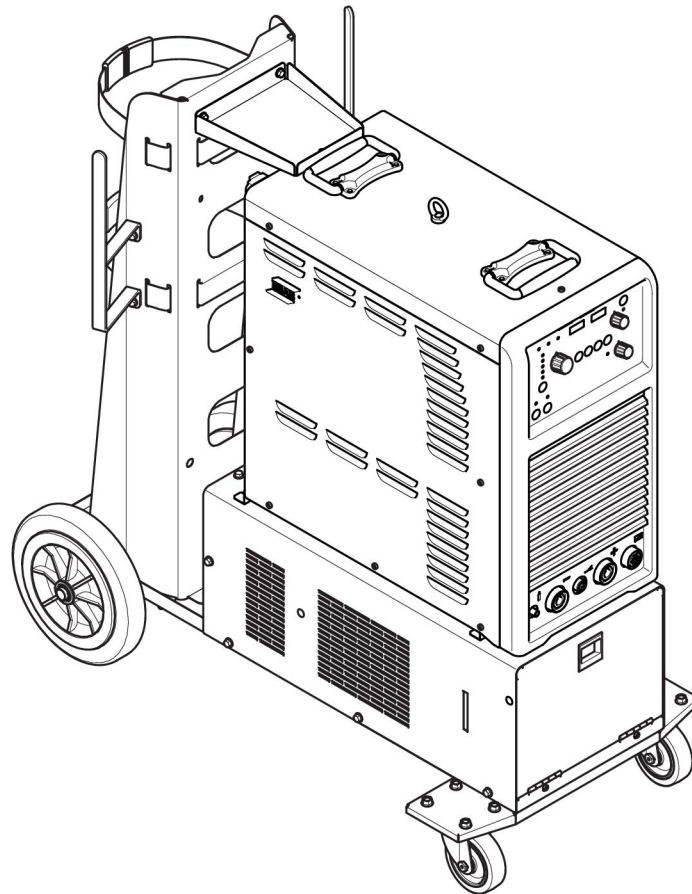


Heliarc AC/DC 283i, 353i



Service manual

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READ THIS FIRST

Maintenance and repair work must be performed by an experienced person, and electrical work only by a trained electrician. Use only recommended replacement parts.

This service manual is intended for use by technicians with electrical/electronic training or help in connection with fault-tracing and repair.

Use the wiring diagram as a form of index for the description of operation.

Use the spare parts list as a guide to where the components are located in the equipment. The spare parts list is published as a separate document.

This manual contains details of design changes that have been made up to and including October 2013.

The manual is valid for: Heliarc® AC/DC 283i, Heliarc® AC/DC 353i



NOTE!

The unit is tested by ESAB in a general set-up. The responsibility for safety and function, of the specific set-up, lies with the integrator.

The Heliarc® family is designed and tested in accordance with Canadian standard CAN/CSA-E60974-1-00 and American standard UL 60974-1. On completion of service or repair work, it is the responsibility of the person(s) doing the work to ensure that the product still complies with the requirements of the above standard.



CAUTION!

Read and understand the instruction manual before installing or operating.



WARNING!

Personnel working with the equipment must be aware of the fact that high voltage is present in the equipment. Parts with high voltage are not accessible during normal operation. If the cover is opened for maintenance or other reason, parts connected to mains such as connection terminals may be exposed.



WARNING!

High voltage is accumulated in capacitors after power has been switched off. Always wait at least five minutes after the power is switched off, before starting any work with the power source.



CAUTION!

Electrostatic discharge (ESD). Sensitive components such as integrated circuits may be damaged by static electricity.

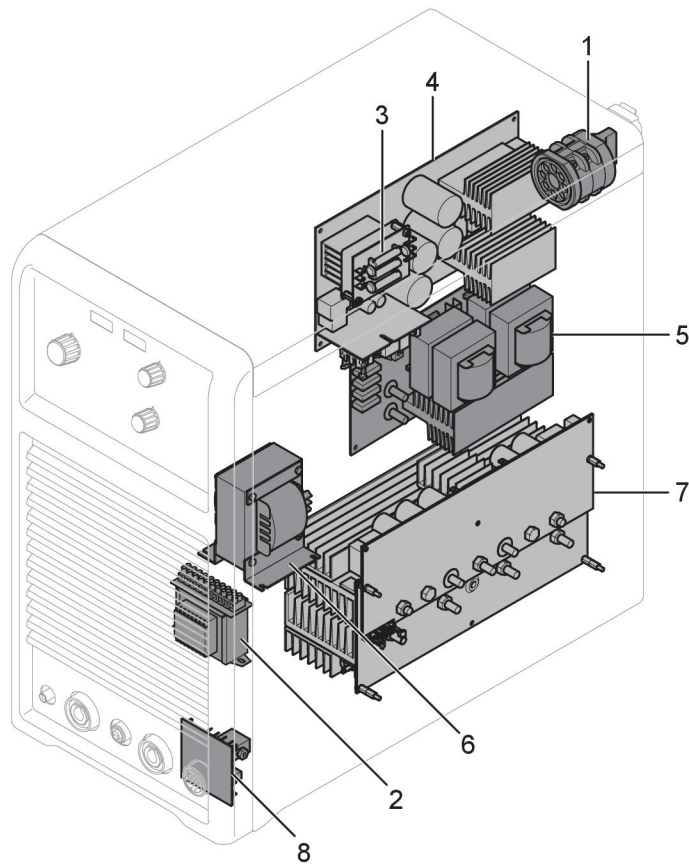


CAUTION!

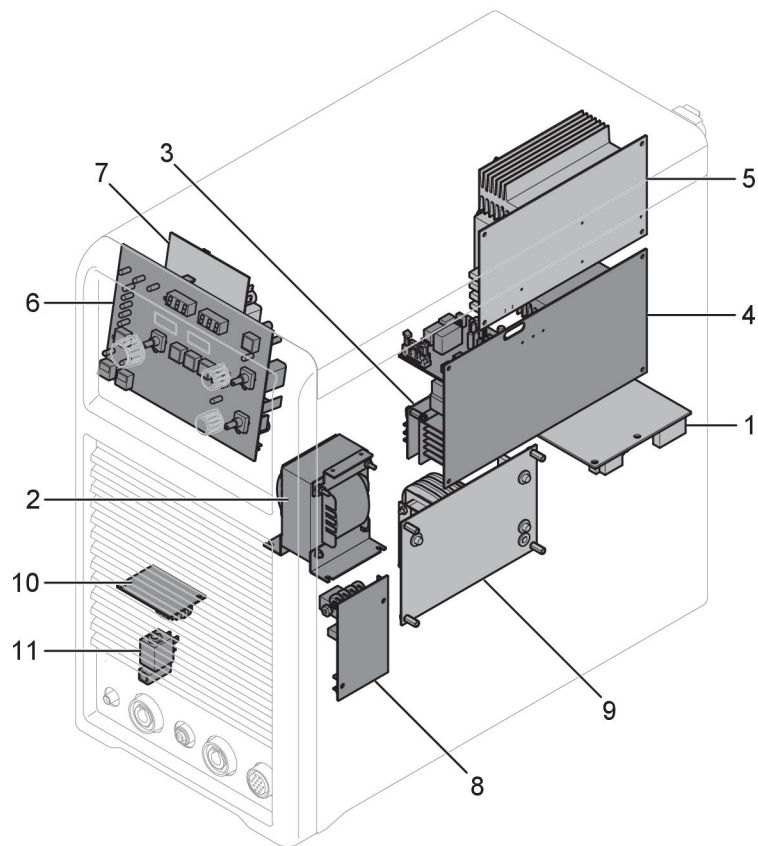
Use an approved antistatic wrist strap to avoid damage to sensitive components. Use the original packaging during transportation and storage of sensitive components.

