



Specification for **Pressure switch**

1. SCOPE

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&M manuals etc., as required for Pressure Switches.

2. Proven Track Record

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 at least 4000 Hours. The above criteria shall be applicable to main equipment, sub- components as well as bought out items if any.

Vendor shall submit necessary supporting documents / past user's confirmation supporting to above PTR requirements along with technical offer.

If offered instruments / equipments are supplied to BHEL PE&SD within last 5 years, above PTR clause is not applicable.

3. INSTRUCTIONS TO BIDDERS

3.1 Bidders **are advised to contact BHEL for essential technical queries in writing within one week of issue of Enquiry**. 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 **and the decision of Purchaser shall be final & binding on Bidder, without any cost & delivery implications. In the event of conflict, most stringent requirements shall be followed in general.**

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.

3.3 Any technical features [over & above BHEL enquiry specification requirements] proposed by Bidder will not be given preference for the purpose of evaluation.

3.4 Bidder shall submit the "Duly filled & Signed copy of Check list" compulsorily along with technical offer without which offer is liable for rejection without any further interaction with the Bidder

4. DESIGN VARIABLES to be provided after P.O. Placement / during drawing approval:

Following variables to be finalized during drawing approval and vendor shall comply the same without any commercial implication:

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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Revisions: Refer to record of revisions	Prepared By:	Checked By :	Approved :	Date :
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5. CHECK LIST (To be filled by BIDDER and submitted along with Technical offer is compulsorily)

Vendor shall submit the following documents mandatorily as part of COMPLTE technical offer.

Enquiry No. / Date :

Name of the Bidder :

Project Name :

Item Description :

S. No	Document	Bidder confirmation (Yes/No)	Remarks
1	Technical offer complies with the specifications and its associated annexures, pre-bid clarifications in Toto and there are no technical deviations. Signed and stamped copy of this specification along with annexures enclosed along with technical offer.		
2	In case of deviation, vendor to confirm that these are technically not feasible deviations and same are submitted in BHEL format . In case technically feasible deviations are proposed by the bidder and subsequently withdrawn, <u>no commercial implications can be claimed by the bidder</u>		
3	All items are manufactured conforming to latest version of material grade standard and manufacturing standard mentioned in this specifications		
4	Bidder to quote as per BHEL price format only. No other format is acceptable. Bidder to attach un-priced price bid format by indicating "QUOTED" against each item and submit with technical offer duly signed & stamped.		
5	For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during ordering and shall be valid up to execution of the contract to the extent of + 10% and -30% of order Value.		
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		

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(Bidder's Signature and stamp with date)



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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

SIGNATURE OF THE BIDDER _____

NAME _____

DESIGNATION _____

DATE _____

COMPANY SEAL

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6. MANDATORY SPARES - Spares requirement shall be as per [enquiry](#).**7. DOCUMENTATION**

7.1 Information to be included with offer

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.

- a) Duly filled & Signed copy of Check list
- b) 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".
- c) Unpriced price schedule (To be submitted compulsorily without fail)
- d) Proven Track record and reference list (if applicable)
- e) Bill of materials (only for information)

7.2 Documentation submission within 2 weeks of placement of LOI (for approval by BHEL and / or BHEL's customer in 4 sets)

- a) Consolidated BOM sheet along with accessories of instruments, finalized make /models of instruments, etc for approval.
- b) Detail Data sheets, GA drawings, Type tests, statutory certificates
- c) Comprehensive Quality Assurance plan (QAP).

NOTES::a) *BHEL Shall provide the following inputs to vendor immediately (within 7 days) after placement P.O. / LOI:*

- 1) Instrument schedule with tag no's, ranges, site identification no's, etc
- 2) Typical Cover page for pressure Switches: This is to be used for all instruments with necessary modification for each variety of instrument

b) Following points to be noted while submitting drgs & data sheets for approval:

- 1) Each instrument data sheet to be submitted along with cover page & tag list.
- 2) All extra quantities to be marked as "E.spares".
- 3) All data sheets & 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 & pieces for approval.

c) *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.*

d) Further BHEL will provide comments on vendor submitted document within 07 working days for revision & resubmission. Vendor shall follow up with BHEL for non-receipt of comments/approvals.

e) 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.

f) 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.

g) Vendor shall obtain final approvals on all technical + quality aspect documents before inspection dates.

h) 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.

7.3 Documents to be submitted during final shop testing and before equipment dispatch. **(Note: submission of these documents are commercially linked)** - all in 16 sets + 3 CD ROM (2 sets to be included with item dispatch and balance to BHEL purchase department).

- a) Complete O& M manual, Approved Engg documents
- b) Guarantee and all test certificates for review and acceptance by BHEL and / or BHEL's Customer



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8. NAME PLATE

Each equipment shall have a 316 SS nameplate attached firmly to it at a visible place furnishing the following information:

- a) Instrument range & Tag number.
- b) Manufacturer's name, Model and emblem.

