

C5 MAGNETIC PARTICLE INSPECTION EQUIPMENT

This specification is covered in 3 parts as follows:

1. Specification For AC/HWDC Portable Magnetic Particle Testing Equipment With Demagnetisation Facility
2. Technical Specification for Electro Magnetic Yoke
3. Technical Specification for Black light with inbuilt Fan.

**SPECIFICATION FOR AC/HWDC PORTABLE MAGNETIC PARTICLE TESTING EQUIPMENT WITH
DEMAGNETISATION FACILITY**

The BIDDER / VENDOR has to necessarily provide the following details, for making an assessment

S. No.	PARTICULARS	BHEL SPECIFICATIONS	Bidder's OFFER [With Complete Technical Details]
1.0	Application	For Magnetic particle examination of butt ,nozzle, fillet welds using prods. Maximum prod spacing used for examination will be 200mm (8")and also to use for demagnetization requirements.	
2.0	Input supply:	230V/50Hz single phase with Nion pilot lamp	
3.0	Maximum output	1500 Amperes at the end of 2 x 5 meter cable	
4.0	HWDC out put	Supplier to specify for 50% duty cycle and 2x5 meter cable	
5.0	Max. ON & OFF time	Adjustable to atleast 0-60 secs	
6.0	Cable size	Shall not be more than 120 sq mm and shall be of Copper conductor, with insulation	
7.0	Current control	Step less , Solid state SCR control using Thyristors	
8.0	Ammeter	AC and HWDC Ammeters	
9.0	Trigger control at prod side	24 V or less	
10.0	Weight of equipment	Light weight around 50 Kg	
11.0	Facility for Demagnetization	Control to be provided	
		Supplier to specify the following for their model	
12.0	KVA rating		
13.0	class of insulation		
14.0	outlet for inspection lamp(24 V)		
15.0	Automatic over load protection		
16.0	Air circulation		

17.0	Over heat protection		
18.0	Dimensions of equipment		
19.0	Circuit diagrams to evaluate the offers.		
20.0	External Hardwares		
20.1	Unit ON/ OFF switch:	Current control, Timer control switch, Trigger switch on prods, Remote cable connector on unit side. Prod assembly connectors on unit side, connectors on prod side, cable lugs which are frequently handled and used shall be sturdy and supplier shall assure these parts are not flimsy and are reliable, trouble free for shop floor conditions.	
21.0	Internal Hardwares	All electrical /electronic components shall be of high quality and are reliable ,trouble free for shop floor conditions	
22.0		Scope of supply	
22.1	Standard Accessories		
22.1	Portable Magnetic particle unit conforming to our specifications and required equipment performance		
22.3	Flexible Input power supply cable-20Meter long with multi strand copper conductor		
22.4	Magntising Copper Cables 2 x 5 meter long with cable lugson unit side and connectors on prod side		
22.5	Individual contact copper prods with standard length		
22.6	Trigger switch in one prod with 10 meters remote cable:		

22.7	Circuit diagrams with operation and Service manual:		
22.8	Gauss meter		
22.9	Lux meter		
23.0	Pre-despatch inspection& free of cost training at Suppliers works		
24.0	commisioning of the equipment at BHEL		
25.0	Performance prove out at BHEL		
26.0		Accessories	
26.1	Ball bearing transport trolley ,sturdy, four wheeled and revolving type .With rubberised wheels 225 mm (9") in dia and two wheels on the rear and two wheels on the front capable of being rotated Swivelled.The trolley should be suitable and useful on BHEL shop floor (Sketch of trolley to be enclosed)		
26.2	ASTM Pie gauge Field indicator: As per E 1444 -05		
26.3	System performance test plate with EDN notch in wooden carrying case:		
26.4	ANSI Ketos steel tool Ring with Copper conductor of diameter 25mm and length 300mm or 400mm (As per E 1444 -05)		
27.0		Spares	

27.1	Copper Prods standard length with nuts and spring washers		
27.1	Copper Prods -350 mm length with nuts and spring washers :		
27.3	Sockets for trigger cable both Male and female :		
27.4	Prod handles without trigger switch:		
27.5	Prod handles with trigger switch and cable:		
27.6	Magnetising Copper cables ,of length 2x5 metres with connectors on both ends:		
27.7	Ammeter AC and DC :		
27.8	Current control PCB		
27.9	Push button switch for prod handle		
27.10	Diodes :		
27.11	Power control PCB:		
27.12	Thyristor		
27.13	DC Ammeter with shunt		
27.14	Any other Critical spares to be listed down"ed by supplier		
28.0	Documentation	Applicable to specification	
28.1	Calibration for equipment & spare ammeters	ASTM E709 with calibration certificate from local National Lab	
27.2	Test report for internal circuit check	verification	
27.3	Test report for internal short circuit check	verification	

27.4	Dimensional report for Magnetic particle field indicator	ASTM E 1444	
27.5	Dimensional report for system performance test plate	verification	
27.6	Warranty	Minimum one year from the date of commissioning	
27.7	Annual Maintenance Contract(AMC)	Supplier to quote for AMC at BHEL Trichy works	

Technical Specification for Electro Magnetic Yoke

PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
Application	Magnetic Particle Inspection on Ferrous materials and welds .	
Design	AC and DC	
Testing Span	300mm	
Arms rotation	In steps of 13 ⁰ approximately	
Input Supply	230V, 50 Hz	
Power Supply cable	5 meter	
Input Current	2 .5 Amps	
Distance across Poles	0 to 300 mm	
Magnetic Field	AC- constant level DC- Pulsed infinitely variable	
Flux Density	10,500 lines of force/cm2 at 100mm poles spacing	
Lifting Power	27 kg(60Lbs) at 100 mm spacing (DC) and 4.5 Kgs (AC)	
Yoke Weight	3.5 Kgs	
Duty Cycle	100%	
Controls	ON/OFF Switch A/C & DC Switch DC field intensity Potentiometer	
Performance Guarantee	1 Year	
Calibration certificate	to be furnished with the yoke supply	
Lifting power	As per ASME Sec V	

Technical Specification for Black light with inbuilt Fan.

PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
Application	For Fluorescent particle testing Inspection and evaluation of materials and welds	
Power Supply	230 V 50Hz 1 phase supply.	
Power cable	5 metres	
Current Draw	1 Amp	
UV Intensity at 300mm	4000 Microwatts/Sq.Cm Details as per ASME Sec V	
Visible light emission at 300mm	less than 0.1 Lux or 1 foot candle	
Wavelength	365 nanometers	
U.V.Bulb	100 Watts	
Filter	Glass filter	
Running Temperature at 20deg.centigrde	Less than 40 deg.centigrade	
Weight (with Fan Cooled hand lamp)	Less than 1.5 kg	
Wt (Fan Cooled hand lamp+ Control unit)	4. 0 kg	
Cable length from lamp to control unit	5 metres	
Performance Guarantee	1 Year	
Calibration certificate and Operating manuals	to be furnished with Black Light supply	