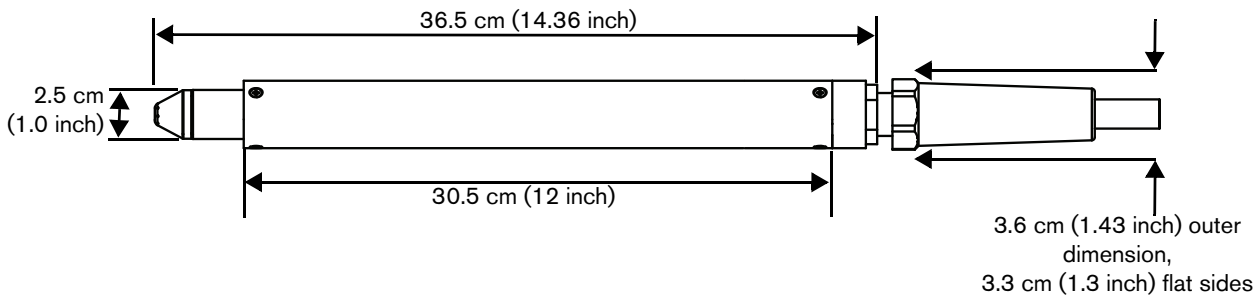
Machine torch setup

Components



1	Consumables	**3**	Brass strain relief ring
2	Positioning sleeve	**4**	Strain relief

Dimensions



Before you use the machine torch

Before using the Duramax LT machine torch, you must:

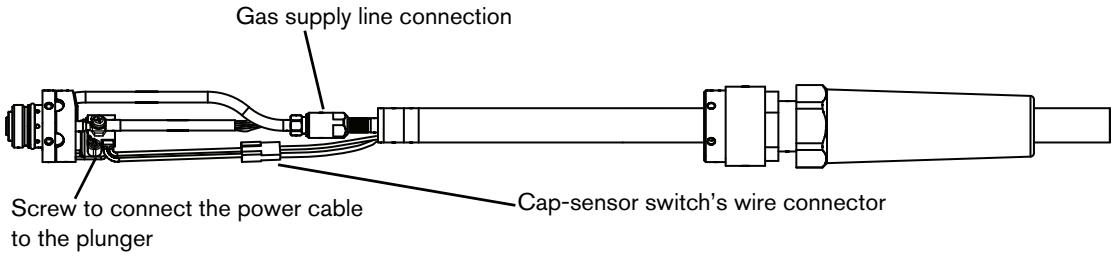
1. Identify the voltage of your electric power source.
   - ❑ 240 V is recommended for best performance and cut quality.
   - ❑ If you must connect your Powermax30 XP to a 120 V power source, refer to page 9.
2. Mount the torch on your cutting table or other equipment. Refer to page 5.
3. Select and install the consumables. Refer to page 6.
4. Align the torch square to the plate.
5. Set up the power supply for remote starting with 2 flying control terminals on the lead. Refer to Torch integration on page 8.

Mount the torch

The Duramax LT machine torch can be mounted on a variety of X-Y tables, track burners, pipe bevelers, and other equipment. With some types of cutting tables, it can be necessary to disassemble the torch to put it through the track and mount it. If your cutting table's track is large enough for you to thread the torch through it without removing the torch body from the lead, do so and then attach the torch to the lifter per the manufacturer's instructions.

If it is necessary to disassemble the torch, do these steps:

1. Disconnect the torch lead from the power supply and remove the consumables from the torch.
2. Remove the 6 screws (3 at each end) that secure the positioning sleeve to the brass strain relief ring and to the torch body. Slide the positioning sleeve off the torch.
3. Disconnect the wires for the cap-sensor switch at the connector in the middle.



4. Use a #2 Phillips screwdriver and a 6 mm (1/4 inch) nut driver (or adjustable wrench) to remove the screw and nut that secure the torch's power cable to the plunger. (Turn the plunger if necessary to gain access to the screw.)
5. Use 6 mm (1/4 inch) and 10 mm (3/8 inch) or adjustable wrenches to loosen the nut that secures the gas supply line to the torch lead. Set the torch body aside.
6. Put the torch lead through the cutting table's track.

   Cover the end of the gas line on the torch lead with tape to keep dirt and other contaminants from getting in the gas line when you route the lead through the track.

7. Reattach the torch's power cable to the torch plunger using the screw and nut. Rotate the plunger so that the screw does not interfere with the cap-sensor switch.
8. Reconnect the gas line to the torch lead.
9. Press the two halves of the cap-sensor switch's wire connector together.
10. Slide the positioning sleeve over the torch body and check the alignment of the screw holes. Replace the three screws at each end.
11. If you are using a gear rack (kit 228229 is not included), attach it to the torch.
12. Attach the torch to the lifter per the manufacturer's instructions.

