



ADOR WELDING LIMITED

WELDING EQUIPMENT GROUP

TITLE: Instruction for FIT of CHAMP 800 INVERTER BASED MMA/TIG welding rectifier type power source.

1.0 SCOPE:

Inverter based welding Rectifier type Power Source, Model: CHAMP 800

2.0 DETAIL OF THE INSTRUCTION:

2.0.1 Use testing panel TEP-WQ-001/TEP-WR-002.

2.0.2 Record the parameters and the result (OK/ NOT OK) in the Test report
For MMA welding rectifier Model: CHAMP 800 (REF: INSP4604 /I5/R0) as the testing progresses.

2.0.3 In the case of any nonconformity at any stage of inspection and testing
Refer to the Procedure for control of nonconforming product (REF: NCCR2001).

2.0.4 After completion of the testing refer to the Procedure for inspection and
Testing and identification of inspection and test status (REF: INSP2001) for further processing.

2.1 MECHANICAL CHECK:

2.1.1 Check for tightness of all hardware and crimping of lugs.

2.1.2 Check whether heat sink compound is applied to base of all power components. (IGBT, Output Diodes, 3-ph Bridge Rectifier & 1-Ph Bridge Rectifier)

2.2 VISUAL INSPECTION (Clause no: 3.7 of 60974-1 © IEC: 2012):

2.2.1 Check as per relevant Machines wiring diagram.

2.3 CONTINUITY TEST:

2.3.1 ON / OFF Switch: "OFF".

2.3.2 Check the Isolation between IGBT HS & DIODE HS.

2.3.3 Check the Isolation between Fabricated Body & DIODE HS.

2.3.4 Check the Isolation between Fabricated Body & IGBT HS.

2.3.5 PROTECTIVE CIRCUIT

The internal protective circuit shall be capable of withstanding currents likely to be encountered in the case of a fault.



ADOR WELDING LIMITED WELDING EQUIPMENT GROUP

- 1) Check the continuity requirement for earthing with respect to following points
(Clause No: 10.5.1 of 60974-1 © IEC: 2012):

- a. Size of Terminal (Clause E.1 of 60974-1 © IEC: 2012): Check the size of conductor

Maximum effective supply current (A)	Range of cross-sectional area of the conductor (mm ²)
50	6 to 16
63	10 to 25

Record parameters (REF: INSP4604 /I5/R0).

- 2) Check the colour for protective earth conductor both inside and outside of welding power source is either of single green colour or of twin colour yellow and green
- 3) Check for the tightness of protective earth conductor by pulling supply cable. Confirm that the length of protective earth conductor is more than length of phase conductor
- 4) Visually check the method of securing the protective earth to the conductive parts (fabrication) i.e. powder coating removed automatically by using e.g. paint-piercing washers, star washer, paint-piercing screws or non painted surfaces
- 5) Conduct the following routine test for protective earth.

Routine Test (Clause No: 10.5.3 of 60974-1 © IEC: 2012)

Step 1: apply 10 A at 50Hz or 60 Hz derived from SELV source between PE terminal and relevant points that are part of the protective circuit for 1 s.

Step 2: Observe that the measured voltage between the PE terminal and the points of test shall not exceed the values given in Table 11

Table 11 – Verification of continuity of the protective circuit

Minimum effective protective conductor cross-sectional area of the branch under test mm ²	Maximum measured voltage drop (values are given for a test current of 10 A) V
1,0	3,3
1,5	2,6
2,5	1,9
4,0	1,4
> 6,0	1,0



ADOR WELDING LIMITED WELDING EQUIPMENT GROUP

2.4 DIELECTRIC STRENGTH (H.V.) TEST (Clause No: 6.1.5 of 60974-1 © IEC: 2012):

Notes:

- 1) The equipment under HV test should be electrically isolated.
- 2) Apply test voltage for minimum 5 sec
- 3) Avoid physical contact with HT tips and the product under test
- 4) If, for any reason, it is desired to carry out HV test for the second time, then the test voltage applied should be 80% of the full test voltage.
- 5) For the operator's safety, the lowest setting of the tripping current (less than or equal to 10 mA) is typical.

A. Remove the connectors as per following table:

PCB	Connector to be Removed
PWM Cum IGBT Driver PCB	CN5
DisplayPCB	CN1, CN2, CN5, CN7, CN9,CN11
Load Resistor PCB	CN1
Shunt Feedback PCB	CN1, CN2
Line Filter PCB	CN1, CN4

B. Carry out the HV test as per following procedure:

- 2.4.1 Primary Input Supply Short Circuit(R, Y, B)
Short circuit input supply (R, Y, B) & Take H.V. between input supply (R, Y, B shorted) & Earthing of machine by applying **1.875 KV for 5sec** (Current Limit below 30mA)
- 2.4.2 Output terminal Short Circuit
Remove short circuit of input supply and short circuit output terminal (+ve and –ve output) & Take H.V. between output terminal (short +ve and –ve output) & Earthing of machine by applying **1.875 KV for 5sec** (Current Limit below 30mA)
- 2.4.3 Primary Input Supply Short Circuit(R, Y, B) & Output terminal Short Circuit
Without removing shorted output, short circuit input supply (R, Y, B) & Take H.V. between input supply (R, Y, B shorted) & output terminal by applying **3.750KV for 5sec** (Current Limit below 30mA)
- 2.4.4 Now connect the machine to the test panel for further testing.

2.5 NO LOAD TEST:

2.5.1 RATED NO LOAD VOLTAGE (Clause No: 11.1 of 60974-1 © IEC: 2012):

2.5.1.1 ON / OFF Switch of power source : Put it in 'ON' condition

2.5.1.2 Carry out OCV (No load Voltage), no load current and power measurement.



ADOR WELDING LIMITED WELDING EQUIPMENT GROUP

Note: During measurement, the actual supply voltage shall not vary from the rated supply voltage by greater than $\pm 6\%$.

