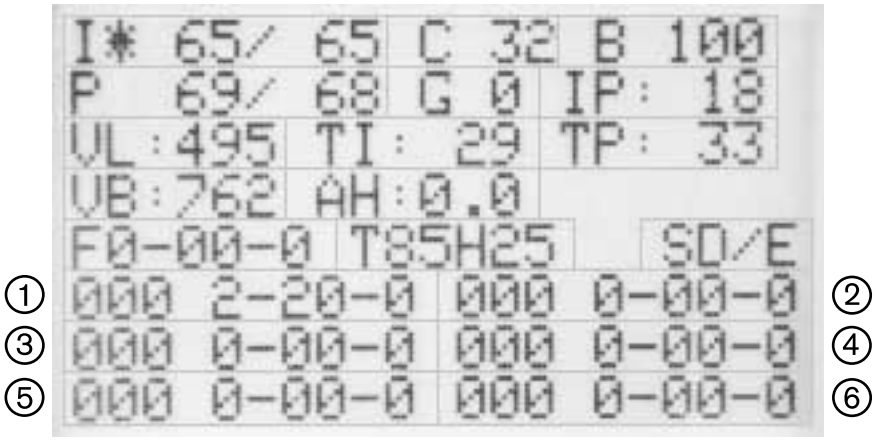
Fault codes

Fault codes displayed on the LCD screen in “service mode” are in the format N-nn-n. Fault codes displayed on the LCD screen in “operator mode” have one fewer digit and appear in the format N-nn. The tables in this section show all digits.

The fault priority is assigned based on the fault code value: the higher the number, the higher the fault priority. Only one fault code is set at one time. If more than one fault occurs at the same time, only the fault with the highest priority is set.

Displaying the service screen

For troubleshooting faults, display the service screen by simultaneously pressing the automatic/manual and current/gas mode selectors for approximately two (2) seconds. The service screen displays.



Designator	Description
I	Current set/read
C	LCD contrast
B	LCD brightness (per cent)
P	Pressure set/read
G	Gas test enable (1)/disable (0)
IP	Boost circuit current (not present in CE machines)
VL	Incoming AC line voltage
TI	Inverter module temperature (°C)
TP	Boost module temperature (°C), not present in CE machines
VB	DC buss voltage
AH	Arc hours
F	Live fault code
T	Torch identifier (amps/H hand or M machine/lead length in feet)
S	DSP/Control board software versions
1 - 6	1 is the most recent fault code; 6 is the oldest fault code

Note: Fault codes beginning with zero (0-nn-n) are not recorded in the fault log.

To move the field selector (*) between fields, press the current/gas mode selector. The asterisk indicates the selected field. You can alter the I, C, B, P, and G fields by turning the adjustment knob.

To toggle between (I) Current set/read and (P) Pressure set/read, press the automatic/manual mode selector. The LED is illuminated when the Pressure set/read field is selected.

To exit the service screen, simultaneously press the automatic/manual and current/gas mode selectors. The operator screen displays.

Important fault icons

One of the following fault icons may appear on the LCD display in operator mode:

Warning

The system continues to operate.

Fault

The system stops cutting and is able to recover when the fault is cleared.

Error

The system needs service.

Performing a cold restart

Sometimes a “cold restart” clears the fault. When a cold restart is recommended in one of the Solutions below, do the following:

1. Power OFF the machine.
2. Wait 20 seconds or until the red LED near the top of the DSP board blinks.
3. Power ON the machine.

Fault codes and solutions

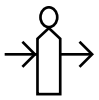
Each table below describes a fault category and suggests solutions for each fault code. Several of the fault descriptions show a test number. If the listed solutions do not resolve the problem, refer to page 5-38 *System tests* and perform the indicated numbered test.

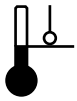
These fault codes indicate non-hardware faults.

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
0-00-0	None	On	Off	-	No errors
0-00-1	Unknown error				▪ Perform a cold restart.
0-00-2	Drive unknown error				▪ Perform a cold restart.

These fault codes identify operational faults. On the operator screen, the last digit is omitted. Display the service screen for more information on faults 11, 19, 30, 40, 60, and 99.

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
0-11-0	Remote controller cut mode invalid	On	Off		There is a problem with the remote controller or the software interface to the system. The system cannot interpret the cut mode, cut current, or pressure information coming from the controller. ▪ Fix the controller. ▪ Check the interface cable.
0-11-1	Remote controller current invalid				
0-11-2	Remote controller pressure invalid				
0-12-0	Low input gas pressure: Warning ***(Test 10)***	On	Off		▪ Adjust the gas inlet pressure as needed.
0-13-0	AC input unstable (line resonance): Warning	Blinks (3 Hz)	Off		▪ Perform a cold restart. ▪ If the fault does not clear, correct the power source. Change the character, generally the impedance, of the line.