INTRODUCTION

Component positions

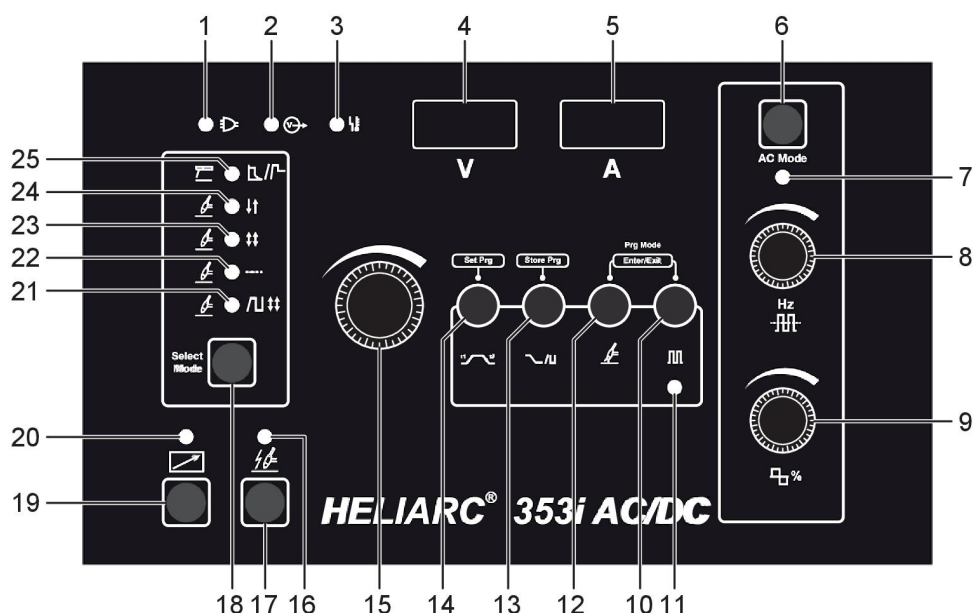


Item	Denomination	Note
1	Power switch	S1
2	Auxiliary transformer	T AUX1
3	Fuse board	FUB2
4	Primary inverter	PCB10
5	Secondary inverter	PCB11
6	Secondary inductance	L2
7	AC/DC Converter	PCB2
8	Remote control filter board	PCB4



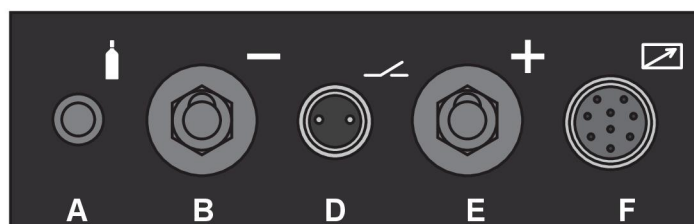
Item	Denomination	Note
1	EMC filter	
2	Primary inductance	L1
3	Fuse board	FUB1
4	Primary inverter	PCB1
5	Secondary inverter	PCB9
6	Logic board	PCB7
7	AC drive board	PCB8
8	HF board spark gap	PCB5
9	HF transformer	PCB3
10	Torch trigger filter board	PCB6
11	Gas valve	

Front panel



Item	Denomination	Item	Denomination
1	Power source live LED	14	Slope up/down button (slope up 0.1-10 sec, slope down 0.1-10 sec)
2	Welding enabled LED	15	Encoder knob for current setting and other settings
3	Over temperature LED	16	HF LED
4	Volt display	17	HF button
5	Ampere display	18	Select mode button
6	AC mode button	19	Remote control button
7	AC mode LED	20	Remote button LED
8	AC frequency setting, 20-200 Hz	21	Mode TIG dual schedule LED
9	AC balance setting, 10-90%	22	Mode TIG spot LED
10	Pulse mode button (0.4-300 Hz DC, 0.4-2 Hz AC)	23	Mode TIG 4 stroke LED
11	Pulse mode LED	24	Mode TIG 2 stroke LED
12	Pre-gas (0.1-2.5 sec) Post-gas (0.1-30 sec) button	25	Mode Stick LED
13	Base current button (10-90%)		

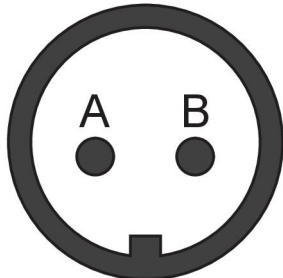
Front connections



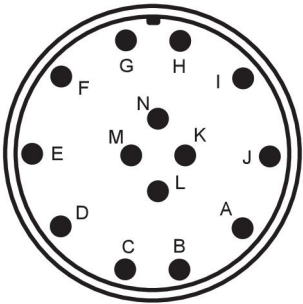
Type	Connection	PIN	Description
TIG	YES	A	Gas
	TIG TORCH	B	Negative
	YES	D-F	Pin
	EARTH CLAMP	E	Positive

Type	Connection	PIN	Description
MMA	NO	A	Gas
	EARTH CLAMP	B	Negative
	POSSIBLE REMOTE	F	Pin
	ELECTRODE	E	Positive

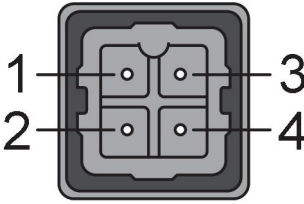
2 pin connector (D)

	PIN	Description	
Torch trigger	A	Torch switch	
	B	Torch switch	

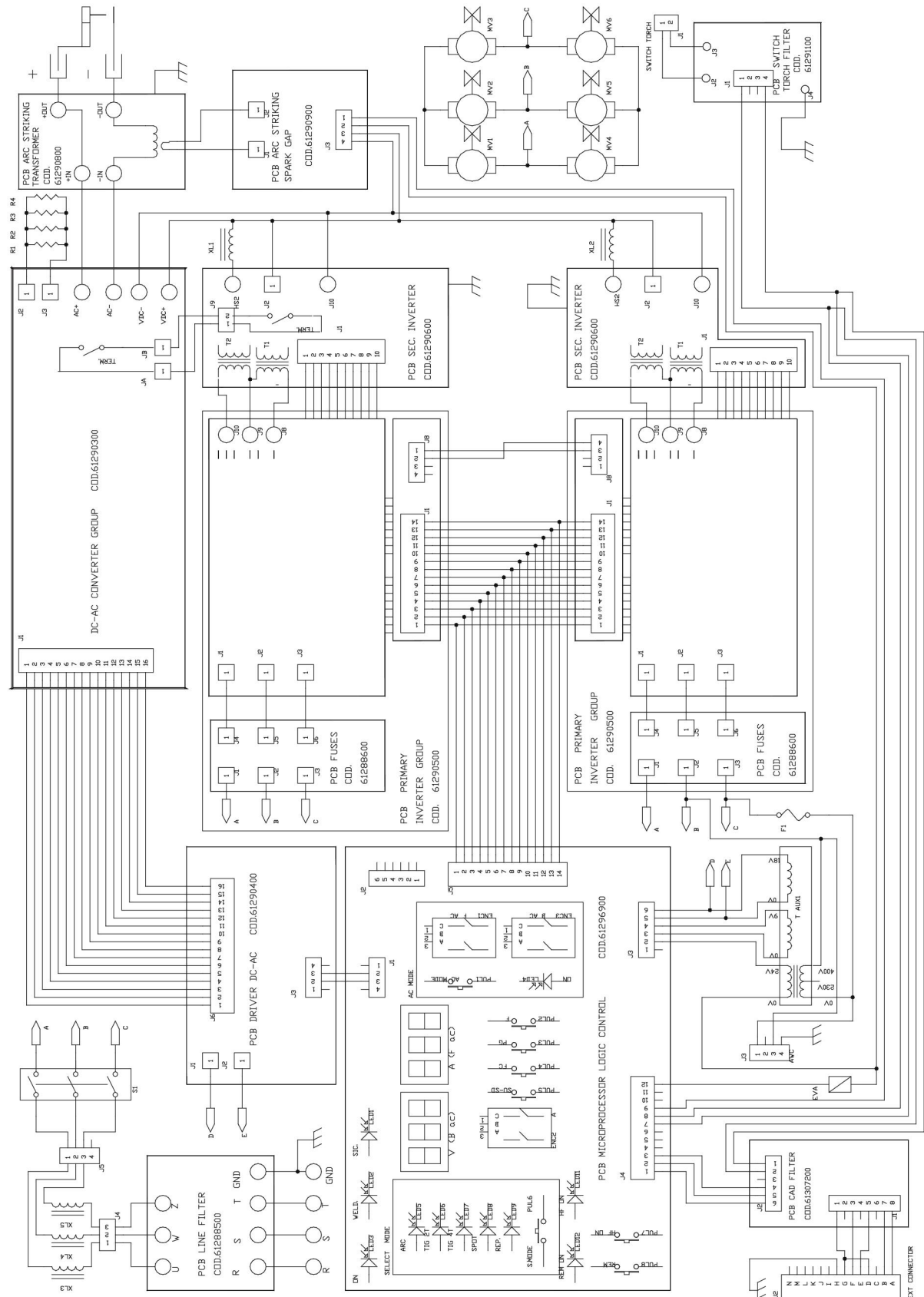
14 pin connector (F)

