TECHNICAL SPECIFICATION FOR BALL VALVE

1. Ball Valve Type:
   - High temperature, fire safe, trunnion mounted
   - Full Bore, Metal Seated, separate ball and shaft, split body design, pneumatically operated ball valve with Manual Over ride and gas purging provision.

2. Pressure Rating:
   - ASME # 300

3. Design Standards:
   - Valve Body: ASME B 16.34
   - Valve Flanges: ASME 16.5
   - Face to Face: ASME B 16.10 (long pattern)

4. Body Material:
   - SS Steel ASTM A351 gr CF8M

5. Ball/Coating Material:
   - SS 316 with NiBo coating

6. Seat and Coating Material:
   - Incoloy with CrC – LF plating

7. Seat Type:
   - Metal Bellows

8. Body Gasket:
   - Graphite Body Gasket Cobalt based alloy thrust bearing

9. Thrust Bearing:
   - Cobalt based alloy thrust bearing

10. Bolting:
    - Stellite trunnion bearing and B8M stud

11. Gland Packing:
    - Graphite

12. Condition of application:
    - Valve operation:
      - The valve should be operated and controlled remotely. Open or close within seconds and approximately 100 Cycles of On-Off operation in a day.
    - Material of handling:
      - The valve is used to handle gas with fly ash at 14 Kg/cm.sq(g) operating pressure and at 550 to 600 Deg.C operating temperature. The gas contains
        - 12 % CO₂; 16 % CO; 12 % H₂; 2 % CH₄; 1 % O₂; 57 % N₂ and trace level H₂S. The valve is expected to handle mainly fly ash of the following Characteristic.
Size distribution of ash:

+ 300 Micron - 9 to 11 %
+ 150 Micron - 16 to 6 %
+ 75 Micron - 25 to 8 %
- 75 Micron - 50 to 75 %

Bulk density of ash - 1300 Kg/cubic metre
Particle density of ash - 2600 Kg/cubic metre

Co-eff. of friction of ash - 0.6

The ash contains (approx) : 60 % SiO₂; 27 % Al₂O₃; 8 % Fe₂O₃; 5 % Oxides of CA & Mg and trace level Alkalis.

13. Actuator : Suitable pneumatic double acting, air to open and air to close and air fail to stay put, remotely controlled On-Off application. The instrument air available is only 4 Kg/cm.sq.(g) (56 psi). It is preferable to have indication of on or off (open or close) position locally stamped on the body. Higher torque actuator (Double the torque actuator) is required since fine ash and high temperature will offer much higher resistance during operation of the valve. The size, the type and torque values are to be selected by the valve manufacturer to ensure leak tightness of the valve. Actuator mounting as per ISO 5211

14. Limit Switch : Explosion proof, dust and water proof type having DPDT with contact rating of 125 V DC, 0.5 Amp. “Honey Well” make 21CX 16 model or equivalent. Junction box provided should also Confirm to explosion dust and water proofs.

15. Solenoid Valve : Suitable “Asco Make” (model AEB 342C3) or equivalent with 3/8” pneumatic tubing) flame proof for on-off application. Solenoid valve rating is 110V plus or minus 10% and 50 HZ. When the solenoid valve is energized, the ball valve should open and when de-energised the ball valve should close. 100 cycles of on-off operation per day is envisaged.
16. Certification : EN/DIN 50049 3.1 B material certificates for body and bonnet. Tightness Test Certificates

17. Valve Testing : To be tested for body integrity and seat tightness. The body test pressure is to be 1.5 times PN. The seat test pressure is to be 1.1 times PN. The test medium will be both air and inhibited water.

18. Seat Test : As per MSS SP-72/ANSI/FCI 70-2 Class V

19. Inspection : By third party/BHEL Engineers

20. The offer should contain the following:

(a) The valve(s) with its accessories should be guaranteed for trouble free operation for the period of 24 months from the date of commissioning the valves at CCDP. The coating on the ball should also be guaranteed for its wear and adhesion to its surface without damage to meet its function.

(b) Relevant test certificates (TCs) have to be enclosed for the material of construction of valve body, stem, etc., and pressure test certificate for the valve and explosion proof, flame proof and dust proof certificates for accessories.

(c) Relevant catalogues viz., quick exhaust valve, actuator type, limit switch, solenoid valve etc., may be provided for approving at the time of submitting the offer.

(d) Atleast 6 sets of O&M instruction manual after approval of first copy shall be supplied.

(e) Dimensional & cross sectional drawing of the valve to be submitted. General arrangement drawing of ball valve with actuator mounting in position to be submitted.

(f) Ball coating, hardness, material selection, process used & coating thickness to be provided. This is applicable for seat also.

(g) Dimensional clearance between ball & body seat to be provided upon placement of order.

(h) Starting torque running torque & closing torque rating to be chosen for the smooth operation of the valve during hot condition and the value may be indicated for both valve and actuator separately upon placement of order.

(i) Seller has to furnish their standard quality plan along with offer (QP subjected to approval by buyer).

(j) Customer reference list highlighting with similar applications suitable for the requirement specified above shall be furnished along with offer.
(k) Spares: Cost of one no. of ball, Seat & Seal with Packings to be Supplied along with the valves as spares. The cost of the above Spares may be included in the offer separately.

(l) Valve marking symbols, abbreviations etc., shall be in accordance with MSS-SP-25 or relevant standard. Vendors name, Valve rating, material designation, nominal size, direction of flow etc., shall be integral on the body. Each valve shall have a corrosion resistance tag giving size, valve tag/code no. securely attached on the valve body.

(m) Vendor to confirm compliance to all points of our specification. Deviation shall be highlighted separately quoting the point number of BHEL specification.

21. Size Range : Size (NB)  Quantity (Nos)

<table>
<thead>
<tr>
<th>Size</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mm (2&quot;)</td>
<td>6</td>
</tr>
<tr>
<td>100 mm (4&quot;)</td>
<td>3</td>
</tr>
<tr>
<td>150 mm (6&quot;)</td>
<td>2</td>
</tr>
<tr>
<td>200 mm (8&quot;)</td>
<td>8</td>
</tr>
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