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| ESP-001-<br>2A Rev. 00<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>PRODUCT STANDARD</b><br><b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b><br><b>HYDERABAD</b> |                                         | Std. / Doc. Number |          |                                                           |   |                                         |                                                      |   |                                         |
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| <p align="center"><b><u>Specification for Pressure switch</u></b></p> <p><b>1. SCOPE</b><br/>This technical specification covers the Design, Engineering, Manufacturing, Assembly, testing at vendor works, inspection by purchaser, packing and transportation to site with necessary documentation like data sheets, statutory approvals, O&amp;M manuals etc., as required for Pressure Switches.</p> <p><b>2. Proven Track Record</b><br/>The items being offered as per specification should be operating satisfactorily in captive power plant applications / hydrocarbon industries like Refinery, Petrochemical and gas processing plants under similar process conditions for <u>at least 4000 Hours</u>. The above criteria shall be applicable to main equipment, sub- components as well as bought out items if any.</p> <p>Vendor shall submit necessary supporting documents / past users confirmation supporting to above PTR requirements along with technical offer.</p> <p>If offered instruments / equipments are supplied to BHEL PE&amp;SD within last 5 years, above PTR clause is not applicable.</p> <p><b>3. INSTRUCTIONS TO BIDDERS</b></p> <p>3.1 Bidders <b>are advised to contact BHEL for essential technical queries in writing within one week of issue of Enquiry.</b> In the event of any conflict between these specifications, data sheets, related standards, codes etc. the vendor shall refer the matter to the purchaser for clarifications before bid submission <b>and the decision of Purchaser shall be final &amp; binding on Bidder, without any cost &amp; delivery implications. In the event of conflict, most stringent requirements shall be followed in general.</b></p> <p>3.2 Offers with incomplete information will not be considered for evaluation, and are likely to be rejected outright without any further interaction with the Bidder.</p> <p>3.3 Any technical features [over &amp; above BHEL enquiry specification requirements] proposed by Bidder will not be given preference for the purpose of evaluation.</p> <p>3.4 Bidder shall submit the "Duly filled &amp; Signed copy of Check list" compulsorily along with technical offer without which offer is liable for rejection without any further interaction with the Bidder</p> <p><b>4. DESIGN VARIABLES to be provided after P.O. Placement / during drawing approval:</b><br/>Following variables to be finalized during drawing approval and vendor shall comply the same without any commercial implication:</p> <table border="1"> <tr> <td>a) Calibration Ranges + Tag List of all Pressure Switches</td> <td>:</td> <td>Shall be intimated after P.O. placement</td> </tr> <tr> <td>b) Safe working/Static pressure of pressure switches</td> <td>:</td> <td>Shall be intimated after P.O. placement</td> </tr> </table> |                                                                                                  |                                         |                    |          | a) Calibration Ranges + Tag List of all Pressure Switches | : | Shall be intimated after P.O. placement | b) Safe working/Static pressure of pressure switches | : | Shall be intimated after P.O. placement |
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| <p><b>Revisions:</b><br/>Refer to record of revisions</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                  |                                         |                    |          |                                                           |   |                                         |                                                      |   |                                         |
| Prepared By:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                  | Checked By :                            | Approved :         | Date :   |                                                           |   |                                         |                                                      |   |                                         |
| Vineet Kumar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                  | Sujatha Sapavat                         | K. Anand           | 10.09.18 |                                                           |   |                                         |                                                      |   |                                         |

| ESP-001-<br>2A Rev : 00<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>PRODUCT STANDARD</b><br><b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b><br><b>HYDERABAD</b>                                                                                                                                                                                                               |                              | Std. / Doc. Number |    |       |          |                              |         |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                                                |  |  |   |                                                                                                                                                |  |  |   |                                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                         |  |  |
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| <p><b>5. CHECK LIST</b> (To be filled by BIDDER and submitted along with Technical offer is compulsorily)</p> <p>Vendor shall submit the following documents mandatorily as part of COMPLETE technical offer.</p> <p>Enquiry No. / Date :</p> <p>Name of the Bidder :</p> <p>Project Name :</p> <p>Item Description :</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                |                              |                    |    |       |          |                              |         |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                                                |  |  |   |                                                                                                                                                |  |  |   |                                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                         |  |  |
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| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Bidder to agree that Bill of materials / list of equipment furnished in the offer is only for information; Vendor shall supply all the material to meet the performance, sizing & technical requirement as per specification & its Annexures, scope matrix etc.                                                |                              |                    |    |       |          |                              |         |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                                                |  |  |   |                                                                                                                                                |  |  |   |                                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                         |  |  |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | All the equipments / items / etc., supplied by bidder are having valid statutory approval certificates and same will be produced at any stage of contract execution to BHEL. The same were eligible to take local statutory regulatory body approval during commissioning of the system                        |                              |                    |    |       |          |                              |         |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                                                |  |  |   |                                                                                                                                                |  |  |   |                                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                         |  |  |
| <p style="text-align: right;">_____<br/>(Bidder's Signature and stamp with date)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                |                              |                    |    |       |          |                              |         |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                                                |  |  |   |                                                                                                                                                |  |  |   |                                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                  |  |  |   |                                                                                                                                                                                                                                                                 |  |  |   |                                                                                                                                                                                                                                                                                         |  |  |