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
0-19-9	Power board hardware protection. One or more major power board hardware faults (or electrical noise) detected: Warning. Fault 0-19-9 can occur three (3) times before becoming a 0-99 fault.	On	On		The inverter shuts down and does not fire again for several seconds. If the fault is caused by electrical noise, the fault clears in a few seconds and the machine operates normally. If a true fault continues to occur, the 0-99 fault code appears on the operator screen. Access the fault log in the service screen to identify the major fault.
0-20-0	Low gas pressure ***(Test 10)*** The gas pressure has fallen below the minimum pressure for that process, mode, and lead length.	On	On		Ensure the gas line is properly installed. Replace the air filter element if dirty. Replace the gas supply line if restricted. Ensure the inlet pressure is 85 to 135 PSI (5.9 to 9.3 bar).
0-21-0	Gas flow lost while cutting ***(Test 9)***	On	On		The DSP monitors the nozzle to electrode voltage and if it detects a rapid change in that voltage, the inverter shuts down. Usually this indicates a rapid loss of gas pressure from a kinked or blocked air supply line. ▪ Correct any gas supply restrictions and restart the power supply. ▪ Check the torch lead for leaks or kinking.
0-22-0	No gas input	On	On		▪ Restore the gas supply. ▪ Restart the power supply.

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
0-30-0	Torch stuck open ***(Test 6)*** The nozzle and electrode are not touching after a start is received.	On	On		▪ If incorrect consumables are installed or the consumables became loose or were removed while the power supply is ON, turn OFF the power supply, correct the problem and then turn ON the power supply to clear this fault. ▪ Inspect the torch for signs of wet or oily air. ▪ Inspect the torch for any signs of damage or pitting on the electrode contact surface. ▪ If the consumables appear to be installed correctly, the torch may be damaged. Test with a known working torch. ▪ For a 0-30-1 fault code, place the unit in gas test mode. Enter “manual mode”, move to “G” (gas), and use the adjustment knob to toggle to “1” (gas test mode). Ensure that only the dump valve light is on during the gas test. Toggle back to “0” and exit “manual mode.” Replace the regulator if necessary. ▪ If the problem persists, contact your Hypertherm distributor or authorized repair facility.
0-30-1	Torch stuck closed ***(Test 6)*** ▪ The nozzle and electrode will not separate after a start is received. ▪ The regulator may not be functioning properly.				
0-40-0	PFC/Boost IGBT module under temperature ***(Test 4)***	On	On		For an over-temperature fault, leave the machine powered ON and confirm that the fan is operating (Test 11). Ensure adequate air flow around the unit. If the duty cycle has been exceeded, let the unit cool and work within the duty cycle limits listed in the *Operation* section. For an under-temperature (<-22°F or -30°C) fault, move the unit to a warmer location. The inverter temperature sensor is a thermistor mounted on the heat sink beside the inverter IGBT module. Its room temperature resistance is about 10 kΩ.
0-40-1	PFC/Boost IGBT module over temperature ***(Test 4)***				
0-40-2	Inverter IGBT module under temperature ***(Test 4)***				
0-40-3	Inverter IGBT module over temperature ***(Test 4)***				

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
0-50-0	Retaining cap off ***(Test 8)***	On	On		▪ Verify that proper consumables and retaining cap are installed. Replace damaged parts. Refer to section *Torch Setup*. ▪ With the retaining cap installed, check for continuity between pins 5 and 7 at the torch connector. ▪ If the consumables appear to be installed correctly, the torch may be damaged. Test with a known working torch. ▪ After correcting the problem, perform a cold restart.
0-51-0	Start/trigger signal on at power up ***(Test 7)*** This situation indicates that the power supply is receiving a start signal at power-up. It is sometimes referred to as a "stuck start."	On	On		If the power supply is turned on while the torch trigger is pressed, the system is disabled. ▪ Release the trigger and cycle the power to the machine. ▪ Check for continuity between Pin 6 and Pin 7 of the torch connector. There should be very low resistance when the torch trigger is pulled. ▪ Test with a known working torch.
0-52-0	Torch not connected	On	On		▪ Plug a torch lead into the FastConnect receptacle on the front of the power supply and recycle the power switch.
0-60-0	Phase loss ***(Test 1)***	On	On		Wear proper personal protection equipment when checking the voltage. ▪ Check for proper voltage (phase to phase and phase to ground) at the power source and at the machine.
0-60-1	Under voltage ***(Test 1)***				▪ Increase the supply voltage.
0-60-2	Over Voltage ***(Test 1)***				▪ Decrease the supply voltage.
0-61-0	AC input unstable: Shutdown	On	On		▪ Test the machine from another AC power source. ▪ Power down and correct the line resonance problem before continuing.

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
0-98-0	Internal communication failure The control board and the DSP are not communicating.	On	On		▪ Perform a cold restart. ▪ Confirm that the connecting ribbon cable is installed properly between the control board and the DSP board.
0-99-0	System hardware fault (service required) Indicates a major fault with the system.	On	On		▪ Display the service screen. ▪ A qualified service technician must service the system. Contact your distributor or authorized repair facility.

