

LIME STONE WEIGH FEEDER & PNEUMATIC DIVERTER ALONG WITH ACCESSORIES

This specification stipulates the requirements for design, engineering, manufacturing, cleaning coating, painting, inspection, testing, packing, forwarding, delivery at site, site painting (if any), supervision of erection, testing, commissioning, performance guarantee test at shop/site, liquidation of punch points of '**Belt Weigh Feeder & Pneumatic diverter along with accessories** 'with all equipment and auxiliaries

Bidder shall refer Document No.BA89096 for qualification requirement.

1. GENERAL DESCRIPTION OF WEIGH FEEDER

The duct from the limestone silo hopper feeds the limestone to the weigh (feeder). The weigh feeder feeds limestone to Wet ball mill system.

Sl. No.	Description	Requirement
1.	Quantity and Design Capacity of Feeder	
	Quantity and Design Capacity of Feeder	18.0 TPH –2 sets
2.	Parameters	
	Media to be Handled	Limestone
	Limestone Analysis	Refer Annexure -1
	Duty	Continuous

2.SCOPE OF WORK

Scope for the bidders shall include Design, Engineering, Manufacture, Inspection/testing as per approved quality plans, Packing, Supply, Supervision of Erection & Commissioning, Performance Guarantee Test and handing over of final Customer.

- a. Design:** Includes basic engineering, detail engineering, preparation and submission of engineering drawings/calculations/datasheets/quality assurance documents/field quality plans, storage instructions, commissioning procedures, Erection & assembly Drawings, operation & maintenance manuals,

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REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22
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106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD	Product STD no. BA89095
				Rev No. 01
				Page 2 of 16

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performance guarantee test procedures and assisting BHEL in obtaining time bound approval from NTPL.

b. Testing: The scope of the bidder includes all shop tests, type tests, site tests, routine tests etc., fulfilment of complete quality assurance & inspection requirement and related activities for all the equipment & systems covered under the scope of the bidder.

c. Painting: The bidder scope of work includes supply of paints and painting of all equipment's as per approved painting schedule from NTPL/BHEL. Approved painting schedule will be provided after award of contract.

d. Supervision of Erection & commissioning: Includes supervision of erection & commissioning, supervision of startup and trial operation.

Performance Guarantee Test: The guarantee tests shall be carried out as per approved Performance guarantee test procedure, all the special equipment, tools and tackles, instruments, measuring devices required for successful conductance test shall be provided by bidder free of cost.

3.. Scope of Supply: The scope of supply shall include but not limited to the following.

3.1.Mechanical:

- a) One number of Spool Piece (Above Rod Gate)
- b) One number of Rod Gate
- c) One number of Spool Piece (Below Rod Gate)
- d) One number of Spool Piece Between Slide Gate And Feeder Inlet
- e) One number of Belt Weigh Feeder (one number below each limestone day silo) each of capacity specified in clause No. 3(1) complete with variable speed drive and its controls (to achieved the capacity from 0 to 100% load, load cell, belt, pulleys, idlers, drive motors, brakes, coupling, coupling guard, complete drive unit, supporting frame along with stools, feeding and discharge chute, belt tensioning arrangement, belt cleaners, dust tight enclosure, pull chord switches, belt sway and zero speed switches, inserts, fasteners, weighing and calibration devices, speed sensor, device for loss of flow detection, local control system etc. including all mechanical, electrical, C&I and structural parts and accessories. Limestone weighing shall be automatic and shall include local & remote indication of rate of flow & totalizer counter.
- f) Distance Piece: Feeder discharge hood and discharge chute up to Inlet flange

REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22
------------------------------------------	------------------------	---------------------------	------------------

RESTRICTED USE



106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89095
					Rev No. 01	
					Page 3 of 16	

of wet ball mill.

g) One number of Motorised gates at feeder inlet

h) One number of Motorised gates at feeder outlet

i) One number of pneumatic diverter gate.

j) One number of mill inlet chute.

k) One number of bypass chute.

l) Equipment fittings, supporting structure, along with insert plates, fixing bolts, MS sleeves, base plates, grouting and proper alignment etc.