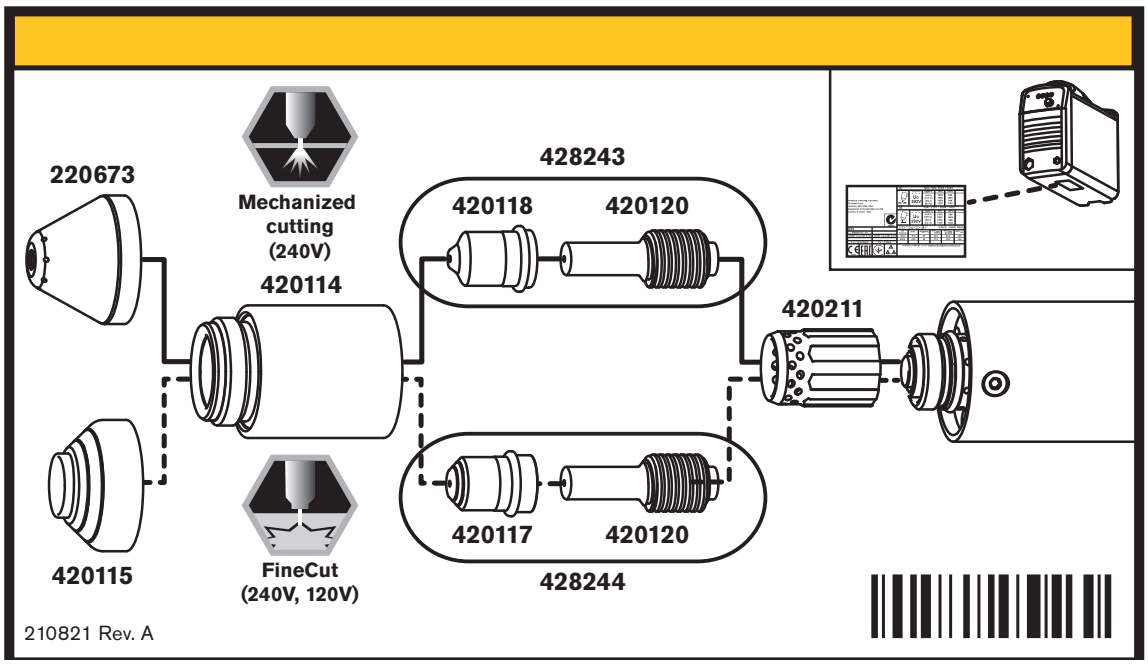
Select and install the consumables

		WARNING! **INSTANT-ON TORCHES** **PLASMA ARC CAN CAUSE INJURY AND BURNS**
		The plasma arc comes on immediately when the torch trigger is activated. Make sure the power is OFF before changing consumables.

For best performance and cut quality, use a 240 V electric power source and standard consumables with the Duramax LT machine torch when possible.

If you must use a 120 V power source, make sure to use FineCut® consumables **and** review the 120 V guidelines on page 9.

Duramax LT machine torch consumables label (210821)



Ohmic sensing retaining cap 220719 is compatible for use with the standard shield (220673) for Initial Height Sensing (IHS) / plate-sensing circuits. However, 220719 is not compatible with the FineCut deflector (420115).

Use the cut charts

For mechanized cut charts for general-purpose (standard) consumables, refer to page 7. Mechanized cut charts for FineCut consumables are not available for Powermax30 XP.

Arc Voltage Control is not supported.

240 V / 30 A cutting

General-purpose (standard) consumables

Metric

Material	Material thickness (mm)	Cut height	Arc current (A)	Recommended cut speed (mm/minute)
Mild steel	1	1.5 mm	30	6350
	2			4400
	3			2300
	4			1450
	5			1000
	6			750
Stainless steel	1	1.5 mm	30	6100
	2			2250
	3			1250
	4			850
	5			625
	6			480
Aluminum	1	1.5 mm	30	6350
	2			4600
	3			2500
	4			1600
	5			1125
	6			830

English

Material	Material thickness (gauge/inches)	Cut height (inches)	Arc current (A)	Recommended cut speed (inches/minute)
Mild steel	18 GA	1/16	30	250
	16 GA			250
	14 GA			190
	12 GA			110
	10 GA			75
	1/4 in			27
Stainless steel	18 GA	1/16	30	180
	16 GA			135
	14 GA			100
	12 GA			60
	10 GA			40
	1/4 in			18
Aluminum	0.050	1/16	30	250
	0.063			250
	0.080			180
	0.100			125
	0.125			90
	0.250			30

