

	<u>BHARAT HEAVY ELECTRICAL LIMITED</u>	Enquiry No. :			
	<u>UNIT'S ADDRESS:</u>	Due Date :			
	<u>UNIT'S ADDRESS:</u>	Supplier Qtn. No.:			
		Date :			
<u>SPECIFICATION CUM COMPLIANCE CERTIFICATE OF MIG WELDING MACHINE</u>					
	NOTE:-				
	1. The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.				
	2. The offer and all documents enclosed with offer should be in English language only.				
	3) Only those models to be quoted which are working satisfactorily in rugged environment for continuous operation in Heavy duty fabrication shop for more than three years after commissioning and of Current capacity 380 A at 100 % duty cycle (10 minutes cycle time.) or higher capacity. Vendor to submit document supporting the same as specified in clause 18.				
	4. The information provided by vendor in specification cum compliance certificate will supercede any other information provided by vendor.				
NAME & ADDRESS OF THE SUPPLIER :			NAME & ADDRESS OF THE INDIAN AGENT :		
TELEPHONE NOS.:			TELEPHONE NOS.:		
FAX NOS.:			FAX NOS.:		
E-MAIL ADDRESS :			E-MAIL ADDRESS :		



**SCOPE: SUPPLY, ERECTION & COMMISSIONING OF MIG WELDING MACHINE COMPLYING WITH
SPECIFICATIONS AS BELOW**

SNO	DESCRIPTION FOR BHEL REQUIREMENT	Vendor to specify/Confirm	OFFERED Parameters	DEVIATIONS	REMARKS
1	PURPOSE & WORKPIECE MATERIAL				
1.1	Purpose: (Operations/Jobs involved) :Inverter based Synergic Pulsed MIG welding machine to do spatter free and heavy duty flux cored/solid wire CO₂ or Ar, CO₂ (mixed gas) welding on mild steel, alloy steel, stainless steel, copper and aluminium. The model must be rugged and suitable for continuous work in heavy fabrication shop in rough environment	Vendor to confirm			
2	Specifications of Inverter based digital control Synergic Pulsed MIG Welding Machine.:				
2.1	Welding Power Source				
2.1.1	Make: ESAB / LINCOLN / MILLER / FRONIUS / OTC / KEMPPI / EWM / PANASONIC	Vendor to confirm			
2.1.2	Type: Digital controlled Inverter based on IGBT/MOSFET technology with switching frequency of 20 KHZ or more.	Vendor to specify.			
2.1.3	IGBT / MOSFET to be on primary side	Vendor to confirm			
2.1.3	Characterstic: Constant Voltage	Vendor to confirm			
2.1.4	Model:	Vendor to specify.			
2.1.5	Welding Current Range: 70-500 A	Vendor to specify			
2.1.6	Welding Current at 60 % duty cycle: 500 A (approx.) considering 10 minutes cycle time at 45°C ambient temperature.	Vendor to confirm			
2.1.7	Welding Current at 100 % duty cycle × 380 A	Vendor to confirm			
2.1.8	Variation in set current: < 1%	Vendor to cofirm.			
2.1.9	Welding Voltage range:	Vendor to specify.			

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2.1.10	No load Power Consumption: < 75 W	Vendor to confirm			
2.1.11	Type of Cooling: Forced Air.	Vendor to confirm			
2.1.12	Protection class (Type of enclosure)	Vendor to specify.			
2.2	Wire Feeder				
2.2.1	Type: All powered & Grooved Four roll drive. Heavy duty metallic	Vendor to confirm			
2.2.2	Wire Feed rate range: 1 -18 m/min	Vendor to confirm			
2.2.3	Solid wire sizes to be used: 1.2, 1.6 & 2.0 mm	Vendor to confirm			
2.2.4	Flux cored wire sizes to be used: 1.2, 1.6 & 2.0 mm diameter	Vendor to confirm			
2.2.5	Spool dia: 300mm (approx.)	Vendor to confirm			
2.2.6	Weight of Wire spool: 15 kg minimum	Vendor to confirm			
2.2.7	Wire Feeder motor type	Vendor to specify.			
2.2.8	Wire spool mounting arrangement with braking device with wire spool properly covered or housed inside the wire feeder unit to prevent direct contact from dust and moisture.	Vendor to confirm			
2.2.9	Communication between wire feeder and the power source should be digital. Details like, protocol used for communication between wire feeder and power source, Details of interconnecting cable, function etc shall be furnished. Backup of operating softwares, all user programs in soft copy. Interface cable and software for downloading the same through a laptop to be provided.	Vendor to confirm			
2.2.10	Protection class (Type of enclosure).	Vendor to specify.			

