# SPECIFICATION FOR BUTTERFLY VALVE (MANUAL )

1. The specification Contains :
   Part I - Standard Requirement , Page : 2 & Data Sheet : 1
   Part II A - Vendor check list
   Part II B - Special contract requirements.
2. If the requirement of part II B is differing with part I. The requirement of part II B will be mandatory Vendor should fill up the Part II after studying Part I and submit along with offer.
3. Vendor should fill up the Part II datasheet if any after placement of order and submit for approval.
4. Vendor offer will be rejected if part II is not filled up and submitted with offer or incomplete submission.

| PREPARED BY: | CHECKED BY: | APPROVED BY : | DATE: |
|---|---|---|---|
| K.B.Choudhury | C.Palanisamy | K.P.A.Jaffer Ali | 30.04.1997 |

| REV No. | DETAILS | REVISED BY | APPROVED BY | DATE |
|---|---|---|---|---|
| | | | | |

# *SPECIFICATION FOR AIR LINE BUTTERFLY VALVE (MANUAL )*

Tenderer shall offer for the butterfly valve confirming to the following specifications. Tenderer to state clearly with reasons, wherever deviating from the specification:-

**1. Application :**

Isolating the cooling / sealing air lines to various equipment.

**2. Ambient conditions:**

a. The ambient air is normally dust laden:
b. Ambient temp. 70 deg C max.:

**3. Flow data through the valve:**

a. flow medium : Ambient air
b. Operating pressure : 1500mm W.C.g
c. Operating temp. : Ambient
d. Allowable pressure drop at max. flow with the valve in fully open position : 10 to 20 mm w.c ( max.)
e. Shut off pressure : 1800mm W.C.g.

**4. Valve construction :**

a. Body : A536/IS 210 Gr.25 or equivalent.
b. Shaft : Stainless steel.
c. Valve flap material : Alloy steel or SS for resistance to corrosion.
d. Bushes, gland or stuffing box. : Stainless steel, with packing, if necessary.
e. Sealing material : Nitrile or BUNA 'N'

**5. General requirements :**

a. The flap shall be minimum of 5 mm thickness plate. Shaft flap and bushing shall be well aligned and balanced for easy operating and of leak proof gland packing. End connection shall be suitable for mounting between flanges ( WAFER TYPE).
b. Valve to be suitable for mounting either in horizontal or in vertical piping.
c. The butterfly valve must be capable of being locked in any position, suitable locking device to be provided.
d. Valve sizes NB 300 and below shall be provided with hand levers and all other higher size valves shall be provided with gear unit.
e. Seat leak tightness and leakage through glands shall be as per API-598 standards.

**6. Inspection and testing:-**

a. Materials used for various components shall be as called for and certified.
b. Valve body shall be hydraulic tested at 5.5 $kg/cm^2$ (g)
c. Seal leak test for valve at 1.5 times the shut off pressure.

**7. Marking:**

a. Stainless steel nameplates with following boldly engraved shall be firmly fixed to the body;Suitable local indicators for open / closed position of the valve.
Maker's name and production serial number; service;BHEL material code ; Type ,size & rating of body ; Size of disc.
b. Each spare shall be individually tagged with part name, maker's name & spare code and BHEL material code.

**8. Painting**

a. All interior surfaces applied with rust preventive oil ,following hydraulic test and drying.
b. All exposed surfaces degreased ,derusted and epoxy coated.

**9. Packing**

a. All openings ( fluid,pneumatic and electric ) shall be firmly capped.
b. Valves shall be seaworthy packed in wooden boxes with water proof under cover.
c. Liberal packing material & struts shall be provided to arrest rolling & to protect from transit damages.

**10. Documents to be furnished by the supplier along with the offer:-**

a. Filled up specification sheet.
b. Three sets of general assembly drawing showing clearly the arrangement of all the components.
c. Catalogues and other relevant documents and drawings of the components of the assembly.
d. Spares offer for two years trouble free operation for butterfly valves.

**11. Documents to be furnished along with the supply:-**

a. 3 copies of the approved drawing and one reproducible print.
b. Test and material certificates of the components.
c. 6 sets of operation and maintenance manuals with illustrated figures.

**12. Guarantee:**

Performance guarantee for a period of one year from the date of commissioning or 18 months from the date of supply whichever is earlier.

