



Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

An ISO 9001
Company

ENQUIRY NOTICE INVITING TENDER	Phone: +91 431 257 7938 Fax : +91 431 252 0031 Email : tvenkat@bheltry.co.in Web : www.bhel.com
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TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two parts.	2631400007	14.02.2014	14.03.2014

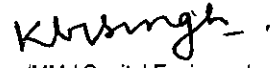
You are requested to quote the Enquiry number, date and due date in all your correspondences. This is only a request for quotation and not an order.
Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of tender opening.

Item	Description	Quantity	Delivery
10	Hydraulic Cylinder for 50 T CLH Testing Station as per the technical specification, BHEL commercial terms & conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	2 Nos.	10.07.2014
20	Hydraulic Power Pack for 50 T CLH Testing Station as per the technical specification, BHEL commercial terms & conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1 No.	10.07.2014

Important points to be taken care during submission of offer

1. Compliance Form to be duly filled and enclosed along with your offer, failing which the offer will not be considered for evaluation.
2. All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.

BHEL's General guidelines / instructions including bank guarantee formats and list of consortium banks, commercial terms compliance form can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units) Bharat Heavy Electricals Limited page) under Enquiry reference "2631400007".

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED  Engineer/MM / Capital Equipment
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KUMAR GAUTAM SINGH
 Engineer
 MM / Capital Equipment
 BHEL, TRICHY - 620 014.

PART B

**SPECIFICATION OF HYDRAULIC POWER PACK FOR CONSTANT
LOAD HANGERS (CLH) OF 50 TON CAPACITY**

Quantity : 1 No.

Sl.no	Description	Bidder's Offer/Comments
1	SCOPE:	Bidder to Confirm
	Design, manufacture, supply, erection and commissioning of hydraulic power pack with hydraulic cylinders and control panel for testing of Constant Load Hangers (CLH) of 50 ton capacity.	
2	SPECIFICATION:	Bidder to Confirm
	Hydraulic power pack with operating control panel for applying load to the Constant Load Hanger spring while testing in vertical direction using two double acting hydraulic cylinders of size: Cylinder Bore Diameter: 200 mm x Piston Rod dia. 110 mm x Stroke 800 mm. (The specification of the hydraulic cylinder is specified in Sl.No.5).	
3	MAJOR PARAMETERS OF POWER PACK:	Bidder to specify/confirm
	<p>Pump flow rate: Around 37.5 lpm (Shall be designed with standby system - 1 No.) System Pressure: 310 bar, Electric motor: 40 hp @ 1440 rpm, # 3 phase 415V, 50Hz Max. Tank Capacity: 250 litres (minimum) Loading while compressing the spring (during return direction of cylinder) The cylinder is mounted vertically. The hydraulic power pack should be suitable for the above cylinder to load the CLH to a maximum load of 50 tons.</p> <p>The load should be adjustable in the following 5 ranges by using electrical selector switches and variable pressure control valves.</p> <ol style="list-style-type: none">1. 0 to 2 tons2. 0 to 5 tons3. 0 to 10 tons4. 0 to 20 tons5. 0 to 50 Tons	

4	OPERATION:	Bidder to specify/confirm
	<p>The CLH Assembly will be made to hang in the testing machine. Top end of CLH will be mounted on the beam connecting the two columns of the machine into which two hydraulic cylinders one each will be installed and these cylinders will be connected by a common member. The bottom end of the CLH will be connected to this common member. While the piston moves downward during the return stroke, the common member also will move downwards and pull the springs of the CLH for testing. The load cell will be placed in the line of CLH.</p> <p>The movement of cylinder should be operated using electrical push buttons by inch mode, mounted on the operating panel. After loading the job, the load should be held for minimum 10 minutes without any pressure drop. Also the speed of the piston should be infinitely adjustable in both directions. Approx. speed required is 700mm per min. for loading and 500mm per min for unloading. Hence, suitable load holding valves and double throttle check valves to be provided in the circuit.</p>	
5	HYDRAULIC CYLINDER:	Bidder to confirm
5.1	Number of cylinders: 2	
5.2	Type of cylinder: Double Acting Hydraulic Cylinder	
5.3	Cylinder Bore Diameter: 200 mm	
5.4	Piston Rod Diameter: 110 mm	
5.5	Stroke: 800 mm	
5.6	Speed: Loading 700mm per min (approx.) Unloading 500mm per min (approx.)	
5.7	Rated pressure: 210 bar.	
5.8	Maximum working pressure: 230 bar	
5.9	Test Pressure (Proof pressure): 310 bar	
5.10	Working Medium: Hydraulic oil - ISO VG 68	
5.11	Working temperature range: 25 deg C to 60 deg C	
5.12	Installation: Vertical	
5.13	Loading: During return stroke of cylinder	

