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			REV NO : 00
	PRODUCT	AUTOMATIC ORBITAL TIG WELDING EQUIPMENT	DATE : 26/09/2006
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SPECIFICATION FOR AUTOMATIC ORBITAL TIG WELDING EQUIPMENT

TUBE TO TUBE WELDING APPLICATION

Orbital welding equipment shall be suitable for Tube to tube, Pipe to Pipe & Tube to tube sheet welding applications. The Orbital welding equipment shall be suitable for making straight through joints (without using filler wire) in SS / CS impulse pipes / tubes laid for instruments process instruments at Nuclear power project site . The impulse tubes of the followings sizes are to be welded at site.


Sl No	Item	Base Metal	Dia	Wall Thickness
1	Impulse tube	St.08x18H10T / St.20	06 mm	2.0 mm
			08 mm	2.0 mm
			14 mm	2.0 mm
			16 mm	2.5 mm
			18 mm	2.5 mm
			20 mm	2.5 mm

Automatic Orbital welding Equipment shall be consisting of the following:

- 1. POWER SOURCE**
- 2. WELD HEADS SUITABLE FOR ABOVE JOB**
- 3. ACCESSORIES**

1 POWER SOURCE:

Power source shall be of a microprocessor based controller and shall have closed loop circuitry to provide continuous feed back for ensuring accurate and repeatable welds. Power source processor shall have the followings:

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Torch rotation control

Wire control

Torch gas control with low flow alarm

Integrated printer for programmed and real values of parameters

Integrated memo card reader with 1 memo card

Detachable power card

2.WELDING HEAD

AIR COOLED WELDING HEAD

The Air cooled welding head shall be of durable and shall provide high quality welds . It shall be suitable for welding tubes in the range 6.00 – 20.00 mm dia.It shall be delivered with a protective case with a foam interior together with cables and tools package.

3. ACCESSORIES

a) The Orbital Welding Machine shall be supplied with the following accessories:

Tube facing tools


Arc gap gauge

Centring gauge

Electrode cleaning tool

Tube cutters

Dentist mirror

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b) Vendor shall quote the rate for the following optional accessories:

Remote Pendant

Remote Pendant extension cable

Tungsten electrode

Weld head extension cable

Bench mounting brackets

Purge pressure kit


Tube facing tools accessories

- cutting inserts
- bench mount stand

c) Vendor shall also indicate optional prices for any accessories required for performing the process, which are not mentioned above.

4. OTHER REQUIREMENTS:

- 1) 3 sets of O&M manual is to be supplied along with System
- 2) Power source & weld head should be calibrated and calibration certificates/test certificates should be enclosed
- 3) Vendor should submit the quality plan / relevant document along with technical bid
- 4) Details of Indian representative for service backup (to carryout breakdown maintenance/preventive maintenance)
- 5) Confirmation on availability of spares for 6-10 years

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- 6) List of operational spares to be furnished
- 7) List of normal operation spares for one year (optional)
- 8) Performance test of the machine is to be conducted at vendor works and results should be enclosed with the machine for comparing the results during commissioning at site.
- 9) Details of weld procedure and selection of different weld heads, shielding gases and materials is to be made available in soft form
- 10) Installation and Training: Vendor should provide qualified representative for installation and for the purpose of training customer representative / operators at free of cost
- 11) Apart from standard performance test conducted by supplier, the equipment shall satisfy the performance test at site as per NPCIL requirement .

SL NO	Technical requirements / specification	Filled by Vendors
1	Fusion welding of SS / CS tube to tube welding of 6 – 20 mm dia with 2.0mm to 2.5mm wall thickness autogenously without using filler material	
2	System should be air cooled and efficient	
3	Cooling should be provided up to tungsten electrode	
4	Cooling system should be an integral part of orbital welding machine	
5	System should be portable and light weight	
6	System should have true data logging facility	



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7	System should be a computer controlled with storing and retrieving welding data's	
8	Suitable for nuclear power project environment	
9	Power source with	
9.1	Microprocessor controller	
9.2	Internal weld schedule	
9.3	External storage in form of word or excel through PC data cards, compact flash cards, SD cards, smart media cards or memory stick which are commonly available	
9.4	Multiple level schedule	
9.5	sloping / ramping between levels	
9.6	Tacking	
9.7	automatic weld schedule generation	
9.8	manual weld schedule entry	
9.9	Auto / manual weld schedule	
9.10	Step programming	
9.11	Fully programmable in every level	
9.12	Resettable and non resettable weld counters	
9.13	Multiple level password protection	
9.14	Internal thermal printer	
9.15	Facility for connecting an external printer for printing weld data's	
9.16	Printer paper should be plain paper	
9.17	Facility for connecting CFT screen directly to the system	
9.18	Continuous Measuring instruments for indicating input voltages ,current, power , flow of gas , temp of weld head, temp of inverter during welding process	
9.19	Adjustable carrying handle / support Stand	
9.20	Detachable power cord	
9.21	Fault diagnosis system includes detection of no gas flow or low gas flow, temp high and Motor struck etc to stop the welding operation by giving message	
9.22	In built wire feeding option	



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9.23	Capable of operating at different voltages with auto ranging facility	
9.24	In built Colour monitor of minimum 10.5" size	
9.25	A protective ABS cover for Monitor to prevent from accidental damages	
9.26	In built integral key pad for operation on the panel	
9.27	HF start	
9.28	Possibility of upgrading software for cope up with future needs	
9.29	Facility copying files from internal memory external one	
9.30	In built motor calibration	
9.31	Power source input Supply voltage	
9.32	Setting range	
9.33	Permissible load at Max output at 35% duty cycle Max output at 60% duty cycle Max output at 100% duty cycle	
9.34	No load power	
9.35	No load voltage	
9.36	Power factor	
9.37	Efficiency	
9.38	Protection class	
9.39	Temp class	
9.40	Weight	
9.41	Setting current	
9.42	Steps of adjustment current	
9.43	Pulse, background time	
9.44	Preheat time	
9.45	Gas pre & past flow	
9.46	Slope up & slope down	
9.47	Method of painting & finish	
10	WELD HEAD (furnish details for each weld head - recommended)	
10.1	Max welding current at 100% duty cycle	



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10.2	Max pulsed welding current	
10.3	Electrode dia	
10.4	Electrode adjustment	
10.5	Rotor turning drive, power	
10.6	Rotor turning drive, voltage	
10.7	Speed Min , Max	
10.8	Control mode	
10.9	Gas flow	
10.10	Cooling arrangement for weld head & electrode	
10.11	Weld head housing temperature max	
10.12	Weight	