	PIN	Description	
Torch trigger	A	Torch switch	
	B	Torch switch	
Remote control	E	Remote control circuit common	
	F	+5 V DC input remote control	
	G	+5 V DC output remote control	
	D	+5 V DC output remote control	
GND	H	Chassis common	

Cooling unit connection

	PIN	Description	
Power supply	1	Power supply common	
	2	Power supply 115/230 V AC	
	3	Power supply 400 V AC	
GND	4	Chassis common	

Diagram



FAULT FINDING

General information

This chapter lists the most common symptoms and fault indications. Some fault indications are displayed on the front panel by the LEDs. In case the fault indication descriptions do not cover a fault condition it is possible to follow the fault finding instructions in section "Fault finding without power supply" and "Fault finding with power supply".

Safety precautions



WARNING!

Work on high voltage installations must be carried out by authorized personnel only.



WARNING!

Personnel working with the equipment must be aware of the fact that high voltage is present in the equipment. Parts with high voltage are not accessible during normal operation. If the cover is opened for maintenance or other reason, parts connected mains such as connection terminal may be exposed.



WARNING!

High voltage is accumulated in capacitors after power has been switched off. Always wait at least five minutes after the power is switched off, before starting any work with the power source.



CAUTION!

Electrostatic discharge (ESD). Sensitive components such as integrated circuits may be damaged by static electricity.



CAUTION!

Use an appropriate antistatic wrist strap to avoid damage to sensitive components. Use the original packaging during transportation and storage of sensitive components.

Required conditions

Make sure that the necessary safety precautions are done to avoid accidents and injury.

Use an approved ESD equipment to avoid damage to sensitive components.

The accuracy of measuring instruments shall be class 2.5 as a minimum, except for the measurement of insulation resistance, where the accuracy of the instruments is not specified but shall be taken in account for the measurement.

The clamp meter shall have an internal resistance of at least 1 Mohm.

Support equipment

- Bit holder
- Torx driver bits (20, 25)
- Hex sockets bits (6,7)
- Adjustable spanner
- A set of shaft spanners (6, 7, 10, 13, 24)
- Nut driver and a set of bits

- A socket wrench set
- A pair of pliers
- Crosshead screwdriver (PH2 × 100, PH0 × 75)
- A slotted screwdriver
- Multimeter
- Clamp meter

Visual inspection

Before fault finding the power source, do a visual inspection. Check the power source for exploded, burnt components or deteriorated wiring. Replace damaged part, component or deteriorated wiring. If no visible damage is discovered go through the possible symptoms and solutions listed in this chapter.

Not enough power

Symptom

The power source is working and the display shows the correct current value, but there is not enough power to weld the material. Measurements with a clamp meter on the return cable show that the power source deliver half the current value.

1. Turn off the power source and wait for five minutes.
2. Remove the cover of the power source.
3. Disconnect J1 on PCB1.
4. Turn on the power source.
5. Select "Stick mode" on the control panel. Is the voltage approximately 68 V DC on the welding outlets?
Yes: Replace PCB1.
No: Go to step 6.
6. Turn off the power source and wait for five minutes.
7. Connect the flat cable connector J1 on PCB1 and disconnect the flat cable connector J1 on PCB10.
8. Turn on the power source.
9. Select "Stick mode" on the control panel. Is the voltage approximately 68 V DC on the welding outlets?
Yes: Replace PCB10.
No: Fault find the power source as described in section "Fault finding without power supply" and "Fault finding with power supply".



NOTE!

If both the boards PCB1 and PCB10 are down the error message "CC" is shown on the display.

One of the motor fans is not working

Symptom

The power source is working but one of the motor fans is not working and the duty cycle is shorter than normal.

1. Is the not working motor fan supplied with the correct mains power supply?
Yes: Replace the defective motor fan.
No: Go to step 2.
2. Is there a correct mains power supply on the power switch S1?
Yes: Check the motor fan wiring connection.
No: Go to step 3.
3. Is there a correct mains power supply on the mains power cable?
Yes: Replace the power switch S1.
No: Check the mains power supply.

No LEDs lit on the front panel

Symptom

No LEDs are lit on the front panel when the power source is turned on.

1. Check that the voltages are present on the auxiliary transformer (T AUX 1). Are they 0-24 VAC, 0-9 VAC and 0-18 VAC?
Yes: Replace the logic board PCB7.



NOTE!

It is not necessary to replace the AC drive board PCB8 attached to the logic board PCB7.

- No:** Go to step 2.
2. Is there a correct mains power supply to the auxiliary transformer (T AUX 1)?
Yes: Replace the auxiliary transformer (T AUX 1).
No: Go to step 3.
3. Is the fuse (F1) on the rear of the power source damaged or blown?
Yes: Replace the fuse (F1). Value = 100 mA T.
No: Go to step 4.
4. Is there a correct mains power supply at the power switch (S1)?
Yes: Replace the power switch (S1).
No: Check the mains power supply.

The over temperature LED is blinking

Symptom

The over temperature LED is blinking continuously.

Before any actions are made, check the following:

- Make sure that the power source is not working above the maximum capacity.
- Make sure that the welding conditions and parameters are correct, compare with the data on the rating plate.

1. Check the thermal switches on PCB1, 2, 9, 10 and 11 by measuring their continuity. The thermal switches are normally closed.
Are the thermal switches ok?
Yes: Try to replace PCB7. If not ok, go to step 2.
No: Replace the defective thermal switch.
2. Select "Stick mode" on the control panel and disconnect the flat cable connector J1 on PCB1. Is the voltage approximately 68 VDC on the welding outlets?
Yes: Replace PCB1.
No: Go to step 3.
3. Connect the flat cable connector J1 on PCB1. Disconnect the flat cable connector J1 on PCB10. Is the voltage approximately 68 VDC on the welding outlets?
Yes: Replace PCB10.
No: Fault find the power source as described in section "Fault finding without power supply" and "Fault finding with power supply".

