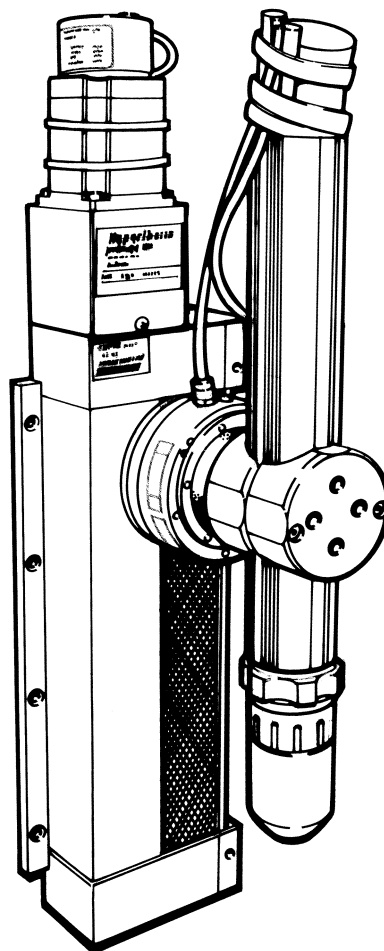


# ***command<sup>®</sup> THC***

## ***X-Y Table Torch Height Control (THC) System***

***Product Configuration  
Manual  
802600 - Revision 4***



EN50199  
EN60974-1

***Hypertherm<sup>®</sup>***

*The world leader in  
plasma cutting technology™*

***command THC***  
***X-Y Table***  
***Torch Height Control***  
***(THC) System***

**Product Configuration Manual**  
**(P/N 802600)**

**Revision 4 - September, 2001**

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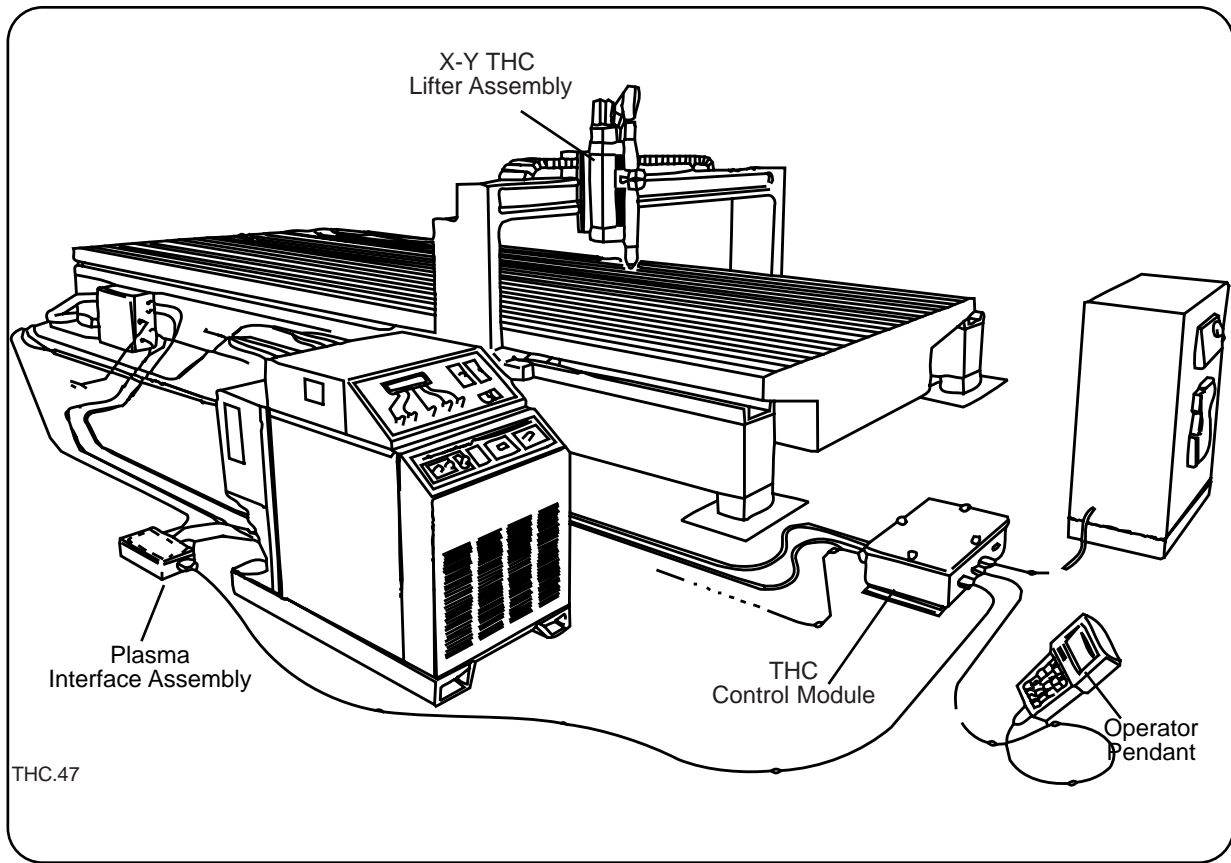
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## Section 1 SPECIFICATIONS & UNIT MOUNTING

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**Figure 1-1 X-Y Command THC System  
Interfaced with Plasma Cutting System and CNC**

## GENERAL

Hypertherm's X-Y Command THC is a torch height control (THC) system designed for plasma cutting applications on an X-Y cutting table. (Figure 1-1). The system uses the plasma arc voltage to control the physical stand-off (distance) between the torch and workpiece during plasma arc cutting. Initial height sensing (IHS) is accomplished by ohmic contact sensing or by a limited force stall detection method.

### System Components

The system includes the following:

- **Plasma Interface Assembly** - Provides communications link between the THC control module and the plasma power supply. It is usually mounted close to the power supply.
- **THC Control Module** - Provides initial height sensing, arc voltage control and interfaces with the torch lifter, the CNC machine, operator pendant and the plasma power supply. It is usually mounted on the cutting machine bridge, but on smaller tables, can be placed close to the power supply or the entrance to the cable carrying system.
- **X-Y Lifter Assembly** - Positions the torch head vertically above the workpiece. It mounts onto the torch station mounting bracket.
- **Operator Pendant (optional)** - Remote control which includes an LCD display and keypad used for THC setup and control. The pendant is required if the controller can not interface with the THC control module.
- **Torch Breakaway Kit (optional)** - Provides protection for the torch, lifter and X-Y table, using air pressure to lock the torch to the THC lifter assembly. Upon side impact, the breakaway releases from the lock position, allows the torch to float and provides an emergency stop signal to the controller to stop motion of the X-Y cutting machine.
- **Interconnecting Cables**

### Customer Supplied Equipment

The following items are not included and must be supplied by the customer:

- **Electrode and Work Lead Sensing Wires** - Required to provide sensing voltage to the THC plasma interface assembly. Use 18AWG (0.9 mm<sup>2</sup>), single pair, unshielded wire, rated for 600V or greater. Install appropriate size fork or ring terminals on wire ends. Length: as required to route from the power supply to the THC plasma interface assembly.
- **MAX100/MAX100D Interface Cable** - Required to interface between the power supply and the THC plasma interface assembly. Use 18AWG (0.9 mm<sup>2</sup>), double pair, shielded wire, rated for 600V or greater. Install appropriate size fork terminals on wire ends. Length: as required to route from the power supply to the THC plasma interface assembly.