Torch integration

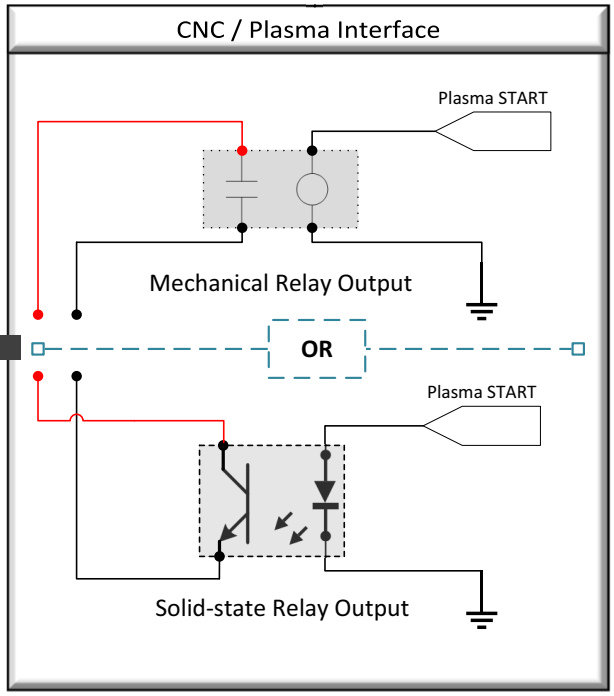
Powermax30® XP Start signal
Input, Normally open
18 VDC open circuit voltage at terminals
Requires dry-contact closure to activate
Red wire = +V DC
Black wire = Signal

Quick Disconnect terminals (x2)
Mating tab width: 6.35 mm (0.25 in)
Wire size: 0.32 – 0.82 mm² (22 – 18 AWG)



QTY. 2 required:





EXAMPLES →

Integration Notes

- Interface cable and male quick connects are neither sold nor supplied by Hypertherm
- Do not make any electrical connections when the Powermax30 XP is energized
- Start signal polarity does not matter if using a mechanical relay
- Start signal polarity DOES matter if using a solid-state relay
- There are no output signals like Motion (Transfer) and Divided Arc Voltage available for use

Things to know if you use a 120 V electric power source

If you do not have access to a 240 V power source, then you can use a 120 V power source.

Here are things to know when using a 120 V power source with the Powermax30 XP Duramax LT machine torch:

- Always use the FineCut consumables shown on the label on page 6.

  The ohmic sensing retaining cap (220719) is not compatible with the FineCut deflector (420115).

- To prevent a circuit breaker from tripping, do these things:
  - Use a 120 VAC / 20 A dedicated circuit breaker to the Powermax30 XP plasma power supply. Do not share the circuit with other devices. Speak to a licensed electrician in your area to make sure the power is installed per local codes.
  - Use these methods to decrease power consumption:
    - Decrease the output current to 15 A – 25 A.
    - Decrease the cut height.

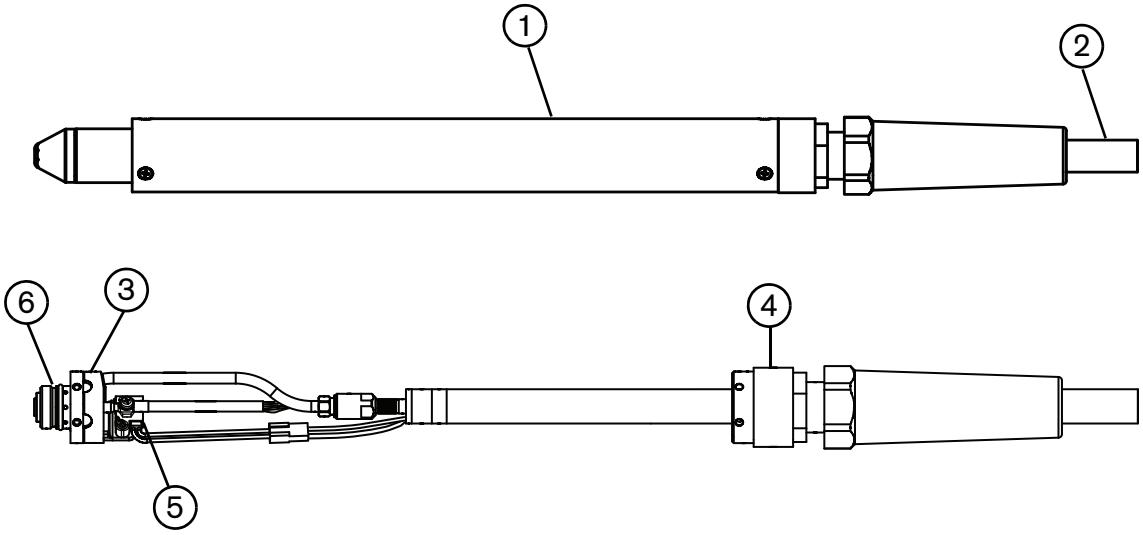
  Mechanized cut charts for FineCut consumables are not available for Powermax30 XP.