1-nn-n

These fault codes usually relate to the DSP board and can only be seen on the service screen.

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
1-00-0	Digital signal processor fault	On	On		These are internal processor checks and are not likely to be caused by a hardware failure. ▪ Perform a cold restart. If that doesn't fix the problem, it is possible that the DSP or Power board have failed.
1-10-0	A/D converter fault				
1-20-0	I/O fault				

These fault codes usually relate to either the DSP or the power board and can only be seen on the service screen.

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
2-00-0	Analog to Digital (A/D) converter value out of range	On	On		▪ Perform a cold restart. If that doesn't fix the problem, it is possible that the DSP or Power board have failed.
2-10-0	Inverter module temp sensor open ***(Test 4)***				▪ Check the associated wiring. ▪ Check the resistance across the thermistor. It should be about 10 kΩ at room temperature. If no problems are found, it is possible that the inverter heat sink temperature sensor assembly (228805) has failed.
2-10-1	Inverter module temp sensor shorted ***(Test 4)***				
2-11-0	Pressure sensor open ***(Test 10)***				▪ Check the associated wiring. ▪ If necessary, replace the pressure sensor (kit 228689)
2-11-1	Pressure sensor shorted ***(Test 10)***				
2-20-0	Torch ID The DSP does not recognize the torch.				▪ Confirm that the torch is seated properly in the connector. ▪ Inspect the connector for the proper pin-out.

These fault codes relate to the power board and can only be seen on the service screen.

Fault code	Description (*System test number*)	Power LED	Fault LED	Fault icon	Solutions
3-00-0	DC bus voltage ***(Test 5)*** DC bus voltage is out of range.	On	On		▪ Inspect the PFC Boost circuitry (CSA) ▪ Test the PFC Boost IGBT (CSA)
3-10-0	Fan speed ***(Test 11)*** The fan speed is below the minimum speed.				▪ Clean the fan assembly.
3-10-1	Fan ***(Test 11)***				▪ Check the associated wiring. ▪ If necessary, replace the fan assembly.
3-11-0	PFC module temp sensor open ***(Test 4)***				▪ Check the associated wiring. ▪ If necessary, replace the PFC/Boost IGBT module.
3-11-1	PFC module temp sensor shorted ***(Test 4)***				▪ Check the associated wiring. ▪ If necessary, replace the PFC/Boost IGBT module.
3-20-0	Fill valve ***(Test 9)*** Indicates that the Fill Valve is not connected.				▪ Check the associated wiring. ▪ If necessary, replace the electronic regulator. (Kit 228687)
3-20-1	Dump valve ***(Test 9)*** Indicates that the Dump Valve is not connected.				▪ Check the associated wiring. ▪ If necessary, replace the electronic regulator. (Kit 228687)
3-20-2	Valve ID ***(Test 9)***				The DSP does not recognize the electronic regulator.
3-20-3	Electronic regulator is disconnected ***(Test 9)*** The electronic regulator is not drawing current.				▪ Inspect the associated wiring, particularly the 7-pin connector. ▪ If necessary, replace the electronic regulator.(Kit 228687)

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
3-41-0	Drive fault	On	On		If an activation signal is sent to a device and the device does not activate (machine motion relay or in-rush relay for example) this fault will occur.
3-42-0	5 or 24 VDC fault ***(Test 5)***				The 5 or 24 VDC supply from the flyback circuit is out of range.
3-42-1	18 VDC fault ***(Test 5)***				The 18 VDC supply from the flyback circuit is out of range. ▪ If necessary, replace the power board.
3-43-0	Inverter capacitors unbalanced ***(Test 2)***				Voltage across one or both inverter caps is more than 25% different than nominal. ▪ CSA units have a 760 VDC bus voltage. ▪ Nominal is 380 VDC for each cap. ▪ Fault condition: < 275 or > 485 VDC across either capacitor. ▪ CE units at 400 VAC have a 560 VDC bus voltage. ▪ Nominal is 280 VDC for each cap. ▪ Fault condition: <200 or> 360 VDC across either capacitor. ▪ Test the IGBT module. ▪ Test the inverter capacitors. (2200µF)
3-44-1	PFC over current				High current in the PFC/Boost circuit. ▪ Test the PFC IGBT. ▪ Replace it if faulty. ▪ If necessary, replace the power board.

Fault code	Description (*System test number)*	Power LED	Fault LED	Fault icon	Solutions
3-51-1	Inverter saturation fault (the inverter is over current)	On	On		Upper and lower inverter IGBTs are gating (being activated) in phase rather than 180° out of phase. ▪ Test the two inverter IGBTs in the module. ▪ Replace the module if either is faulty. ▪ If necessary, replace the power board.
3-52-0	Shoot through				
3-60-0	Power board				The DSP does not recognize the power board. The code is for future machines where the current DSP board will not work with future power boards.
3-70-0	Internal serial communications fault				There is a fault with the communication between the DSP and Power board. ▪ Check the board connector. ▪ If necessary, replace either the DSP or Power board.