**SPECIFICATIONS**

**THC Control Module**

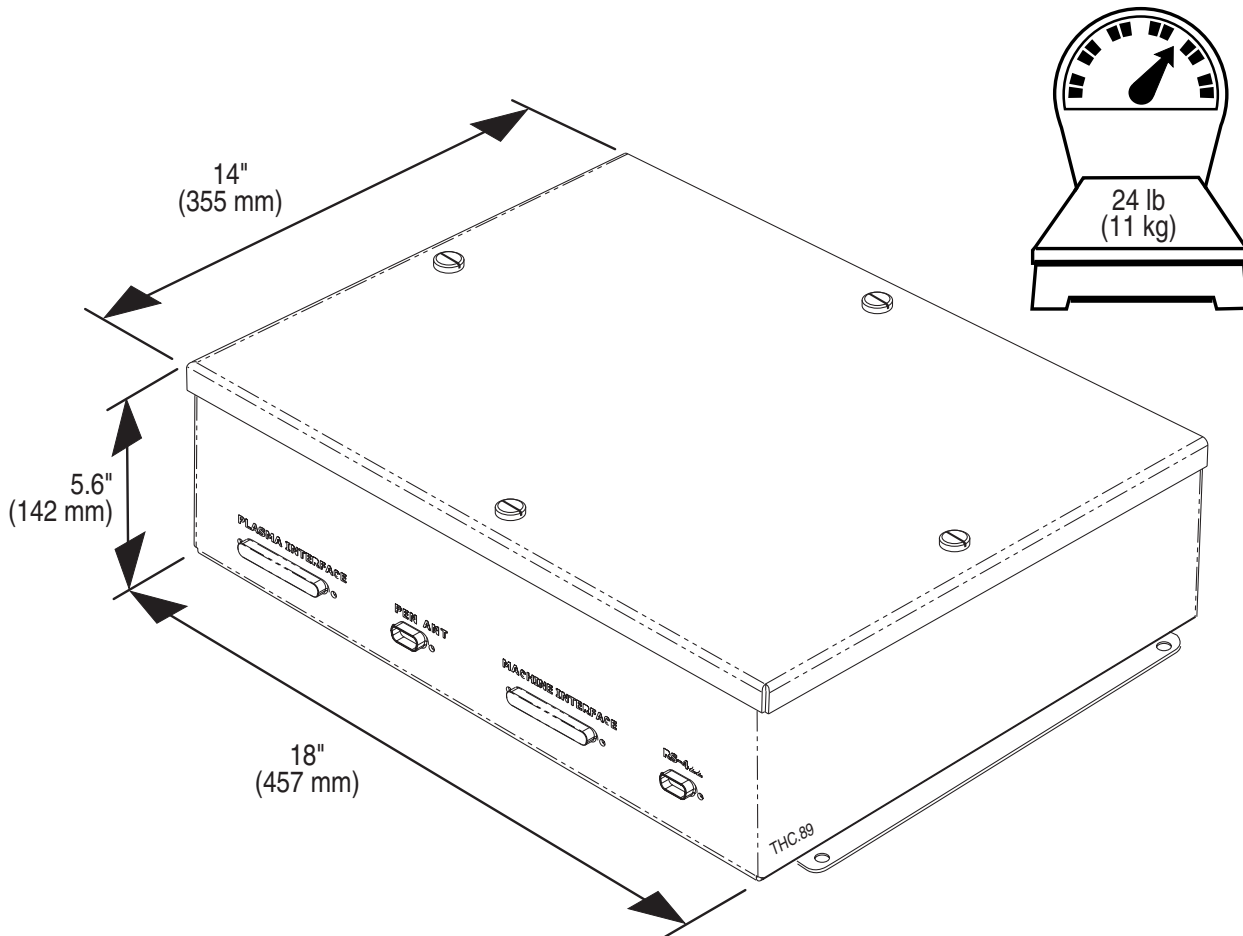
**Electrical**

Input Power (automatic selecting dual range) ....115 VAC or 230 VAC, 1 Phase,  
50/60 Hz

Parallel Digital I/O .....+ 12 VDC

Serial Digital I/O (RS-422) .....+ 5 VDC (operator pendant), CNC

**Weight and Dimensions.....**Figure 1-2



**Figure 1-2 THC Control Module Weight and Dimensions**

**Plasma Interface Assembly**

**Electrical**

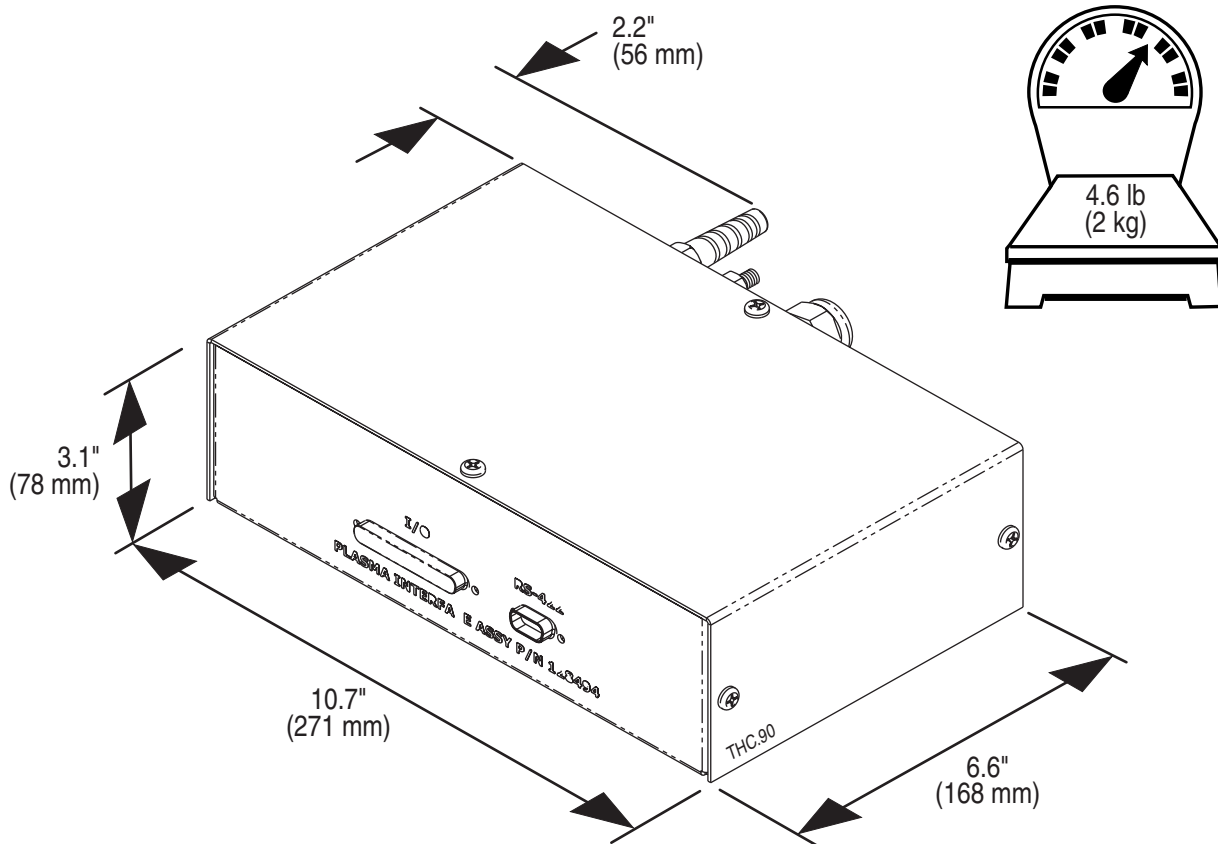
Input Power (from THC Control Module).....+ 24 VDC  
 Parallel Digital I/O .....+ 12 VDC  
 Serial Digital I/O (RS-422).....+ 5 VDC