Fault indication "CC" when torch trigger is pushed

Symptom

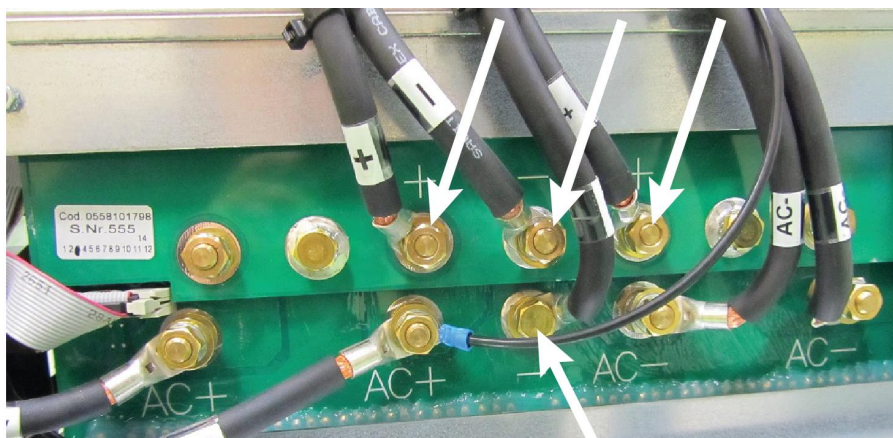
The power source is turned on and all the LEDs are ok. When the operator push the torch trigger the indication for short circuit "CC" is shown on the display.

1. Turn off the power source and wait for 5 minutes. Disconnect the 2 positive and 2 negative power cables from PCB2.



CAUTION!

Note the positions of the power cables, to prevent mixing them up when connecting them to PCB2 again.



WARNING!

Isolate the power cables to prevent short circuit between them.

2. Turn on the power source.
Select "Stick mode" on the control panel.
Is the error message "CC" still present on the display?
Yes: Go to step 3.
No: Replace PCB2.



NOTE!

Always replace PCB8 before you replace PCB2.

3. Turn off the power source.

Disconnect the mains power supply and wait for five minutes.

- a) Measure the diodes on PCB9 and PCB11. Use a multimeter in diode test mode.
Value should be 300 to 400 mV.

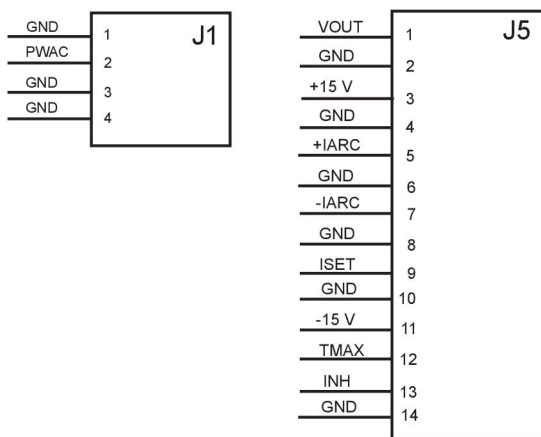


Not possible to adjust current with the encoder

Symptom

The power source is turned on and all the LEDs are ok. There is open circuit voltage (OCV) but it is not possible to adjust the current with the encoder knob.

1. Check the PCB7. Measure the values on J1 and J5 test points on PCB7.



J1 test point values

Pin	Type	Value
1	-	GND = circuit common reference
2	input	PWAC = reference for driver DC AC board (+15 V = DC mode - square wave 20-200 Hz AC mode)
3	-	GND = circuit common reference
4	-	GND = circuit common reference

J5 test point values

Pin	Type	Value
1	input	VOUT = reference signal from Vout (64 V DC = 75 V DC no load voltage)
2	-	GND = circuit common reference
3	output	+15 V POT = +15 V DC power for primary inverter pwrn control
4	-	GND = circuit common reference
5	input	+IARC = common reference from secondary shunt
6	-	GND = circuit common reference
7	input	- IARC = set reference from secondary shunt (100 A = 30 mV)
8	-	GND = circuit common reference
9	output	ISET = set reference signal for primary inverter pwrn control (0.04 V DC = 4 A - 1.9 V DC = 280 A)
10	-	GND = circuit common reference
11	output	-15 V = -15 V DC reference for primary inverter pwrn control
12	input	TMAX = signal from thermal sensors (0 V = temp. ok - 2.2 V DC = overtemp)
13	output	INH = reference signal for primary inverter (4 V DC = inverter off -0 V = inverter on)
14	-	GND = circuit common reference

Is the problem solved?

Yes: Go to chapter "At completion".

No: Go to step 2.

2. Turn off the power source and wait for five minutes.

3. Remove the cover of the power source.
4. Disconnect the flat cable connector J1 on PCB1. Turn on the power source.
5. Turn on the power source and select "Stick mode" on the control panel. Is the voltage approximately 68 V DC on the welding outlets and is it possible to adjust the current with the encoder knob?
Yes: Replace PCB1.
No: Go to step 3.
6. Turn off the power source and wait for five minutes.
7. Connect the flat cable connector J1 to PCB1 and disconnect the flat cable connector J1 on PCB10.
8. Turn on the power source and select "Stick mode" on the control panel. Is the voltage approximately 68 V DC on the welding outlets and is it possible to adjust the current with the encoder knob?
Yes: Replace PCB10.
No: Fault find the power source as described in section "Fault finding without power supply" and "Fault finding with power supply".

Power source in TIG mode does not strike

Symptom

The power source is turned on and all the LEDs are ok. The power source does not strike in TIG mode.

1. Check PCB5. Is there a spark in the gap when the torch trigger is pushed?
Yes: Go to step 2.
No: Go to step 3.
2. Measure the continuity in the torch cable? Is the cable defective?
Yes: Replace the cable.
No: Go to step 3.
3. Check that the voltages are present on the auxiliary transformer (T AUX 1), they should be 0-24 VAC, 0-9 VAC and 0-18 VAC. Are they present?
Yes: Go to step 4.
No: Go to step 5.
4. Check the input voltage on pin 1 and 2 at PCB5. Is 24 VAC present?
Yes: Replace PCB5.
No: Go to step 5.
5. Check the wiring and connectors between T AUX1 and PCB5. Are they damaged or defective?
Yes: Replace damaged and defective wiring and connectors.
No: Go to step 6.
6. Is there correct mains power supply on the auxiliary transformer (T AUX 1)?
Yes: Change the auxiliary transformer (T AUX 1).
No: Go to step 7.
7. Is the fuse F1 at the rear of the power source damaged or blown?
Yes: Replace the fuse F1. Value = 100 mA T.
No: Replace PCB7.

The solenoid valve does not work

Symptom

The power source is working but the weld is not good and there is poor or no gas flow when the torch trigger is pressed.

1. Check that the voltages are present on the auxiliary transformer (T AUX 1), they should be 0-24 VAC, 0-9 VAC and 0-18 VAC. Are they present?
Yes: Go to step 2.
No: Go to step 3.
2. Is the input voltage on the solenoid valve 24 V AC?
Yes: Replace the solenoid valve.
No: Check the wiring and connectors between the solenoid valve and T AUX 1.
3. Is there correct mains power supply present at the auxiliary transformer (T AUX 1)?
Yes: Replace the auxiliary transformer (T AUX 1)
No: Go to step 4.
4. Is the fuse F1 at the rear of the power source damaged or blown?
Yes: Replace the fuse F1. Value = 100 mA T.
No: Replace PCB7.

Welding in DC but not in AC

Symptom

The power source is working, but only in DC mode not in AC.

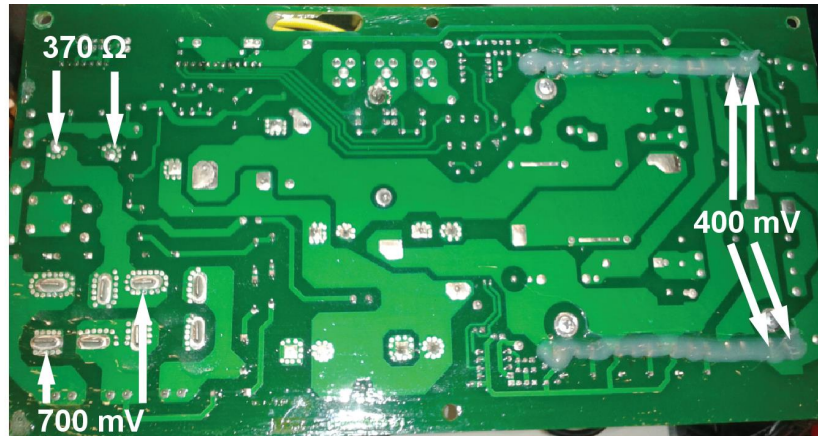
1. Set the power source in DC mode. Make sure that everything is working normally. Set the power source in AC mode. Does the power source work in AC mode?
Yes: The power source is working.
No: Replace PCB 2 and PCB 8.
2. Does the fault remain?
Yes: Go to step 3.
No: Go to section "At completion".
3. Measure between point 2 and 3 on connector J1, the value should be +15 VDC and 0 VDC at OCV. Are the values correct?
Yes: Fault find the power source as described in section "Fault finding without power supply" and "Fault finding with power supply".
No: Replace PCB7.