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|-------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| ESP-001-<br>2A Rev : 00 |  | <b>PRODUCT STANDARD</b><br><b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b><br><b>HYDERABAD</b> | Std. / Doc. Number<br><b>PY 56321</b><br>Rev. No. <b>01</b><br>Sheet 03 of 08 |
|-------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|

### DEVIATION FORMAT

Enquiry No.:

Item:

Name of Bidder:

Offer Ref. No.:

| Sl. No. | Clause no. & Spec. no. | Description as per Specification | Deviation taken | Nature of Deviation | Remarks |
|---------|------------------------|----------------------------------|-----------------|---------------------|---------|
|         |                        |                                  |                 |                     |         |
|         |                        |                                  |                 |                     |         |
|         |                        |                                  |                 |                     |         |
|         |                        |                                  |                 |                     |         |

**NOTES:**

1. Technical offer of the bidder will be evaluated only on the basis of Deviation Schedule. Deviation Schedule constitutes this sheet (with these Notes) duly signed and stamped.
2. Deviations, if any, shall be clearly brought out only in this format. Deviations mentioned / taken elsewhere or in any other format will be ignored.
3. Additional sheets in the same format can be attached by the vendor, if necessary.
4. Nature of Deviations shall only be of Design / Manufacturing constraints and non-availability of items / components / makes in market.
5. No price implications shall be entertained for deviations withdrawn during the technical scrutiny. If any deviations are accepted by BHEL during technical scrutiny then also there will be no price implication. Hence, in no case there will be consideration of Price implications.
6. Reasons for the deviations shall be specified in the Remarks column.
7. If there are no deviations from the specifications, bidder still has to submit the signed copy of this format by writing "NO Deviations" on this format.
8. If the "Deviation Schedule" is not submitted along with the offer, the bidder's offer is likely to be rejected without any further interaction with the bidder. Only the accepted deviations in conjunction with the original tender shall constitute the contract document for the award of job to the bidder

COMPANY SEAL

SIGNATURE OF THE BIDDER \_\_\_\_\_

NAME \_\_\_\_\_

DESIGNATION \_\_\_\_\_

DATE \_\_\_\_\_

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| ESP-001-<br>2A Rev : 00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | <p align="center"><b>PRODUCT STANDARD</b></p> <p align="center"><b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b></p> <p align="center"><b>HYDERABAD</b></p> | <p>Std. / Doc. Number</p> <p><b>PY 56321</b></p> <p>Rev. No. <b>01</b></p> <p>Sheet 04 of 08</p> |
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| <p><b>6. MANDATORY SPARES</b> - Spares requirement shall be as per <a href="#">enquiry</a>.</p> <p><b>7. DOCUMENTATION</b></p> <p>7.1 Information to be included with offer</p> <p>Vendor shall make the offer in detail, with respect to every item of the Purchaser's specifications. Any offer not conforming to this shall be summarily rejected.</p> <ol style="list-style-type: none"> <li>Duly filled &amp; Signed copy of Check list</li> <li>Deviation list, if any (as per "No deviation format" given in this specification). If there are no deviations, bidders shall submit "Deviation format" by mentioning deviations "Nil".</li> <li>Unpriced price schedule (To be submitted compulsorily without fail)</li> <li>Proven Track record and reference list (if applicable)</li> <li>Bill of materials (only for information)</li> </ol> <p>7.2 Documentation submission within 2 weeks of placement of LOI (for approval by BHEL and / or BHEL's customer in 4 sets)</p> <ol style="list-style-type: none"> <li>Consolidated BOM sheet along with accessories of instruments, finalized make /models of instruments, etc for approval.</li> <li>Detail Data sheets, GA drawings, Type tests, statutory certificates</li> <li>Comprehensive Quality Assurance plan (QAP).</li> </ol> <p><b>NOTES::</b></p> <ol style="list-style-type: none"> <li>BHEL Shall provide the following inputs to vendor immediately (within 7 days) after placement P.O. / LOI:             <ol style="list-style-type: none"> <li><u>Instrument schedule</u> with tag no's, ranges, site identification no's, etc</li> <li><u>Typical Cover page for pressure Switches</u>: This is to be used for all instruments with necessary modification for each variety of instrument</li> </ol> </li> <li>Following points to be noted while submitting drgs &amp; data sheets for approval:             <ol style="list-style-type: none"> <li>Each instrument data sheet to be submitted along with cover page &amp; tag list.</li> <li>All extra quantities to be marked as "E.spares".</li> <li>All data sheets &amp; drgs to be submitted in soft copy first and once it is cleared for manufacturing, then same shall be submitted in spiral hard copies for formal approval. Do not submit drgs/data sheets in loose papers as well as in bits &amp; pieces for approval.</li> </ol> </li> <li>All vendor documents and its sub-items shall be submitted to Customer / Consultant for approval during order execution (if applicable). Any comment furnished by Customer / Consultant / BHEL shall be taken care by vendor during ordering execution.</li> <li>Further BHEL will provide comments on vendor submitted document within 07 working days for revision &amp; resubmission. Vendor shall follow up with BHEL for non-receipt of comments/approvals.</li> <li>Revised drawings / Documents shall be submitted by Bidder in 07 days of receipt of comments / observations from BHEL. BHEL shall revert within 7 days on receipt of these revised documents / drawings from vendor for approvals.</li> <li>All the approvals required for manufacturing shall be completed within 1 month from P.O to meet the P.O delivery schedule. Accordingly vendor shall ensure the submission of approval category documents (which are required for manufacturing) and obtain their approvals.</li> <li>Vendor shall obtain final approvals on all technical + quality aspect documents before inspection dates.</li> <li>It is vendor's responsibility to obtain approvals from BHEL as earliest as possible to meet PO delivery schedules. Accordingly vendor to plan and execute the supplies in time.</li> </ol> <p>7.3 Documents to be submitted during final shop testing and before equipment dispatch. <b>(Note: submission of these documents are commercially linked)</b> - all in 16 sets + 3 CD ROM (2 sets to be included with item dispatch and balance to BHEL purchase department).</p> <ol style="list-style-type: none"> <li>Complete O&amp; M manual, Approved Engg documents</li> <li>Guarantee and all test certificates for review and acceptance by BHEL and / or BHEL's Customer</li> </ol> |                                                                                   |                                                                                                                                                              |                                                                                                  |