**Voltage Divider Function** .....41 :1 Arc Voltage (isolated)

**Weight and Dimensions**.....Figure 1-3

**HT4400 INSTALLATION**

**NOTE:** Instructions to remove the plasma interface PCB from the interface enclosure and install it into the HT4400 power supply are included in the CommandTHC instruction manual 802780.  
 The plasma interface enclosure is not used for the HT4400 installation.



**Figure 1-3 Plasma Interface Assembly Weight and Dimensions**



# SPECIFICATIONS & UNIT MOUNTING

## X-Y Lifter Assembly

### Electrical

Motor .....+ 2.48 VDC, 2- phase (3.3 amp per ph.)  
 Limit switches .....+ 24 VDC

### Lifter Control Function

Motor .....Stepper  
 Motor Drive .....Stepper, chopped constant current  
 Lifter Feedback .....Encoder  
 Lifter Limit Switches .....Home switch and lower limit switch  
 Maximum Z Axis Speed.....200 inches (508 cm) per minute  
 Maximum Z Axis Stroke.....8- inches (203 mm)

Weight and Dimensions.....Figure 1-4

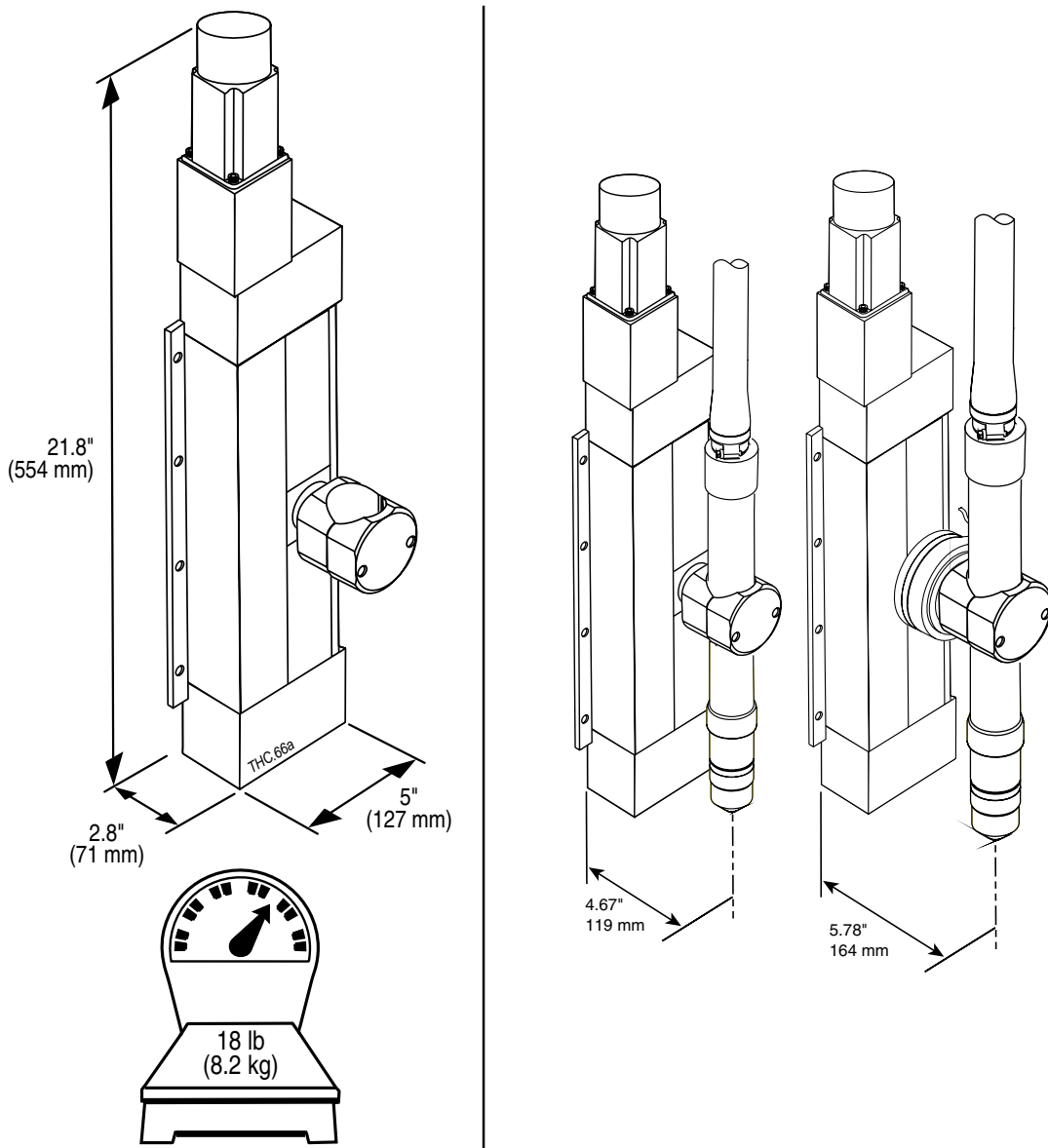
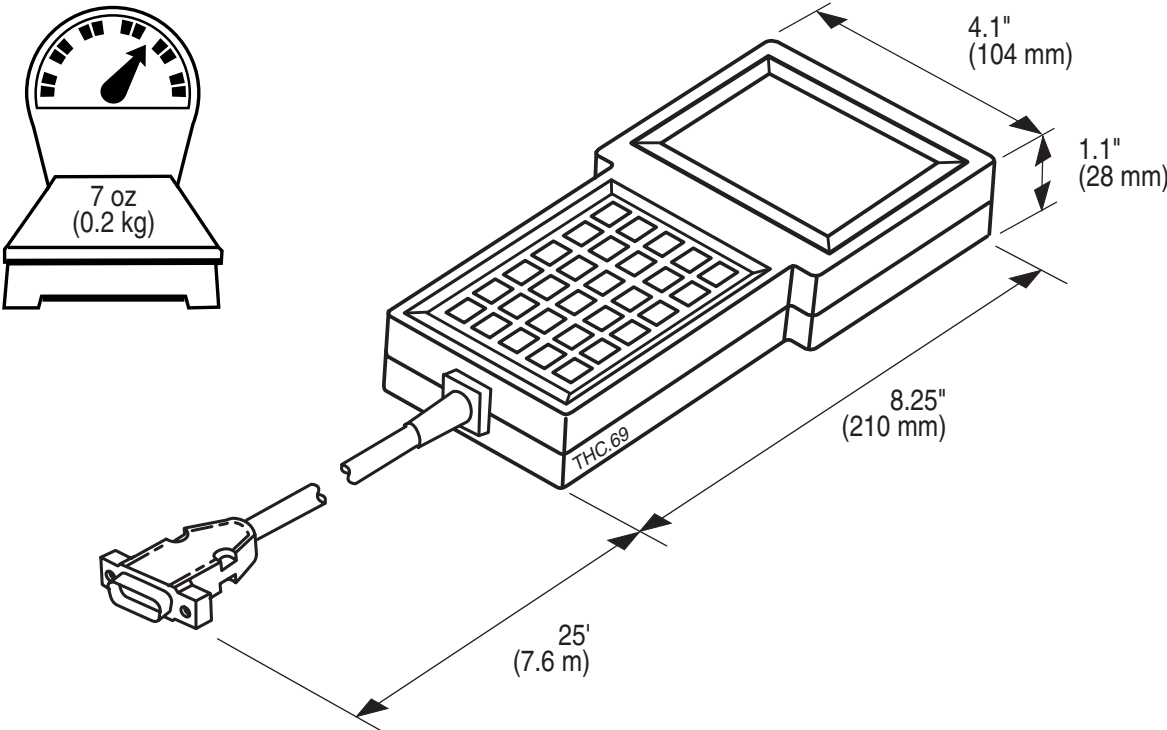


