




106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89172	
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<p style="text-align: center;">Technical Specification for detailed Engineering & Supply of Wet ball mill Piping (Water, Slurry & Instrument Air), Valves, Pneumatic distributor box and instruments</p> <p>1. Purpose</p> <p>This specification stipulates the requirements for Design, engineering, manufacture / fabrication, supply, inspection & testing, transportation, handling, lowering, laying & joining, pipe component assembly, hydro-testing, performance guarantee of Slurry piping, Water piping and instrument air piping, design & supply of Valves, Instruments, Strainers, Pipe Fittings, pipe supports, Flanges, Gaskets, Bolting material etc as per the wet ball mill P&ID's.</p> <p>It also covers of Piping layouts, isometrics, stress analysis and supports detailing for wet ball mill piping equipment.</p> <p>2. General Information</p> <p>Application : Flue Gas Desulphurization plant (wet) Medium handled : Corrosive, abrasive slurry (Limestone) Surrounding : Hot, dusty, humid & corrosive atmosphere Installation : Outdoor (open to sky) Operation : Continuous/Intermittent</p> <p>3 SCOPE OF WORK:</p> <p>Total number of mills -2. (1 working+1stand by). Scope of supply shall include for both mills requirement.</p> <p>Vendor shall thoroughly understand and supply material as per the below annexures</p> <p>Annexure-1 Piping and valves specification which broadly covers the codes and standards to be followed, Design and construction, scope of supply and services, specification of pipes and fittings, services of various categories of valves, specification of gate,/Globe/ check/ball valves and butter fly valves.</p> <p>Annexure-2 P&ID of wet ball mill</p> <p>Annexure 3 Wet ball mill building layout drawing for equipment's location</p>							
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p>Annexure 4 Wet ball mill GA drawing to understand equipment.</p> <p>Annexure-5 Lime stone properties</p> <p>Annexure-6 Mass flow balance.</p> <p>Annexure-7 Control and Instrumentation specification</p> <p>Annexure-8 TECHNICAL SPECIFICATION OF MOTORS</p> <p>Annexure-9 SPECIFICATION FOR CABLES</p> <p>Annexure-10 MANDATORY SPARES</p> <p>Annexure-11 LIST OF DEVIATIONS_EXCEPTIONS</p> <p>Annexure-12 INDICATIVE VENDOR LIST</p> <p>Annexure-13 MANDATORY SPARES</p> <p>The scope of supply shall include but not limited to the following.</p> <p>Vendor shall ensure & quote for both mills requirement. Supply and design includes inside wet ball mill building and up to slurry storage tank.</p> <p>3.1 Design and Supply</p> <ol style="list-style-type: none"> 1.Design of all Water, Slurry & Instrument Air Piping Arrangement Documents and supply of all Water, Slurry & Instrument Air Piping as per the attached P&D ANNEXURE -2. Vendor shall ensure the sizes of pipes with respect to mass flow balance given in ANNEXURE-6. 2. Design and supply of all the instruments as per the attached P&ID, ANNEXURE –2 3.Design and supply of all the valves covered in P&ID, ANNEXURE –2 4.Design & supply of Strainers, Pipe Fittings, pipe supports, Flanges, Gaskets, Bolting material and other equipment's to complete the system . 5. Design and submission of Piping layouts, isometrics, 3d model, stress analysis and supports detailing documents.. 6 Design and submission of All piping (Slurry, water and instrument air) lines and valves sizing report documents 7.Design and supply of pneumatic distributor box along with actuator and limit switches. Distribution box details as per P&ID ANNEXURE –2. 8.Submission of Bill of material documents. 				
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- Spool no (if pre-fabricated)
- Batch no. or date of manufacture
- Colour bands (if applicable)


9. Electrical:


The scope of supply for electrical system shall include, but not limited to the following. Vendor shall follow Annexure-8 ELECTRICAL SPECIFICATION for design and supply of electrical items.