3.2 Electrical & Control instruments

a) Cables, Cable glands ,Local electrical control panels, JB'S, transmitter, Motors with terminal boxes, VFD with accessories (cable sizing, cable race way and cable procurement between VFD and VFD operated motor) , Cable trays/conduits with supporting system

b) All the necessary Control & field instrumentation i.e. Transmitters, process actuated switches pull cord switches, belt sway switches, zero speed switches, Under Belt Switch, Chute Blockage Switch limit switches, switch for loss of flow, sensors, final control elements, solenoid / motor operated valves, etc.) as per finally approved P&ID/Flow Scheme, and to facilitate effective control of the system, shall be supplied by Bidder. These shall suit the actual FGD DDCMIS

c) All transmitters, gauges etc. shall be suitably grouped together and mounted inside:

(i) Local Instruments Enclosures (LIEs) in case of open areas

(ii) In Local Instrument Racks (LIRs) in case of covered areas.

Instrument rack / enclosure shall be free standing type with CRCA steel and painting

d) Belt Weigh feeder shall be controlled through either through microprocessor based DDCMIS, supplied by Employer or local control panel based on bidder's standard practice. However in case of control through LCP, start / stop command with necessary control and monitoring feedback (Hard wired) shall be provided by bidder from LCP to DDCMIS. Detailed operation and control philosophy shall be furnished by bidder and the same shall be subject to purchaser / owner's approval during detailed engineering.

REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22
------------------------------------------	------------------------	---------------------------	------------------

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106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89095
					Rev No. 01	
					Page 4 of 16	

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e) Two (2) number of pull-cord switches shall be provided at both side along the length of each belt conveyor, which shall enable the respective conveyor to be stopped immediately. Each pull chord switch shall be identified by a specific number on HMI in the main control room. All instruments/JB/racks shall be tagged as per Purchaser's tagging philosophy.\

f) Scope of C&I Cable and Cable engineering:
 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

g) 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 for Belt weigh feeder .

h) Temperature transmitter, pressure transmitter and motorized actuators shall be HART PROTOCOL based. All actuators shall be certified for SIL 2 or better.

3.3 Scope of Supply - Civil & Structural:
 Structural loading drawings indicating the vertical and lateral loads transmitted to the foundation at each support location. The loads due to dead load, live load, wind load, seismic load and other pertinent conditions shall be listed separately. This shall include, but not be limited to, magnitude, direction of forces; location, service, and / or connection details to Purchaser's furnished supports. All such drawings shall be submitted under separate cover.. Overall base plate dimensions and Anchor bolt information shall include the size and location of bolts in relation to equipment center-line, anchor bolt projection above concrete surface, bolt material strength, and required length. Levelling provisions shall be fully described.
 BIDDER shall submit design calculations, which include the determination of operating loads, foundation reactions and anchorage design.


****Bidder shall supply any other items required for completeness of the equipment except the items covered in the exclusions.**

4 .Miscellaneous Scope:
 I. All equipment, systems and components etc. supplied under this specification shall be fully designed and engineered by Supplier.

REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22
------------------------------------------	------------------------	---------------------------	------------------

RESTRICTED USE



106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89095
				Rev No.	01	
				Page	5 of 16	
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>II. Supply of all consumables like chemicals, lubricants required for start-up and commissioning, trial runs, performance guarantee test and up to handing over of the complete plant to the Employer by the Purchaser including first fill of lubricants. The first fill requirement same includes oils and lubricants for one-year toppings.</p> <p>III. Supply of all Start-up and commissioning spares Bidder shall quote for recommended spares, if any, as an optional item.</p> <p>IV. Special tools & tackles, which are necessary or convenient for erection, commissioning and overhauling of any equipment.</p> <p>V. Testing instruments during commissioning and performance guarantee testing at site shall be provided by the Bidder and provision for install of these items to be provided.</p> <p>VI. All equipment, systems and components mentioned under this specification shall be technically complied with codes/standards, technical requirements and technical datasheet to meet the mentioned guaranteed requirements. Bidder shall fully own the responsibility of functional requirement of equipment covered in this specification.</p> <p>VII. Inspection and testing for all equipment and components at Bidder's works and his sub-vendor's works shall be as per approved QAP, applicable codes and approved drawing/documents/procedures.</p> <p>VIII. Supervision of Erection and Supervision of commissioning of all equipment and system under scope of this package. For Erection and commissioning requirements.</p> <p>IX. Supervision of Performance guarantee testing as specified elsewhere in the specification.</p> <p>X. Bidder shall be responsible for establishment of overall performance of the System/equipment supplied under this contract. Bidder shall provide qualified technical field personnel & testing equipment/instruments as required for commissioning, testing and as well as for establishment of performance parameters at site. Any additional work (if required) on equipment and accessories/associated systems to establish performance parameters as per the specification/Purchaser/Employer observation shall be performed by the Bidder without any commercial and schedule implication to Purchaser.</p>				
REVISION See record notes of revision		PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22		