Figure 1-4 X-Y Lifter Assembly Weight and Dimensions

**Operator Pendant**

**Electrical**  
Input Power (from THC Control Module) .....+ 12 VDC  
Serial Digital I/O (RS-422) .....+ 5 VDC

**Weight and Dimensions**.....Figure 1-6



**Figure 1-6 Operator Pendant Weight and Dimensions**

**THC Breakaway Option (128050)**

**Electrical**

Pressure switch .....CNC emergency stop circuit voltage

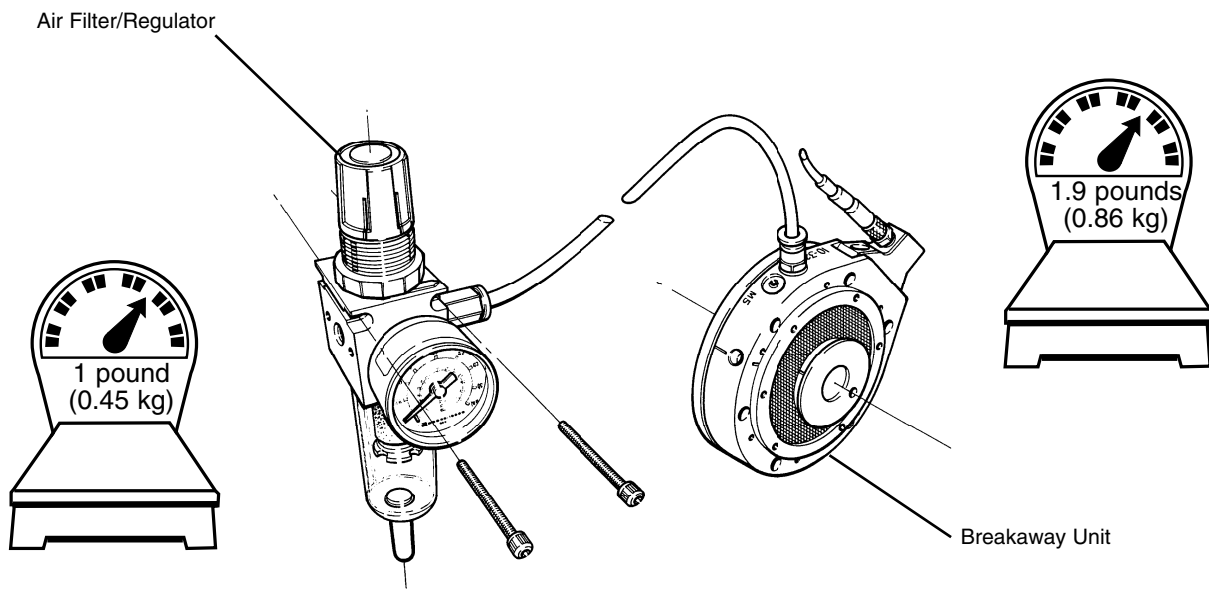
**Breakaway Control Function**

Shop air pressure .....100 psi (6.9 bar) maximum

**Size**

Breakaway Width .....3.8 inches (97 mm)  
Breakaway Height (thickness) .....2.25 inches (57 mm)  
Air filter/regulator Height .....7.06 inches (179 mm)  
Air filter/regulator Width .....1.56 inches (40 mm)  
Air filter/regulator depth (from gauge to back) .....3.125 inches (79 mm)