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5.14	MOUNTING AND OTHER DETAILS	
5.14.1	Piston end: 80 mm thick Male Clevis plate with 90 mm hole. Rod end: Male thread M106 x2pitch with thread length for 100 mm from end of the rod. This arrangement should be able to withstand pulling force of Min. 50 ton by two such cylinders.	Bidder to specify
5.14.2	Cylinder port size shall be 3/4" BSP and port opening shall be in line with male clevis bore.	Bidder to confirm
5.14.3	Cylinder shall be of welded construction in which gland OD in line with cylinder Outer tube OD.	Bidder to confirm
5.14.4	Layout of cylinder with detailed drawing to be submitted while quoting for offer itself.	Bidder to confirm
5.15	GENERAL POINTS	Bidder to confirm
5.15.1	Cylinder bore to be honed to a surface finishing not less than 20 micro inches or Ra 0.6 to Ra 0.4, Piston rod should be hard chrome plated to 40 microns (min) and 55 - 58 HRC (min) hardness.	
5.15.2	Latest wear resistant standard size, seals and O rings of Hunger/ Hallite/ Parker/ James Walker/ Merkel/ Simrit/ Busak & Shamban (Trelleborg) only can be used.	
5.16	Materials for construction for all hydraulic cylinder components are as follows	Bidder to Specify/Confirm
	CYLINDER TUBE	ST52-W SEAMLESS STEEL
	PISTON ROD OR RAM	C45/ EN 8/ EN 24
	PISTON	EN 8/M.S
	END COVERS/FLANGES	M.S/EN 8
	FASTENERS	HIGH TENSILE GRADE 10.9/12.8 Make TVS/UNBROKO/LPS
	SEALS & ITS MATERIALS	PU/PTFE/VITON and Makes as per enquiry.
6	HYDRAULICS:	Bidder to specify/confirm
6.1	The latest version of pumps, valves, hoses, accessories, etc., should be used with BOSCH REXROTH / EATON VICKERS/ PARKER make only unless otherwise specified.	



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6.2	The Power pack should be tropicalized for Indian conditions - for an ambient temperature of 45 deg C. Suitable oil cooling arrangement ,preferably with oil chiller(Refrigerant: R-134A/CFC free) to be provided to maintain the oil temperature within 50 deg C. Necessary digital temperature gauge should be mounted on the hydraulic power pack for measuring the oil temperature. Chiller unit shall be connected in direct type.	
6.3	All the pipe / hose fittings shall be of standard weld nipple with O-ring seating type (DIN 3865 OR Equivalent) heavy series fittings only and no ferrule joints are to be proposed in the hydraulic system. All threaded connections shall be of metric sizes.	
6.4	Pressure measuring minimess check points (preferably with 1/4" BSP stud end) to be provided, wherever required for quick pressure measuring and pressure setting while trouble shooting. One set of handheld minimess pressure gauge (glycerine filled) of suitable range with micro bore standard hose (around 1.5 m length) also has to be supplied along with the power pack.	
6.5	Fixed Pressure gauge (dial size: minimum 100 mm) with gauge isolator valve (Push and lock type), range: 0 to 500 Kg / Sq.cm. to be provided in the power pack.	
6.6	Suitable vibro-mounts, compensators (flexible bellows), delivery hose between pump and valve block, polypropylene pipe and hose clamps, etc. are to be provided to minimize the vibration induced and transmitted to the hydraulic joints.	
6.7	The oil to be used shall be of standard ISO Viscosity Grade 68Centi-Stokes at 40 deg C. The grade of oil and capacity of tank should be painted on the tank near the oil filler unit.	
6.8	The control voltages for all the Solenoids of the valves shall be of 24-V DC and all solenoid operated DC valves should have manual over-ride provision and light indicating solenoids.	
6.9	Suitable filtration system should be provided with Duplex / standby filter units. It is preferable to use re-usable type of filter elements in the system. Bidder to confirm & Furnish	