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2.3	Torch (make to be same as offered machine or world renowned like Binzel Germany)	Vendor to confirm			
2.3.1	Type: One Water cooled torch fitted with 2/4 step On-Off switch.	Vendor to confirm			
2.3.2	Capacity: 500 A (approx) at 60 % duty cycle considering 10 minutes cycle time.	Vendor to confirm			
2.3.3	Shape: Goose neck shape.	Vendor to confirm			
2.3.4	Length : 4.5 m	Vendor to confirm			
2.3.5	Wire sizes to be used: 1.2, 1.6, 2.0 mm	Vendor to confirm			
2.3.6	Type of end connection: Euro Connector	Vendor to confirm			
2.4	Water cooling Unit:				
2.4.1	Flow rate for effective cooling of torch.	Vendor to specify.			
2.4.2	Tank capacity:	Vendor to specify.			
2.4.3	Cooling fluid inlet and outlet temperature;	Vendor to specify.			
2.4.4	Cooling liquid:	Vendor to specify.			
2.4.5	Torch temperature during continuos welding at rated capacity should be below 60 deg. cent.	Vendor to confirm			
2.4.6	Cooling unit be capable to build up sufficient pressue to work at height.	Vendor to confirm			
2.4.7	Water cooling Unit should be detachable whenever required.	Vendor to confirm			
2.4.8	Protection class (Type of enclosure) IP 23C.	Vendor to confirm			

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2.5	The machine should be compatible to change from water cooled to air cooled and vice versa at any point of time. (Complete details of the system to be specified by vendor.)	Vendor to confirm			
2.6	Cables				
2.6.1	Power source to Wire feeder Interconnection Cable - 15 m. length	Vendor to confirm			
2.6.2	Earthing cable with plug / connector - 10 m. Length	Vendor to confirm			
2.7	OPERATION AND CONTROL SYSTEM:	Vendor to confirm			
2.7.1	Welding Process Controller:	Vendor to confirm			
	1) All parameters (Current, voltage, wire feed speed etc.) should be programmable in stepless mode.	Vendor to confirm			
	2) Control of Welding Voltage & Current through independent knobs as optional feature.	Vendor to confirm			
	3) Digital Display of Welding Voltage and Current.	Vendor to confirm			
	4) Wire / Gas inching facility.	Vendor to confirm			
	5) Pre flow / Post flow control.	Vendor to confirm			
	6) Hot start facility.	Vendor to confirm			
	7) Crater control and fill.	Vendor to confirm			
	8) Creep start facility.	Vendor to confirm			
	9) Inductance control in stepless mode.	Vendor to confirm			
	10) Burn back control facility.	Vendor to confirm			
	11) 2 / 4 track control to be provided.	Vendor to confirm			



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2.7.2	Pre program in pulsed mode for solid wire and flux cored wires of dia 1.2 mm and 1.6 mm for carbon steel, alloy steel, stainless steel , copper and aluminium with Argon gas combinations.	Vendor to confirm			
2.7.3	Pre program in standard mode for solid wire and flux cored wires of dia 1.2 mm and 1.6 mm for carbon steel, alloy steel, stainless steel, copper and aluminium with Argon gas combinations.	Vendor to confirm			
2.7.4	Other than standard programs as mentioned above following should also be available: 1) 1.2 mm and 1.6 mm dia flux cored and solid wire for carbon steel with 100 % Co2 shielding 2) 1.2 mm and 1.6 mm dia flux cored and solid wire for stainless steel with 100 % Co2 shielding	Vendor to confirm			
2.7.5	Interlock to trip the Power source when cooling water supply to torch reduces or stops. Indication of fault on the control panel to be displayed.	Vendor to confirm			
2.7.6	WARNING/Error indicating lamp in the front of the power source to indicate the abnormalities.	Vendor to confirm			
2.7.7	The welding voltage and current to remain in set stable condition against the supply voltage fluctuation of $\pm 10\%$ and even in case of any change in ambient temperature up to 45°C.	Vendor to confirm			
2.7.8	Note: Parties to submit following details: - Complete blowup OGA of the Front Operator Panel alongwith description of each devices, its function etc. Further explanation of programmable functions like: - Method of programming, - List of parameters that can be programmed. - No. of programs that can be stored. - Method of recalling the program etc - Connectivity with PC for recording of weld data				