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| ESP-001-<br>2A Rev : 00                                                                                                                                                                                                                                     |  | <p align="center"><b>PRODUCT STANDARD</b></p> <p align="center"><b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b></p> <p align="center"><b>HYDERABAD</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p>Std. / Doc. Number</p> <p><b>PY 56321</b></p> <p>Rev. No. <b>01</b></p> <p>Sheet 05 of 08</p> |
| <p align="center"><b>COPYRIGHT AND CONFIDENTIAL</b></p> <p>The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED .<br/>It must not be used directly or indirectly in any way detrimental to the interest of the company.</p> |                                                                                   | <p><b>8. NAME PLATE</b></p> <p>Each equipment shall have a 316 SS nameplate attached firmly to it at a visible place furnishing the following information:</p> <ol style="list-style-type: none"> <li>Instrument range &amp; Tag number.</li> <li>Manufacturer's name, Model and emblem.</li> </ol> <p><b>9. MARKING, PACKING AND DESPATCH</b></p> <p>9.1 All items shall be marked (stamped/etched) in accordance with the applicable code/standard/specification. In addition, the item code, if available, shall also be marked. For ease of identification, the color of painted strip (wherever required) shall be as per the applicable standard.</p> <p>9.2 Part number/Dispatch link-up of all the equipment's/items supplied and also their co-relation with system/drawing/approved BOQ. Paint or ink for marking shall not contain any harmful metal or metal salts which can cause corrosive attack either ordinarily or in service. Special items/smaller items shall have attached corrosion resistant tag providing salient features.</p> <p>9.3 The equipment shall be transported to site by the vendor in fully assembled condition. However, in case some components are liable to be damaged during transit, the same shall be dismantled and supplied separately, to be reassembled at site the vendor. Assembly of the item supplied loose at site and repairing of any item damaged during transport shall be in the vendor's scope. The vendor shall send each consignment to site with a detailed packing list.</p> <p>9.4 All the equipment shall be divided into several sections for protection and ease of handling during transportation. The equipment shall be properly packed for transportation by ship/rail or trailer. The equipment shall be wrapped in polythene sheets before being placed in crates/cases to prevent damage to the finish. Crates/cases shall have skid bottom for handling.</p> <p>9.5 Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight', 'Owner's particulars', 'PO Nos.' etc. shall be clearly marked on the package together with other details as per purchaser order.</p> <p>9.6 The equipment/items may be stored outdoors for long periods before installation. The packing shall be completely suitable for outdoor storage in areas with heavy rains/high ambient temperature, unless otherwise agreed.</p> <p>9.7 The following minimum packing procedures shall be followed:-</p> <ol style="list-style-type: none"> <li>All items shall be dry, clean and free from moisture, dirt and loose foreign material of all kinds.</li> <li>All items shall be protected from rust, corrosion, and mechanical damage during transportation and handling.</li> <li>Each variety and size of item shall be supplied in separate packaging marked with the purchase order no., item code (if available), and the salient specifications.</li> <li>All electrical, instrumentation etc., shall be properly packed to prevent damage during transport, storage, handling at site.</li> <li>All the items which the Bidders considered liable to be damaged during shipment or storage, shall be packaged for separate shipment. If instruments are removed from the panel, they and their connection shall be suitably tagged to ensure simple re installation at the job site. Each instrument shall be sealed in plastic bags containing moisture absorbing dessicants.</li> <li>It shall be bidder's sole responsibility to protect all the material during period of dispatch, storage and erection against corrosion, incidental damage due to vermin, sunlight, rain, high temperature, humid atmosphere, rough handling in transit and including delays in transit.</li> <li>Commissioning spares, Tools &amp; tackles to be packed separately &amp; suitably tagged.</li> </ol> <p>9.8 <i>If mandatory spare items are ordered, same shall be sent in pre-decided lots in containers /secure boxes distinctly marked in Red color with boldly written "S" mark on each face of the containers /secure boxes</i></p> <p>9.9 <i>Loose vendor items sent by vendor to sites shall be quantified/numbered/tagged and not merely mentioned as ONE lot of loose items.</i></p> <p>9.10 <i>A packing list covering items having shelf life are to be intimated to site. Also, shelf life items shall be packed separately in black color painted box for easy identification at site.</i></p> |                                                                                                  |