*DATA SHEET FOR BUTTERFLY VALVE (MANUAL)*

| IIA | BHEL SPECIFICATION | |
|---|---|---|
| 0.0 | | |
| 1.0 | **SERVICE** | Isolating the cooling / sealing air lines |
| 1.1 | Flow max. | Ncu.m/hr |
| 1.2 | Inlet pr. Normal / Max. | mmWC |
| 1.3 | Allowable DP | mmWC |
| 1.5 | Temp. Normal / Max. | 30 / 70 deg C |
| 1.6 | CV Reqd. @ 100% open | |
| 1.7 | Valve CV rating | |
| 1.8 | Valve opening / closing time | <5 Sec. |
| 2.0 | **VALVE MAKE & TYPE** | |
| 2.1 | Valve size overall : L x b x h | x x mm |
| 2.2 | Valve / Disc Type | Wafer type / butterfly |
| 2.3 | Flange ( provided by BHEL ) | NB ANSI Class 150 |
| 2.4 | Ends | Suitable to mount between flanges |
| 2.5 | Body rating | Class 150 |
| 2.6 | Body Material | carbon steel (cast/ fabricated) |
| 2.7 | Disc material | |
| 2.8 | Seat material | |
| 2.9 | Stem material | Stainless steel |
| 2.10 | Seal material | |
| 2.11 | Packing material | |
| 2.12 | Stem size | |
| 2.13 | Seat leak class | As per API 598 stds. |
| 2.14 | Leakage thro' glands | |
| 2.15 | **Torque required for Butterfly valve operation** | |
| 2.16 | **Weight of entire valve assemblies** | |
| 3.0 | **Type of Bearings** | |
| 4.0 | **Lubricant** | |
| 5.0 | **JUNCTION BOX** | |
| 5.1 | Enclosure | NEMA 4 |
| 6.0 | Recommended spares | |
| | | |

| PREPARED BY (VENDOR) | DATE | APPROVED BY ( BHEL) | DATE |
|---|---|---|---|
| | | | |

*PART- IIA: VENDOR CHECK LIST FOR BUTTERFLY VALVE (MANUAL )*

**BHEL MATERIAL CODE :** **ENQUIRY No.:**

| IIA | BHEL SPECIFICATION | | VENDOR CONFIRMATION |
|---|---|---|---|
| **1.0** | **Service** | **Isolating cooling / sealing air** | |
| 1.1 | Flow max. | Ncu.m/hr | |
| 1.2 | Inlet pr. Normal / Max. | mmWC | |
| 1.3 | Allowable DP | mmWC | |
| 1.4 | Temp. Normal / Max. | deg C | |
| 1.5 | CV Reqd. @ 100% open | | |
| 1.6 | Valve CV rating | | |
| 1.7 | Valve opening / closing time | Sec. | |
| **2.0** | **Valve size overall Lxbxh** | x mm | |
| 2.1 | Valve / Disc Type | Wafer type / Butterfly | |
| 2.2 | Ends | To suit flanges | |
| 2.3 | Flanges (BHEL ) | NB ANSI Class 150 | |
| 2.4 | Body rating | Class 150 | |
| 2.5 | Body Material | A536/IS 210 Gr.25 or Equivt. | |
| 2.6 | Valve Flap material : | Alloy steel / Stainless steel | |
| 2.7 | Bushes,gland,stuffing box : | Stainless steel | |
| 2.8 | Packing material | vendor to specify | |
| 2.9 | Seat leak class | As per API-598 Stds | |
| 2.10 | Leakage thro' glands | vendor to specify | |
| **3.0** | **Type of bearings** | | |
| **4.0** | **Lubrication** | | |
| **5.0** | **Junction box** | vendor to specify | |
| 5.1 | Enclosure | NEMA 4 | |
| **6.0** | **Marking** | | |
| 6.1 | Stainless steel name plate | | |
| 6.2 | Each spares shall be individually tagged | | |
| **7.0** | **Painting** | | |
| 7.1 | Interior surface with rust preventive oil | | |
| 7.2 | Epoxy coated over red oxide primer | | |
| **8.0** | **Packing** | | |
| 8.1 | All opening shall be firmly capped. | | |
| 8.2 | Seaworthy packed in wooden boxes. | | |
| **9.0** | **Test Certificates** | | |
| 9.1 | Body hydraulic test | | |
| 9.2 | Seat Leak Test | | |
| 9.3 | Material test | | |
| 9.4 | Standard performance test | | |
| 9.5 | Dimensional test | | |
| 9.6 | Chemical composition test | | |
| 10.0 | Documents enclosed : | | |
| 10.1 | O & M manuals | | |
| 10.2 | Complete dimensional drawings | | |
| 10.3 | Quality plan | | |
| 10.4 | Spares identification Drgs. | | |

| **BHEL** | | | **VENDOR** | | |
|---|---|---|---|---|---|
| **PREPARED BY** | **APPROVED BY** | **DATE** | **PREPARED BY** | **APPROVED BY** | **DATE** |
| | | | | | |

*PART- IIA: VENDOR CHECK LIST FOR BUTTERFLY VALVE (MANUAL )*

**BHEL MATERIAL CODE :** **ENQUIRYNo.:**

| **IIB** | **SPECIAL CONTRACT REQUIREMENT, IF ANY** | |
|---|---|---|
| | BHEL SPECIFICATION | VENDOR CONFIRMATION |
| | (USE AN ANNEXURE IF THIS SPACE IS INADEQUATE ) | |

| **BHEL** | | | **VENDOR** | | |
|---|---|---|---|---|---|
| **PREPARED BY** | **APPROVED BY** | **DATE** | **PREPARED BY** | **APPROVED BY** | **DATE** |
| | | | | | |

# SPECIFICATION FOR BUTTERFLY VALVE (PNEUMATIC )

1. The specification Contains :
   Part I - Standard Requirement , Page : 2 & Data Sheet : 1
   Part II A - Vendor check list
   Part II B - Special contract requirements.
2. If the requirement of part II B is differing with part I. The requirement of part II B will be mandatory Vendor should fill up the Part II after studying Part I and submit along with offer.
3. Vendor should fill up the Part II datasheet if any after placement of order and submit for approval.
4. Vendor offer will be rejected if part II is not filled up and submitted with offer or incomplete submission.

| PREPARED BY: | CHECKED BY: | APPROVED BY : | DATE: |
|---|---|---|---|
| G.Saravanakumar | S.V.Sivaramulu | C.Palanisamy | 21.06.03 |

| REV No. | DETAILS | REVISED BY | APPROVED BY | DATE |
|---|---|---|---|---|
| | | | | |

*PART - I : SPECIFICATION FOR BUTTERFLY VALVES (PNEUMATIC )*

1. BINDING DOCUMENTS:
   A. The partially filled up datasheet shall be carefully gone through and technical requirements met with.
   B. Vendor shall fill the complete data and submit with offer.
   C. The specification and the final approved datasheet shall form part of the purchase order , and be binding.
2. TECHNICAL REQUIREMENTS:
   A. For flow parameters and requirements of accessories refer to item Description and / or the Vendor check list .
   B. Carbon steel body to specified rating.
   C. Carbon steel disc ,SS stem , and SS seat ; seal and packing materials as per service requirements.
   D. Stem polished & finished to 2-4 microns RMS in case of TFE packing.
3. THE FLUID
   A. The ambient air dust laden, 70 $^0$C max.
4. GENERAL REQUIREMENTS:
   a. The flap shall be minimum of 5 mm thickness plate. Shaft flap and bushing shall be well aligned and balanced for easy operating and of leak proof gland packing. End connection shall be suitable for mounting between flanges ( WAFER TYPE) with matting flanges & fasteners to suit the pipe sizes specified or flanged to ANSI 16.5 with counter flanges & fasteners to suit the pipe sizes specified.
   b. Valve to be suitable for mounting either in horizontal or in vertical piping.
   c. Seat leak tightness and leakage through glands shall be as per API-598 standards.
   d. The locating screws, if any, required for the valves shall be supplied by vendor. The Flange thickness (under purchaser scope) to be considered for valve size greater than NB 650mm is 20mm and for the rest it is to be considered as 10mm thickness.
   e. The mating flanges & fasteners (except locating screws) are under Purchaser scope. For valve sizes of NB 650mm & above the Flange PCD & bolt hole diameter shall as per ASME B16.47 Class 150 Series B. For other lesser size valves, the parameters shall be as per ASME B16.5 Class 150. Consider above flange thickness to provide fasteners list (clause 10.e).
   f. Valve to be suitable for out door application in highly dusty, salty, corrosive and polluted atmosphere.
5. ACCESSORIES:
   A. Include accessories as under item description &/or Vendor check list.
   B. Positioner be for 0.2 to 1.0 bar (g) input , direct / reverse action, field adjustable & gauges, if required.
   C. Limit switches of Honeywell or equiv. or cam operated enclosed rotary switches with DPDT contacts (240 Vac,10A) & 1/2 inch NPSM female cable entry.
   D. All accessories shall be, weather proof ,water/oil tight to Nema 4 & 13, suitable for outdoor installation & 70 deg C ambient.
   E. All accessories shall be supplied in fully mounted & pipe dup condn., with 3/8" OD PVC jacketed copper tube.
   F. Pneumatic ports on all equipment shall be 3/8 " NPT female.
   G. Solenoid pilot valve as per Vendor check list.
   H. Limit switches and / or solenoid pilot wiring shall be terminated to junction box.
6. MARKING:
   A. Stainless steel nameplates with following boldly engraved shall be firmly fixed to the body; Suitable local indicators for open
   B. / closed position of the valve.
   C. Maker's name and production serial number; service; BHEL material code; Type, size & rating of body ; Size of disc;
   D. Type, size & spring range of actuator; valve action; air failure position.
   E. Each spare shall be individually tagged with part name, maker's name & spare code and BHEL material code.
7. PAINTING
   a. All interior surfaces applied with rust preventive oil ,following hydraulic test and drying.
   b. All exposed surfaces degreased, derusted and epoxy coated.

*PART - I: SPECIFICATION FOR BUTTERFLY VALVES (PNEUMATIC)*

8. PACKING

A. All openings (fluid, pneumatic and electric) shall be firmly capped.
B. Valves shall be seaworthy packed in wooden boxes with water proof under cover.
C. Liberal packing material & struts shall be provided to arrest rolling & to protect from transit damages.
D. The limit switches, positioner, solenoid valve and such components shall be capsulated / covered properly with thermocole
E. material.

9. TEST CERTIFICATES:

Following Works test certificates shall be submitted along with the supplies:

a. Body hydraulic test done at 1.5 times of cold working pressure.
b. Seat leak test as per applicable API-598 or ANSI / FCI / 70-2 standards.
c. Material certificate for body, disc, seat seal , and shaft.
d. Standard performance tests for open / closed.
e. For proper actuation and response of switches.
f. Dimensional certificate for overall dimensions and all terminal connections.
g. Shore hardness for resilient materials.

10. INWARD INSPECTION:

a. Verify the works test certificates, marking particulars, name plates of each accessory and the scope of supply.
b. Watch for damages.
c. Perform random check on all terminal connections and in internal particular.

11. AFTER PLACEMENT OF PURCHASE ORDER 6 SETS OF FOLLOWING DOCUMENTS / DRGS. REQUIRED WITHIN ONE MONTH FROM THE DATE OF PURCHASE ORDER:

a. Quality plan.
b. Supporting arrangement details for valves.
c. Complete dimensional drgs.
d. O & M instruction for all items concerned.
e. Spares identification drgs.

12. ALONG WITH THE QUOTATION , SUBMIT FOLLOWING DOCUMENTS IN FULL FOR TECHNICAL EVALUATION:

a. Completely filled in vendor check list / Data sheet.
b. Dimensional drawings with all accessories mounted, catalogues, specifications, spares identifier drgs, O & M manuals.
c. Spares quotations for three years operation with clear descriptions , part numbers, identification drgs, break-up prices and 6
d. months validity.
e. Copies of std test methods and copies of certificates formats for main valve and all accessories.

13. ALL MATERIALS / ASSEMBLIES are subjected to purchasers Customer's inspection at any stage. The stages of inspection will be decided based on the quality plan submitted by the vendor.

14. SUPPLIER SHALL BE INDICATE TOTAL WEIGHT OF THE ASSEMBLIES FOR ALL THE ITEMS.

15. GUARANTEE & WARRANTEE :

All materials shall be defect free and shall be replaceable free of cost during guarantee period. The performance of valve shall be guaranteed for a period of 12 months from the date of commissioning.