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3	ELECTRICAL/ ELECTRONIC SYSTEM :				
3.1	415V \pm 10% , 50HZ \pm 3%, 3 Phase AC (3 wire system without neutral) Power Supply Source will be provided by BHEL at a single point near the machine, as per layout recommended by Vendor. All types of cables (including input power cable of atleast 5 m length), connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/control cabinets, shall be the responsibility of vendor.	Vendor to confirm			
3.2	All electrical & electronic control cabinets & panels should be dust and vermin proof	Vendor to confirm			
3.3	All the PCB's shall be sprayed with mould coating to prevent damage from dust, grinding particles. The PCB's shall preferably be housed in separate dust proof compartments.	Vendor to confirm			
3.4	Supplier will specifically mention the protections taken such as seals etc. used to prevent entry of dust etc. in to the machine.	Vendor to confirm			
3.5	IGBT/MOSFET shall be suitably protected during shortcircuiting at the output. Details of measures taken for protection, Schematic drawing of components added etc shall be furnished.	Vendor to confirm			
3.6	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm			
4	SAFETY ARRANGEMENTS :	Vendor to specify and furnish a copy of the standard.			
	1) Power source design and construction should be in conformance to International safety norms. Vendor to specify the standard.				
	2). All the cables etc. on the machine should be well supported and protected.				



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	3)The power source, wire feeder and cooling unit should be CE marked.	Vendor to confirm			
5	ENVIRONMENTAL PERFORMANCE OF THE MACHINE : The Machine shall conform to following factors related to environment :				
5.1	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm			
5.2	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to confirm			
6	Consumable spares & Accessories (for each machine apart from standard consumables and accessories supplied with machine): Price of every items specified below to be mentioned seperately	Vendor to confirm			
6.1	Co2 Two stage regulator with flowmeter and heater. (Quantity 1 No.) Power for the preheater should be drawn from power source. Proper pin connection should be available on power source.	Vendor to confirm			
6.2	Argon two stage regulator (Quantity 1 no.)	Vendor to confirm			
6.3	Hand tool kit consisting of Nozzle cleaners, allen keys, plier for cutting wire etc. (Quantity: 1 set)	Vendor to confirm			
6.4	Trolley for Powersource & Argon/CO2 Gas Cylinders(Quantity 1 No.)	Vendor to confirm			
6.5	Heavy Duty Mettalic Rollers for wire size: 2 set of 1.2 mm size & 2 set of 1.6 mm size (In case same rollers for size 1.2 mm and 1.6 mm are used 4 sets to be provided).	Vendor to confirm			
6.6	Nozzles: 3 nos of 1.2 mm size & 3 nos of 1.6 mm size (In case same nozzles for size 1.2 mm and 1.6 mm are used 6 nos to be provided).	Vendor to confirm			



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6.7	Contact tips of (Cu-Cr-Zr): 5 nos of 1.2 mm size & 5 nos of 1.6 mm size (In case same tips for size 1.2 mm and 1.6 mm are used 10 nos to be provided).	Vendor to confirm			
6.8	Spiral tube: 2 nos of 1.2 mm size & 2 nos of 1.6 mm size (In case same spiral tube for size 1.2 mm and 1.6 mm are used 4 nos to be provided).	Vendor to confirm			
6.9	Diffuser 2 nos of 1.2 mm size & 2 nos of 1.6 mm size (In case same diffuser for size 1.2 mm and 1.6 mm are used 4 nos to be provided).	Vendor to confirm			
6.10	500 amp, 4.5 m long, Water cooled torch fitted with 2/4 step On-Off switch. (1 with m/c + 1 extra)	Vendor to confirm			
7	Machine Maintenance Spares:				
7.1	All types of spares for total machine and accessories should be available for atleast ten years after supply of the machine. If machine or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required	Vendor to confirm			
7.2	The following 1 set of spares (for complete lot of machines to be procured in this enquiry) are to be offered separately. Price of every items specified below to be mentioned seperately.	Vendor to confirm			



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7.2.1	Complete set of control PCBs.	Vendor to confirm			
7.2.2	One set of power devices (IGBT/MOSFET) used in the machine	Vendor to confirm			
7.2.3	One set of display meters.	Vendor to confirm			
7.2.4	One set motor of wire feeder unit.	Vendor to confirm			
7.2.5	All type of guide tubes (1 no each)	Vendor to confirm			
7.2.6	Solenoid for wire feeder: 1 no	Vendor to confirm			
7.2.7	Solenoid for cooling unit: 1 no	Vendor to confirm			
7.2.8	Power source connector -Male+Female: 1no	Vendor to confirm			
7.2.9	Wire feeder connector Male+Female: 1 no.	Vendor to confirm			
8	DOCUMENTATION : Five sets of following documents (Hard copies) in English language should be supplied along with the machine	Vendor to confirm			
8.1	Operating and maintenance manuals of Machine and all supplied accessories.	Vendor to confirm			
8.2	Detailed Maintenance manual of machine which shall contain System Description, Block diagram, Schematic drawings, Circuit diagrams & hardware details of PCB's, diagrams & MMI. Trouble shooting charts. Do's & don'ts, exploded diagrams of welding torch with identifications nos, details of in-built programs. All Assembly/ Sub Assembly Drawings shall be supplied with the part list.	Vendor to confirm			