Sl.No.	Package scope matrix	
1.	Cables between bidder's supplied equipment and its raceway	Bidder
2.	Cable glands and lugs for bidder supply cable	Bidder
3.	Cable glands for all other cable (all incoming cable)	Bidder
4.	Skid or equipment mounted Junction Box (JB)	Bidder
5.	Local Electrical Control Panel (as required)	Bidder
6.	Electric motors complete with main & auxiliary terminal boxes, space heaters, RTD, BTD, (all temperature detector along with transmitter) and earthing pads.	Bidder
7.	VFD with accessories (cable sizing, cable race way and cable procurement between VFD and VFD operated motor)	Bidder
8.	Motorised valves with actuators & integral starter of actuator.	Bidder
9.	Grounding provision for all equipment for connection to the Purchaser's earthing conductor/grid. Skid mounted equipment shall be earthed through skid ground pad. All the equipment on by Supplier's skid shall be earthed up to the skid ground pad.	Bidder
10.	Special Cable (if any) including cabling, termination & accessories, Cable trays/conduits with supporting system.	Bidder
11.	Any other required electrical devices for safe and trouble free operation of the plant	Bidder

All the Electrical systems shall be supplied as per Annexure-9 .

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p>interruption of service to adjacent devices or unduly disturbing piping and tubing.</p> <p>Instruments shall be located in instrument enclosure or rack containing maximum up to six instruments.</p> <p>Dimension shall be provided by supplier. In case grouping is not possible and installed individually, canopy shall be provided. The grouping and design of racks/ canopy shall be approved by Employer during detail engineering. Bidder shall supply LIE/LIR as per finally approved drawings within the quoted price.</p> <p>10.5 For skid mounted instruments and instruments integral to equipments, process connection and piping can be in line with bidder's standard and proven practice.</p> <p>10.6. Detailed operation and control philosophy for all the equipment's shall be furnished by bidder and the same shall be subject to purchaser / owner's approval during detailed engineering.</p> <p>10.. All instruments/JB/racks shall be tagged as per Purchaser's tagging philosophy.</p> <p>10.8 Scope of C&I Cable and Cable engineering: Bidder shall include following instrumentation and control cables in bidder's scope along with all accessories like Cable glands, lugs, ferrules, etc. Further, complete package cable engineering for Bidder's supplied cables shall be in Bidder's scope.</p> <ul style="list-style-type: none"> • From field instruments/ valves/ devices to JB's – Bidder's scope • From JB's/field instruments/valves/ devices to Bidder's supplied Local panels : Bidder's scope • Between BIDDER's supplied items – Bidder's scope • From JB's / local panels to DDCMIS cabinet – Purchaser's Scope <p>10.9 All required mounting & erection hardware like impulse pipes/ tubes, SS/ PVC insulated copper tubes, root/ drain valves and instrument fittings, snubbers, pulsation dampeners, gauge protector, counter flanges, cable glands, and instrument rack/ stanchion/ enclosure for installing Bidder's supplied instruments on as required basis.</p> <p>10.10 The equipment shall employ latest state of the art technology to guard against obsolescence. In any case, Bidder shall be required to ensure supply of spare parts for lifetime of the plant. In case, the Bidder feels that certain equipment/component is likely to become obsolete, the Bidder shall clearly bring out the same in his Bid and indicate steps proposed to deal with such obsolescence.</p> <p>10.11 For DDCMIS preparation of logic/loops in case of operation from DDCMIS, I/O list, Drive list, Instrument List, mimics/ displays etc. shall be provided by Bidder for implementation in DDCMIS.</p> <p>10.12 Bidder shall provide IO quantity (DI, DO, AI, AO) for bidder supplied equipment in the offer.</p>					
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p>10.13 Bidder shall support as required for smooth engineering including DDCMIS up to commissioning & handover of bidder supplied equipment along with Control system (DDCMIS) to Purchaser.</p> <p>10.14 All actuators shall be certified for SIL 2 or better.</p> <p style="text-align: center;">* Communication protocol to be followed shall be Conventional HART type.</p> <p>11. Packing & Transportation Requirements</p> <p>Ends of pipe, fittings and pipe openings shall be sealed to prevent entrance of dirt, water, or other foreign matter. All pipe and pipe fittings shall be suitably protected, coated, covered or boxed to prevent damage or deterioration during transit, handling and storage at site, till the time of erection.</p> <p>Each packing shall have necessary handling marks. Boxes, bags, or bundles of small parts shall be tagged or labelled with weatherproof tags. Each packing shall contain a packing slip indicating the details of item like item description, quantity, weight etc. Detailed packing list shall be submitted for BHEL approval for giving dispatch clearance by BHEL.</p> <p>Details of handling & Storage instruction shall also be provided in each packing. Vendor shall submit a write up for safe handling and stacking of pipes during transportation and at site.</p> <p>All items shall be properly packed with adequate cushioning material to prevent rough handling and transport. Special care shall be given to prevent damage to the piping components.</p> <p>In case of transport by ship, packing shall be sea worthy so as to ensure safe delivery till site.</p> <p>The material being delivered at site shall be jointly inspected by BHEL and vendor. Defective or damaged pipe shall be rejected by BHEL and vendor is liable to replace the same with new ones without any commercial implications to BHEL. In case of minor damage, the BHEL may allow repair of the pipe by the Vendor to the satisfaction of the BHEL.</p> <p>12. PAINTING REQUIREMENTS</p> <p>Painting shall be followed as per approved painting scheme. However, for components where no specific requirement is stipulated, the painting conforming to the</p>					
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requirements stipulated below shall be as per OEM practice