9. MARKING, PACKING AND DESPATCH

- 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.
- 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.
- 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.
- 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 **wooden** crates/cases to prevent damage to the finish. **Wooden** Crates/cases shall have skid bottom for handling.
- 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.
- 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.
- 9.7 The following minimum packing procedures shall be followed: -
 - c) All items shall be dry, clean and free from moisture, dirt and loose foreign material of all kinds.
 - d) All items shall be protected from rust, corrosion, and mechanical damage during transportation and handling.
 - e) 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.
 - f) All electrical, instrumentation etc., shall be properly packed to prevent damage during transport, storage, handling at site.
 - g) 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.
 - h) 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.
 - i) Commissioning spares, Tools & tackles to be packed separately & suitably tagged.
- 9.8 *If mandatory spare items are ordered, same shall be sent in pre-decided lots in containers /secure wooden boxes distinctly marked in Red color with boldly written "S" mark on each face of the containers /secure wooden boxes*
- 9.9 *Loose vendor items sent by vendor to sites shall be quantified/numbered/tagged and not merely mentioned as ONE lot of loose items.*



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9.10 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 wooden box for easy identification at site.

9.11 In case of imported/exported items, seaworthy packing shall be done as per specification no: **AA0490004** (latest revision) and the type of packing applicable for flow orifice is "**CQ**". HY0490573 (latest revision). This specification shall be obtained by vendor on request.

VARIANT TABLE-1 (Pressure Switches) With Manifold

Var. No	Material Code	Type of Pressure Switch (Normal/Remote Diaphragm seal)	Switch Housing	Maximum Range	Static Pressure
00	PY9756321008	Normal type	SS	0 to 8 Kg/cm2(g)	20 Kg/Cm2 (g)
01	PY9756321016	Normal type	SS	0 to 16 Kg/cm2(g)	25 Kg/Cm2 (g)
02	PY9756321024	Normal type	Die cast Aluminium	0 to 16 Kg/cm2(g)	20 Kg/Cm2 (g)
03	PY9756321032	Remote Diaphragm seal	Die cast Aluminium	0 to 16 Kg/cm2(g)	20 Kg/Cm2 (g)
04	PY9756321040	Normal type	Die cast Aluminium	0 to 8 Kg/cm2(g)	20 Kg/Cm2 (g)
05	PY9756321059	Normal type	Die cast Aluminium	0 to 20 Kg/cm2(g)	25 Kg/Cm2 (g)
06					
07					

VARIANT TABLE-2 (Pressure Switches) Without Manifold

Var. No	Material Code	Type of Pressure Switch (Normal/Remote Diaphragm seal)	Switch Housing	Maximum Range	Static Pressure
11	PY9756321113	Normal type	SS	0 to 8 Kg/cm2(g)	20 Kg/Cm2 (g)
12	PY9756321121	Normal type	SS	0 to 16 Kg/cm2(g)	25 Kg/Cm2 (g)
13	PY9756321130	Normal type	Die cast Aluminium	0 to 8 Kg/cm2(g)	20 Kg/Cm2 (g)
14	PY9756321148	Normal type	Die cast Aluminium	0 to 16 Kg/cm2(g)	25 Kg/Cm2 (g)



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Data sheet for PRESSURE SWITCH (Weather proof)

(1)	GENERAL	Range & Qty.	: As per enquiry
(2)			
(3)		Ambient temperature	: 0 to 50 Deg C
(4)	SWITCH	Switching differential	:
(5)		Switch type	: Snap acting, shock & vibration proof
(6)		Type	: Piston for high pressure application Bellow / Diaphragm for low pressure application
(7)		Switch configuration	: Two SPDT (240V, 5A AC/220V, 0.5A DC/6A 24V DC)
(8)		Set point adjuster & terminal block	: Shall be inside the switch housing
(9)		Repeatability	: ± 0.5 % of full scale range
(10)		Accuracy	: ± 1 % of full scale range
(11)		Safe working/Static pressure	: As per variant table
(12)		Process Connection	: 1/2" NPT (F)
(13)		Instrument connection	: 1/2" NPT (M)
(14)		Electrical Connection	: Option-1: 2 No's of 1/2" NPT (F) Option-2: Plug in socket type (Finalized during Drawing/Datasheet approval stage)
(15)	Protection	: Weather proof to IP 65	
(16)	Over Range protection	: 150% of Max pressure	
(17)	Impulse Entry	: Side / Bottom (Shall be finalized during datasheet approval)	
(18)	Sensing element material	: SS 316	
(19)	Wetted parts	: SS316	
(20)	Case	: SS/Die Cast Aluminium as per enquiry	
(21)	Adjustment	: Internal set point	
(22)		: Differential adjustment	
(23)		: Setter Scale	: Black graduation on white linear scale. Graduation 0-100% with red pointer for set points
(24)		Terminal Block	: Suitable for full ring lugs
(25)	ACCESSORIES	Mounting Bracket with U clamp and fasteners	: Suitable for 2" pipe mounting, MOC: SS304; 1 Set per Switch
(26)		Cable Glands with Slipper type PVC sleeves cable shrouds	: Nickel plated brass Double Compression type; 2 No's per switch (Applicable for Electrical connection ½" NPT(F))
(27)		Cable entry Dummy Plugs	: Required, SS 304 ; 1 No per switch (Applicable for Electrical connection ½" NPT(F))
(28)		Tag Plate	: Required, SS
(29)		Bolts + Nuts	: Required. A193GrB7 + A194Gr2H
(30)		Manifold	: Two valve manifold (M.O.C-SS316) as per enquiry
(31)		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.
(32)	Inspection & Testing	Bill of Material (model, dim., Tag no's)	: 100% Witness
(33)		Spares (BOM, part no's)	: 100% Witness (if ordered)
(34)		Statutory approvals (main inst & accessories) like CCOE/PESO, BIS, etc.	: 100% Review
(35)		Material compliance certificate	: 100% Review
(36)		Calibration certificate	: 100% review.
(37)		Hydro test for pressure parts	: 100% Review
(38)		Ingress Protection Test	: 100% Review