| ESP-001-<br>2A Rev : 00<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>PRODUCT STANDARD</b><br><b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b><br><b>HYDERABAD</b> |                                                           | Std. / Doc. Number |                   |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                  |                                                           | PY 56321           |                   |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                  |                                                           | Rev. No.           | 01                |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                  |                                                           | Sheet 06 of 08     |                   |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 9.11 In case of imported/exported items, seaworthy packing shall be done as per specification no. AA0490573 (latest revision) and the type of packing applicable for flow orifice is "CO".HY0490573 (latest revision). This specification shall be obtained by vendor on request.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                  |                                                           |                    |                   |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| <b>VARIANT TABLE-1 (Pressure Switches)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                  |                                                           |                    |                   |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| <table border="1"> <thead> <tr> <th>Var. No</th> <th>Material Code</th> <th>Type of Pressure Switch<br/>(Normal/Remote Diaphragm seal)</th> <th>Switch Housing</th> <th>Maximum Range</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>PY9756321008</td> <td>Normal type</td> <td>SS</td> <td>0 to 8 Kg/cm2(g)</td> </tr> <tr> <td>01</td> <td>PY9756321016</td> <td>Normal type</td> <td>SS</td> <td>0 to 16 Kg/cm2(g)</td> </tr> <tr> <td>02</td> <td>PY9756321024</td> <td>Normal type</td> <td>Die cast Aluminium</td> <td>0 to 16 Kg/cm2(g)</td> </tr> <tr> <td>03</td> <td>PY9756321032</td> <td>Remote Diaphragm seal</td> <td>Die cast Aluminium</td> <td>0 to 16 Kg/cm2(g)</td> </tr> <tr> <td>04</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>05</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>06</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>07</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> |                                                                                                  |                                                           |                    |                   | Var. No | Material Code | Type of Pressure Switch<br>(Normal/Remote Diaphragm seal) | Switch Housing | Maximum Range | 00 | PY9756321008 | Normal type | SS | 0 to 8 Kg/cm2(g) | 01 | PY9756321016 | Normal type | SS | 0 to 16 Kg/cm2(g) | 02 | PY9756321024 | Normal type | Die cast Aluminium | 0 to 16 Kg/cm2(g) | 03 | PY9756321032 | Remote Diaphragm seal | Die cast Aluminium | 0 to 16 Kg/cm2(g) | 04 |  |  |  |  | 05 |  |  |  |  | 06 |  |  |  |  | 07 |  |  |  |  |
| Var. No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Material Code                                                                                    | Type of Pressure Switch<br>(Normal/Remote Diaphragm seal) | Switch Housing     | Maximum Range     |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PY9756321008                                                                                     | Normal type                                               | SS                 | 0 to 8 Kg/cm2(g)  |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PY9756321016                                                                                     | Normal type                                               | SS                 | 0 to 16 Kg/cm2(g) |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PY9756321024                                                                                     | Normal type                                               | Die cast Aluminium | 0 to 16 Kg/cm2(g) |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PY9756321032                                                                                     | Remote Diaphragm seal                                     | Die cast Aluminium | 0 to 16 Kg/cm2(g) |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                  |                                                           |                    |                   |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                  |                                                           |                    |                   |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                  |                                                           |                    |                   |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |
| 07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                  |                                                           |                    |                   |         |               |                                                           |                |               |    |              |             |    |                  |    |              |             |    |                   |    |              |             |                    |                   |    |              |                       |                    |                   |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |    |  |  |  |  |

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| ESP-001-<br>2A Rev. 00                                                                                                                                                                                                          |  | <b>PRODUCT STANDARD</b><br><b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b><br><b>HYDERABAD</b> |                                                                        | Std. / Doc. Number                                                                                                  |                                                                                   |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  |                                                                        | PY 56321                                                                                                            |                                                                                   |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  |                                                                        | Rev. No.                                                                                                            | 01                                                                                |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  |                                                                        | Sheet 07 of 08                                                                                                      |                                                                                   |                                                                                                                                  |
| <b>Data sheet for PRESSURE SWITCH (Weather proof)</b>                                                                                                                                                                           |                                                                                   |                                                                                                  |                                                                        |                                                                                                                     |                                                                                   |                                                                                                                                  |
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|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | (2)                                                                    | Type                                                                                                                | :                                                                                 | Field mounted, Weather proof, Blind pressure switch                                                                              |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | (3)                                                                    | Ambient Temp Limit                                                                                                  | :                                                                                 | -20 to 100°C; suitable to ambient of Ammonia; copper and copper alloys shall be avoided for all the parts exposed to atmosphere. |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | (4)                                                                    | Switching differential                                                                                              | :                                                                                 | Fixed                                                                                                                            |
|                                                                                                                                                                                                                                 | (5)                                                                               | <b>SWITCH</b>                                                                                    | Switch type                                                            | :                                                                                                                   | Auto reset with internal Adjustable snap action micro switch, hermetically sealed |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (6)                                                                               |                                                                                                  | Contact rating                                                         | :                                                                                                                   | 2 SPDT, 5A @ 240 V AC & 1A @ 24 V DC                                              |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (7)                                                                               |                                                                                                  | Set point adjuster & terminal block                                    | :                                                                                                                   | Shall be inside the switch housing                                                |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (8)                                                                               |                                                                                                  | Repeatability                                                          | :                                                                                                                   | ± 0.5 % of full scale range                                                       |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (9)                                                                               |                                                                                                  | Accuracy                                                               | :                                                                                                                   | ± 1 % of full scale range                                                         |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (10)                                                                              |                                                                                                  | Safe working/Static pressure                                           | :                                                                                                                   | 180 Kg/cm2(g) or less (exact details shall intimated after P.O. placement)        |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (11)                                                                              |                                                                                                  | Process Connection                                                     | :                                                                                                                   | 1/2" NPT (F)                                                                      |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (12)                                                                              |                                                                                                  | Instrument connection                                                  | :                                                                                                                   | 1/2" NPT (M)                                                                      |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (13)                                                                              |                                                                                                  | Electrical Connection                                                  | :                                                                                                                   | 2 No's of 1/2" NPT (F)                                                            |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (14)                                                                              |                                                                                                  | Protection                                                             | :                                                                                                                   | Weather proof to IP 65                                                            |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (15)                                                                              |                                                                                                  | Over Range protection                                                  | :                                                                                                                   | 150% of Full scale                                                                |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (16)                                                                              |                                                                                                  | Impulse Entry                                                          | :                                                                                                                   | Side / Bottom ( Shall be finalized at the datasheet approval)                     |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (17)                                                                              |                                                                                                  | Sensing material                                                       | :                                                                                                                   | SS 316L Diaphragm sealed piston                                                   |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (18)                                                                              |                                                                                                  | Wetted parts                                                           | :                                                                                                                   | SS316                                                                             |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (19)                                                                              |                                                                                                  | Case                                                                   | :                                                                                                                   | SS/Die Cast Aluminium as per enquiry                                              |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (20)                                                                              |                                                                                                  | Humidity limits                                                        | :                                                                                                                   | 0 - 100% RH                                                                       |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (21)                                                                              | Setter Scale                                                                                     | :                                                                      | Black graduation on white linear scale. Graduation 0-100% with red pointer for set points                           |                                                                                   |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (22)                                                                              | Terminal Block                                                                                   | :                                                                      | Suitable for full ring lugs                                                                                         |                                                                                   |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (23)                                                                              | <b>ACCESSORIES</b>                                                                               | Mounting Bracket with U clamp and fasteners                            | :                                                                                                                   | Suitable for 2" pipe mounting, MOC: SS304; 1 Set per Switch                       |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Cable Glands with Slipper type PVC sleeves cable shrouds               | :                                                                                                                   | Nickel plated brass Double Compression type; 2 No's per switch                    |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Cable entry Dummy Plugs                                                | :                                                                                                                   | Required, SS 304 ; 1 No per switch                                                |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Tag Plate                                                              | :                                                                                                                   | Required, SS 316                                                                  |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Bolts + Nuts                                                           | :                                                                                                                   | Required. A193GrB7 + A194Gr2H                                                     |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (28)                                                                              | Manifold                                                                                         | :                                                                      | Two valve manifold (M.O.C-SS316)                                                                                    |                                                                                   |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (29)                                                                              | Remote Diaphragm seal with capillary                                                             | :                                                                      | As per enquiry; If required SS316 Remote seal 2" flanged with SS-316 Capillary with length 3 meters to be provided. |                                                                                   |                                                                                                                                  |
|                                                                                                                                                                                                                                 | (30)                                                                              | <b>Inspection &amp; Testing</b>                                                                  | Bill of Material (model, dim., Tag no's)                               | :                                                                                                                   | 100% Witness                                                                      |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Spares (BOM, part no's)                                                | :                                                                                                                   | 100% Witness (if ordered)                                                         |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Statutory approvals (main inst & accessories) like CCOE/PESO, BIS, etc | :                                                                                                                   | 100% Review                                                                       |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Material compliance certificate                                        | :                                                                                                                   | 100% Review                                                                       |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Calibration certificate                                                | :                                                                                                                   | 100% review.                                                                      |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Hydro test for pressure parts                                          | :                                                                                                                   | 100% Review                                                                       |                                                                                                                                  |
|                                                                                                                                                                                                                                 |                                                                                   |                                                                                                  | Ingress Protection Test                                                | :                                                                                                                   | 100% Review                                                                       |                                                                                                                                  |

Receipt No : 50416/2020/PE-SD-450\_C-

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| ESP-001-<br>2A Rev.00<br>                                                                                                                      | <b>PRODUCT STANDARD</b><br><b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b><br><b>HYDERABAD</b> |            | Std. / Doc. Number                           |            |                                       |
|                                                                                                                                                                                                                                 |                                                                                                  |            | <b>PY 56321</b>                              |            |                                       |
|                                                                                                                                                                                                                                 |                                                                                                  |            | Rev. No.                                     | 01         |                                       |
|                                                                                                                                                                                                                                 |                                                                                                  |            | Sheet 08 of 08                               |            |                                       |
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|                                                                                                                                                                                                                                 | Rev. No.                                                                                         | Date       | Revision Details                             | Revised By | Approved By                           |
|                                                                                                                                                                                                                                 | 00                                                                                               | 10.09.2018 | Original issue                               | -----      | K. Anand Babu<br><i>K. Anand Babu</i> |
|                                                                                                                                                                                                                                 | 01                                                                                               | 28.07.2020 | Cl -19,28,29 revised, variant - 02,03 added. | Sonalika   | K. Anand Babu<br><i>K. Anand Babu</i> |
|                                                                                                                                                                                                                                 |                                                                                                  |            |                                              |            |                                       |
|                                                                                                                                                                                                                                 |                                                                                                  |            |                                              |            |                                       |
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| TD-201<br>Rev No. 00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Form No. | <br>HYDERABAD | <b>PRODUCT STANDARD</b><br>PROJECT ENGINEERING & SYSTEMS DIVISION<br>HYDERABAD | ANNEXURE<br>Rev No. 00<br>Page 1 of 3 |
| <div style="text-align: center;"> <p><b>QAP GUIDELINES &amp; FORMAT</b></p> <p>( ANNEXURE - )</p> </div> <p>The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement.</p> <p><b>Note :</b></p> <ol style="list-style-type: none"> <li>1. Typical /Indicative /Standard QAP(s) for equipment /package attached is reference document and to use by successful bidder in future for preparation and submission of QAP for BHEL /CUSTOMER approval.</li> <li>2. No deviation to reference document is acceptable.</li> </ol> |          |                                                                                                |                                                                                |                                       |

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| Form No.                                                                                                                                                                                                                         | <br>HYDERABAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>PRODUCT STANDARD</b><br>PROJECT ENGINEERING & SYSTEMS DIVISION<br>HYDERABAD | ANNEXURE                                                                                                                                                                                              |
|                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                | Rev No. 00                                                                                                                                                                                            |
|                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                | Page 2 of 3                                                                                                                                                                                           |
| <b>COPYRIGHT AND CONFIDENTIAL</b><br>The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED .<br>It must not be used directly or indirectly in any way detrimental to the interest of the company. | <p style="text-align: center;"><b><u>GUIDELINES TO VENDORS FOR<br/>PREPARATION OF QUALITY ASSURANCE PLAN</u></b></p> <ol style="list-style-type: none"> <li>QAP shall be made in landscape mode on A4 size paper as per the format enclosed. Font size shall be minimum 10.</li> <li>Each page of QAP shall contain the following information.           <ol style="list-style-type: none"> <li>Vendor's name &amp; address.</li> <li>Customer: BHEL, Hyderabad.</li> <li>Project.</li> <li>BHEL Product Standard Number/revision number as referred in P.O.</li> <li>BHEL Purchase Order Number &amp; Date.</li> <li>Product as per P.O. description.</li> <li>QAP Number (unique and shall not repeat)/revision number/date.</li> <li>Page number and number of pages</li> </ol> </li> <li>QAP shall contain four parts / stages as follows.           <ol style="list-style-type: none"> <li>Raw materials and bought out items.</li> <li>In process Control / Inspection.</li> <li>Final assembly, Inspection &amp; Testing.</li> <li>Painting, preservation &amp; packing.</li> </ol> </li> <li>Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc).</li> <li>Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT,DP etc.), hydrostatic test, calibration check etc.)</li> <li>Under 'Class', indicate minor, major or critical depending on the importance of characteristic.</li> <li>Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.)</li> <li>Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.)</li> <li>Under 'Reference document' and 'Acceptance norms', appropriate National &amp; International standards, BHEL standards, approved drawing references etc. should be indicated. It is not correct to mention as "Vendor's internal standards or Vendor's standard practice etc.". If vendors' internal standards are referred, same shall be in line with BHEL Spec. indicated in the P.O. These may require review &amp; approval by our Engineering dept.</li> <li>Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc.</li> </ol> |                                                                                |                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Ref. Doc                                                                       | 11. Please refer 'Agency' in QAP format.<br>Under P: Perform, W: Witness, V: Verify<br>Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR<br>2: (Vendor / Sub vendor) |

|           |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |
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| Form No.  |  | <b>PRODUCT STANDARD</b><br>PROJECT ENGINEERING & SYSTEMS DIVISION<br>HYDERABAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ANNEXURE    |
|           |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Rev No. 00  |
|           |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Page 3 of 3 |
| HYDERABAD |                                                                                   | <p>Note: Performing agency is normally vendor or his sub vendor (Legend 2). Where witness points are indicated in specification, P.O., Drawing etc., for such operations, under Witness (W) column use 1. Under 'Verify' column, use code1.</p> <p>12. Under 'D' please put ( <input type="checkbox"/> Tick) against each characteristic where vendor proposes to submit test certificate/report etc. OR as required as per BHEL Specification.</p> <p>13. Vendor's signature &amp; stamp should be available on each page of QAP.</p> <p>14. Vendor should read the BHEL Product Standard thoroughly and QAP should be made only inline and relevant to the Specification &amp; Approved Drawings.</p> <p>15. The following operations/characteristics/check points may be included (AS APPROPRIATE)</p> <ul style="list-style-type: none"> <li>a) Visual check</li> <li>b) Dimensional check</li> <li>c) Mechanical and Chemical properties.</li> <li>d) Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.)</li> <li>e) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc.</li> <li>f) Check for correctness for all components mounted as per General arrangement Drawing, Bill Of Materials (BOM), etc. for range, rating, make, color, size, location as per GA, quantity, label description including tag nos., annunciator facia, loose components, accessories, spares etc.</li> <li>g) Verification of test certificate for protection class for the enclosures.</li> <li>h) Mechanical functioning of switches.</li> <li>i) Continuity of earthing and provision of earth points.</li> <li>j) Colour coding of wiring, size, tightness &amp; dressing of wiring.</li> <li>k) Review of test certificates of assembled items, raw materials, internal test reports etc.</li> <li>l) Witness of functional checks, which may include mechanical run &amp; electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc.</li> <li>m) PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc.</li> <li>n) Material identification ( for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.)</li> <li>o) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non Destructive Tests.</li> <li>p) Tests on Galvanised items (Visual, Hammer Test, Knife Test, Thickness, Pierce Test (Copper sulphate test), Hydrogen evaluation test, Stripping test (for Mass of Zinc coating)</li> <li>q) All tests as per BHEL Product Standard &amp; approved drawings including Type tests and Routine tests on individual items and on System as a whole.</li> <li>r) For loose items test certificate or COC is required.</li> <li>s) Packing and Preservation.</li> </ul> <p>16. <b>QAP Format enclosed.</b></p> <p>17. <b>Typical Manufacturing QAP is attached.</b></p> |             |
| Ref. Doc  |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |

Receipt No : 50416/2020/PE-SD-450\_C-

| VENDOR'S NAME & ADDRESS:                                                                                                                                                                                                                                                                                                                                                                                                                |            |                 |       | MANUFACTURING QUALITY PLAN |                  |                    |                  |                  |     |   |   |             |        | QP. NO.: |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|-------|----------------------------|------------------|--------------------|------------------|------------------|-----|---|---|-------------|--------|----------|--|--|
| CUSTOMER: BHEL, HYDERABAD – 32.<br>PROJECT:<br>PRODUCT:                                                                                                                                                                                                                                                                                                                                                                                 |            |                 |       | BHEL P.O.NO.:              |                  |                    |                  | P.O.DATE:        |     |   |   | REV NO.:    |        | DATE:    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                 |       | BHEL SPEC:                 |                  |                    |                  | REV:             |     |   |   | PAGE 1 OF 1 |        |          |  |  |
| SL NO                                                                                                                                                                                                                                                                                                                                                                                                                                   | COMPONENTS | CHARACTERISTICS | CLASS | TYPE OF CHECK              | QUANTUM OF CHECK | REFERENCE DOCUMENT | ACCEPTANCE NORMS | FORMAT OF RECORD | * D | P | W | V           | AGENCY | REMARKS  |  |  |
| <b>1.0 RAW MATERIALS &amp; BOUGHT OUT ITEMS</b>                                                                                                                                                                                                                                                                                                                                                                                         |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |
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| <b>2.0 INPROCESS INSPECTION</b>                                                                                                                                                                                                                                                                                                                                                                                                         |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |
| <b>3.0 FINAL INSPECTION &amp; TESTING</b>                                                                                                                                                                                                                                                                                                                                                                                               |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |
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| <b>4.0 PRESERVATION &amp; PACKING</b>                                                                                                                                                                                                                                                                                                                                                                                                   |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |
| <b>VENDOR TO NOTE:</b> THIS FORMAT IS IN MICROSOFT WORD. HEADER & FOOTER SHALL BE AVAILABLE IN EACH PAGE OF QP. QP SHALL BE IN LANDSCAPE & A4 SIZE ONLY. FONT SIZE SHALL BE MIN 10. VENDOR SHALL SIGN & STAMP IN EACH PAGE OF QP. LOI REF. & DATE ARE NOT ACCEPTABLE. P.O.NO. & DATE SHALL BE INDICATED. QP NO. SHOULD BE UNIQUE AND SHALL NOT REPEAT. ALL THE TESTS / CHECKS INDICATED IN THE BHEL SPEC. SHALL BE INDICATED IN THE QP. |            |                 |       |                            |                  |                    |                  |                  |     |   |   |             |        |          |  |  |

  

| LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS. | PREPARED BY                | APPROVED BY               | APPROVED BY                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------|------------------------------|
|                                                                                                                                                                                                                                                                                                                             | VENDOR'S SIGNATURE & STAMP | BHEL QA SIGNATURE & STAMP | CUSTOMER'S SIGNATURE & STAMP |

Receipt No : 50416/2020/PE-SD-450\_C-

| TYPICAL MANUFACTURING QUALITY PLAN                                           |  |  |  |  |                |  |  |  |  | MQP. NO.:   |  |
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| RC PURAM, HYD-502032                                                         |  |  |  |  | ACCEPTANCE     |  |  |  |  | FORMAT OF   |  |
| CHARACTERISTICS                                                              |  |  |  |  | NORMS          |  |  |  |  | RECORD      |  |
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| TYPICAL MANUFACTURING QUALITY PLAN                                      |                   |                                         |       |               |                                                                                       |                                                   |                                                   |                       |     | MQP. NO.:   |    |   |
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| PROJECT ENGINEERING & SYSTEMS<br>DIVISION BHEL,<br>RC PURAM, HYD-502032 |                   |                                         |       |               | PO NO:<br>PROJECT: BHUSAWAL<br>PACKAGE: PRESSURE SWITCH<br>BHEL TECH SPEC:PY56321 R01 |                                                   |                                                   |                       |     | REV NO:     |    |   |
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| SL NO                                                                   | COMPONENTS        | CHARACTERISTICS                         | CLASS | TYPE OF CHECK | QUANTUM OF CHECK                                                                      | REFERENCE DOCUMENT                                | ACCEPTANCE NORMS                                  | FORMAT OF RECORD      | * D | AGENCY      |    |   |
|                                                                         |                   |                                         |       |               |                                                                                       |                                                   |                                                   |                       |     | P           | W  | V |
| 2.5                                                                     |                   | GUARANTEE PERFORMANCE                   | MAJOR | REVIEW        | 100%                                                                                  | Approved Datasheet/ Approved Drawing/ Tech. spec. | Approved Datasheet/ Approved Drawing/ Tech. spec. | GUARANTEE CERTIFICATE | ✓   | 2           | -- | 1 |
| 2.6                                                                     |                   | Hydro test for pressure parts*          | MAJOR | REVIEW        | 100%                                                                                  | Approved Datasheet/ Approved Drawing/ Tech. spec. | Approved Datasheet/ Approved Drawing/ Tech. spec. | TEST REPORT           | ✓   | 2           | -- | 1 |
| 2.7                                                                     |                   | Radiography for weld joints*            | MAJOR | REVIEW        | 100%                                                                                  | Approved Datasheet/ Approved Drawing/ Tech. spec. | Approved Datasheet/ Approved Drawing/ Tech. spec. | TEST REPORT           | ✓   | 2           | -- | 1 |
| 2.8                                                                     |                   | Statutory approvals (CCOE/PESO/BIS etc) | MAJOR | REVIEW        | 100%                                                                                  | Approved Datasheet/ Approved Drawing/ Tech. spec. | Approved Datasheet/ Approved Drawing/ Tech. spec. | TEST REPORT           | ✓   | 2           | -- | 1 |
| 2.9                                                                     | COMPLETE ASSEMBLY | PACKING                                 | MAJOR | PACKING       | 100%                                                                                  | Approved Datasheet/ Approved Drawing/ Tech. spec. | Approved Datasheet/ Approved Drawing/ Tech. spec. | PACKING LIST          | ✓   | 2           | -- | 1 |

**NOTE:-**

1. This MQP should be read along with specification (latest revision), approved drawings & approved data sheet.

LEGEND: P: PERFORM, W: WITNESS, V: TEST CERTIFICATE REVIEW. INDICATE 1 FOR BHEL / BHEL NOMINATED INSPECTION AGENCY & 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. \* FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.

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|  |            | <b>TYPICAL MANUFACTURING QUALITY PLAN</b>                                             |       |               |                  |                    | MQP. NO.:        |                  |        |             |   |   |         |
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| PROJECT ENGINEERING & SYSTEMS<br>DIVISION BHEL,<br>RC PURAM, HYD-502032             |            | PO NO:<br>PROJECT: BHUSAWAL<br>PACKAGE: PRESSURE SWITCH<br>BHEL TECH SPEC:PY56321 R01 |       |               |                  |                    | PAGE 3 OF 3      |                  |        |             |   |   |         |
| SL NO                                                                               | COMPONENTS | CHARACTERISTICS                                                                       | CLASS | TYPE OF CHECK | QUANTUM OF CHECK | REFERENCE DOCUMENT | ACCEPTANCE NORMS | FORMAT OF RECORD | *<br>D | AGENCY<br>P | W | V | REMARKS |

2. Drawing/data sheet shall prevail over quality plan for contradiction if any between quality plan and drawing/specification.
3. All test certificates/reports reviewed and certified by TPI/BHEL shall be submitted to BHEL as documentation package.
4. All type test reports submitted shall not be older than 5 yrs from the date of purchase order.
5. Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.
6. For Spares of main supply, test certificate shall be reviewed for Make, Model No., BOM verification, tag no., dimension, visual check etc.

LEGEND: P: PERFORM, W: WITNESS, V: TEST CERTIFICATE REVIEW. INDICATE 1 FOR BHEL / BHEL NOMINATED INSPECTION AGENCY & 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. \* FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.