Fault finding without power supply

To do fault finding without power supply, follow the instructions below.

1. Turn off the power source and wait for five minutes.
2. Remove the cover of the power source.
3. Loosen and remove PCB9 and then PCB1.

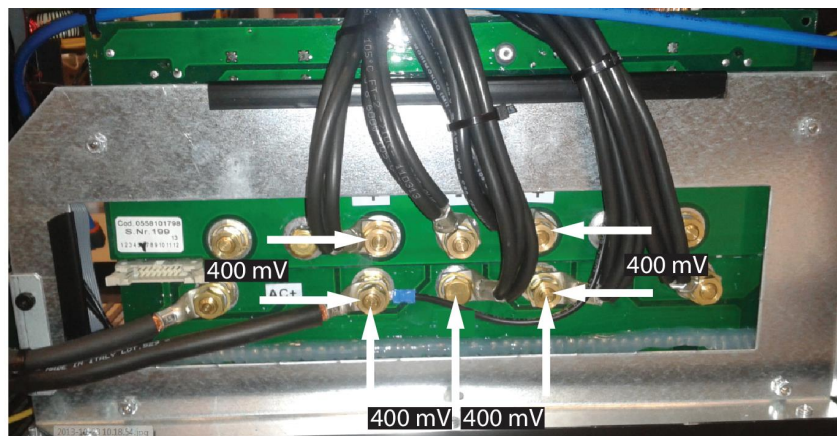
4. Check the PCB1, the primary power board. Measure on:
 - a) Inrush current resistor, 370 ohm
 - b) Primary rectifier, 700 mV DC
 - c) Freewheel diodes (inverter), 400 mV DC



5. Check the secondary rectifier PCB9. Measure the diode, 300 mV DC.



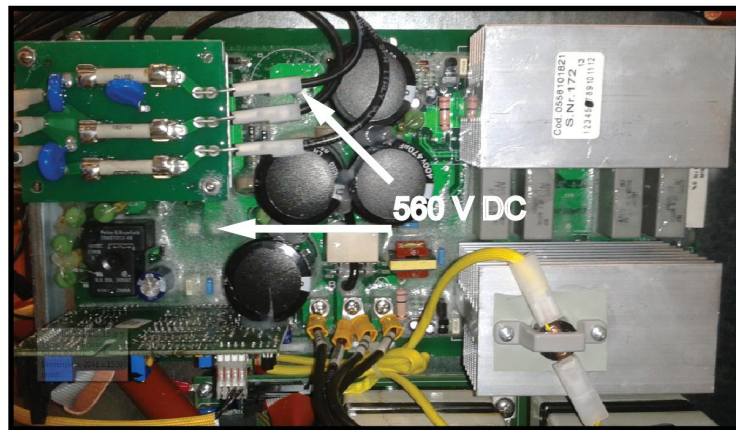
6. Loosen and remove PCB10 and then PCB11.
7. Check PCB10 in the same way as PCB1.
8. Check PCB11 in the same way as PCB9.
9. Check the AC converter PCB2. Measure the diodes, 400 mV DC.



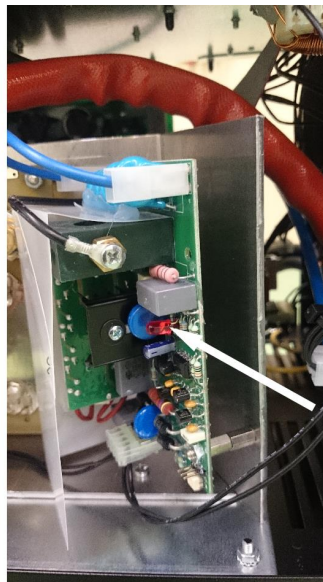
Fault finding with power supply

To do fault finding with power supply, follow the instructions below.

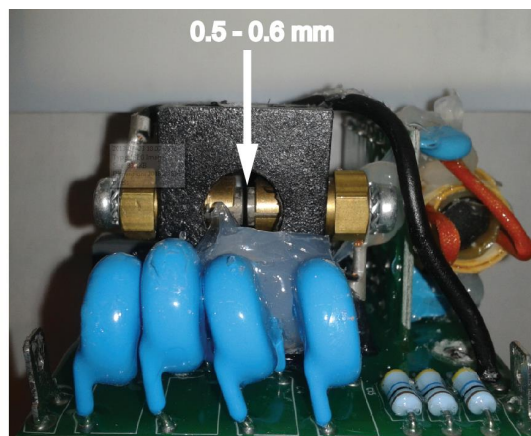
1. Check the voltage over the smothing caps on PCB1 and PCB10.



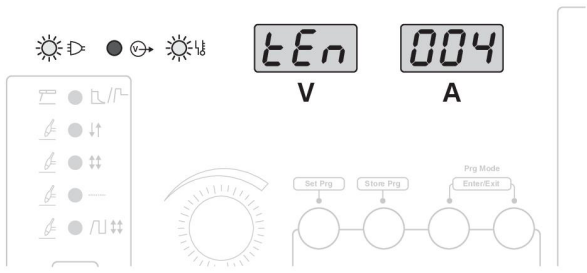
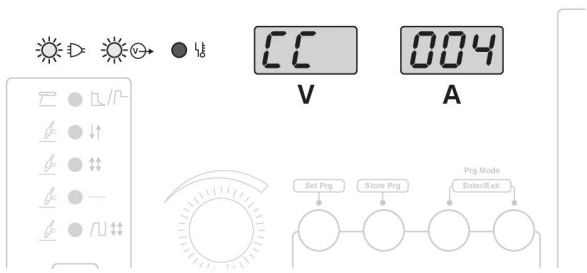
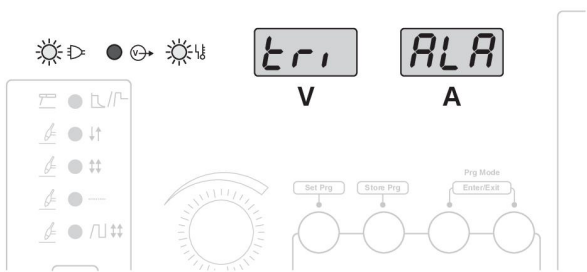
2. Check that PCB5 is supplied with 24 V DC, it is indicated by the red diode on the board.



3. Turn off the power source and wait for five minutes.
4. Check the spark gap on PCB5 with a feeler gauge. The gap shall be 0.5 - 0.6 mm.



Fault finding indications

Description	Indication on display
Over temperature The duty cycle is exceeded. The over temperature LED is lit and the Volt display shows "tEm". Action: Refer to section "The over temperature LED is blinking".	
Short circuit A PCB is short circuited. The display shows "CC". Action: Refer to section "Fault indication "CC" when torch trigger is pushed".	
Trigger alarm The power source is turned on with the torch trigger pushed. The over temperature LED is lit, the Volt display shows "tri" and the Ampere display shows "ALA". Action: • Turn off the power source completely. • Make sure that the torch trigger is not pushed. • Check if the torch trigger is damaged. • Turn on the power source again.	

SERVICE INSTRUCTIONS

**CAUTION!**

STATIC ELECTRICITY can damage circuit boards and electronic components.