13. Documents Submission:


13.1 Documents along with offer


Bidder shall submit the following drawings/data and technical information along with their Techno-commercial offer


Item	Description
1.	General arrangement drawing of belt weight feeder
2.	Quality assurance plan(QAP)
3.	Published equipment brochures and documents
4.	Experience/installation list of similar projects
5.	Other vendor supplied supporting documents
6.	Warranty & performance guarantee schedule
7.	Sub vendor list
8.	Guaranteed auxiliary power consumption
9.	Complete electrical load list .

13.2 Documents after award of contract. Bidder shall submit the following drawings/data and technical information along with after award of contract. For approval or Information:

Item	Description
1.	All Piping Arrangement Drawings (Water, Slurry & Instrument Air) - In Mill Building
2.	All piping (Slurry, water and instrument air) lines and valves sizing report
3.	Data sheet of Pipe & fittings for Air & water system
4.	Data sheet of Pipe Fittings for Slurry application

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<ul style="list-style-type: none"> • MDL shall be finalized with the successful Bidder after award of contract. • Other drawings as may be required will be determined at a later date. • Bidder shall submit instruction manual for all the equipment's covered under the scope of bidder as per agreed engineering schedule. The instruction manuals shall contain full details required for erection, commissioning, operation and maintenance of each equipment. The manual shall be specifically compiled for this project. The erection portion of manual shall contain erection strategy, sequence of erection, erection instructions, critical checks (along with permissible deviations/tolerance), Bill Of Materials, procedure for erection, general safety procedures to be followed. Procedure for initial checking after erection, procedure for testing (along with acceptance norms) check list for commissioning/pre-commissioning activities, List of tools and tackles. 																			
<p>14. SUPERVISION OF ERECTION, TESTING AND COMMISSIONING</p>																			
<ul style="list-style-type: none"> • The erection of piping ,valves and instruments will be done by owner (BHEL) as per Erection Manual and check List provided by bidder. The bidder has to supervise for erection, pre-commissioning & post- commissioning check-up, start-up, trial runs of all the items covered under the scope of supply. • There will be two visits . The bidder will be informed well in advance for the visit. Bidder shall consider 15 working days. 																			
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- 7.HOISTS
8.MILL INLET& OUT CHUTES
9.FEEDER INLET OUTLET GATES ALONG WITH CONNECTION CHUTES
10 PNEUMATIC DIVERTER &GATE ALONG WITH CHUTES

ANNEXURES LIST:


Annexure Sl. No.	Description
1.	SPECIFICATION FOR PIPES ,PIPE FITTINGS AND VALVES
2.	P& ID FOR WET BALL MILL
3.	WET BALL MILL BUILDING DRAWING
4.	MILL GA DRAWING
5.	LIME STONE AND WATER PROPERTIES
6.	MASS FLOW BLANCE WBM
7.	CONTROL AND INSTRUMENTATION SPECIFICATION
8.	TECHNICAL SPECIFICATION OF MOTORS
9.	SPECIFICATION FOR CABLES
10.	GENERAL INFORMATION
11.	LIST OF DEVIATIONS_EXCEPTIONS
12.	INDICATIVE VENDOR LIST
13	MANDATORY SPARES