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	details.	
6.10	The power pack shall be terminated with 2 Nos. of 3/4" hydraulic hoses with end fittings and length around 10 meter each. In the power pack wherever possible seamless steel piping (Annealed and Pickled) can be used, on requirement standard length minimum flexible hydraulic hoses with end fittings can be used.	
6.11	The power pack shall be fitted with lifting hook.	
6.12	The Power pack shall be placed with suitable legs at floor level for easy maintenance.	
6.13	The system shall be designed and constructed so that components are located where they are accessible and can be safely adjusted and serviced. Hydraulic components including piping shall be accessible and fitted so as not to interfere with adjustment or maintenance. Particular attention shall be given to the location of systems and components that need regular maintenance. Manifold (Sub - plate mounting valves) shall be placed separately for easy maintenance from the power pack with tray. Note: Pump shall not be located directly on the power pack tank.	Bidder to provide the general layout details with critical dimensions (L x B x W).
6.14	Each pump should have an independent motor. Tandem pumps shall be avoided.	Bidder to confirm
6.15	Failure indication for oil level, temperature, pressure, filter clogging should be provided	Bidder to confirm & Furnish details.
6.16	All hydraulic pipelines, hoses and electrical control cables to be neatly laid out with proper clamps and flexible hose conveyors/cable drag chains (IGUS/TSUBAKI/GORTRAC) wherever required.	Bidder to confirm
6.17	Automatic shut off provision during hose failures, chiller failure, low oil level etc. Pump unloading feature during idle running to be provided for energy conservation. Details should	Bidder to specify

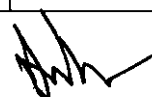
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	be submitted.	
6.18	All the components in the hydraulic power pack shall be provided with identification numbers, as per the hydraulic circuit and should be pasted with metallic identification number plates.	Bidder to confirm
6.19	Hydraulic oil will be supplied by BHEL during commissioning at BHEL works. Vendor to provide the oil during pre-dispatch inspection.	Bidder to confirm
7	ELECTRICALS:	Bidder to specify/confirm
7.1	Along with hydraulic Power pack, the supplier should provide suitable operating panel, which shall be mounted on a separate fixed stand.	
7.2	The operating panel shall have the Push button controls for main ON / OFF, pump ON / OFF, selector switch for selecting load ranges of 2 Tons, 5 Tons, 10 Tons, 20 Tons and 50 Tons, mushroom type emergency switch, Push buttons for cylinder's piston Up / Down and Load Holding in Neutral (inching mode).	
7.3	This operating panel will be located at a distance of 15 metres from the power pack. Suitable control transformer, control and power cables with cable hose to be supplied along with control panel.	
7.4	Electrical junction box with ferrule numberings to be provided in the power pack.	
7.5	One Main ON / OFF isolator switch with proper earthing to be provided in the power pack.	
7.6	Input power supply of 415v, 3 ph., 3 wires, 50 Hz with isolator will be provided by BHEL.	
7.7	The electric motor shall be of Kirloskar / ABB / Siemens/Crompton make conforming to S1 - continuous duty with IP-55 protection and EFF1 energy efficient type	
7.8	All electrical components in control panel / operating panel should be of reputed makes of Siemens / L and T / Telemecanique only.	
7.9	The operating panel should have sufficient aesthetic appearance and ergonomic to normal operation.	
7.10	All electrical terminations to be provided with suitably sized cable glands.	

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7.11	Apart from fixed operating panel, one remote control pendant having only Push buttons for cylinder's piston Up / Down and Load Holding in Neutral (inch mode) to be supplied. This remote pendant should be as small in size as possible with 5 meter cable.	
7.12	Emergency switch terminals wire shall be connected to connecting terminals.	
8	DOCUMENTATION	
8.1	Documents to be provided along with offer for technical evaluation:	Bidder to confirm
	<p>The following documents to be provided along with offer for technical evaluation. In the absence of all the required documents, the offer will not be considered.</p> <ol style="list-style-type: none"> 1. Hydraulic circuit with Bill of materials giving complete purchase specifications and make of each item. 2. Technical catalogues of pump, valves and fittings. 3. Electrical schematic and control circuit diagram with complete bill of materials including makes of each components in it. 4. Technical catalogues of oil chiller unit. 5. General assembly drawing with sealing arrangement of cylinder. 	
8.2	Documents to be provided for approval before manufacturing:	Bidder to confirm
8.2.1	<p>In case of ordering, the supplier should provide the following documents for our approval before manufacturing.</p> <ol style="list-style-type: none"> a. Hydraulic circuit with Bill of materials giving complete purchase specifications and make of each item. b. Cross sectional assembly drawing, component drawings and sealing arrangement drawings of cylinder with complete data sheets (part number) of the seals & O-rings. c. Electrical schematic and control circuit diagram with complete bill of materials including makes of each components in it. d. Electrical wiring diagram with ferrule numbers. 	