- Observe precautions for handling electrostaticsensitive devices.
- Use proper static-proof bags and boxes.

**ESD**

What is ESD?

A sudden transfer or discharge of static electricity from one object to another. ESD stands for Electrostatic Discharge.

How does ESD damage occur?

ESD can cause damage to sensitive electrical components, but is not dangerous to people. ESD damage occurs when an ungrounded person or object with a static charge comes into contact with a component or assembly that is grounded. A rapid discharge can occur, causing damage. This damage can take the form of immediate failure, but it is more likely that system performance will be affected and the component will fail prematurely.

How do we prevent ESD damage?

ESD damage can be prevented by awareness. If static electricity is prevented from building up on you or on anything at your work station, then there cannot be any static discharges. Nonconductive materials (e.g. fabrics), or insulators (e.g. plastics) generate and hold static charge, so you should not bring unnecessary nonconductive items into the work area. It is obviously difficult to avoid all such items, so various means are used to drain off any static discharge from persons to prevent the risk of ESD damage. This is done by simple devices: wrist straps, connected to ground, and conductive shoes.

Work surfaces, carts and containers must be conductive and grounded. Use only antistatic packaging materials. Overall, handling of ESD-sensitive devices should be minimized to prevent damage.

Calibration procedure

Safety precautions

**WARNING!**

Work on high voltage installations must be carried out by authorized personnel only.

**WARNING!**

Personnel working with the equipment must be aware of the fact that high voltage is present in the equipment. Parts with high voltage are not accessible during normal operation. If the cover is opened for maintenance or other reason, parts connected mains such as connection terminal may be exposed.



WARNING!

High voltage is accumulated in capacitors after power has been switched off. Always wait at least five minutes after the power is switched off, before starting any work with the power source.



CAUTION!

Electrostatic discharge (ESD). Sensitive components such as integrated circuits may be damaged by static electricity.



CAUTION!

Use an appropriate antistatic wrist strap to avoid damage to sensitive components. Use the original packaging during transportation and storage of sensitive components.

Required conditions

Make sure that the necessary safety precautions are done to avoid accidents and injury.

Use an approved ESD equipment to avoid damage to sensitive components.

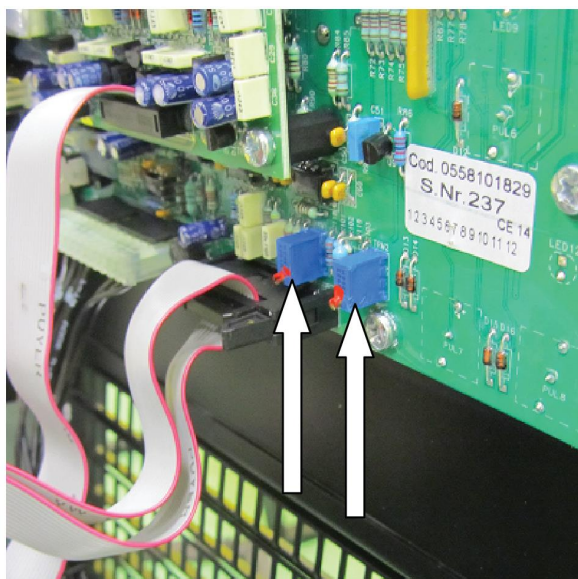
The accuracy of measuring instruments shall be class 2.5 as a minimum.

Support equipment

- Resistance load, 350 A / 30 V
- Digital instrument, better class than 2.5 and true RMS reading
- A slotted screwdriver, for trimmer potentiometer adjustment

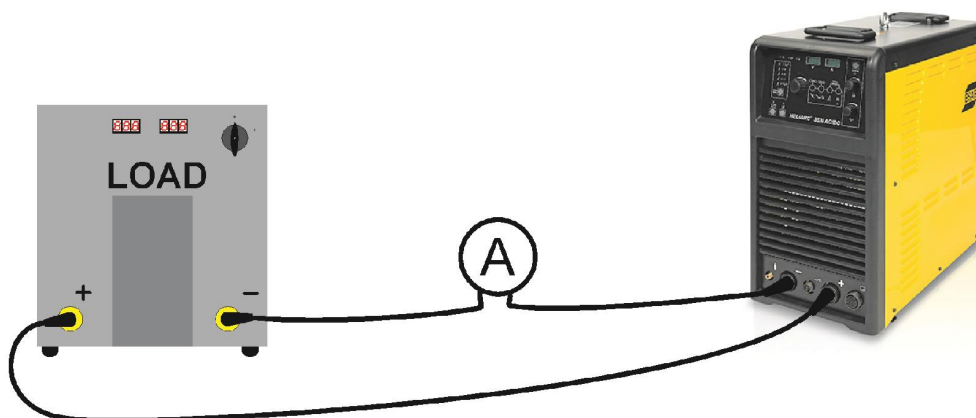
Procedure

1. Turn off the power source and wait for five minutes.
2. Remove the cover of the power source.
3. Make sure that you have access to the trimmer potentiometers TRM1 and TRM2 on PCB7.



4. Turn on the power source.
5. Select STICK mode on the front panel.
6. Measure the voltage on the welding outlets, it should be 68 V DC.
7. If the voltage is not correct, adjust it with the trimmer potentiometer TRM2 on PCB7.
8. Turn off the power source and wait for five minutes.

9. Connect the power source to a resistance load (350 A / 30 V) and a digital instrument. Let the resistance load be turned off.



10. Turn on the power source.
11. Select STICK mode on the front panel.
12. Measure the current on the welding outlets, it should be 350 A.
13. If the current value is not correct, adjust it with the trimmer potentiometer TRM1 on PCB7.
14. Make sure that the power source has the following settings:
 - **STICK MODE**
 - **ARC FORCE = 0 (Default value)**
 - **HOT START = 0 (Default value)**
 - **NO HF**
 - **NO AC MODE**
 - **NO TIG TORCH ON**
 - **183 A (SHOWN ON AMP DISPLAY)**

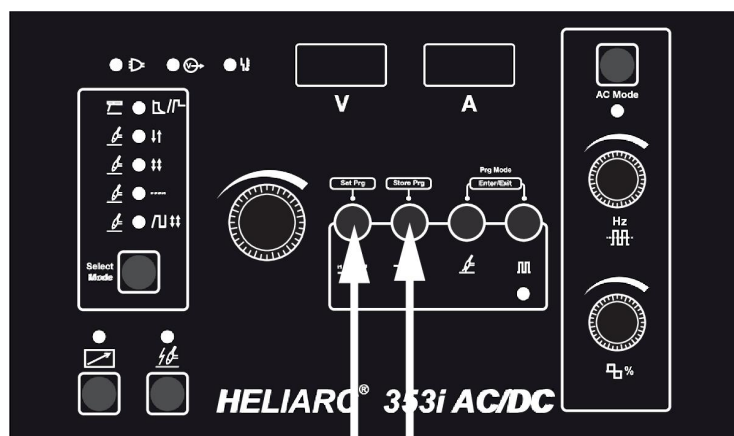
How to adjust ARC FORCE and HOT START if they are not set to default values

In STICK mode push the select mode button for 2 seconds.