106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89095
					Rev No. 01	
					Page 6 of 16	

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5 Equipment Functional Guarantee

1. Bidder shall provide minimum availability of Belt Weigh Feeder as minimum 98%.

6 .Other Services

a) Training of Employer’s Personnel :

The Bidder’s supervisory personnel at site shall train adequate number of Employer’s operation and maintenance personnel at site during erection and commissioning of equipment to enable them to take over proper operation and maintenance of the equipment after commissioning.

b) Shop inspection and Test Procedures

The Equipment’s covered by this specification shall be subjected to inspection and testing. The Bidder shall provide all services to establish and maintain quality of workmanship in his works and that of his sub-Vendors to ensure the mechanical accuracy of components, compliance with drawings, identification and acceptability of all materials, parts and equipment.

c) Quality plan shall submit after award of contract. Bidder shall follow quality plan approved by BHEL/Customer

d) Packaging for Transportation

All the equipment’s shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit till the time of erection. While packing all the materials, the limitation from the point of view of the sizes of railway wagons available in India should be taken account of.

The Bidder shall be responsible for any loss or damage during transportation due to improper packing.

Preservative coatings used on components shall be suitable for the conditions normally expected during shipping, storage and throughout the erection period.

Each type of preservative used shall be identified as to quality, life expectancy and type. Toxic and hazardous-type preservatives shall not be allowed. Complete information shall be submitted to the Purchaser covering step-by-step procedures, including federal, state and local governing controls for handling and removal of each type of preservative. This information shall be submitted six months prior to delivery.

REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22
------------------------------------------	------------------------	---------------------------	------------------

RESTRICTED USE



106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89095
					Rev No. 01	
					Page 7 of 16	

The Bidder shall indicate the Weights and dimensions of each component, which shall be shipped along with the offer.

7 .EXCLUSION:

Broad terminal points have been indicated in the tender specification. Within these terminal points, all equipment and electrical distribution, piping network, control and instrumentation etc. as required shall be furnished by the Bidder unless specifically excluded as follows:

7.1 Mechanical

- I. Limestone Day Silo and its supporting structure.
- II. Wet ball mill
- III. All concrete foundations and RCC works (if applicable).

7.2 Electrical

- I. Main LT power supply
- II. Lightning System.

7.3Control & Instrumentation

- I. FGD DDCMIS and its associated RIOP Cabinets, Data highway, Workstation
- II. Cabling between local JB/LCP to FGD DDCMIS
- III. Fire Detection & Alarm System

7.4 CIVIL:All concrete foundations and RCC works,

REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22
------------------------------------------	------------------------	---------------------------	------------------

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PRODUCT STANDARD

PULVERISERS

HYDERABAD

Product
STD no.