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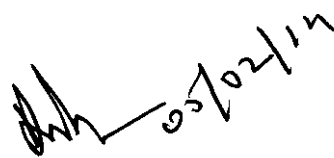
	e. Control panel and remote pendant lay-out. f. Technical leaflets of bought out items.	
8.2.2	Documents to be provided for approval before manufacturing within 4 - 7 weeks from PO/LOI.	
8.3	Documents to be supplied along with material supply:	Bidder to confirm
	<p>Three sets of the following documents are to be provided along with each power pack (Both hard binded copy and Soft copy- CD/DVD):</p> <ol style="list-style-type: none"> 1. Hydraulic Circuit (preferably with standard colouring) with Bill of materials giving purchase specifications for each item. 2. Function diagram for the entire operations of the system giving solenoid sequences, interlocks and pressure & flow parameters for each operation. 3. Pump lay out and piping lay out giving sizes of each pipe line. 4. Detailed technical Catalogues in original for all components in the system. 5. Electrical schematic/ control circuit diagram with Bill of materials giving complete purchase specification of all bought out components. 6. Electrical wiring diagram with ferrule numbers. 7. Control panel lay-out. 8. Cross sectional assembly drawings, component drawings and sealing arrangement drawings of cylinder with complete data sheets (part number) of the seals & O-rings. 	
9	TESTING, INSPECTION AND PROVE OUT	Bidder to confirm
9.1	The power pack and hydraulic cylinders will be tested at supplier's works for the operating parameters before dispatch of materials.	
9.2	The cylinder will be tested for a proof test pressure of 310 bar for a holding time of minimum 10 minutes, keeping the piston at its mid stroke position as per test procedure of Indian Standard IS-10585: 2002.	
9.3	The supplier should produce test certificate for the hardness and chrome plating thickness of cylinder for verification during pre-dispatch inspection.	

9.4	The supplier should provide all facilities for testing the above at supplier's works and prove the performance of the power pack with cylinder.	
9.5	Test certificates for hydraulic pressure testing and materials to be submitted during pre-dispatch inspection.	
9.6	The supplier should carryout erection and commissioning of the power pack system and hydraulic cylinders at BHEL, Trichy and proves out the system.	
10	GUARANTEE AND OTHER POINTS	Bidder to confirm
10.1	Installation and prove-out of the Total power pack, Hydraulic cylinders & Control panel is in supplier's scope and forms part of commissioning. Note: Fabricated column and basic machine structure with job loading arrangement, Load cell and Linear scale will be in BHEL's scope.	
10.2	The equipment should be guaranteed for a minimum of 12 months from the date of commissioning or 18 months from the date of supply whichever is earlier	
10.3	Delivery shall not exceed 20 weeks from date of Purchase order/LOI.	
10.4	The following operating spares can be listed in the offer (To be included in the scope of supply itself) Seal Kit - 1 Set in each type Hydraulic Valves - 1 No in each type Hydraulic Hose with end fittings - 1 No in each type Filters - 1 No in each type	
10.5	The metallic plate indicating the power pack hydraulic circuit drawing shall be anodized and fixed in the power pack for troubleshooting purpose suitably. (Qty: 1 No.)	
11	PAINTING	Bidder to confirm
	The outside surface of the complete power pack and cylinder shall be painted with 2 coats of red oxide primer and 2 coats of apple green paint (RAL 7011) before dispatch. If paint peels offs in between the same shall be corrected before prove out at BHEL Trichy works by supplier itself.	

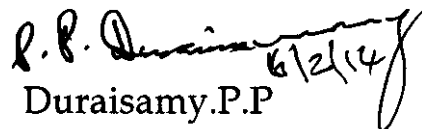
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	Standard colouring shall be followed for pipe lines and other accessories.	
12	MAKES OF BOUGHT OUT ITEMS SHALL BE AS FOLLOWS UNLESS OTHERWISE SPECIFIED	Bidder to confirm
	1.All hydraulic system: Rexroth/Eaton Vickers/Parker 2.All hydraulic hoses: Parker/Aeroquip/Gates only 3.Hydraulic filters: Rexroth/Eaton Vickers/Parker/Pall/Hydac 4.Pressure Gauge: Wika/Waree/Parker 5.All Coupling: SKF/Fenner/Hydax 6.Hydraulic fittings: Parker/Swageloc/Hyloc/HT 7.Oil Chiller: Werner finley/Rittal/ Daikin 8.Digital Temperature Gauge: Wika/Waree/Sridharan 9. Anti-vibration mounts: Lousion/Lovejoy/Trelleborg/Dunlop/Polybond 10. Hydraulic Seals: Hunger/ Hallite/Parker/James Walker/Merkel/ Simrit/ Busak & Shamban (Trelleborg) 11. Micro bore hydraulic hose: Hydrotechnik UK /Sparrow/Polyhose	
13	IMPORTANT ASPECT FOR THE SUPPLIER/VENDOR	Bidder to Specify/Confirm
	The specification provided is absolutely for educative nature for the offer. The offerer is hereby directed to get acquainted with the BHEL Trichy area conditions before submitting the offer. Anything unspecified but necessary for the equipment function shall be indicated by the vendor/supplier during quoting itself.	



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DGM/M&S/B-50 & HRDC



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