**Weight**.....Figure 1-7



**Figure 1-7 THC Breakaway Option**

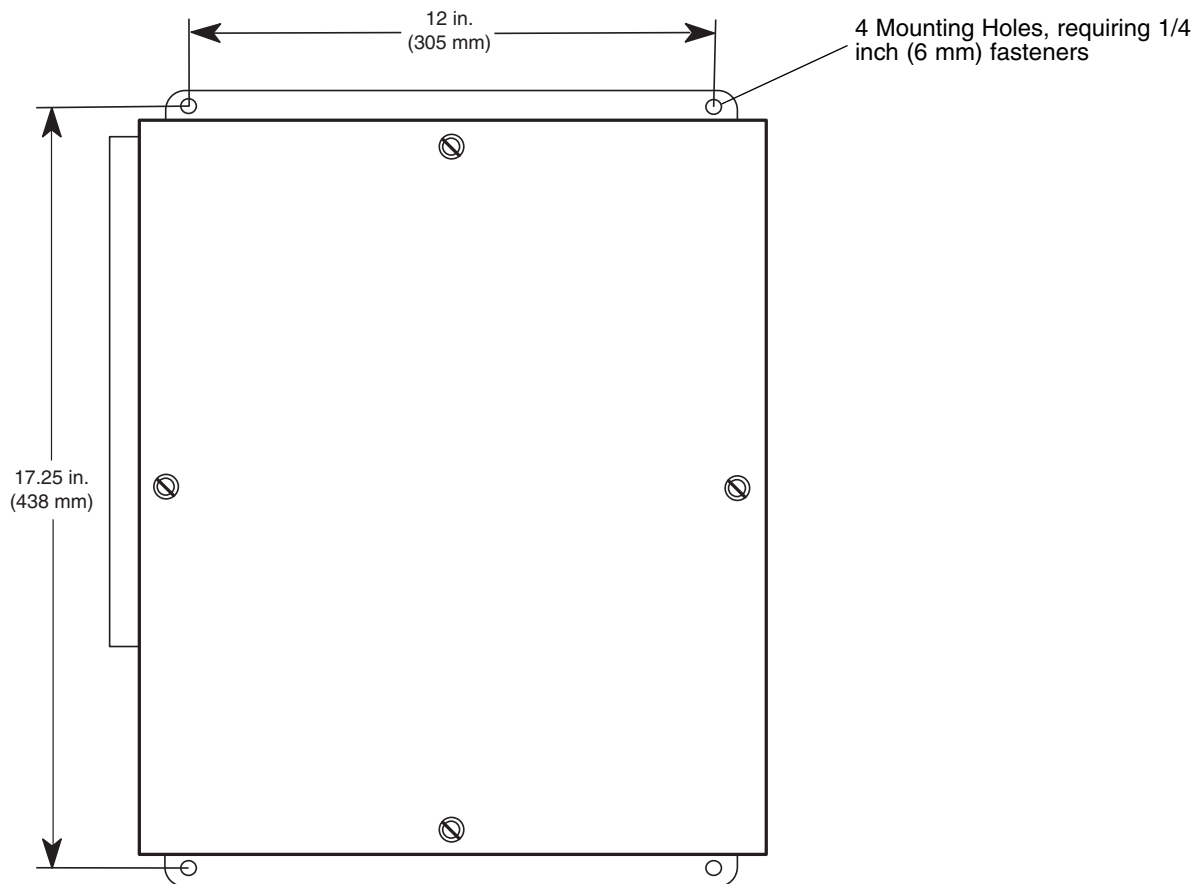
## SYSTEM UNIT MOUNTING

Detailed installation instructions are included with the system.

Mount the electrical control units (THC control module and plasma interface assembly) as required using customer supplied hardware. Do not allow the units to lay unsecured on top of cabinets or on the floor.

### THC Control Module

Mount the THC control module close to the CNC controller for easy access to the THC system power and to provide easy access for routing and connecting cables. The unit can be mounted in any position **except with the power module (AC receptacle and switch) facing up**. See Figure 1-8 for mounting details.



**Figure 1-8 THC Control Module Mounting Details**

# SPECIFICATIONS & UNIT MOUNTING

## Plasma Interface Assembly

### HT4400 INSTALLATION

**NOTE:** Instructions to remove the plasma interface PCB from the interface enclosure and install it into the HT4400 power supply are included in the CommandTHC instruction manual 802780.

The plasma interface enclosure is not used for the HT4400 installation.

Mount the plasma interface assembly close to the plasma power supply. Close proximity will allow ease in routing and connecting control and process signal wires between the units. The unit can be mounted in any position. See Figure 1-9 for mounting details.

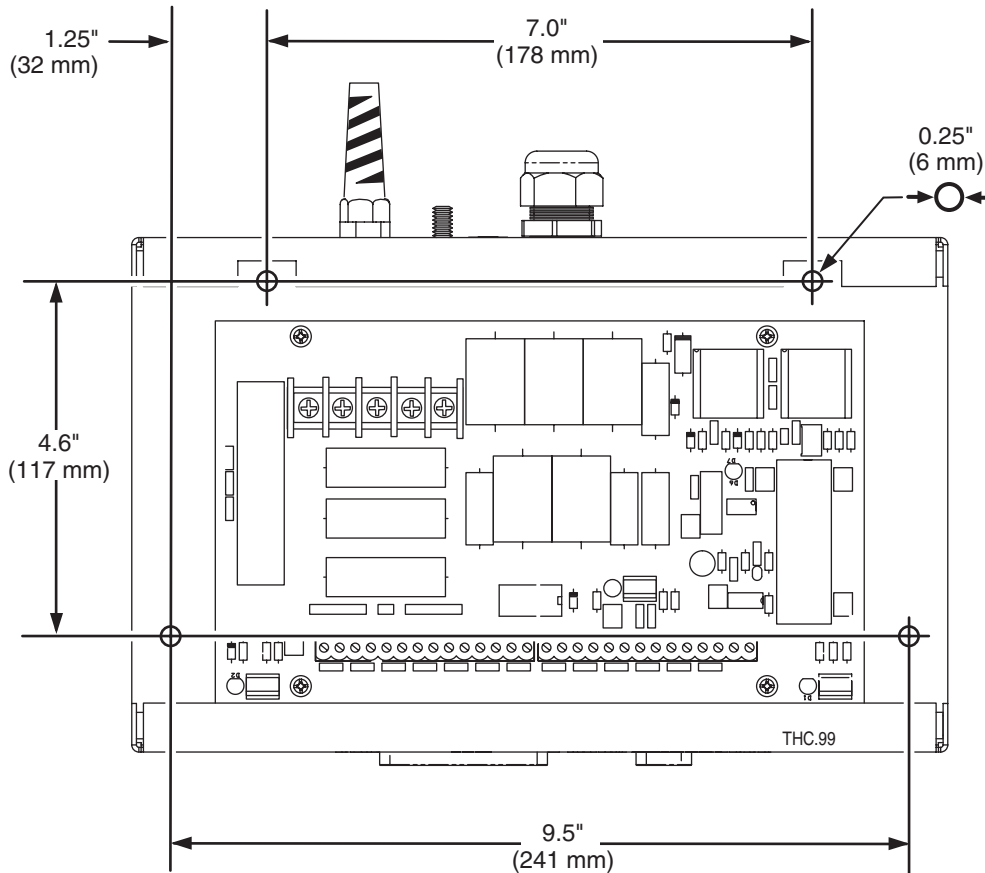
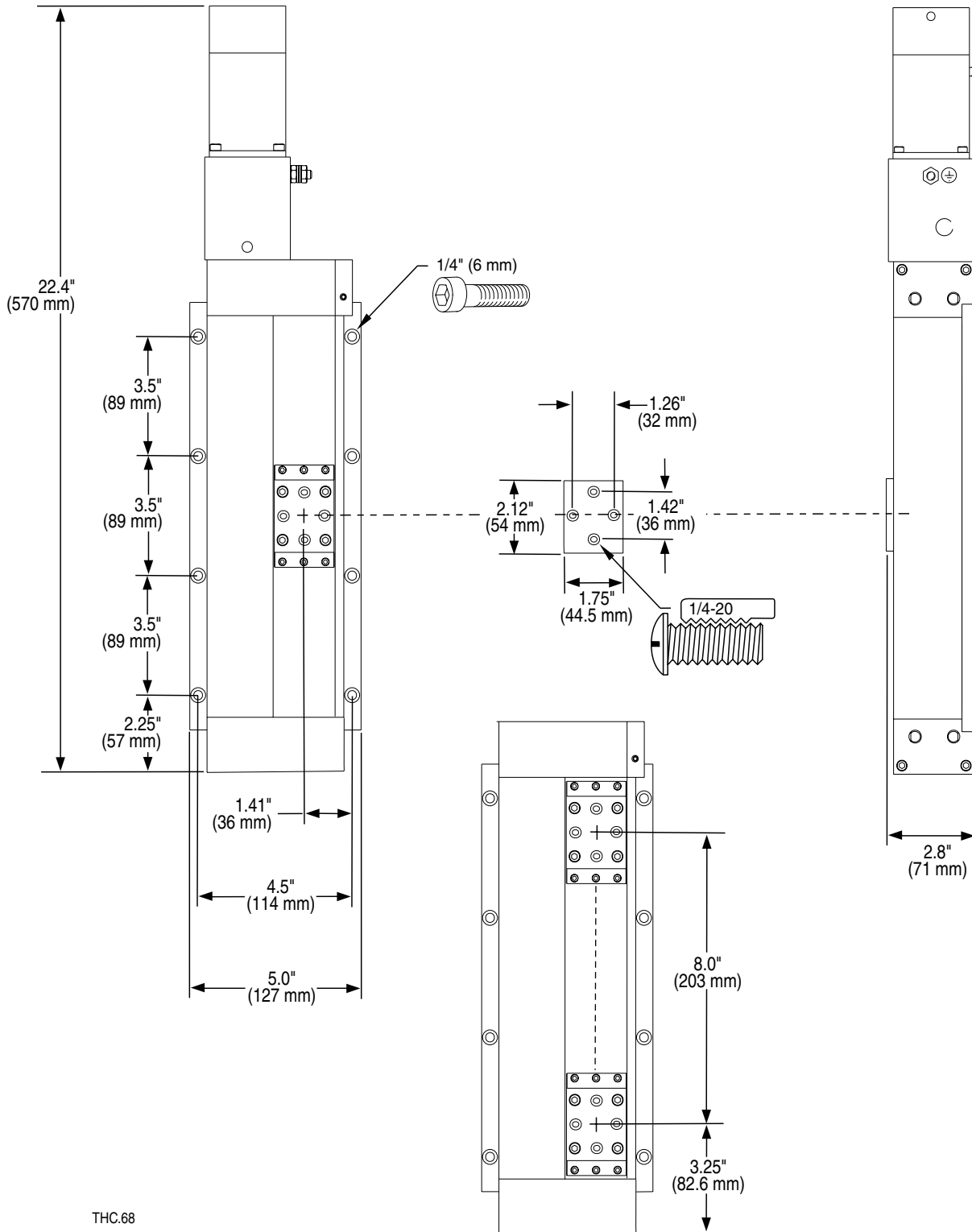