VARIANTS – TABLE

VARIANT NO.	DESCRIPTION	MATEIRAL CODE
00	WBM PIPING DESIGN&SUPPLY INC VALVES&INS	BA9789172001
01	COMPLETE VALVES ASSEMBLY	BA9789172010
02	SEAT, DISC, SPINDLE WITH NUTS & BOLTS	BA9789172028
03	DIAPHRAGMS FOR VALVES	BA9789172036
04	FLAPS FOR NON-RETURN VALVES	BA9789172044
05	ACTUATOR FOR CONTROL/ISOLATION	BA9789172052
06	LIMESTONE SLURRY PIPE	BA9789172060

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REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY S MAHESH	DATE 15.09.22
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106-1 Rev No. 5 Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89172					
				Rev No. 01						
				Page 13 of 14						
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						08	OTHER VALVES-COMplete VALVES	BA9789172087		
						09	OTHER VALVES-SEAT, DISC, SPINDLE WITH NUT	BA9789172095		
						10	OTHER VALVES-DIAPHRAGMS	BA9789172109		
						11	OTHER VALVES-FLATS OF NONRETURN VALVES	BA9789172117		
						12	ELECTRONIC TRANSMITTERS (PRESSURE, DIFFERENTIAL PRESSURE, LEVEL, SPEED ETC.) ALL TYPES	BA9789172125		
						13	SWITCH (PRESSURE, DIFFERENTIAL PRESSURE, LEVEL, FLOW, TEMPERATURE ETC.)	BA9789172133		
						14	THERMOCOUPLE	BA9789172141		
						15	RTD	BA9789172150		
						16	THERMO-WELL FOR BOTH TC AND RTD	BA9789172168		
						17	COMPLETE SOLENOID VALVE ASSEMBLY	BA9789172176		
						18	COIL (SINGLE OR DOUBLE COIL TYPE)	BA9789172184		
						19	GAUGE (PRESSURE, DIFFERENTIAL PRESSURE, TEMPERATURE, LEVEL)	BA9789172192		
						20	AIR FILTER REGULATOR COMPLETE SET WITH PRESSURE GAUGES	BA9789172206		
						21	GAUGE GLASS / LEVEL INDICATOR	BA9789172214		
						22	PNEUMATIC DIAPHRAGM FOR DIAPHRAGM ACTUATED VALVE	BA9789172222		
						23	ACTUATOR SEAL KIT FOR PNEUMATIC CYLINDER ACTUATED VALVE	BA9789172230		
						24	GLAND PACKING	BA9789172249		
						25	PLUG, SEAT, CAGE, STEM ETC.	BA9789172257		
						26	RETAINER RING, SEAL RING ETC.	BA9789172265		
						27	GASKET	BA9789172273		
						28	ACTUATOR SEAL KIT	BA9789172281		
						29	GASKET	BA9789172290		
						30	COMPLETE SET OF POWER CYLINDER	BA9789172303		
						31	POSITION TRANSMITTER COMPLETE SET	BA9789172311		
						32	CONTROL VALVE/POWER CYLINDER E/P	BA9789172320		
						REVISION See record notes of revision		PREPARED BY P V S B	APPROVED BY S MAHESH	DATE 15.09.22

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	POSITIONER COMPLETE SET	
33	COMPLETE SET OF SOLENOID VALVE FOR PNEUMATIC TYPE ON/OFF VALVE/POWER CYLINDER	BA9789172338
34	SOLENOID COIL FOR PNEUMATIC TYPE ON/OFF VALVE/POWER CYLINDER	BA9789172346
35	POSITION LIMIT SWITCH FOR PNEUMATIC TYPE ON/OFF VALVE/POWER CYLINDER	BA9789172354

RECORD OF REVISIONS

REV. NO	DATE	REVISION DETAILS	REVISED	APPROVED

REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY S MAHESH	DATE 15.09.22
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