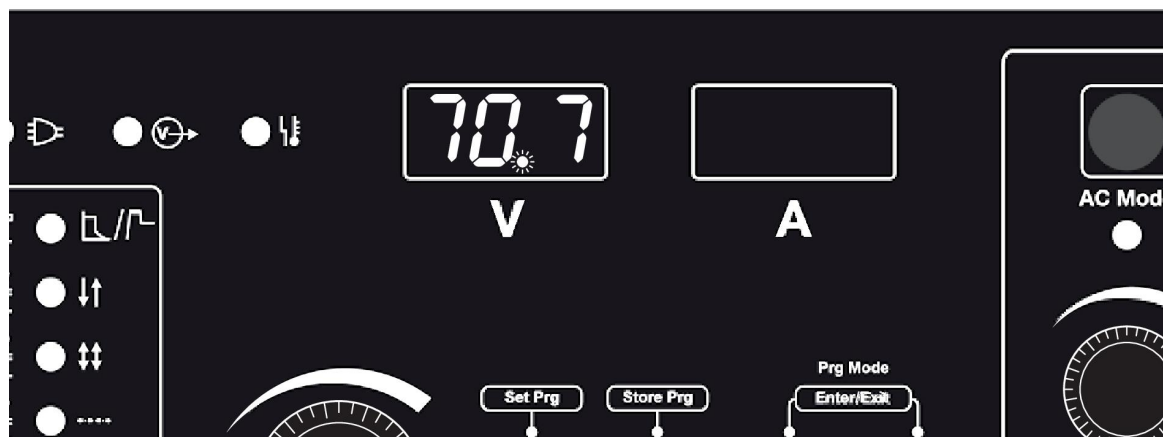
The LED for STICK mode will flash and by pushing the select mode button the display will alternately show HS or AF.

Adjust the HS and AF value with the encoder knob.

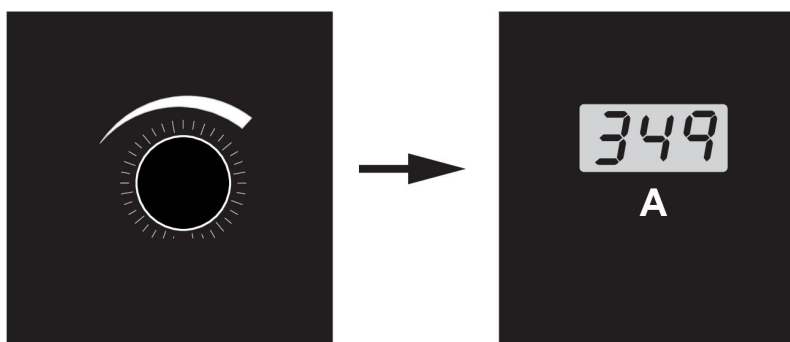
15. Turn off the power source.
16. Push and hold the "Set Prg" and "Store Prg" buttons and at the same time turn on the power source.



17. A flashing point appears on the volt display.



18. Adjust the current value on the power source with the encoder knob.



19. Turn on the resistance load at 350 A and 30 V.
20. Read the current value on the digital instrument, it should be 349 A.
21. If the current value is not correct, adjust it with the encoder knob on the power source.

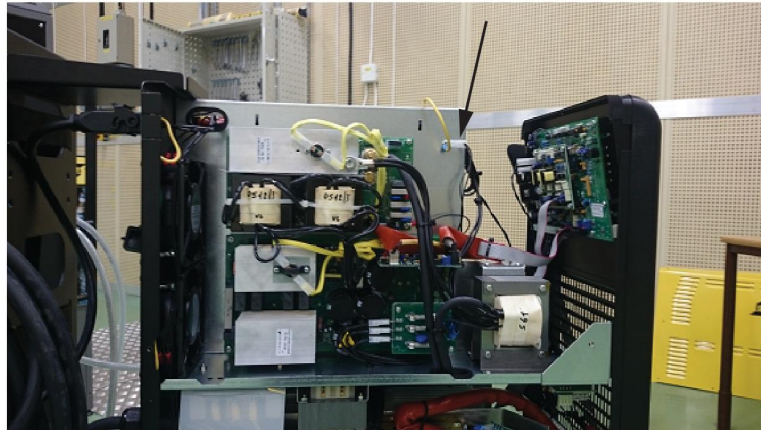
**NOTE!**

IMPORTANT! Read the current value on the digital instrument not the current value on the power source display.

22. Calibrate the voltage display on the power source by pushing the HF button.
23. Make sure that the digital instrument and the voltage display on the source shows the same value. Do this check with different ampere values.

Test EN 60974-4

1. Remove the cover of the power source.
2. Disconnect the fast sleeve connector attached to the central baffle panel on the power source.



3. Run the test EN 60974-4.
4. Attach the fast sleeve connector to the central baffle panel on the power source.



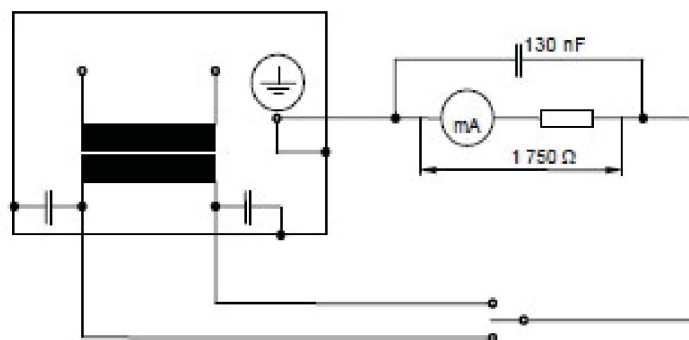
NOTE!

If the service technician cannot do the above mentioned set up, the insulation resistance test may be replaced by the tests of the primary and circuit leakage current in accordance with section 5.4 and 5.5 of the test EN 60974-4.

Welding circuit leakage current

The leakage current between the welding outlets and the protective conductor terminal shall not exceed 10 mA a.c. RMS.

Conformity shall be checked by measurement of the leakage current with a circuit as shown below at the rated supply voltage and no-load condition.



The measuring circuit shall have a total resistance of $1750 \text{ ohm} \pm 250 \text{ ohm}$ and shall be shunted by a capacitor so that the time constant of the circuit will be $225 \text{ } \mu\text{s} \pm 15$. In the case of 1750 ohm , the capacitor will be 130 nF .



NOTE!

For all class II equipment, use the PE-terminal of earthed supply circuit network.

Primary leakage current

The primary leakage current in the external protective conductor shall not exceed:

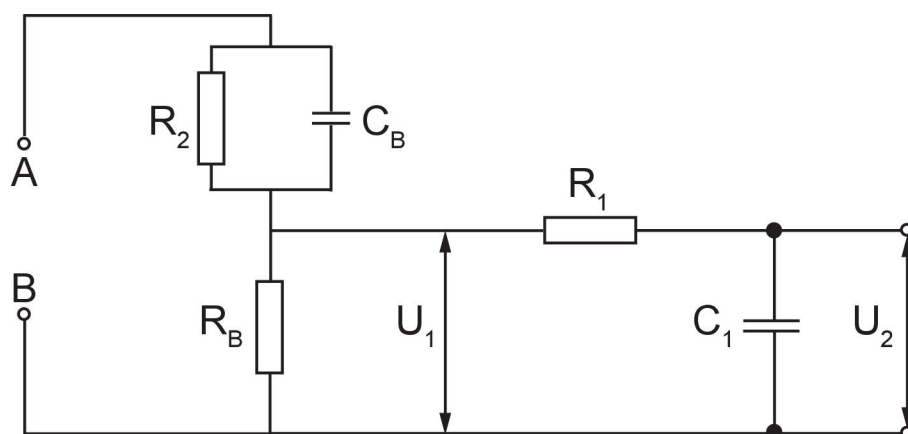
- 5 mA RMS for plug-connected equipment rated up to and including 32 A.
- 10 mA RMS for plug-connected equipment rated more than 32 A
- 10 mA RMS for equipment for permanent connection, without special measures for the protective conductor.
- 5 % of the rated input current per phase, for equipment for permanent connection with a reinforced protective conductor.

Conformity shall be checked using the measuring circuit shown below with a conventional voltmeter and a welding equipment that is:

- isolated from the ground plane
- supplied by the rated supply voltage
- not connected to the protective earth except through measurement components
- the output circuit is in the no-load condition
- interference suppression capacitors shall not be disconnected

**NOTE!**

The circuit given in the illustration below is used to obtain reproducible results.