Figure 1-9 THC Control Module Mounting Details

**X-Y Lifter Assembly**

The X-Y lifter assembly is mounted on the X-Y cutting table. See Figure 1-10 for mounting details.



**Figure 1-10 X-Y Lifter Assembly Mounting Details**

### Torch Mounting Block Kit

A torch mounting block kit is required to mount the torch to the lifter or to the optional breakaway.

Each kit includes all hardware required to mount the torch to the X-Y lifter as shown in Figure 1-11. The kit can also be used to mount the torch to the optional breakaway as shown in Figure 1-12.

There are 3 kits available depending on the diameter of your torch. Use the order form to determine which kit you need.

- See Figure 1-5 for torch-to-lifter mounting dimensions.

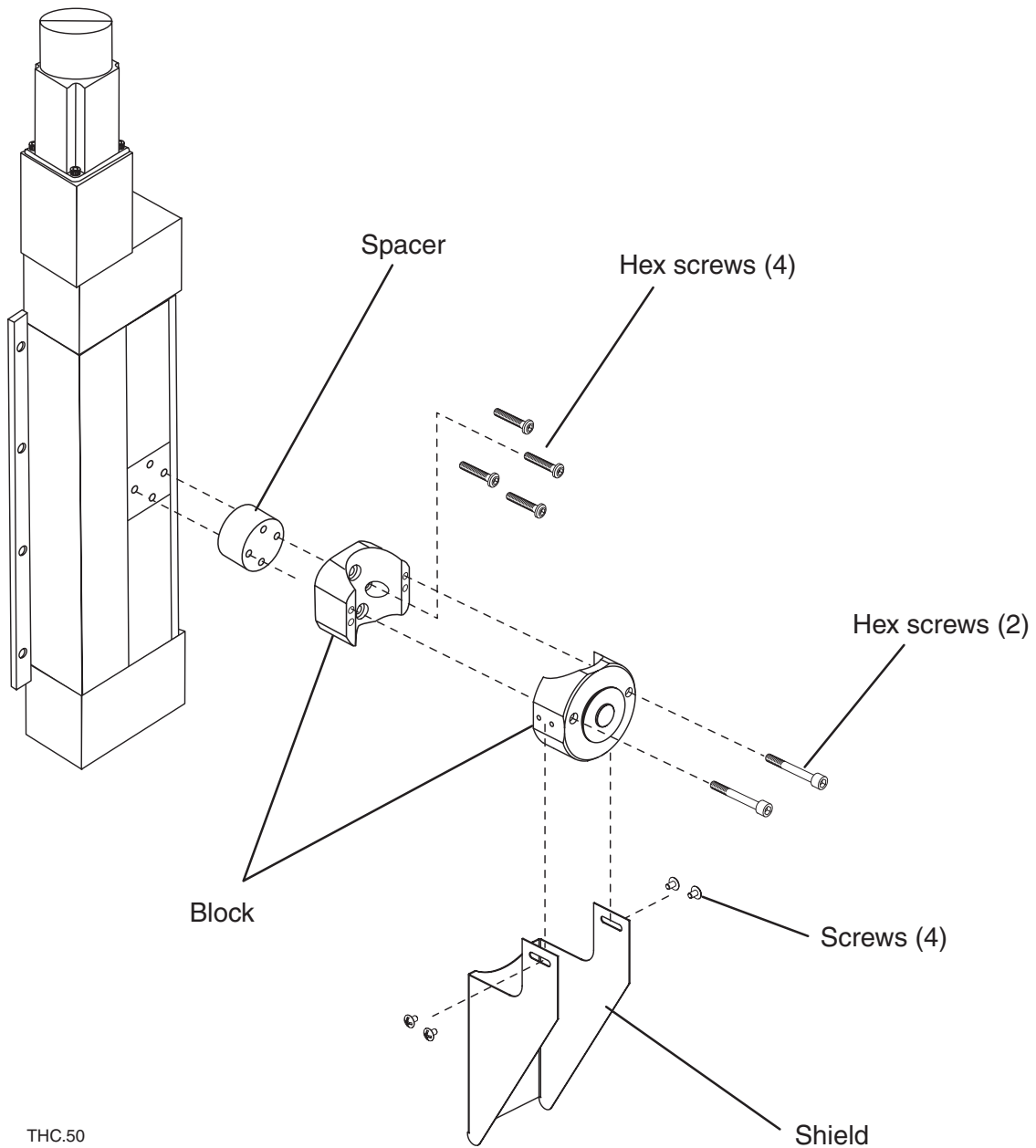


Figure 1-11 X-Y Lifter Assembly Torch Mounting Block Mounting Details

### Torch Breakaway Kit 128281 (Optional)

The breakaway kit includes all hardware required to mount the breakaway to the X-Y lifter as shown in Figure 1-12. Detailed installation instructions are included with the THC system. Additional requirements are listed below:

1. Install the breakaway pressure switch wiring lead (6) to the CNC emergency stop circuit.
2. Mount the filter/regulator (7) per Figure 1-12.
3. Plumb the air supply to the regulator (7) inlet port at 100 psi (6.9 bar) (recommended maximum pressure). The regulator inlet port size is 1/4 inch NPTF.
4. See Figure 1-5 for torch-to-lifter mounting dimensions.