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**Bill of Material Cum Price Bid format
[for Main Supply + Mandatory Spares]**

Annexure - [A] of PY56321

Rev.03

Pressure Switch-Framework

BHEL ENQUIRY NO :


Vendor Offer ref no:

Ref. date:

Ref. date:

NOTES ::

- A This document details the price schedule format for the enquiry. **No other format will be entertained.**
Applicable taxes and duties shall be indicated separately in commercial offer.
- B Duly signed & stamped un-priced price schedule format shall be submitted by vendor in the technical offer as a token of concurrence that price schedule would be submitted in this format. Any tampering / modification / additions, etc. are NOT allowed and not considered binding and is liable for rejection of the offer.
- C **Bidders shall be evaluated on overall L1 basis.**
- D For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during order execution and shall be valid up to execution of the contract to the extent of + 30%, - 50% of overall order Value. These would include the cost up to engineering, installation of the item, wiring up in the panel and seamless integration with main system at works/site without any cost implications. All accessories as required for this purpose also shall be included in the Price Quoted
- E Components/Items for addition/deletion, spares shall be identical to the main equipment.
- F Billing will be as per BOM of actual supplied main equipment (including accessories) & spares.
- G Unit Rates of the individual package items shall be derived by multiplying the "Unit Price Fixing Factor" with the Lumpsum Price quoted. Unit Rates of the Individual items thus arrived, shall be binding on the bidder, in case of any repeat order/Ammendment of order as per BHEL policies. Observations / Objections, if any, of the Bidder, to the "Unit Price Fixing Factor" shall be brought to the notice of BHEL, during Pre-Bid Stage. No Observations / Objections shall be entertained after the Techno-Commercial Bid is opened.
- H Bidder to indicate "Quoted" in the column "Bidder's Confirmation" as a confirmation of their bid to the respective item.
- I The Bid Evaluation is on Overall L1 Basis. Each and Every item of the Package shall be quoted by the bidder. Partial offers will not be considered for evaluation and the same are liable for rejection.

		Price Bid format [for Main Supply + Mandatory Spares]			Annexure - [A] of PY56321 R03		
		Pressure Switch-Framework					
S. No	Material Code	Item Description	Quantity [I]	Unit	Unit Rate (Rs.) [II]	TOTAL PRICE (Rs.) [I*II]	REMARKS
[A]	MAIN SUPPLY						
1	PY9756321016	PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- With manifold	158	No			
2	PY9756321121	PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- Without manifold	292	No			
3	PY9756321024	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- With manifold	481	No			
4	PY9756321148	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- Without manifold	546	No			
MAIN SUPPLY Total prices (Sub-total of [A]) (Rs.) ::							
[B]	MANDATORY SPARE						
1	PY9756321016	PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- With manifold	16	No			
2	PY9756321121	PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- Without manifold	20	No			
3	PY9756321024	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- With manifold	3	No			
4	PY9756321148	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- Without manifold	3	No			
MANDATORY SUPPLY Total prices (Sub-total of [B]) (Rs.)=							
Total prices for overall L1 evaluation ([A]+[B]) (Rs.) ::							

		[A] PRESSURE SWITCH-MAIN SUPPLY				Annexure - [A] of PY56321 R03	
		PROJECT WISE BREAKUP					
		FRAMEWORK					
		A	B	C	D		
Material Code →		PY9756321016	PY9756321121	PY9756321024	PY9756321148		
Item Description →		PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- With manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- Without manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- With manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- Without manifold	Project Specific Requirement↓	
Sl. No.	PROJECT NAME ↓	Unit					
1	NTPC TALCHER TPS (2x660 MW)	Nos			114	543	Elec.Connection: Plug in socket
2	NTPC PATRATU STPS(3X 800MW)				349		Elec.Connection: Plug in socket
3	FGD NTPC Mauda	Nos	2	8			
4	FGD NTPC Sipat	Nos	2	10			
5	FGD NTPC Bhilai	Nos	2	10			
6	FGD North Karanpura	Nos	3	11			
7	FGD NTPL Tuticorin	Nos	8	4			
8	FGD TSGENCO Bhadradi	Nos	2	10			
9	TSGENCO Kothagudem	Nos	2	10			
10	NSPCL BHILAI FGD (2X250 MW)	Nos	3	11			
11	NTPC BARH-I (3X660MW)	Nos	3	11			
12	NTPC BARH-II 2X660MW FGD	Nos	3	11			
13	NTPC KORBA STAGE-I, II, III.	Nos	7	31			
14	NTPC KAHALGAON STAGE -I, II, (4x210 MW + 3x500 MW)	Nos	6	22			
15	TANGEDCO-NORTH CHENNAI (1X800MW)	Nos	3	11			
16	NPGCL NABINAGAR (3X660MW)	Nos	3	10			
17	BRBCL NABINAGAR (4X250MW)	Nos	0	8			