*DATA SHEET FOR BUTTERFLY VALVE (PNEUMATIC)*
*BLEED AIR REGULATING DAMPER*

**BHEL MATERIAL CODE :** **ENQUIRY No.:**

Customer : Kothagudam TPS (0641)

| | | |
|---|---|---|
| 1.0 | **SERVICE** | Bleed air regulation |
| 1.1 | Flow max. | 2,140 Ncu.m/hr |
| 1.2 | Inlet pr. Normal / Max. | 580 / 850 mm WC |
| 1.3 | Allowable DP | 10 to 20 mm WC |
| 1.4 | Actuator sizing DP | 1,800 mm WC |
| 1.5 | Temp. Normal / Max. | 50 / 70 deg C |
| 1.6 | CV Reqd. @ 100% open | |
| 1.7 | Valve CV rating | |
| 1.8 | Valve opening / closing time | < 5 Sec. |
| 2.0 | **VALVE MAKE & TYPE** | |
| 2.1 | Line size OD x t | 166.5 x 4.8 mm |
| 2.2 | Valve body size | NB 150 |
| 2.3 | Valve / Disc Type | Wafer type / butterfly |
| 2.4 | Flange ( provided by BHEL ) | NB150 ANSI Class 150 |
| 2.5 | Ends | Suitable to mount between flanges |
| 2.6 | Body rating | Class 150 |
| 2.7 | Body Material | Carbon steel (cast/ fabricated) / ASTM A216 WCB/ IS210 Gr.FG220 |
| 2.8 | Disc material | Carbon steel / ASTM A216 WCB |
| 2.9 | Seat material | Nitrile (bonded) Rubber |
| 2.10 | Stem material | Stainless steel – AISI 420 |
| 2.11 | Seal material | Nitrile (bonded) Rubber |
| 2.12 | Packing material | PTFE |
| 2.13 | Stem size | Vendor to specify |
| 2.14 | Seat leak class | As per API 598 stds. |
| 2.15 | Leakage thro' glands | Vendor to specify |
| 3.0 | **ACTUATOR** | Pneumatic piston, double acting, Rack & Pinion type with 90° rotation |
| 3.1 | Size & Volume | Vendor to specify |
| 3.2 | Spring number / range | Vendor to specify |
| 3.3 | Action | Air to open / Air to close |
| 3.4 | Air pressure | 3.5 Kg/sq.cm (g) |
| 3.5 | Pressure port connection | 3 / 8 " NPT (F) |
| 3.6 | Action on air failure | Stay put |
| 4.0 | **AIR LOCK UP VALVE** | |
| 5.0 | **AIR SET** | |
| 6.0 | **SOLENOID PILOT VALVE** | **NOT REQUIRED** |
| 6.1 | Solenoid pilot Cv | |
| 6.2 | Enclosure / Coil | |
| 7.0 | **LIMIT SWITCHES** | **NOT REQUIRED** |
| 7.1 | Type / Rating | |
| 7.2 | Enclosure | |
| 7.3 | Cable entry | |
| 8.0 | **JUNCTION BOX** | **NOT REQUIRED** |
| 8.1 | Enclosure | |
| 9.0 | POSITIONER | |
| | | |
| | | |
| 10.0 | POSITIONER TRANSMITTER | |
| | | |
| | | |