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8.3	Complete Master List of parts and spares used in the machine (with identifications, make, model, rating , price and name & address of suppliers of all items) shall be submitted by the vendor.	Vendor to confirm			
8.4	One additional set of all the above documentation in soft copy.	Vendor to confirm			
9	AMBIENT CONDITIONS & THERMAL STABILITY :				
9.1	Total machine and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Power Supply: Voltage: 415 V \pm 10% Frequency: 50 Hz \pm 0.5% No. of phases = 3 Ambient Conditions: Temperature = 5 to 50 degree celsius with variation of 25 degree celcius (max), dusty atmosphere. Relative Humidity = 95% max. (Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor)	Vendor to confirm			

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10	EQUIPMENT ACCEPTANCE: (Tests/Activities To be Performed by Vendor)	Should be accepted & confirmed by Vendor			
10.1	Tests/Activities should be carried out at supplier's works on the equipment before dispatch :				
10.1.1	The equipment should be tested for repeated testing operations. If any break down occurs during this test, the test should be repeated.	Vendor to confirm			
10.1.2	Demonstration of all features of the equipment, and all accessories.	Vendor to confirm			
10.1.3	Three BHEL Persons should be trained at supplier's / BHEL Works for mutually agreed period in the area of (b) Electronic and software maintenance for equipment & other supplied equipments (c) Mechanical & Electrical maintenance of the equipment & other supplied equipments (d) Operation of the equipment & other supplied equipments.	Vendor to confirm			
10.1.4	Vendor to quote for training on man / week basis	Vendor to confirm			
10.2	Test to be carried out by Vendor at BHEL works while commissioning the machine :				
10.2.1	Demonstration of all features of the machine & all accessories to the satisfaction of BHEL for their efficient and effective use.	Vendor to confirm			
10.2.2	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	Vendor to confirm			
10.2.3	Training of BHEL personnels on machine for trouble shooting and effective maintenance of complete machine & accessories by the manufacturer's experts/ engineers during their stay at BHEL works.	Vendor to confirm			

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10.2.4	Training of BHEL welder in operation of complete machine & accessories etc by the manufacturer's experts / engineers during their stay at BHEL works	Vendor to confirm			
10.2.5	Insrument must be calibrated and proved against setting knob as well as against actual current measured by tong tester while welding a job.	Vendor to confirm			
11	PACKING:				
11.1	Sea worthy & rigid packing for all items of complete machine.	Vendor to confirm			
12	GUARANTEE :				
12.1	Supplier should guarantee the machine performance for 24 months from the date of acceptance of machine and shall provide spares and services during guarantee period to maintain the machine in working condition.	Vendor to confirm & include the cost in the equipment price.			
12.2	Service to be provided within 48 hours.	Vendor to confirm			
13	GENERAL : The vendor should submit the following information:				
13.1	Machine Model	Vendor to specify			
13.2	Total connected load (KVA):	Vendor to specify			
13.3	Total weight of the machine	Vendor to specify			

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18	QUALIFYING CONDITIONS :				
18.1	Only those vendors who have supplied to at least two customers in the past ten years welding inverter of capacity 380 A capacity at 100% duty cycle or higher capacity and such machines are presently working satisfactorily for more than one years after commissioning shall quote. The following information is to be submitted by the vendor about the companies where similar machines have been supplied.	Vendor to Confirm			
18.1.1	Authorization certificate from manufacturer along with complete responsibility of manufacturer for after sales service to be provided.				
18.1.2	Name of the customer / company where similar machine is installed.	Vendor to Confirm			
18.1.3	Complete postal address of the customer.	Vendor to Confirm			
18.1.4	Year of commissioning.	Vendor to Confirm			
18.1.5	Application for which the machine is supplied.	Vendor to Confirm			
18.1.6	Name and designation of the contact person of the customer.	Vendor to Confirm			
18.1.7	Phone, FAX no. and email address of the contact person of the customer.	Vendor to Confirm			
18.1.8	Performance certificate from any one customer regarding satisfactory performance of machine supplied to them. The certificate to be issued within one year of issue of tender	Vendor to Confirm			
18.1.9	BHEL reserves the right to verify information provided by vendor. In case the information provided by vendor is found to be false/incorrect, the offer shall be rejected.	Vendor to Confirm			