

	BHARAT HEAVY ELECTRICALS LIMITED			Enquiry No. :	
	UNIT'S ADDRESS			Due Date :	
	UNIT'S PHONE NOS.			Supplier Qtn. No.:	
	CONTACT PERSON'S NAME/DESIGN/PHONE NO./E-MAIL (FROM PURCHASE DEPTT.)			Date :	

SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR AIR DRYER SYSTEM WITH COMPRESSOR

Rev : 00

NOTE :-

1. Vendor must submit complete information against clause no. 16.0 (Qualifying Condition). The offer meeting this clause would only be processed.
2. Vendor to furnish the offer using this standard template of the specification. While furnishing the offer, no change is to be made in the first three columns (i.e. 'S.NO.', 'DESCRIPTION FOR BHEL REQUIREMENT' & 'ACTION BY VENDOR'). Only 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.
3. The offer and all documents enclosed with offer should be in English language only.
4. Vendor should confirm/clarify/specify pointwise (all the points) as per specification and provide original technical leaflet, technical details, photograph, scope of supply etc. at the first instance.

NAME & ADDRESS OF THE SUPPLIER :

NAME & ADDRESS OF THE INDIAN AGENTS :

TELEPHONE NOS./ MOBILE NO OF DEALING PERSON:

TELEPHONE NOS./ MOBILE NO OF DEALING PERSON:

FAX NOS.:

FAX NOS.:

E-MAIL ADDRESS :

E-MAIL ADDRESS :

SUPPLY, INSTALLATION AND PROVING OF AIR DRYER SYSTEM WITH COMPRESSOR AS BELOW :

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	DEVIATIONS	REMARKS
1.0	PURPOSE :				
1.1	The high purity dryer air system with compressor required to cater the dry air of dew point better than (-60 °C) to supply dry air to prevent moisture ingress during case fitting, dismantling , internal inspection for transformer & reactors. Also the dry air required to fill the transformer and reactor tanks before dispatch.	VENDOR TO NOTE			
1.2	EQUIPMENT CONFIGURATION:- The Portable Air Dryer System with Air Compressor, Air storage tank, air cooling unit, oil and air partical filters, twin chamber desiccant air dryer, online digital dew point meter, control panel for complete automatic operation of the system & mounted on a movable trolley having high strength wheels shall be of robust in construction and of latest proven compact design which guarantees reliable service, most convenient, high effeciency & safe operating conditions and least maintenance requirements. The complete unit shall be consist in a portable & fabricated structural steel frame work with four wheels with provision of locking system in each wheel shall be of welded steel construction. A suitable nos. of lifting hook shall also be provided to movement of system through EOT crane. Detailed General Arrangement (G.A.) drawing shall be submitted by the supplier for approval by BHEL before manufacturing.	VENDOR TO CONFIRM			
1.3	The Dry Air System is required to produce 100 cfm of dry compressed air at 7 Kg/cm ² and dew point better than (-60 °C) with on line Dew Point Monitoring.	VENDOR TO CONFIRM			
1.4	The System will consist of following basic components:-	VENDOR TO CONFIRM			
1.4.1	High efficiency screw type air compressor with automatic control, lubrication system , air & oil separatorss etc. to deliver 100 cfm of compressed air at 7 kg/cm ² pressure.	VENDOR TO CONFIRM			
1.4.2	Air cooled air cooler to cool down the compressed air to below 50°C.	VENDOR TO CONFIRM			
1.4.3	Set of air partical and oil filters to remove fine particals & oil traces from air down to 1 micron.	VENDOR TO CONFIRM			
1.4.4	Refrigeration type air cooling unit to cool down the hot air to 5 to 7 °C temperature so that 90 % of its moisture is removed and having automatic moisture separation.	VENDOR TO CONFIRM			
1.4.5	Twin Tower, Automatic regenerative type Desiccant Dryer having Molecular sieve as desiccant to dry the air to dew point better than -60°C measured at atmospheric Pressure.	VENDOR TO CONFIRM			
1.4.6	Dry Air storage receiver tank of 1000 Ltrs (1 m ³) capacity to store the dry compressed air. The Receiver tank shall be fabricated as per IS -2825 & must be equipped with the safety devices.	VENDOR TO CONFIRM			
1.4.7	Digital On-line Dew Point Meter with desiccant dry down chamber for Sensor protection to monitor the Dewpoint of Outgoing Dry Air.	VENDOR TO CONFIRM			
1.4.8	Control Panel for complete Automatic Operation, start / stop controls and indication of various parameters.	VENDOR TO CONFIRM			
1.4.9	Common skid for all the above items with Heavy Wheels and locking provision for easy movement inside the shop area.	VENDOR TO CONFIRM			
1.4.10	A suitable nos. of lifting hook shall also be provided to movement of system through EOT crane	VENDOR TO CONFIRM			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT		ACTION BY VENDOR	OFFERED	DEVIATIONS	REMARKS
1.5	TECHNICAL PARAMETERS					
1.5.1	Max. Working Capacity	: 100 cfm	VENDOR TO CONFIRM			
1.5.2	Operating Pressure	: 7 Kg/cm ² (minimum)	VENDOR TO CONFIRM			
1.5.3	Outlet Air Dew Point	: Better than - 60 °C	VENDOR TO CONFIRM			
1.5.4	Dry Air Storage Vessel	1 m ³	VENDOR TO CONFIRM			
2.0	TECHNICAL DESCRIPTION OF INDIVIDUAL ITEMS					
2.1	AIR COMPRESSOR : (01 No.)					
2.1.1	Screw Type, Energy efficient enclosed in a Sheet Metal enclosure and Total Automatic Electronic Control System. The compressor will have inbuilt Air cooled cooler, Air Oil Separator, Automatic Lubrication system with Oil filters, Suction Air Filter, Automatic Capacity Control system, Automatic Loading / Unloading system & Mounted on Anti vibration Pads.		VENDOR TO CONFIRM			
2.1.2	Capacity	: 100 cfm at 7 Kg/cm ² Pressure	VENDOR TO CONFIRM			
2.1.4	Make		VENDOR TO SPECIFY			
2.2	PRE - FILTER CUM MOISTURE SEPARATOR UNIT (01 No.)					
2.2.1	On- line Cartridge Type Moisture Separator cum Pre-filter having Sintered Bronze Filter element of 5 micron rating and fitted with Automatic Drain Trap.		VENDOR TO CONFIRM			
2.2.2	Capacity	: 100 cfm	VENDOR TO CONFIRM			
2.2.3	Working Pressure (Max)	: 10 Kg/cm ²	VENDOR TO CONFIRM			
2.2.4	Matl. of Const. (Housing)	: Carbon Steel	VENDOR TO CONFIRM			
2.2.5	Matl. of Const. (Element)	: Sintered Bronze	VENDOR TO CONFIRM			
2.2.6	Filter Rating	: 5 Micron	VENDOR TO CONFIRM			
2.2.7	Drain	: Automatic	VENDOR TO CONFIRM			
2.2.8	Make		VENDOR TO SPECIFY			
2.3	AIR COOLING UNIT (01 No.)					
2.3.1	Refrigeration Type Air Cooled, Unit for Cooling the Compressed Air from 50 °C to 5°C. The cooling Unit will have Compact Aluminum Channel Type Heat Exchanger & Evaporator, centrifugal type condensate separator and Auto Drain valve. It should be able to work on 10 To 100 % load variation of Air Capacity. The dryer will be compact and totally enclosed in a Sheet metal enclosure.		VENDOR TO CONFIRM			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT		ACTION BY VENDOR	OFFERED	DEVIATIONS	REMARKS
2.3.2	Capacity	: 100 cfm	VENDOR TO CONFIRM			
2.3.3	Working Pressure (Max)	: 10 Kg/cm ²	VENDOR TO CONFIRM			
2.3.4	Compressor	: Hermetically sealed	VENDOR TO CONFIRM			
2.3.5	Max. Ambient Temp.	: 45 °C	VENDOR TO CONFIRM			
2.3.6	Air Cooling Temperature	: 5 to 7 °C	VENDOR TO CONFIRM			
2.3.7	Drain	: Automatic	VENDOR TO CONFIRM			
2.3.8	Make		VENDOR TO SPECIFY			
2.3.9	Gas	Eco-friendly non CFC	VENDOR TO CONFIRM & SPECIFY			
2.4	OIL FILTER (01 No.)					
2.4.1	On- line Coalescing type Oil Filter to remove fine oil traces from Compressed air and fitted with Automatic DrainTrap.		VENDOR TO CONFIRM			
2.4.2	Capacity	: 100 cfm	VENDOR TO CONFIRM			
2.4.3	Working Pressure (Max)	: 10 Kg/cm ²	VENDOR TO CONFIRM			
2.4.4	Matl. of Const. (Housing)	: Die -Cast Aluminum	VENDOR TO CONFIRM			
2.4.5	Matl. of Const. (Element)	: Borosilicate Glass Fibre	VENDOR TO CONFIRM			
2.4.6	Filter Rating		VENDOR TO SPECIFY			
2.4.7	Drain	: Automatic	VENDOR TO CONFIRM			
2.4.8	Choking Indicator	: Color indicating type.	VENDOR TO CONFIRM			
2.4.9	Make		VENDOR TO SPECIFY			
2.5	DESICCANT AIR DRYER (01 No.)					
2.5.1	Desiccant Type, Twin Tower, Pressure Swing Adsorption Air Drying System to Dry the Compressed Air to a dewpoint of better than -60 °C and will have Automatic Cycle Control System, Auto Regeneration and Auto Change over.		VENDOR TO CONFIRM			
2.5.2	Capacity	: 100 cfm	VENDOR TO CONFIRM			
2.5.3	Working Pressure (Max)	: 10 Kg/cm ²	VENDOR TO CONFIRM			
2.5.4	Desiccant	: Molecular sieves	VENDOR TO CONFIRM			
2.5.5	Dry Air DewPoint	: -60 °C or Better	VENDOR TO CONFIRM			
2.6	AFTER FILTER (01 No.)					
2.6.1	On- line Cartridge type Dust Filter to remove fine particles of desiccant and installed after Desiccant Dryer.		VENDOR TO CONFIRM			
2.6.2	Capacity	: 100 cfm	VENDOR TO CONFIRM			
2.6.3	Working Pressure (Max)	: 10 Kg/cm ²	VENDOR TO CONFIRM			
2.6.4	Matl. of Const. (Housing)	: Die -Cast Aluminum	VENDOR TO CONFIRM			
2.6.5	Matl. of Const. (Element)	: Cellulose Fibre	VENDOR TO CONFIRM			
2.6.6	Filter Rating		VENDOR TO SPECIFY			
2.6.7	Make		VENDOR TO SPECIFY			

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2.7	<u>AIR RECEIVER VESSEL (01 No.)</u>					
2.7.1	Storage vessel to store the Dry Air for further use. The vessel shall be fitted with Std safety features like- Safety Valve, Pressure Gauge, Vent valve, Outlet Air Flow control valve, Mini Air Pressure valve, & other necessary Instruments as required for the system.		VENDOR TO CONFIRM			
2.7.2	Volumetric Capacity	: 1000 Ltrs (01 m ³)	VENDOR TO CONFIRM			
2.7.3	Working Pressure (Max)	: 10 Kg/cm ²	VENDOR TO CONFIRM			
2.7.4	Matl. of Const.	: MS as per IS 2062	VENDOR TO CONFIRM			
2.7.5	Code of Fabrications	: IS - 2825	VENDOR TO CONFIRM			
2.7.6	Make		VENDOR TO SPECIFY			
2.8	DEWPOINT MONITORING SYSTEM (1 No.) : Online Dew point monitoring system (mounted at outlet of dry air) consist of (1) display unit, and (2) Sensor.		VENDOR TO CONFIRM			
2.8.1	Display Unit :					
2.8.1.1	Display :	LED Red, 7 segment, Height : 13 mm (min.), 5 digits.	VENDOR TO CONFIRM			
2.8.1.2	Power supply :	230 VAC	VENDOR TO CONFIRM			
2.8.1.3	Operating temperature :	0 to 60 °C	VENDOR TO CONFIRM			
2.8.2	Sensor :					
2.8.2.1	Measuring range :	20 to -80° C	VENDOR TO CONFIRM			
2.8.2.2	Accuracy :	± 3 °C at -50 to -80 °C	VENDOR TO SPECIFY			
2.8.2.3	Protection class :	IP65	VENDOR TO CONFIRM			
2.8.3	Make		VENDOR TO SPECIFY			
2.8.4	Calibration certificate to be furnished along with supply.		VENDOR TO CONFIRM			
3.0	ELECTRICAL AND CONTROL SYSTEM :					
3.1	415V +/-10%, 50 Hz +/-1.5 Hz, 3 Phase AC (3 wire system without neutral) Power Supply Source will be provided by BHEL at a single point near the equipment. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the equipment, shall be the responsibility of vendor. Requirement of grounding/earthing with required material details is to be informed by vendor well in advance (If required).		VENDOR TO CONFIRM			
4.0	CONTROL PANEL : A common Control Panel for Power Supply to Individual Items and Total Automatic Control, Indication of Air DewPoint, fault alarms, etc. The Panel shall be with Sheet Metal body duly Powder coated with Reputed makes of Switchgears.		VENDOR TO CONFIRM			

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5.0	PERFORMANCE :				
5.1	The equipment shall be guaranteed for meeting the specified performance as per clause 1.5.3	VENDOR TO CONFIRM			
6.0	SAFETY:				
6.1	Following safety features in addition to other standard safety features should be provided on the equipment.	VENDOR TO CONFIRM			
	1.Equipment should have adequate and reliable safety devices to avoid damage to the equipment and the operator due to the malfunctioning or mistakes.	VENDOR TO CONFIRM			
	2. Emergency Switches at suitable locations as per International Norms are to be provided.	VENDOR TO CONFIRM			
7.0	AMBIENT CONDITIONS & THERMAL STABILITY:				
7.1	Desiccant type Air Dryer should work trouble free and efficiently under following operating conditions and should give specified accuracies. Power Supply: Voltage: 415 V +/- 10% , Frequency: 50 Hz +/- 1.5 HZ No. of phases = 3 Ambient Conditions: Temperature = 5 to 45 degree celsius Relative Humidity = 90% max. in rainy season (Vendor to confirm that device is suitable for above).	VENDOR TO CONFIRM			
7.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Equipment shall be kept in the normal shop floor condition. Max. temperature variation is up to 25 deg Celsius in 24 hours. (Vendor to confirm that equipment is suitable for above).	VENDOR TO CONFIRM			
7.3	Thermal Stability of the complete system keeping in view specified Ambient Conditions and accuracy requirements of BHEL components and trouble free operation of the system should be ensured by vendor.	VENDOR TO CONFIRM			
8.0	DOCUMENTATION : 2 copies of each of the following shall be supplied along with the system				
8.1	Instruction manual.	VENDOR TO CONFIRM			
8.2	Maintenance manual along with detailed circuit diagram and schematics.	VENDOR TO CONFIRM			
8.3	Test, Guarantee and calibration certificate (validate of 1 year from the date of supply).	VENDOR TO CONFIRM			
9.0	SYSTEM INSPECTION:				
9.1	Inspection of the system to be carried out at supplier's works, before dispatch of the system in unassembled condition. Broadly following items shall be checked before dispatch: (a) Scope of supply. (b) make and quality of bought out items. (c) Verification test/Calibration certificate of all bought out items.	VENDOR TO CONFIRM			
10.0	TRAINING:				
10.1	BHEL personnel should be trained at BHEL works in the area of operation and Electrical & Mechanical maintenance of the equipment & associated accessories.	VENDOR TO CONFIRM			

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11.0	INSTALLATION(START-UP) & COMMISSIONING:				
11.1	Supplier to take full responsibility for carrying out the Installation, start up and proving of supplied equipment. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier. Other requirements like crane and helping personnel shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance.	VENDOR TO CONFIRM			
11.2	Tools, instruments and other necessary equipment required to carry out all above activities should be brought by the supplier on returnable basis..	VENDOR TO CONFIRM			
11.3	Required spares for installation and proving of the system within stipulated time, shall be brought by the supplier.	VENDOR TO CONFIRM			
11.4	Portion, if any, of the Desiccant Type Air Dryer, Refrigerated air dryer, Compressor and other supplied items where paint has rubbed off or peeled during transit should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours of paint used.	VENDOR TO CONFIRM			
11.5	Schedule for Installation shall be submitted with the offer.	VENDOR TO FURNISH			
12.0	PROVEOUT AND ACCEPTANCE OF SYSTEM (Test/Activities carried out by vendor during commissioning work).				
12.1	Complete prove out of system shall be done by Vendor at BHEL works as per para 2.1, 2.3 and 2.5. Vendor shall be fully responsible for prove-out of system as per requirements specified by BHEL to the full satisfaction of BHEL. Clarifications, if any required by vendor, regarding accuracy requirements of the plant, whether specified or not, should be discussed and cleared by vendor during initial technical discussions.				
12.2	Demonstration on full load test of all features of the system & all accessories to the satisfaction of BHEL for their efficient and effective use.				
12.3	Minimum three job trial will be taken as per BHEL process specifications.				
13.0	PACKING:				
13.1	Standard & rigid packing for all items of complete system, all accessories and other supplied items to avoid any damage/loss in transit.	VENDOR TO CONFIRM			
14.0	GARANTEE :				
14.1	18 months from the date of acceptance of the equipment at BHEL, Bhopal.	VENDOR TO CONFIRM			
15.0	GENERAL :- The vendor to submit following information				
15.1	Equipment Model (for Refrigerate dryer, compressor and Air dryer).	VENDOR TO SPECIFY			
15.2	Total connected load, if applicable.	VENDOR TO SPECIFY			
15.3	Floor area required (Length x width)	VENDOR TO SPECIFY			
15.4	Total weight of the system.	VENDOR TO SPECIFY			
15.5	Painting of equipment.	VENDOR TO SPECIFY IN DETAIL			
15.6	Detailed catalogues/General Arrangement drawing indicating all details of refrigerated air dryer, Screw type compressor and desiccant type air dryer & dew point meter should be submitted with the offer.	VENDOR TO FURNISH			

S. NO.	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	DEVIATIONS	REMARKS
16.0	QUALIFYING CONDITIONS :				
16.1	The vendor should either be an Original Equipment Manufacturer (OEM) or authorized dealer of the OEM of the offered equipment. Dealers have to submit valid Certificate of Authorization of the OEM for quoting for the equipment. The Certificate of Authorization must be submitted along with the offer.	VENDOR TO CONFIRM			
16.2	The vendor / OEM must have supplied and commissioned at least one Air Dryer System complete with Refrigerated Air dryer and Screw type compressor of similar or higher rating / capacity in the past five years (from the tender opening date) and such equipment is working satisfactorily for more than one year after commissioning.	VENDOR TO CONFIRM			
16.3	Following information is to be submitted by the bidder about the companies where such equipments have been supplied. This is required from all the vendors for qualification of their offer.	VENDOR TO NOTE			
16.3.1	Un-priced copy of purchase order for equipment supplied in line with Clause no. 16.2	VENDOR TO FURNISH			
16.3.2	Complete postal address of the customer.	VENDOR TO SPECIFY			
16.3.3	Month & Year of commissioning.	VENDOR TO SPECIFY			
16.3.4	Details of equipment supplied & application for which it is used.	VENDOR TO SPECIFY			
16.3.5	Name and designation of the contact person of the customer.	VENDOR TO SPECIFY			
16.3.6	Phone and email address of the contact person of the customer.	VENDOR TO SPECIFY			
16.3.7	Performance certificate from the customer (in the name of bidder / OEM) regarding satisfactory performance of the equipment (as detailed above) supplied to them. The Performance Certificate should be recently issued (i.e. its date of issue should not be more than 1 year old than from the tender opening date).	VENDOR TO FURNISH			
16.3.8	BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.	VENDOR TO NOTE & CONFIRM			