- Expect these cutting outcomes when cutting with a 120 V power source (as an alternative to the recommended 240 V power source):
  - Decreased cut speed
  - Decreased cut quality
  - Decreased cut capacity
  - Shorter duty cycle

Parts

Use the kit numbers in this guide to order replacement parts for your Duramax LT machine torch.

Machine torch parts



The entire machine torch and lead assembly can be replaced, or individual component parts can be replaced.

Item	Part number	Description
	429219*	Kit: Duramax LT machine torch assembly with 4.6 m (15 foot) lead
	429224	Kit: Duramax LT machine torch main body
1	429241	Kit: T30M positioning sleeve
2	429242	Kit: Duramax LT torch lead 4.6 m (15 foot) replacement
3	228322**	Kit: T45m front mounting ring
4	228323**	Kit: T45m rear mounting ring
5	228321**	Kit: T45m cap-sensor switch replacement
6	058503	O-ring: Viton 0.626 x 0.070
	228229**	Kit: T45m gear rack replacement (Optional)

* This kit includes one set of standard machine torch consumables. Refer to page 6.

** This kit can be used on both the Duramax LT machine torch and the Powermax45 T45m machine torch.

Hypertherm does not supply machine interface cables or male quick connects.

Machine torch consumables

Refer to Select and install the consumables on page 6.

Plasma power supply parts and labels

Part number	Description
088178	Powermax30 XP 120 V – 240 V CSA plasma power supply (mechanized) with machine torch, consumables, and 4.6 m (15 foot) lead
528152	Kit: Powermax30 XP mechanized DOM label
528153	Kit: Powermax30 XP mechanized rear panel

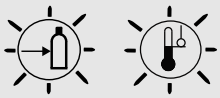
Service inquiries

For aid with repairing or replacing internal torch components:

1. Speak to your Hypertherm distributor or authorized Hypertherm repair facility.
2. Speak to the nearest Hypertherm office shown in the front of this guide.

Troubleshooting

The table that follows gives examples of issues that can occur while using the Powermax30 XP Duramax LT machine torch.

Problem	Cause/Solution
The temperature LED illuminates. 	▪ Refer to the duty cycle information located on the data plate on your plasma power supply. ▪ Refer to "Understand duty-cycle limitations" in the *Powermax30 XP Operator Manual* (808160).
The gas pressure and temperature LEDs blink when the system is powered ON (**I**). 	This may mean that the system was powered on while the plasma start signal was being sent. The start circuit could be stuck closed. **Suggested action:** With the power supply OFF (O), disconnect the external start wires. Supply power again. ▪ If the problem stops, examine the external control circuit and wiring for issues. ▪ If the problem continues, speak to the supplier of your mechanized cutting system.
The cut quality or performance is poor.	▪ Gouging the plate (instead of cutting the plate) can occur if the cut height is too high or if there is poor ground contact. ▪ When cutting with 120 V power, refer to Things to know if you use a 120 V electric power source on page 9. Cut quality can usually be improved by cutting with the standard consumables at 240 V.
Arc just "spits" and goes out and machine motion continues.	There is no arc transfer or machine motion signal. An issue with the Powermax30 XP plasma power supply will not prevent a CNC from moving the table axes through a part program. It is possible that the start signal has a momentary (instead of a sustained) closure, or there is a fault present. Check the front panel of the plasma power supply for LED activity.
The torch lead or strain relief are damaged.	▪ For replacement part numbers, refer to Parts on page 10. ▪ For service procedures, refer to "Replacing the torch lead and strain relief" in the *Powermax30 XP Service Manual* (808150). The wires in the machine torch lead are orange, blue, and black.

For information about how to troubleshoot issues with the Powermax30 XP plasma power supply, refer to the *Powermax30 XP Operator Manual* (808160). Technical documentation is available at www.hypertherm.com/docs.