Inverter Based Single phase AC/DC Welding Machine

1.0 SCOPE OF SUPPLY AND COMMISSIONING

1.1 This specification covers design, construction, inspection & testing, delivery and commissioning of Single phase IGBT Inverter Based AC/DC TIG, Pulsed TIG & Stick Welding Unit with In-built HF, Pulser & sequencer Unit and its accessories.
Machine must be complete with IGBT Inverter based power source, along with trolley, heavy duty foot switch, Gas cooled 220 Amps TIG welding torch along with torch switch & control cable, earthing cable along with earthing clamp, argon regulator with flow meter as detailed below:

a) Inverter based AC/DC Welding Power Source along with trolley

Specifications of Power Source: Mains Input Voltage: 1ph 230 V AC 50 Hz (±15%)
Rated output: 3A/10V…230 A/19.2V TIG
10A/20.5V…180 A/27.2V MMA
200 A (60% Duty Cycle TIG)
170 A (100% Duty Cycle TIG)
10 – 180 A MMA

AC/DC Pulse Panel, Touch pad & Knob controls for AC/DC Selection, Gas pre-flow, Slope-up, Pulse on time, Pulse off time, Slope-down, Gas post flow, AC Balance, Frequency, Minilog etc.
Fuse rating: 16A, Weight: 15 Kg Approx

b) 220A Gas-cooled TIG Torch with 8 mtrs cable length
c) SMAW welding Electrode holder with 10 mtrs electrical cable
d) Earth cable with clamp of 10 mtrs length
e) Foot switch with 8 mtrs cable length
f) Argon Gas regulator with flow meter

1.2 Accessories kit for the supplied TIG torch comprising of collet, collet body, ceremaic nozzle, long cap, short cap, ceriated tungsten rod for 2.4mm

1.3 Accessories kit for the supplied TIG torch comprising of collet, collet body, ceremaic nozzle, long cap, short cap, ceriated tungsten rod for 3.2 mm

1.4 Thoriated tungsten Electrode Size 2.4mm X 150 mm

1.5 Thoriated tungsten Electrode Size 3.2mm X 150 mm

1.6 Ceramic Nozzle 6no.

2.0 ACCEPTABLE CODES AND STANDARDS

2.1 The design, materials of construction, manufacture, inspection and performance testing of the equipment shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed. Nothing in these specifications shall be construed to relieve the Vendor of his responsibility.

3.0 TECHNICAL SPECIFICATION REQUIREMENTS OF WELDING POWER SOURCE

3.1 Inverter Based AC/DC TIG, Pulsed TIG & Stick Welding Unit with In-built HF.

3.2 Welding Current: The welding current range shall be 03 – 230 Amps AC TIG and 10 – 180 Amps MMA. OCV shall be 58 V DC approx.

3.3 Power Requirement: Input power will be **Single phase (230 V AC 50 Hz)**. The machine should be able to withstand the normal fluctuation in the input voltage.

3.4 Duty Cycle: Minimum should be as follows:-

230 A (40% Duty Cycle TIG)
170 A (100% Duty Cycle TIG)
180 A (40% Duty Cycle MMA)
120 A (100% Duty Cycle MMA)

3.5 Mode Selection: Machine shall have provision for either pulse mode or normal mode by using a mode selection switch. Machine shall have provision for setting the independent amperage for the EP & EN during the AC cycle.

3.6 Memory: It should be possible to store the set of parameters for different uses. At least 10 set of parameters shall be possible to store It should be possible to recall the last parameter stored.

3.7 The machine shall have sine or square waveform selection for AC.

3.8 High Frequency: High frequency shall be provided for easy and smooth arc starting without touching the job.

3.9 Auto Post Flow: The post flow of the inert gas shall be as per the parameter selected and should be automatic & adjustable.