A, B	Test terminals	U_1	Rated supply voltage
R_B	1 500 Ω	R_1	10 000 Ω
R_2	500 Ω	U_2	Conventional load voltage
C_B	0.22 μF	C_1	0.022 μF

AT COMPLETION

After repair, inspection and test

Inspection and test shall be done after repair according to manufacturers instructions and local regulations. They are:

- Visual inspection
- Functional test

General requirements

Test of power sources can be hazardous and shall be done by an expert in the field of electrical repair, preferably also familiar with welding and allied processes.

Test shall be done at an ambient air temperature between 10 to 40°C (50 to 104°F).

Visual inspection

Turn off and disconnect the mains power supply to the power source. During visual inspection, each safety related function judged as relevant by the test personnel, shall be checked for correct operation.

During visual inspection, the following listed items shall be checked:

1. Torch holder, cutting current return clamp:
 - a) missing or defective insulation
 - b) defective connections
 - c) defective, damaged switches
 - d) other damage
2. Mains supply:
 - a) defective, damaged cable
 - b) deformed, faulty plug
 - c) broken or thermally damaged plug pins
 - d) ineffective cable anchorage
 - e) cables and plugs unsuitable for the intended use and performance
3. Cutting circuit:
 - a) defective, damaged cable
 - b) deformed, faulty or thermally damaged couple/sockets
 - c) ineffective, cable anchorage
 - d) cables and coupler unsuitable for the intended use and performance
4. Enclosure:
 - a) missing or damaged parts
 - b) unauthorised modifications
 - c) cooling opening blocked
 - d) signs of overload and improper use
 - e) missing or defective protective covers
 - f) conductive objects put in the enclosure

5. Control and indicators:
 - a) defective switches and lamps
 - b) defective pressure regulator or manometer
 - c) incorrect fuse
6. General condition:
 - a) defective air hoses and connections
 - b) poor legibility of markings and labelling
 - c) other damage or signs of improper use

Functional test

Do a functional test to make sure that the power source is working in a correct way.

1. Prepare a working area with a workpiece.
2. Connect the mains power supply to the power source.
3. Connect the return cable to the workpiece.
4. Turn on the power source and check that the power source ON led is lit on the front panel.
5. Check the function of the power source by welding a workpiece.

ESAB subsidiaries and representative offices

Europe

AUSTRIA

ESAB Ges.m.b.H
Vienna-Liesing
Tel: +43 1 888 25 11
Fax: +43 1 888 25 11 85

BELGIUM

S.A. ESAB N.V.
Heist-op-den-Berg
Tel: +32 15 25 79 30
Fax: +32 15 25 79 44

BULGARIA

ESAB Kft Representative Office
Sofia
Tel: +359 2 974 42 88
Fax: +359 2 974 42 88

THE CZECH REPUBLIC

ESAB VAMBERK s.r.o.
Vamberk
Tel: +420 2 819 40 885
Fax: +420 2 819 40 120

DENMARK

Aktieselskabet ESAB
Herlev
Tel: +45 36 30 01 11
Fax: +45 36 30 40 03

FINLAND

ESAB Oy
Helsinki
Tel: +358 9 547 761
Fax: +358 9 547 77 71

GREAT BRITAIN

ESAB Group (UK) Ltd
Waltham Cross
Tel: +44 1992 76 85 15
Fax: +44 1992 71 58 03

ESAB Automation Ltd
Andover
Tel: +44 1264 33 22 33
Fax: +44 1264 33 20 74

FRANCE

ESAB France S.A.
Cergy Pontoise
Tel: +33 1 30 75 55 00
Fax: +33 1 30 75 55 24

GERMANY

ESAB GmbH
Solingen
Tel: +49 212 298 0
Fax: +49 212 298 218

HUNGARY

ESAB Kft
Budapest
Tel: +36 1 20 44 182
Fax: +36 1 20 44 186

ITALY

ESAB Saldatura S.p.A.
Bareggio (Mi)
Tel: +39 02 97 96 8.1
Fax: +39 02 97 96 87 01

THE NETHERLANDS

ESAB Nederland B.V.
Amersfoort
Tel: +31 33 422 35 55
Fax: +31 33 422 35 44

NORWAY

AS ESAB
Larvik
Tel: +47 33 12 10 00
Fax: +47 33 11 52 03

POLAND

ESAB Sp.zo.o.
Katowice
Tel: +48 32 351 11 00
Fax: +48 32 351 11 20

PORTUGAL

ESAB Lda
Lisbon
Tel: +351 8 310 960
Fax: +351 1 859 1277

ROMANIA

ESAB Romania Trading SRL
Bucharest
Tel: +40 316 900 600
Fax: +40 316 900 601

RUSSIA

LLC ESAB
Moscow
Tel: +7 (495) 663 20 08
Fax: +7 (495) 663 20 09

SLOVAKIA

ESAB Slovakia s.r.o.
Bratislava
Tel: +421 7 44 88 24 26
Fax: +421 7 44 88 87 41

SPAIN

ESAB Ibérica S.A.
Alcalá de Henares (MADRID)
Tel: +34 91 878 3600
Fax: +34 91 802 3461

SWEDEN

ESAB Sverige AB
Gothenburg
Tel: +46 31 50 95 00
Fax: +46 31 50 92 22

ESAB International AB
Gothenburg
Tel: +46 31 50 90 00
Fax: +46 31 50 93 60

SWITZERLAND

ESAB AG
Dietikon
Tel: +41 1 741 25 25
Fax: +41 1 740 30 55

UKRAINE

ESAB Ukraine LLC
Kiev
Tel: +38 (044) 501 23 24
Fax: +38 (044) 575 21 88

North and South America

ARGENTINA

CONARCO
Buenos Aires
Tel: +54 11 4 753 4039
Fax: +54 11 4 753 6313

BRAZIL

ESAB S.A.
Contagem-MG
Tel: +55 31 2191 4333
Fax: +55 31 2191 4440

CANADA

ESAB Group Canada Inc.
Mississauga, Ontario
Tel: +1 905 670 02 20
Fax: +1 905 670 48 79

MEXICO

ESAB Mexico S.A.
Monterrey
Tel: +52 8 350 5959
Fax: +52 8 350 7554

USA

ESAB Welding & Cutting
Products
Florence, SC
Tel: +1 843 669 44 11
Fax: +1 843 664 57 48

Asia/Pacific

AUSTRALIA

ESAB South Pacific
Archerfield BC QLD 4108
Tel: +61 1300 372 228
Fax: +61 7 3711 2328

CHINA

Shanghai ESAB A/P
Shanghai
Tel: +86 21 2326 3000
Fax: +86 21 6566 6622

INDIA

ESAB India Ltd
Calcutta
Tel: +91 33 478 45 17
Fax: +91 33 468 18 80

INDONESIA

P.T. ESABindo Pratama
Jakarta
Tel: +62 21 460 0188
Fax: +62 21 461 2929

JAPAN

ESAB Japan
Tokyo
Tel: +81 45 670 7073
Fax: +81 45 670 7001

MALAYSIA

ESAB (Malaysia) Snd Bhd
USJ
Tel: +603 8023 7835
Fax: +603 8023 0225

SINGAPORE

ESAB Asia/Pacific Pte Ltd
Singapore
Tel: +65 6861 43 22
Fax: +65 6861 31 95

SOUTH KOREA

ESAB SeAH Corporation
Kyungnam
Tel: +82 55 269 8170
Fax: +82 55 289 8864

UNITED ARAB EMIRATES

ESAB Middle East FZE
Dubai
Tel: +971 4 887 21 11
Fax: +971 4 887 22 63

Africa

EGYPT

ESAB Egypt
Dokki-Cairo
Tel: +20 2 390 96 69
Fax: +20 2 393 32 13

SOUTH AFRICA

ESAB Africa Welding & Cutting
Ltd
Durbanvill 7570 - Cape Town
Tel: +27 (0)21 975 8924

Distributors

For addresses and phone numbers to our distributors in other countries, please visit our home page

www.esab.com



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