		[A] PRESSURE SWITCH-MAIN SUPPLY				Annexure - [A] of PY56321 R03	
		PROJECT WISE BREAKUP					
		FRAMEWORK					
		A	B	C	D		
Material Code →		PY9756321016	PY9756321121	PY9756321024	PY9756321148		
Item Description →		PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- With manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- Without manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- With manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- Without manifold	Project Specific Requirement ↓	
Sl. No.	PROJECT NAME ↓	Unit					
18	NTPC RAMAGUNDAM STAGE-I & II, (3X200MW + 3X500 MW)	Nos	5	21			
19	Panchet HEP	Nos	0	0	18	3	Elec.Connection: Plug in socket
20	Kodayar HEP	Nos	12	0			
21	Kutiyadi HEP	Nos	4	4			
22	R&M Chilla	Nos	15	18			
23	Rahughat	Nos	2	2			
24	Arun-III 4x225mw	Nos	19	24			
25	Shapurkandi Ph 1 & 2	Nos	23	7			
26	Pipalkoti	Nos	13	16			
27	Rammam	Nos	16	22			
	Total Quantity	Nos	158	292	481	546	

		[B] PRESSURE SWITCH-MANDATORY SUPPLY				Annexure - [A] of PY56321 R03	
		PROJECT WISE BREAKUP					
		FRAMEWORK					
		A	B	C	D		
Material Code →		PY9756321016	PY9756321121	PY9756321024	PY9756321148		
Item Description →		PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- With manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- Without manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- With manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- Without manifold	Project Specific Requirement ↓	
Sl. No.	PROJECT NAME ↓	Unit					
1	NTPC TALCHER TPS (2x660 MW)	Nos			1	1	Elec.Connection: Plug in socket
2	NTPC PATRATU STPS(3X 800MW)				2	2	Elec.Connection: Plug in socket
3	FGD NTPC Mauda	Nos	1	0			
4	FGD NTPC Sipat	Nos	1	0			
5	FGD NTPC Bhilai	Nos	1	0			
6	FGD North Karanpura	Nos	1	0			
7	FGD NTPL Tuticorin	Nos	0	0			
8	FGD TSGENCO Bhadradi	Nos	2	0			
9	TSGENCO Kothagudem	Nos	0	0			
10	NSPCL BHILAI FGD (2X250 MW)	Nos	1	1			
11	NTPC BARH-I (3X660MW)	Nos	0	0			
12	NTPC BARH-II 2X660MW FGD	Nos	1	1			
13	NTPC KORBA STAGE-I, II, III.	Nos	1	3			
14	NTPC KAHALGAON STAGE -I, II, (4x210 MW + 3x500 MW)	Nos	1	2			
15	TANGEDCO-NORTH CHENNAI (1X800MW)	Nos	1	1			

		[B] PRESSURE SWITCH-MANDATORY SUPPLY				Annexure - [A] of PY56321 R03	
		PROJECT WISE BREAKUP					
		FRAMEWORK					
		A	B	C	D		
Material Code →		PY9756321016	PY9756321121	PY9756321024	PY9756321148		
Item Description →		PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- With manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 SS- Without manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- With manifold	PRESSURE SWITCH RANGE 0-16 KG/CM2 Die-Cast Al- Without manifold	Project Specific Requirement ↓	
Sl. No.	PROJECT NAME ↓	Unit					
16	NPGCL NABINAGAR (3X660MW)	Nos	1	1			
17	BRBCL NABINAGAR (4X250MW)	Nos	0	1			
18	NTPC RAMAGUNDAM STAGE-I & II, (3X200MW + 3X500 MW)	Nos	1	2			
19	Panchet HEP	Nos	0	0	0	0	
20	Kodayar HEP	Nos	0	0			
21	Kutiyadi HEP	Nos	0	0			
22	R&M Chilla	Nos	0	0			
23	Rahughat	Nos	1	1			
24	Arun-III 4x225mw	Nos	2	2			
25	Shapurkandi Ph 1 & 2	Nos	0	0			
26	Pipalkoti	Nos	0	0			
27	Rammam	Nos	0	5			
	Total Quantity	Nos	16	20	3	3	



Specification for Differential Pressure Switch

1. SCOPE

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&M manuals etc., as required for Differential Pressure Switches.

2. Proven Track Record

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 at least 4000 Hours. The above criteria shall be applicable to main equipment, sub- components as well as bought out items if any.

Vendor shall submit necessary supporting documents / past user's confirmation supporting to above PTR requirements along with technical offer.

If offered instruments / equipments are supplied to BHEL PE&SD within last 5 years, above PTR clause is not applicable.

3. INSTRUCTIONS TO BIDDERS

3.1 Bidders **are advised to contact BHEL for essential technical queries in writing within one week of issue of Enquiry**. 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 **and the decision of Purchaser shall be final & binding on Bidder, without any cost & delivery implications. In the event of conflict, most stringent requirements shall be followed in general.**

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.