BA89095

Rev No. 01

Page 8 of 16

8. TERMINAL POINTS

The following are the Bidder's battery limits:

8.1 MECHANICAL

Sl. No.	System / Equipment	Bidder's Battery Limits / Purchaser's Connection
1.	Limestone receipt	Limestone day silo shall be provided by Purchaser. Bidder scope starts from the Discharge flange of Silo. Counter flange, gasket, fasteners and seal shall be supplied by bidder
2.	Limestone Discharge	Bidder's scope terminates at the limestone discharge at wet ball mill material inlet. Counter flange, gasket, fasteners and seal shall be supplied by bidder

8.2 ELECTRICAL

The following are the Bidder's battery limits:

Sr.No.	System/Equipment	Bidder's Battery Limit / Purchaser's Connection
1	VFD	a. Terminals for Main incoming power cable b. Terminals for control cable interface c. Earthing terminal
2	Local Push Button Station (LPBS) if any provided by bidder	a. Control terminals b. Earthing terminals on LPBS enclosure

8.3 Control & Instrumentation

Sr.No.	System/Equipment	Bidder's Battery Limit / Purchaser's Connection
1.	Outgoing cables to FGD DDCMIS	Belt weigh feeder local JB/LCP terminals

REVISION
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2.	Power supply to C&I equipment/items	Purchaser will be provide the 230V AC UPS/Non UPS or 24V DC power to equipment / instruments at one end and further distribution through distribution box (PDB) of power supply to instruments / actuators will be in bidder`s scope of supply.
3,	Earthing	Earthing of bidder supplied panels by bidder to nearest earthing JB including earthing JB.

9. CODES AND STANDARDS

All equipment, systems and services covered under this specification shall comply with all currently applicable statutory regulations and safety codes in the locality where the equipment will be installed. The equipment and systems shall also conform to the latest applicable standards specified. All codes and standards referred to in the specification shall be understood to be the latest version on the date of offer made by the Bidder unless otherwise indicated. Nothing in this specification shall be construed to relieve the Bidder of this responsibility.

- Bureau of Indian standards (BIS)
- Japanese Industrial Standards (JIS)
- American National Standards Institute (ANSI)
- American Society of Mechanical Engineers (ASME)
- American Society for Testing and Materials (ASTM)
- American Petroleum Institute (API)
- American water works association. (AWWA)
- Standards of the Hydraulic Institute, USA
- International Organisation for Standardisation (ISO)
- Tubular Exchanger Manufacturer's Association (TEMA)
- American Welding Society (AWS)
- National Electrical Manufacturers Association (NEMA)
- National Fire Protection Association (NFPA)
- International Electro-Technical Commission (IEC)

REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22
-------------------------------------------------	-------------------------------	----------------------------------	-------------------------

RESTRICTED USE



106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89095
					Rev No. 01	
					Page	10 of 16

Expansion Joint Manufacturers Association (EJMA)
Heat Exchange Institute (HEI)
IEEE Standard
JEC Standard
Occupational Safety & Health Administration (OSHA)
American Standard Association (ASA)
Uniform Building Code (UBC)
American Institute of Steel Construction (AISC)
Steel Structures painting Council (SSPC)
State Elevator and Escalator Act
State Elevator and Escalator Rules
Indian Electricity Act.
Indian Electricity Rules.

10 DESIGN AND CONSTRUCTION REQUIREMENTS

10.1 Mechanical

Belt Weigh feeder shall be designed as per the requirement specified in Tender document .

All parts in contact with limestone except belt shall be of stainless steel construction.

Belt feeders shall be positively self-cleaning and have dust tight construction. It shall be provided with flanged belt, rubber lagged head pulleys and inspection doors. No chain/belt drives shall be accepted.

The limestone feeder belt shall be of seamless rubber construction. It should be possible to adjust the belt tension from outside without opening the feeder body.

The feeder shall have adequate instrumentation to detect 'loss of flow'.

The feeder shall have a motor/pneumatic operated gate at the outlet.