# SPECIFICATIONS & UNIT MOUNTING

## LEGEND

- (1) Lifter Assembly
  - (2)\* Fiberglass Bracket
  - (3)\* Breakaway
  - (4)\* Collar
  - (5) Torch Mounting Block
  - (6)\* Wiring Lead
  - (7)\* Filter/Regulator
  - (8) Hex Screws, 2  
8-32 X 1.5 inch  
(4 mm X 40 mm)  
Customer Supplied
  - (9)\* Tubing
- \*Included in breakaway kit.

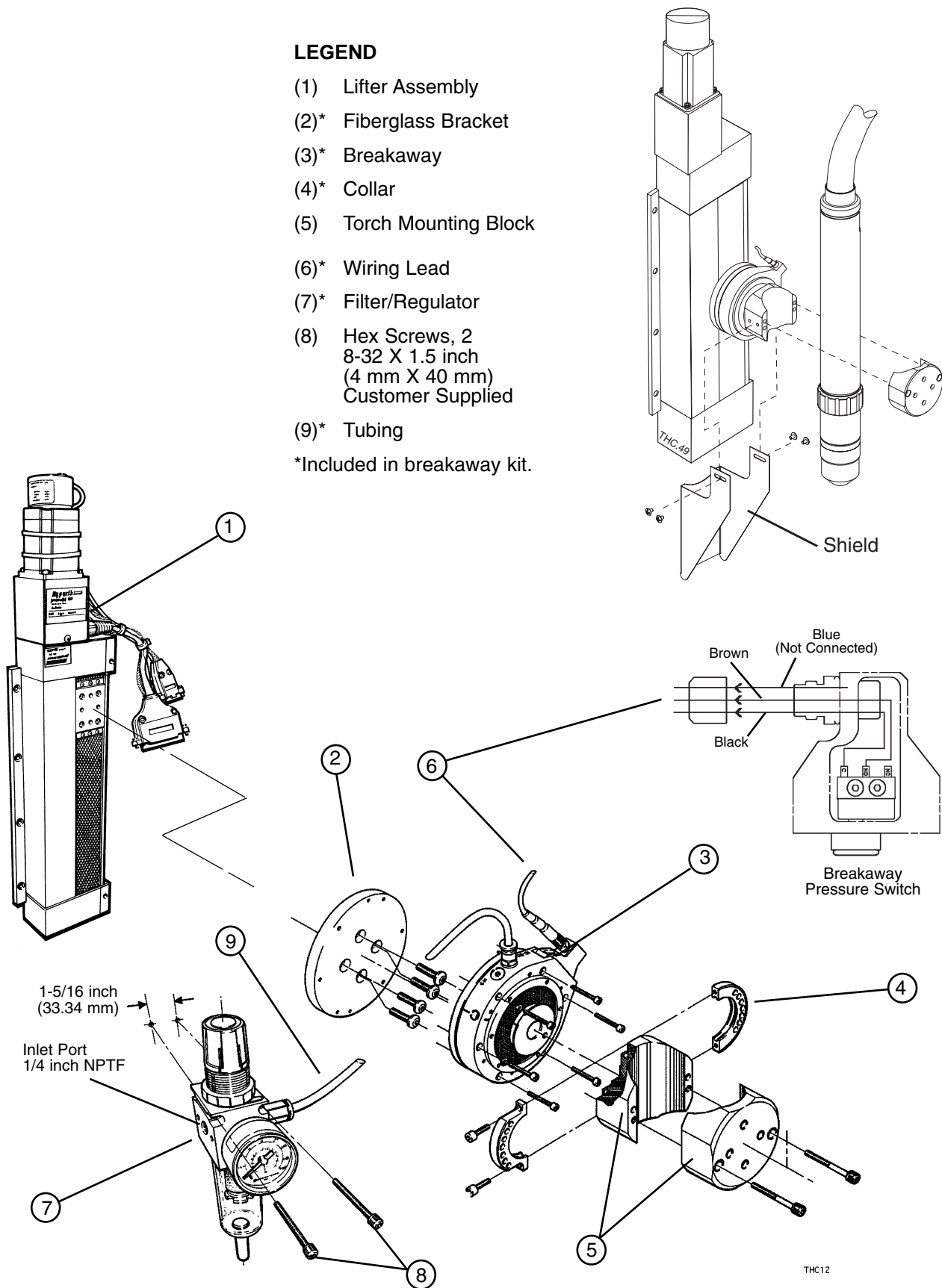


Figure 1-12 Robotic Lifter Breakaway Kit Mounting Requirements

## Section 2 ORDER FORM

Distributor Information:

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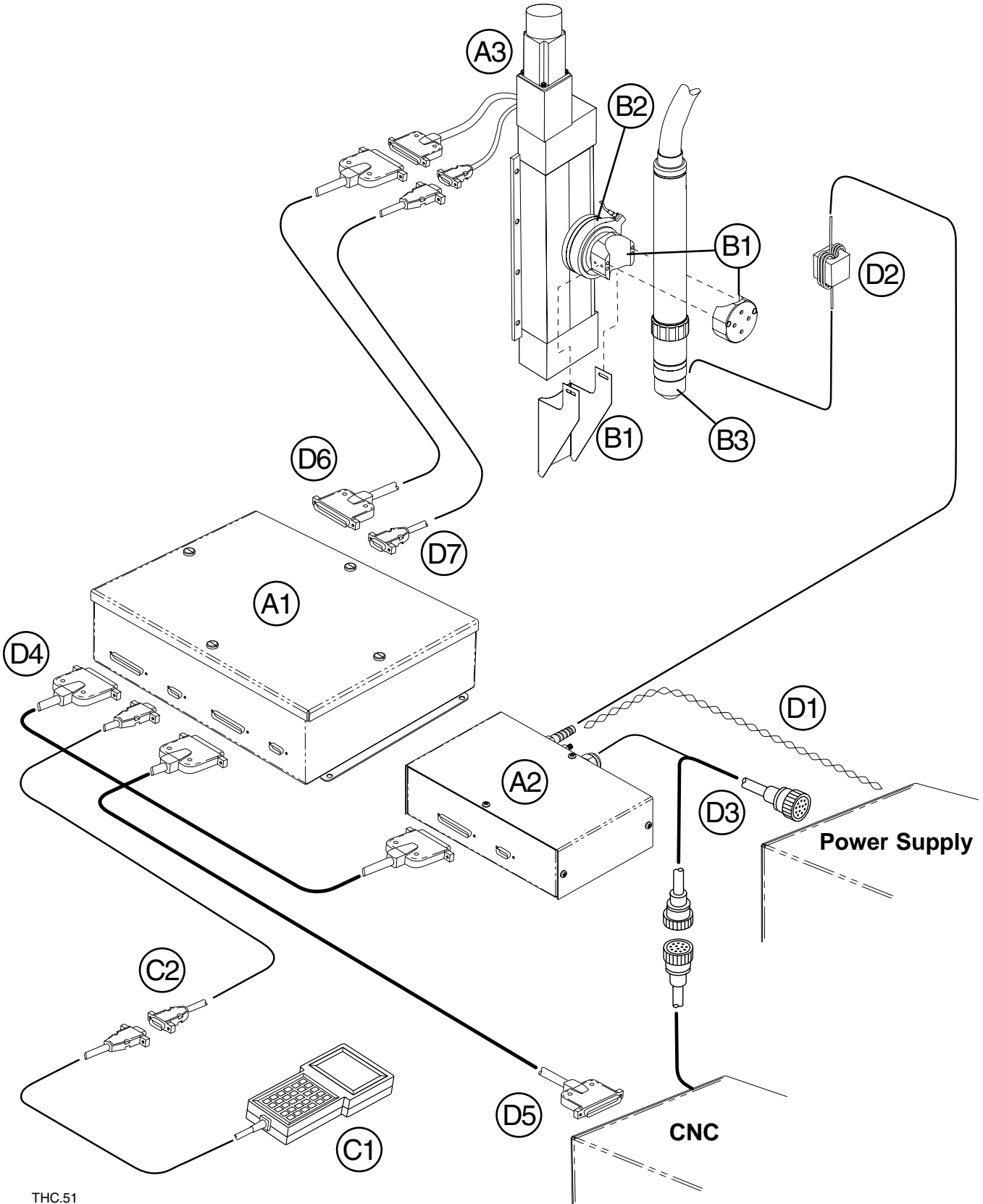
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Customer Information:

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THC.51

**(A) X-Y THC Standard System Components**

**050021 X-Y THC System**

- (A1) 053018** THC Control Module
- (A2) 128494** Plasma Interface Assembly
- (A3) 128606** X-Y Lifter Assembly without Torch Mounting Block Assembly

**(B) Torch Mounting Block and Breakaway Kits**

**(B1) Mounting Block Kits**

- Customer Supplied
- 128279 2 inch dia. torch
- 128278 1-3/4 inch dia. torch
- 128277 1-3/8 inch dia. torch

**(B2) Breakaway Kit**

- 128281

**(B3) Torch Retaining Cap with IHS Tab**

- 120543 PAC184 HD3070
- 020687 PAC186 HD3070
- 120837 MAX200, HT2000, HT2000LHF
- 120907 HT4400

**(C) Optional Operator Control Pendant**

- (C1) 053019** Control Pendant with attached 25 ft. (7.6 m) cable

**(C2) Optional Control Pendant Extension Cable**

- 123018 25 ft. (7.6 m)
- 123019 50 ft. (15.2 m)

**(D) X-Y System Interconnecting Cables**

**(D1) Electrode (-) and Work (+) Sensing Wires**

- Customer Supplied (HT4400: Not required)

**(D2) IHS Ohmic Contact Wire (HD3070, MAX200, HT2000, HT2000LHF, HT4400 only)**

- 123464 10 ft./3 m
- 123465 20 ft./6.1 m
- 123221 25 ft. (7.6 m)
- 123222 30 ft. (9.1 m)
- 123223 40 ft. (12.2 m)
- 123039 50 ft. (15.2 m)
- 123224 75 ft. (23 m)
- 123225 100 ft. (30.5 m)
- 123226 125 ft. (38 m)
- 123227 150 ft. (45.6 m)

**(D3) Power Supply Interface Cable**

- Customer Supplied
- 123270 6 ft. (1.8 m) (HD3070/1070)
- 123329 6 ft. (1.8 m) (HT2000/HT2000LHF)
- 123330 6 ft. (1.8 m) (HT4001)
- 123358 6 ft. (1.8 m) (MAX200)
- PowerMax Series - Supplied with Machine Systems
- MAX100 - Customer Supplied
- HT4400 - Not required with CommandTHC

**(D4) Plasma Interface Cable**

- 123209 5 ft. (1.5 m)
- 123210 10 ft. (3 m)
- 123211 15 ft. (4.6 m)
- 123212 20 ft. (6.1 m)
- 123022 25 ft. (7.6 m)
- 123213 30 ft. (9.1 m)
- 123214 35 ft. (10.6 m)
- 123215 40 ft. (12.2 m)
- 123216 45 ft. (13.7 m)
- 123023 50 ft. (15.2 m)
- 123217 75 ft. (23 m)
- 123218 100 ft. (30.5 m)
- 123219 125 ft. (38 m)
- 123220 150 ft. (45.6 m)

**(D5) Machine Interface Cable**

- 123209 5 ft. (1.5 m)
- 123210 10 ft. (3 m)
- 123211 15 ft. (4.6 m)
- 123212 20 ft. (6.1 m)
- 123022 25 ft. (7.6 m)
- 123213 30 ft. (9.1 m)
- 123214 35 ft. (10.6 m)
- 123215 40 ft. (12.2 m)
- 123216 45 ft. (13.7 m)
- 123023 50 ft. (15.2 m)
- 123217 75 ft. (23 m)
- 123218 100 ft. (30.5 m)
- 123219 125 ft. (38 m)
- 123220 150 ft. (45.6 m)

**(D6) Lifter I/O Interface Cable**

- 123209 5 ft. (1.5 m)
- 123210 10 ft. (3 m)
- 123211 15 ft. (4.6 m)
- 123212 20 ft. (6.1 m)
- 123022 25 ft. (7.6 m)
- 123213 30 ft. (9.1 m)
- 123214 35 ft. (10.6 m)
- 123215 40 ft. (12.2 m)
- 123216 45 ft. (13.7 m)
- 123023 50 ft. (15.2 m)
- 123217 75 ft. (23 m)
- 123218 100 ft. (30.5 m)
- 123219 125 ft. (38 m)
- 123220 150 ft. (45.6 m)

**(D7) Motor Drive Cable**

- 123197 5 ft. (1.5 m)
- 123198 10 ft. (3 m)
- 123199 15 ft. (4.6 m)
- 123200 20 ft. (6.1 m)
- 123020 25 ft. (7.6 m)
- 123201 30 ft. (9.1 m)
- 123202 35 ft. (10.6 m)
- 123203 40 ft. (12.2 m)
- 123204 45 ft. (13.7 m)
- 123021 50 ft. (15.2 m)
- 123205 75 ft. (23 m)
- 123206 100 ft. (30.5 m)
- 123207 125 ft. (38 m)
- 123208 150 ft. (45.6 m)