3.3 Any technical features [over & above BHEL enquiry specification requirements] proposed by Bidder will not be given preference for the purpose of evaluation.

3.4 Bidder shall submit the "Duly filled & Signed copy of Check list" compulsorily along with technical offer without which offer is liable for rejection without any further interaction with the Bidder

4. DESIGN VARIABLES to be provided after P.O. Placement / during drawing approval:

Following variables to be finalized during drawing approval and vendor shall comply the same without any commercial implication:

a)	Calibration Ranges + Tag List of all Differential Pressure Switches	:	Shall be intimated after P.O. placement
b)	Safe working/Static pressure of Differential Pressure Switches	:	Shall be intimated after P.O. placement

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Revisions: Refer to record of revisions	Prepared By:	Checked By :	Approved :	Date :
	Sunil Kumar Gautam	Kamal Kumar	K. Anand	10.01.22



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5. CHECK LIST (To be filled by BIDDER and submitted along with Technical offer is compulsorily)

Vendor shall submit the following documents mandatorily as part of COMPLTE technical offer.

Enquiry No. / Date :

Name of the Bidder :

Project Name :

Item Description :

S. No	Document	Bidder confirmation (Yes/No)	Remarks
1	Technical offer complies with the specifications and its associated annexures, pre-bid clarifications in Toto and there are no technical deviations. Signed and stamped copy of this specification along with annexures enclosed along with technical offer.		
2	In case of deviation, vendor to confirm that these are technically not feasible deviations and same are submitted in BHEL format . In case technically feasible deviations are proposed by the bidder and subsequently withdrawn, <u>no commercial implications can be claimed by the bidder</u>		
3	All items are manufactured conforming to latest version of material grade standard and manufacturing standard mentioned in this specifications		
4	Bidder to quote as per BHEL price format only. No other format is acceptable. Bidder to attach un-priced price bid format by indicating "QUOTED" against each item and submit with technical offer duly signed & stamped.		
5	For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during ordering and shall be valid up to execution of the contract to the extent of + 10% and -30% of order Value.		
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		

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(Bidder's Signature and stamp with date)



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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

SIGNATURE OF THE BIDDER _____

NAME _____

DESIGNATION _____

DATE _____

COMPANY SEAL



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6. MANDATORY SPARES - Spares requirement shall be as per [enquiry](#).

7. DOCUMENTATION

7.1 Information to be included with offer

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.

- a) Duly filled & Signed copy of Check list
- b) 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".
- c) Unpriced price schedule (To be submitted compulsorily without fail)
- d) Proven Track record and reference list (if applicable)
- e) Bill of materials (only for information)

7.2 Documentation submission within 2 weeks of placement of LOI (for approval by BHEL and / or BHEL's customer in 4 sets)

- a) Consolidated BOM sheet along with accessories of instruments, finalized make /models of instruments, etc for approval.
- b) Detail Data sheets, GA drawings, Type tests, statutory certificates
- c) Comprehensive Quality Assurance plan (QAP).

NOTES::

a) *BHEL Shall provide the following inputs to vendor immediately (within 7 days) after placement P.O. / LOI:*

- 1) Instrument schedule with tag no's, ranges, site identification no's, etc
- 2) Typical Cover page for Differential Pressure Switches: This is to be used for all instruments with necessary modification for each variety of instrument

b) Following points to be noted while submitting drgs & data sheets for approval:

- 1) Each instrument data sheet to be submitted along with cover page & tag list.
- 2) All extra quantities to be marked as "E.spares".
- 3) All data sheets & 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 & pieces for approval.

c) *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.*

d) Further BHEL will provide comments on vendor submitted document within 07 working days for revision & resubmission. Vendor shall follow up with BHEL for non-receipt of comments/approvals.

e) 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.

f) 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.

g) Vendor shall obtain final approvals on all technical + quality aspect documents before inspection dates.

h) 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.

7.3 Documents to be submitted during final shop testing and before equipment dispatch. **(Note: submission of these documents are commercially linked)** - all in 16 sets + 3 CD ROM (2 sets to be included with item dispatch and balance to BHEL purchase department).

- a) Complete O& M manual, Approved Engg documents
- b) Guarantee and all test certificates for review and acceptance by BHEL and / or BHEL's Customer



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8. NAME PLATE

Each equipment shall have a 304 SS nameplate attached firmly to it at a visible place furnishing the following information:

- a) Instrument range & Tag number.
- b) Manufacturer's name, Model and emblem.

9. MARKING, PACKING AND DESPATCH

- 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.
- 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.
- 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.
- 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 **Wooden** crates/cases to prevent damage to the finish. **Wooden** Crates/cases shall have skid bottom for handling.
- 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.
- 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.
- 9.7 The following minimum packing procedures shall be followed: -
 - c) All items shall be dry, clean and free from moisture, dirt and loose foreign material of all kinds.
 - d) All items shall be protected from rust, corrosion, and mechanical damage during transportation and handling.
 - e) 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.
 - f) All electrical, instrumentation etc., shall be properly packed to prevent damage during transport, storage, handling at site.
 - g) 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 desiccants.
 - h) 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.
 - i) Commissioning spares, Tools & tackles to be packed separately & suitably tagged.
- 9.8 *If mandatory spare items are ordered, same shall be sent in pre-decided lots in containers /secure wooden boxes distinctly marked in Red color with boldly written "S" mark on each face of the containers /secure wooden boxes*
- 9.9 *Loose vendor items sent by vendor to sites shall be quantified/numbered/tagged and not merely mentioned as ONE lot of loose items.*



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9.10 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 wooden box for easy identification at site.