2.5.1.2.1 Additional requirements (Clause No: 11.1.5 of 60974-1 © IEC: 2012)

- The rated no-load voltage at all possible output settings shall not exceed DC 113V

2.5.4 FAN FLOW CHECK (BACK TO FRONT):

As per test report (REF: INSP4604 /I5/R0).

2.6 CALIBRATION PROCEDURE FOR MACHINE AT LOAD CONDITION:

2.6.1 Calibration procedure in MMA mode.

2.6.1.1 Set "CURRENT POTENTIOMETER" on front panel to 600A current.

2.6.1.2 Check voltage at test point TP5 on PWM PCB & is equal to -3.236 VDC. If not adjust it by preset P1 on Display PCB

2.6.1.3 Check voltage at test point TP7=0V on PWM PCB. If not adjust it by preset P3 on PWM PCB

2.6.1.4 Load the Machine at 600A/44V.

2.6.1.5 Check actual current on clamp meter and on Display PCB, if it is not 600A on display PCB
Calibrate by varying pot VR2 on Display PCB

2.6.1.6 Check actual load voltage on multi meter and on Display PCB, if it is not 44.0V on display PCB
calibrate by varying pot VR1 on Display PCB.

2.7 LOAD TEST:

2.7.1 Set "CURRENT" POT on front panel to current at 60% DC
Load current / voltage accordingly
Record parameters (REF: INSP4604 /I5/R0).

2.7.2 Set "CURRENT" POT on front panel to current at 100% DC
Load current / voltage accordingly
Record parameters (REF: INSP4604 /I5/R0).

MODEL	60% DC		100% DC	
	Set current pot at	Load (Amp /Volt)	Set current pot at	Load (Amp /Volt)
CHAMP 800	800	800A /44V (+/-2V)	600	600A /44V (+/-2V)

2.7.3 Display calibration check:
Confirm current reading on power source +/- 5 amps of reading on testing
Panel at maximum.

2.7.3 Carry out the load test including control transformer voltages as per test report (INSP4604 /I5/R0) & record the readings.



ADOR WELDING LIMITED WELDING EQUIPMENT GROUP

2.8 REMOTE CONTROL OPERATION TEST

2.8.1 Connect the remote to the machine. Machine will enter in Remote Mode

2.8.2 Connect remote control unit. Observe variation 100A – 800A (tolerance +/- 2) on Display PCB and put machine in load condition, then vary the Remote control potentiometer from minimum to maximum. Observe variation on Display

MODEL	Variation on Display
CHAMP 800	0-800A (+/- 2A)

2.9 SUPPLY VOLTAGE IMMUNITY CHECK:

2.9.1 Supply voltage = 415 VAC
Load current / voltage = 600 A / 44 V

2.9.2 Vary the supply voltage : 370 VAC - 470 VAC
Load current should remain at 600 A.

2.10 SINGLE PHASING PROTECTION TEST :

2.10.1 Remove “Y” phase connected to the machine.

2.10.2 The TRIP LED on front panel will become ON.

2.10.2 Conduct the same test for R & B phase after connecting the removed “Y” phase
The TRIP LED remains OFF when all three phases are present.

2.11 OVER VOLTAGE PROTECTION TEST:

2.11.1 Increases the I/P supply voltage more than 470VAC (+/-5V)

2.11.2 The TRIP LED on front panel will become ON.

2.11.3 The TRIP LED on front panel will become OFF when I/P supply voltage is decreased below the limit.

2.12 UNDER VOLTAGE PROTECTION TEST:

2.12.1 Decreases the I/P supply voltage less than 330VAC (+/-5V)

2.12.2 The TRIP LED on front panel will become ON.

2.12.3 The TRIP LED on front panel will become OFF when I/P supply voltage is increased above the limit



ADOR WELDING LIMITED WELDING EQUIPMENT GROUP

2.12 MMA WELDING TEST:

2.12.1 POLARITY: Electrode holder: “+”

2.12.2 Electrode type = ”7018”
Diameter = 6mm, 4 mm

2.12.3 PARAMETER :
Current = 275A, 170A

2.12.4 WORK-PIECE :
MS plate: 12mm, 10mm

2.12.5 JOINT: “Fillet” and/or “bead on plate”.

2.12.6 POLARITY : Electrode holder: “-”

2.12.7 Electrode type = ”6013”
Diameter = 6mm, 4 mm

2.12.8 PARAMETER :
Current = 275A, 170A

2.12.9 WORK-PIECE :
MS plate: 12mm, 10mm

2.12.10 JOINT: “Fillet” and/or “bead on plate”.

2.12.16 CHECK POINTS:

2.12.16.1 Arc stability

2.12.16.2 Arc striking

2.12.16.3 Spatter level

2.12.16.4 Bead shape

2.12.16.5 Slag detachability

2.13 GOUGING TEST

2.13.1 POLARITY: Electrode holder: “+”

2.13.2 Electrode type = ”A902”
Diameter = 6 mm & 9mm

2.13.3 PARAMETER :
Current = 350A, 500A & 600A

2.13.4 WORK-PIECE :
MS plate: 25mm, 15mm thick.

2.14 ARC FORCE OPERATION TEST:

2.14.1 Put the machine on MMA mode, set 200A. Put Arc Force Potentiometer on maximum position

2.14.2 Short the output terminals using welding cable and measure the current flowing through the output, it should be around 50 to 100 Amperes more than set current. Now remove the short circuit.