| PREPARED BY (VENDOR) | DATE | APPROVED BY ( BHEL) | DATE |
|---|---|---|---|
| | | | |

*PART- IIA: VENDOR CHECK LIST FOR BUTTERFLY VALVE (PNEUMATIC )*

**BHEL MATERIAL CODE :** **ENQUIRY No.:**

| IIA | BHEL SPECIFICATION | | VENDOR CONFIRMATION |
|---|---|---|---|
| | | | |
| **1.0** | **Service** | Bleed air regulation | |
| 1.1 | Flow max. | 2140 Ncu.m/hr | |
| 1.2 | Inlet pr. Normal / Max. | 580 / 850 mm WC | |
| 1.3 | Allowable DP | 10 to 20 mm WC | |
| 1.4 | Actuator sizing DP | 1800 mm WC | |
| 1.5 | Temp. Normal / Max. | 50 / 70 deg C | |
| 1.6 | CV Reqd. @ 100% open | vendor to specify | |
| 1.7 | Valve CV rating | vendor to specify | |
| 1.8 | Valve opening / closing time | < 5 Sec. | |
| **2.0** | **Line size OD x t** | 166.5 x 4.85 mm | |
| 2.1 | Valve body size | NB 150 | |
| 2.2 | Valve / Disc Type | Wafer type / Butterfly | |
| 2.3 | Ends | To suit flanges | |
| 2.4 | Flanges (BHEL ) | NB 150 ANSI Class 150 | |
| 2.5 | Body rating | Class 150 | |
| 2.6 | Body Material | Carbon steel (cast/ fabricated) / ASTM A216 WCB/ IS210 Gr.FG220 | |
| 2.7 | Disc material | Carbon steel / ASTM A216 WCB | |
| 2.8 | Seat material | Nitrile (bonded) Rubber | |
| 2.9 | Stem material | Stainless steel – AISI 420 | |
| 2.10 | Seal material | Nitrile (bonded) Rubber | |
| 2.11 | Packing material | PTFE | |
| 2.12 | Stem size | vendor to specify | |
| 2.13 | Seat leak class | As per API-598 Stds | |
| 2.14 | Leakage thro' glands | vendor to specify | |
| **3.0** | **Actuator** | Pneumatic piston,double acting | |
| 3.1 | Size & Volume | vendor to specify | |
| 3.2 | Spring number / range | vendor to specify | |
| 3.3 | Action | Air to open / Air to close | |
| 3.4 | Air pressure available | 3.5 Kg/sq.cm (g) | |
| 3.5 | Pressure port connection | 3 / 8 " NPT (F) | |
| 3.6 | Action on air failure | Stay put | |
| 3.7 | Air lock up valve | | |
| 3.7.1 | Set pressure | | |
| 3.8 | Air set | | |
| 3.8.1 | Pressure range | 0 - 7 Kg/sq.cm (g) | |
| 3.8.2 | Ends | 3 / 8 " NPT (F) | |
| **4.0** | **Solenoid Pilot Valve** | **NOT REQUIRED** | |
| 4.1 | Solenoid pilot CV | | |
| 4.2 | Enclosure / Coil | | |
| **5.0** | **Limit Switches** | **NOT REQUIRED** | |
| 5.1 | Type / Rating | | |
| 5.2 | Enclosure | | |
| 5.3 | Cable entry | | |
| **6.0** | **Junction box** | **NOT REQUIRED** | |
| 6.1 | Enclosure | | |
| **7.0** | **Marking** | | |
| 7.1 | Stainless steel name plate | | |
| 7.2 | Each spares shall be individually tagged | | |
| **8.0** | **Painting** | | |
| 8.1 | Interior surface with rust preventive oil | | |
| 8.2 | Epoxy coated | | |

| BHEL | | | VENDOR | | |
|---|---|---|---|---|---|
| **PREPARED BY** | **APPROVED BY** | **DATE** | **PREPARED BY** | **APPROVED BY** | **DATE** |
| S.Gomathinayagam | M.Thandapani | 9/11/07 | | | |

*PART- IIA: VENDOR CHECK LIST FOR BUTTERFLY VALVE (PNEUMATIC )*

**BHEL MATERIAL CODE :** **ENQUIRY No.:**

| | BHEL SPECIFICATION | VENDOR CONFIRMATION |
|---|---|---|
| **9.0** | **Packing** | |
| 9.1 | All opening shall be firmly capped | |
| 9.2 | Seaworthy packed in wooden boxes | |
| 9.3 | Limit switches, Solenoid valves etc.shall be encapsulated/ packed in thermocole. | |
| **10.0** | **Test Certificates to be enclosed :** | |
| 10.1 | Body hydraulic test | |
| 10.2 | Seat Leak Test | |
| 10.3 | Material test | |
| 10.4 | Standard performance test | |
| 10.5 | Dimensional test | |
| 10.6 | Chemical composition test | |
| 11.0 | Enclosed Documents : | |
| 11.1 | Quality plan. | |
| 11.2 | Complete dimensional drawings. | |
| 11.3 | O & M manuals. | |
| 11.4 | Spares identification drgs. | |
| **IIB** | **SPECIAL CONTRACT REQUIREMENT, IF ANY** | |
| | A. Positioner for 0.2 to 1.0 bar (g) input, direct / reverse action, field adjustable & gauges.<br>Positioner sensitivity +/- 1% of input span under no load;<br>Repeatability +/- 3% of output span under no load ;<br>Accuracy +/- 3% of input span under no load.<br>Dead band +/- 1.8% of output span under no load.<br>Provision of reversal and positioner bypass required.<br><br>B. Electronic position transmitter with 24V D.C input, 2 wire type and 4-20 mA output with IP55 enclosure. | |
| | (USE AN ANNEXURE IF THIS SPACE IS INADEQUATE ) | |

| BHEL | | | VENDOR | | |
|---|---|---|---|---|---|
| **PREPARED BY** | **APPROVED BY** | **DATE** | **PREPARED BY** | **APPROVED BY** | **DATE** |
| S.Gomathinayagam | M.Thandapani | 9/11/07 | | | |