9.11 In case of imported/exported items, seaworthy packing shall be done as per specification no: **AA0490004** (latest revision) and the type of packing applicable for flow orifice is "**CQ**". HY0490573 (latest revision). This specification shall be obtained by vendor on request.

VARIANT TABLE-1 (Differential Pressure Switches) With Manifold

Var. No	Material Code	Type of Differential Pressure Switch (Normal/Remote Diaphragm seal)	Switch Housing	Maximum Range	Static Pressure
00	PY9756601000	Normal type	SS	0.1 to 4 Bar	
01	PY9756601019	Normal type	Die Cast AL	0 to 1.5 Kg/Cm2	

VARIANT TABLE-2 (Differential Pressure Switches) Without Manifold

Var. No	Material Code	Type of Differential Pressure Switch (Normal/Remote Diaphragm seal)	Switch Housing	Maximum Range	Static Pressure



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Data sheet for DIFFERENTIAL PRESSURE SWITCH (Weather proof)

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(1)	GENERAL	Range & Qty.	: As per enquiry
(2)			
(3)		Ambient temperature	: 0 to 50 Deg C
(4)	SWITCH	Switching differential	:
(5)		Switch type	: Snap acting, shock & vibration proof
(6)		Type	: Piston for high pressure application Bellow / Diaphragm for low pressure application
(7)		Switch configuration	: Two SPDT (240V, 5A AC/220V, 0.5A DC/6A 24V DC) snap action dry contact. Auto reset with internal Adjustable snap action micro switch.
(8)		Set point adjuster & terminal block	: Shall be inside the switch housing
(9)		Repeatability	: ± 0.5 % of full scale range
(10)		Accuracy	: ± 1 % of full scale range
(11)		Safe working/Static pressure	: As per variant table
(12)		Process Connection	: 1/2" NPT (F)
(13)		Instrument connection	: 1/2" NPT (M)
(14)		Electrical Connection	: Option-1: 2 No's of 1/2" NPT (F) Option-2: Plug in socket type (Finalized during Drawing/Datasheet approval stage)
(15)		Protection	: Weather proof to IP 65
(16)		Over Range protection	: 150% of Max pressure
(17)		Impulse Entry	: Side / Bottom (Shall be finalized during datasheet approval)
(18)		Sensing element material	: SS 316
(19)		Wetted parts	: SS316
(20)		Case	: SS/Die Cast Aluminium as per enquiry
(21)	Dead band adjustment	: Adjustment upto 10% at set points.	
(22)	Setter Scale	: Black graduation on white linear scale. Graduation 0-100% with red pointer for set points	
(23)	Adjustments	: Internal Set point adjustment	
(24)		: Differential adjustment	
(25)	Terminal Block	: Suitable for full ring lugs	
(26)	ACCESSORIES	Mounting Bracket with U clamp and fasteners	: Suitable for 2" pipe mounting, MOC: SS304; 1 Set per Switch
(27)		Cable Glands with Slipper type PVC sleeves cable shrouds	: Nickel plated brass Double Compression type; 2 No's per switch (Applicable for Electrical connection ½" NPT(F))
(28)		Cable entry Dummy Plugs	: Required, SS 304 ; 1 No per switch (Applicable for Electrical connection ½" NPT(F))
(29)		Tag Plate	: Required, SS
(30)		Bolts + Nuts	: Required. A193GrB7 + A194Gr2H
(31)	Manifold	: 5 valve manifold (M.O.C-SS316) as per enquiry	
(32)	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.	
(33)	Inspection & Testing	Bill of Material (model, dim., Tag no's)	: 100% Witness
(34)		Spares (BOM, part no's)	: 100% Witness (if ordered)
(35)		Statutory approvals (main inst & accessories) like CCOE/PESO, BIS, etc.	: 100% Review
(36)		Material compliance certificate	: 100% Review
(37)		Calibration certificate	: 100% review.
(38)		Hydro test for pressure parts	: 100% Review
(39)		Ingress Protection Test	: 100% Review
(40)			



**Bill of Material Cum Price Bid format
[for Main Supply + Mandatory Spares]
Differential Pressure Switch-Framework**

**Annexure - [A] of PY56601
Rev.01**

BHEL ENQUIRY NO :

Vendor Offer ref no:

Ref. date:

Ref. date:

NOTES ::

A

This document details the price schedule format for the enquiry. **No other format will be entertained.**
Applicable taxes and duties shall be indicated separately in commercial offer.

B

Duly signed & stamped un-priced price schedule format shall be submitted by vendor in the technical offer as a token of concurrence that price schedule would be submitted in this format. Any tampering / modification / additions, etc. are NOT allowed and not considered binding and is liable for rejection of the offer.