3.10 AC Frequency Control: 50-250 Hz for focusing the arc for increased directional control and arc stability.

3.11 Spot welding function: This function adjusts the duration of the welds, range 0-10 sec.

3.12 Micro Tack function: This function shall be provide in M/c for weld thin materials using low heat input.

3.13 Machine Panel: Machine shall have calibrated Alpha-Numeric Dual Digital Display Panel and shall have selection switches & indicators on touch pad for TIG welding & current type, for MMA welding & current type, current, voltage & others parameters display, for 2T/4T function, for High Frequency adjustment, for remote control selection, for Gas testing, for welding parameter adjustment, for pre-gas(0.0-10 sec) & post gas(1-30 sec),for upslope (0-10 sec) & down slope (0-15 sec) and for memory functions etc. Also, Digital Meter Displays spell out most errors by HELP Message.

3.14 Temperature Class/Degree of Protection- B (130 °C), H (180 °C) / IP 23C

3.15 External Dimensions approx Length 450 mm, width 200 mm, Height 400mm approx

3.16 Safety Features: Essential safety features such as overload protection, high temperature protection, etc. shall be provided in the machine.

3.17 Controls: All controls should be digital.

3.18 Material Test certificate must be provided for the Welding wire ER5356.

4.0 INSPECTION & TESTING

4.1 The performance testing of Welding Power Source should be shown to BARC representative at the vendor's premises before delivery of the Machine. During performance test the following information shall be recorded:

i. Proper functioning of the welding power source with all parameters
ii. Supply voltage, frequency
iii. Open Circuit voltage
iv. Temperature level.
v. Efficiency / Duty cycle

4.2 Sample pieces of metals will be welded as per the capacity of the equipment during performance testing.

4.3 During performance testing of machine all its protection system provided shall also be checked for proper functioning.

4.4 Test Certificates

Necessary test certificates for the various tests shall be furnished by the vendor for the purchaser's record. Following certificates shall be submitted by the vendor at the time of inspection.

a. Performance test certificate
b. Material test certificate
d. Guarantee certificate

4.5 Acceptance by the Purchaser of the test procedures and test report does not relieve the Contractor of his responsibility for guaranteed performance of the equipment.

4.6 The supplier should provide all the help required & technical assistance to commission the machine at site inside BARC.

5.0 CATALOGUES & DRAWING

Bidder shall submit all the necessary catalogues, information brochure, drawings, circuit diagrams, etc. along with their offer. The offer shall be complete with all the details of the machine offered and all the values, parameters & ranges required as per our tech spec. and any other information required to evaluate/compare the machine.

6.0 NAME PLATE

Equipment should be provided with a nameplate indicating the following details in addition to others:

a) Name of manufacturer
b) Model number & serial number
c) Supply voltage, phase, frequency
d) Weight of equipment
e) Efficiency/ Duty Cycle
f) Class of protection / Insulation
g) All other essential parameters

7.0 SHIPPING RELEASE & PACKING

7.1 All equipment/material shall be protected for inland transport, carriage at the site and outdoor storage during transit and at the Site, strictly according to the instructions given in this specification.

7.2 The Supplier shall pack the equipment at his own cost sufficiently and properly to ensure that they are free from loss or damage while in transit to the ultimate destination.

7.3 The Supplier shall be responsible for any damage to the equipment during transit and storage in all climatic conditions due to improper and inadequate packing.

7.4 All openings in the equipment shall be tightly covered, plugged or capped to prevent foreign material from entering.

7.5 All equipment shall be protected for the entire period of dispatch, storage and erection, against corrosion, incidental damage due to vermin, sunlight, rain, high temperature, humid atmosphere, rough handling in transit and storage in the open including possible delays in transit..

7.6 All spare parts shall be packed and treated for long storage conditions at site.

8.0 PAINTING

Chassis, Panel etc. shall be provided with good quality anti rust powder coating.

9.0 GUARANTEE

The Welding Power Source and other accessories shall be guaranteed for trouble free operation for a period of at least 12 months from the date of final acceptance.