There shall be no reduction of section in the bunker outlet chute from bunker to feeder. The inlet chute shall be provided with suitable poke doors/holes inorder to remove

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REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22
------------------------------------------	------------------------	---------------------------	------------------

RESTRICTED USE



106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89095
					Rev No. 01	
					Page 11 of 16	
<p style="text-align: center;">jamming/blockage.</p> <p>10.2 Electrical</p> <p>All the electrical work and supply shall be as per tender requirements. This specification is intended to broadly define design base of electrical system equipment required for control, operation, protection and monitoring of this package. Bidders may refer applicable clause in Annexure-3 for Electrical system design.</p> <p>10.3 C&I</p> <ul style="list-style-type: none"> • Primary instruments like microprocessor based transmitters employing HART protocol, thermocouples & RTD's along with temperature transmitters, pressure/diff pressure/temperature/flow*ultrasonic/electromagnetic) transmitter & gauges. • Integral to equipment which are not indicated in the tender drawings, but are required for control, monitoring and operation of the equipment for which no P&ID is attached shall be provided to meet the actual system requirements and meeting redundancy and other technical specifications. • For binary and analog inputs required in major equipment's of FGD system, protection triple-sensing devices shall be provided. Binary and analog inputs, which are required for protection of more than one equipment as well as protection signals for HT drives etc., triple sensing devices shall be provided. • For other critical binary and analog inputs required for protection and interlock purpose of other equipment (Eg. Those interlocks which may lead to loss if production, non-availability of major equipment etc.,) triple sensors shall be provided • Temperature elements, electronic transmitters etc., are to be provided for all the cases. Use of process actuated switches is acceptable only in case indicated in tender drawings. • Redundancy in instrumentation shall be designed by the Bidder, to ensure that malfunction of any single instrument shall not lead to loss of any Major Auxiliary (all HT Drives and Critical LT drives) or loss of Generation or loss of control function or loss of protection function. Bidder shall also ensure that Loss/ Malfunction of any single sensor shall not jeopardize the safety of the equipment. 						
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PRODUCT STANDARD

PULVERISERS

HYDERABAD

Product
STD no.

BA89095

Rev No. 01

Page 12 of 16

- All instruments supplied by the Bidder shall be of proven type. In the event of any instrument/ system not working satisfactorily as per the intent of the specification within performance guarantee period in spite of best attention by the Bidder, the Bidder shall replace them with a good one to the satisfaction of Purchaser. The items/ systems so replaced by the Bidder shall have the same guarantee for satisfactory performance starting from the date of replacement without any commercial & schedule implication.

PAINTING REQUIREMENTS

Painting shall be followed as per approved painting scheme. However, for components where no specific requirement is stipulated, the painting conforming to the requirements stipulated below shall be as per OEM practice.

11. Documents Submission:

11.1 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 .

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11.2 Documents along with offer

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


Item	Description
1.	Data Sheet & General arrangement drawing of belt weight feeder
2.	Quality assurance plan(QAP)
3.	Utility Consumption & Lubricating Oil List
4.	Equipment sizing & Motor sizing calculations
5.	Sub vendor items documents & quality plans
6.	Sub vendor list
7.	GA Drawings with dimensional details of all offered panels
8.	Complete electrical load list .
9.	loading details(static and dynamic loads) Drawing, Anchor Bolts, mounting plates static & dynamic details
10.	Cross sectional drawings
11.	VFD and Motor Data Sheet and type test report(as applicable)
12.	Erection and commissioning manual
13.	Performance test procedures
14.	Shop inspection and test procedures
15.	Operation and maintenance manual in a comprehensive manner prepared for use by operating and maintenance personnel.(3 sets)

- 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.

REVISION See record notes of revision	PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22
-------------------------------------------------	-------------------------------	----------------------------------	-------------------------

RESTRICTED USE



106-1 Rev No. 5	Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD no.	BA89095
				Rev No.	01	
				Page	14 of 16	
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.		<ul style="list-style-type: none"> • Descriptions in the drawings, in the documents, and in the displays shall be in English. • 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 complied 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. • All the manuals shall be two rim PVC bound stiff sided binder able to withstand constant usage. The cover shall be printed with project name. <p>13.Mandatory spares: Mandatory spares shall quote as per attached annexure-3 along with offer.</p> <p>14. SUPERVISION OF ERECTION, TESTING AND COMMISSIONING</p> <ul style="list-style-type: none"> • The erection of Belt Weigh Feeder & Pneumatic diverter along with accessories 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 per each weigh feeder assembly totally there will be 4 visits. The bidder will be informed well in advance for the visit. Bidder shall consider 15 working days per weigh feeder assembly. • In case erection and commissioning activities get delayed due to any account, resulting into overstay of vendor supervisory engineer beyond schedule time, then BHEL shall pay for additional man-day stay of vendor supervisory engineers. Vendor to quote Per day cost for deputation along with this offer. • TA/DA, boarding and lodging shall be borne by the bidder and shall be inclusive in supervision charges portion. • Charges for supervision of Erection & commissioning shall be quoted by the bidder. • Price comparison for evaluating the lowest bid will be considered all main supply, supervision of E&C charges and mandatory spares price all together. 				
REVISION See record notes of revision		PREPARED BY P V S B	APPROVED BY AMAN SURIN	DATE 28.03.22		