C

Bidders shall be evaluated on overall L1 basis.

D

For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during order execution and shall be valid up to execution of the contract to the extent of + 30%, - 50% of overall order Value. These would include the cost up to engineering, installation of the item, wiring up in the panel and seamless integration with main system at works/site without any cost implications. All accessories as required for this purpose also shall be included in the Price Quoted

E

Components/Items for addition/deletion, spares shall be identical to the main equipment.

F

Billing will be as per BOM of actual supplied main equipment (including accessories) & spares.

G

Unit Rates of the individual package items shall be derived by multiplying the "Unit Price Fixing Factor" with the Lumpsum Price quoted. Unit Rates of the Individual items thus arrived, shall be binding on the bidder, in case of any repeat order/Ammendment of order as per BHEL policies. Observations / Objections, if any, of the Bidder, to the "Unit Price Fixing Factor" shall be brought to the notice of BHEL, during Pre-Bid Stage. No Observations / Objections shall be entertained after the Techno-Commercial Bid is opened.

H

Bidder to indicate "Quoted" in the column "Bidder's Confirmation" as a confirmation of their bid to the respective item.

I

The Bid Evaluation is on Overall L1 Basis. Each and Every item of the Package shall be quoted by the bidder. Partial offers will not be considered for evaluation and the same are liable for rejection.



Price Bid format [for Main Supply + Mandatory Spares]

**Annexure - [A]
of PY56601 R01**

Differential Pressure Switch-Framework

S. No	Material Code	Item Description	Quantity [I]	Unit	Unit Rate (Rs.) [II]	TOTAL PRICE (Rs.) [I*II]	REMARKS
[A]	MAIN SUPPLY						
1	PY9756601019	DIFFERENTIAL PRESSURE SWITCH RANGE 0-1.5 KG/CM2 Die-Cast Al- With manifold	5	No			
MAIN SUPPLY Total prices (Sub-total of [A]) (Rs.) ::							
[B]	MANDATORY SPARE						
1	PY9756601019	DIFFERENTIAL PRESSURE SWITCH RANGE 0-1.5 KG/CM2 Die-Cast Al- With manifold	0	No			
MANDATORY SUPPLY Total prices (Sub-total of [B]) (Rs.)=							
Total prices for overall L1 evaluation ([A]+[B]) (Rs.) ::							

	[A] DIFFERENTIAL PRESSURE SWITCH-MAIN SUPPLY			Annexure - [A] of PY56601 R01
	PROJECT WISE BREAKUP			
	FRAMEWORK			
			A	
	Material Code →		PY9756601019	
	Item Description →		DIFFERENTIAL PRESSURE SWITCH RANGE 0-1.5 KG/CM2 Die-Cast Al- With manifold	Project Specific Requirement ↓
Sl. No.	PROJECT NAME ↓	Unit		
1	NTPC TALCHER TPS (2x660 MW)	Nos	1	Elec.Connection: Plug in socket
2	Shapurkandi Ph 1 & 2	Nos	2	
3	Pipalkoti	Nos	2	
	Total Quantity	Nos	5	

	[B]DIFFERENTIAL PRESSURE SWITCH-MANDATORY SUPPLY			Annexure - [A] of PY56601 R01
	PROJECT WISE BREAKUP			
	FRAMEWORK			
			A	
	Material Code →		PY9756601019	
	Item Description →		DIFFERENTIAL PRESSURE SWITCH RANGE 0-1.5 KG/CM2 Die-Cast Al- With manifold	Project Specific Requirement ↓
Sl. No.	PROJECT NAME ↓	Unit		
1	NTPC TALCHER TPS (2x660 MW)	Nos	0	Elec.Connection: Plug in socket
2	Shapurkandi Ph 1 & 2	Nos	0	
3	Pipalkoti	Nos	0	
	Total Quantity	Nos	0	



भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)

Bidder shall comply the following points.

1.0	Technical Pre-qualification Criteria
a	The bidder should have Designed, Tested & Supplied Pressure Switches within the period not exceeding Five (5) years reckoned from bid submission date in any one of the captive power plant applications / hydrocarbon industries like Refinery, Petrochemical and gas processing plants under similar process conditions.
b	The bidder should have executed at least Two (2) jobs in last 7 years for establishment of business continuity.

2.0	Following Documents / Information to be submitted in support of Technical Pre-Qualification Criteria above
a	Bidder shall provide the following documents in support of s.no. 1.0 (a) above (1) Purchase Order details (2) Invoice/End user Approved drawings / documents which indicates Make, model, application, etc (OR) any other document which provides the above details
b	Bidder shall provide the following documents in support of s.no. 1.0 (b) above (1) Purchase Order details (2) LR copies / invoices



PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

QUALITY ASSURANCE REQUIREMENTS

The vendor shall prepare & submit Quality Assurance Plan (QAP) for respective package /equipment in customer QAP format.

A customer standard QAP/typical QAP in customer format /BHEL format attached for respective equipment /package is a reference document for the vendor for future use by vendor for preparation and submission of QAP in customer format. **Hence, no deviation to such document is acceptable.**

Any, additional type or special tests or routine tests or acceptance test if found necessary to establish the intended quality after detailed engineering then the same shall have to be incorporated in the QAP without any commercial implication.