15. Guarantee/ Warranty Requirement:

- 18 months from the date of commissioning or 24 months from the date of supply whichever is early

ANNEXURES LIST:

Annexure Sl. No.	Description
1.	Wet Ball Mill Selection Parameters and Lime stone properties
2.	General information
3.	Mandatory spares - Shall quote along with offer .
4.	Deviation list.
5.	Vendor scope of items drawing
6.	Wet ball mill GA drawing
7.	VFD specification

VARIANTS – TABLE

VARIANT NO.	DESCRIPTION	MATEIRAL CODE
00	LIME STONE WEIGH FEEDER & PNEMUNATIC DIV	BA9789095007
01	LIME STONE FEEDERS BELT	BA9789095015
02	LIME STONE FEEDER BELT DRIVE MOTOR	BA9789095023
03	LIME STONE FEEDERS BELT DRIVE REDUCER	BA9789095031
03	LGS FEEDERS SPEED REDUCER ASSEMBLY	BA9789095040
04	LIME STONE FEEDERS WEIGHING INSTRUMENTS	BA9789095058
05	LIME STONE FEEDERS FEEDER WEIGHING ROLL	BA9789095066
06	GRAVIMETRIC FEEDER GATE ACTUATOR ASSY	BA9789095074
07	LGS COUNTER ASSEMBLY OF FEEDER COMPLETE	BA9789095082
08	LGS FEEDER HEAD PULLEY ASSEMBLY	BA9789095090
09	KNIFE GATE VALVE SLIDE EACH TYPE	BA9789095104

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DATE
28.03.22

106-1
Rev No. 5

Form No.



PRODUCT STANDARD

PULVERISERS

HYDERABAD

Product
STD no.

BA89095

Rev No. 01

Page 16 of 16

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10	KGVCOMPLETE ASSY EACH TYPE ONE NO CYLIN	BA9789095244
11	SOLENOID VALVES EACH TYPE ONE NO	BA9789095112
12	KGV COMPLETE ASSY EACHTYPE ONE NO MANUA	BA9789095120
13	415 VOLT MOTOR ND SHIELD COVER DE&NDE	BA9789095139
14	415 VOLT MOTOR HEATERS SETS EACH TYPE	BA9789095147
15	415V MOTR BEARINGS(DE&NDE)FOR EACH TYPE	BA9789095155
16	415V MOTOR COOLING FAN ALL TYPE&RATING	BA9789095163
17	DUST SEALS AND GASKETS FOR EACH TYPE OF	BA9789095171
18	415 V MOTOR TERMINAL BLOCK EA TYPE&RAT	BA9789095180
19	415 V MOTOR COMPLETE SET OF COUPLING	BA9789095198
20	COMPLETE SOLENOIDVALVE ASSY 2NO EA TYPE	BA9789095201
21	SOLENOIDVALVE COIL(SINGLE,DOUBLE CO)10%	BA9789095210
22	GAUGE(PRESSURE,DIFF PR,LEVEL,FLOW)10%	BA9789095228
23	AIR FILTER REGULATORCOMP SET WITH PR GA	BA9789095236

RECORD OF REVISIONS

REV. NO	DATE	REVISION DETAILS	REVISED	APPROVED
01	13.06.22	Vfd details attached	pvsb	aman

REVISION
See record notes of revision

PREPARED BY
P V S B

APPROVED BY
AMAN SURIN

DATE
28.03.22

RESTRICTED USE