Customer QAP format is enclosed along with this document.

Note : Vendor shall submit QAP with in 07 days from PO receipt date.

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QAP GUIDELINES & FORMAT


(ANNEXURE)


The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement.

Note :

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.
2. No deviation to reference document is acceptable.

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.	<u>GUIDELINES TO VENDORS FOR PREPARATION OF QUALITY ASSURANCE PLAN</u>		
	Ref. Doc	<ol style="list-style-type: none"> 1. QAP shall be made in landscape mode on A4 size paper as per the format enclosed. Font size shall be minimum 10. 2. Each page of QAP shall contain the following information. <ol style="list-style-type: none"> a) Vendor's name & address. b) Customer: BHEL, Hyderabad. c) Project. d) BHEL Product Standard Number/revision number as referred in P.O. e) BHEL Purchase Order Number & Date. f) Product as per P.O. description. g) QAP Number (unique and shall not repeat)/revision number/date. h) Page number and number of pages 3. QAP shall contain four parts / stages as follows. <ol style="list-style-type: none"> a) Raw materials and bought out items. b) In process Control / Inspection. c) Final assembly, Inspection & Testing. d) Painting, preservation & packing. 4. Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc). 5. Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT,DP etc.), hydrostatic test, calibration check etc.) 6. Under 'Class', indicate minor, major or critical depending on the importance of characteristic. 7. Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.) 8. Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.) 9. Under 'Reference document' and 'Acceptance norms', appropriate National & 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 & approval by our Engineering dept. 10. Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc. 11. Please refer 'Agency' in QAP format. Under P: Perform, W: Witness, V: Verify Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR 2: (Vendor / Sub vendor) 	

Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE Rev No. 00 Page 3 of 3
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.	<p>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 (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 & 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 & Approved Drawings.</p> <p>15. The following operations/characteristics/check points may be included (AS APPROPRIATE)</p> <ol style="list-style-type: none"> a) Visual check b) Dimensional check c) Mechanical and Chemical properties. d) Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.) e) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc. 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. g) Verification of test certificate for protection class for the enclosures. h) Mechanical functioning of switches. i) Continuity of earthing and provision of earth points. j) Colour coding of wiring, size, tightness & dressing of wiring. k) Review of test certificates of assembled items, raw materials, internal test reports etc. l) Witness of functional checks, which may include mechanical run & electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc. m) PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc. n) Material identification (for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.) o) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non Destructive Tests. 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) q) All tests as per BHEL Product Standard & approved drawings including Type tests and Routine tests on individual items and on System as a whole. r) Packing and Preservation. <p>16. QAP Format enclosed.</p> <p>17. Typical Manufacturing QAP is attached.</p>		
Ref. Doc			



BHARAT HEAVY ELECTRICALS LIMITED
RAMACHANDRAPURAM:: HYDERABAD – 502032
PROJECT ENGINEERING & SYSTEMS DIVISION
QUALITY & BUSINESS EXCELLANCE DEPARTMENT
Format for inspection call

Ref: BHEL/PESD/QA/11

Dt: 28.07.2020

Due to unavailability of all BHEL/Customer, approved documents TPIAs visits are being wasted .To avoid this it is mandatory that vendor should arrange all the approved reference documents and then only raise the inspection call in portal. Vendor has to fill the below details and upload this documents in portal while raising the inspection call.

Sr.No	Approved Documents	Approved Documents date
	Approved QAP No with revision	
	Approved Drawing No with revision	
	Approved Data Sheet No with revision	
	Purchase specification	
	Purchase Order/BBU	

Note: While raising inspection call vendor has to take care of below points.

1. **Purchasing Unit:** Purchasing Unit should be PE & SD.
2. **Joint Inspection:** Joint inspection means that BHEL and BHEL client both are jointly attending the inspection.
3. **CQ Center:** CQ center is a TPIA nearest region, suppose inspection is in Mumbai than CQ center will be either of TUV Mumbai or BVI Mumbai.

Vendor Signature



**PROJECT ENGINEERING & SYSTEMS DIVISION
RC PURAM, HYDERABAD.
QUALITY & BUSINESS EXCELLENCE**

INSPECTION / TC REVIEW FORMAT

1	Vendor's Name:		5	Applicable BHEL Spec No:	
2	Project:		6	Approved Drawing No:	
3	PO No:		7	Approved Data Sheet No:	
4	Item Description:		8	Approved QAP No:	

OFFER LIST

S.No	BBU/ PO Sr. No.	Item Description	Total Qty as per PO/BBU	Qty. already accepted	Qty offered for TC review	Cumulative Qty	Balance Qty
A							
B							
C							
D							

TC REVIEW REQUISITION

BBU / PO Sr. No.	QAP Clause No.	Format of Record	Certificate No. & Date	Page No.	REMARKS
A. Item Description:					
B. Item Description:					
C. Item Description:					
D. Item Description:					
E. Item Description:					

SUPPLIER / VENDOR SIGNATURE WITH SEAL

BHEL/ BHEL's TPIA SIGNATURE WITH SEAL

Dt:

Dt: