



Ref. Enquiry No.: PE/PG/RTC/E-5562/2017

Dated: 10/04/2017

TENDER ENQUIRY THROUGH E-PROCUREMENT

DUE DATE
21/04/2017
BY 1400 HRS

SUBJECT: TENDER ENQUIRY FOR RATE CONTRACT OF STEEL GATE/GLOBE/NR VALVES (WATER SYSTEM) AS PER TECHNICAL SPECIFICATION NO. PE-TS-20-100-M001

OUR REF: TENDER ENQUIRY NO: PE/PG/RTC/E-5562/2017, DTD-10/04/2017

Dear Sir/ Ma'am,

We are pleased to invite your offer for subject package in two parts strictly as per Clause-2.0 of the enclosed "Instructions to Bidders". Please upload your best quotation/ offer on <https://bheleps.buyjunction.in> for the requirement strictly as per schedule of price format before above mentioned due date & time. The details of the tender enquiry are as mentioned below:

Sl. No	Description for which Rate Contract is desired	Tentative Quantity	Delivery required
1	STEEL GATE/GLOBE/NR VALVES (WATER SYSTEM) - Refer Technical specification no PE-TS-20-100-M001 for detailed description.	As per BOQ cum price schedule (in Annexure-I) cumulative for the Prospective Projects (Annexure-III)	Delivery: - "Four (04) months from drgs. /docs. approval in CAT-I issued by BHEL. Successful bidder to make 1st submission of drawing/docs as per list mentioned in clause 13 of Technical Specification-PE-TS-020-100-M001 within 10 days from the date of P.O. Vendor to re-submit documents within 7 days, taking care of all the comments of BHEL. Any deficiency in documents submitted w.r.t. agreed specification/ comments from BHEL shall be treated as non-submission and no. of days delay in submission of complete documents during approval process, on account of this, would be reduced from the delivery. The vendor shall be responsible for getting approval from BHEL as early as possible and BHEL will support the process, in full, within above time frame and terms & conditions."

Your best quotation/offer for the above requirement, in line with our terms and conditions, should be submitted online via e-procurement system. It shall be the responsibility of the bidder to ensure that the Tender is submitted on or before the due date by 2 p.m. Part-I bids shall be opened at 3 p.m. on the due date in the presence of authorized representatives of the bidders, who may like to be present.

Note:-

- Documents and Credential as per Technical PQR, Techno Commercial Bids and Price Bids should be uploaded on the e-procurement portal.**
- Evaluation will be done on overall L1 (Total cost to BHEL) basis with necessary loading as applicable. Incomplete offer or offer for part of NIT BOM/BOQ shall be summarily rejected.**

Please refer GCC Rev-06 which is available on www.bhelpem.com. You are requested to kindly download the same.

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1. Rate contract on firm price basis is proposed for 2 years from placement of Rate Contract PO with a provision for further extension after review on mutual consent.

Rate Contract is proposed to be done with 2 vendors in ratio of 60: 40, value wise at L1 FOR site price for subject package (% of splitting of RC between 2 vendors may be changed during ordering process, if L1 bidder is not customer approved); however, order for a project (only for the BOQ required as per specific project requirement) shall not be split and will be placed on single vendor.

Evaluation will be done on overall L1 (Total cost to BHEL) basis with necessary loading as applicable.

2. Prices shall be firm.
3. Bidders to note the following: -
 - a) Rate contract shall be decided on the basis of grand Total FOR site price of Total BOQ as listed in price format (Annexure-I)
 - b) Though evaluation is proposed on Grand Total FOR site, but there is % allocation weightage against BOQ quantity of each item which shall be used for arriving at price break up. Bidders need to give only their Ex Works price for given BOQ at Column No. 18) of Annexure I.
 - c) Bidders also require to mention % of taxes/ duties (against respective column for ED, CST & Service Tax) applicable for each item.
 - d) Bidder to give % of freight charges considering anywhere in India in the freight column.
 - e) Rest of the prices shall be derived by BHEL in line with % allocation fixed for each item.
 - f) For better clarity to the bidders where value is to be filled is noted as "to be quoted" and for other columns it will be noted as "derived" which denotes shall be derived by BHEL as per % allocation fixed against each item.
4. L1 rates shall be counter offered to vendors (L2, L3 & so on) in succession. If none accepts L1 rates, RC shall be done with L1 vendor for 100 % value. Vendors shall be asked to quote prices with CST against form C and same state ordering shall not be done to save VAT.
5. Vendor shall be informed that evaluation shall be done on CST basis, however in case, the entire business volume goes to one vendor (or volume of business shared between the vendors in line with enquiry) having manufacturing facility in the same state, then BHEL may do suitable amendment in PO on case to case basis for taking care the provision of VAT in case of project falling in the same State where manufacturing factory of the vendor is also located.

TERMS AND CONDITIONS

1. Procurement of the subject package shall be done through e-procurement
2. Enquiry No., due date etc. must be legibly super scribed on the offers as per clause no. 2.0 of "Instructions to Bidders".
3. Offers should be uploaded in two parts online at <https://bheleps.buyjunction.in> as follows:
 - a) Part-I Bid :- Documents and Credential as per Technical PQR and Techno-Commercial offer (along with un-priced copy of un-priced bid and un-priced schedule of Technical-Commercial Deviation, Annexure I & VI)
 - b) Part II Bid :- Price Bid and Priced schedule of Technical-Commercial Deviation

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4. Terms and conditions:-
- a) Part I bid will be opened on date & time mentioned in the NIT or subsequent corrigenda/amendments, if any.
- b) **Techno-commercial offer of only those bidders shall be evaluated who will meet the Technical pre-qualifying requirement of the tender.**
5. Vendors shall quote in accordance with the requirements mentioned in the tender documents. In case of deviations (Technical/ Commercial), the same shall be highlighted separately giving Clause references along with the Cost of withdrawal of Deviations as per **Annexure-II to GCC Rev 06 of "DEVIATION SHEET (COST OF WITHDRAWAL)"** along with reasons for taking such deviations
Bidder to note all the points mentioned in "Notes" of Annexure-II to GCC Rev 06
6. **Please note the following:**
- a. **Price format is enclosed for compliance.**
- b. **SCC enclosed for compliance.**
- c. **GCC enclosed for compliance. GCC Rev-06 is available on www.bhelpem.com. You are requested to kindly download the same.**
7. Tenders shall be submitted strictly in accordance with the requirements of the above tender documents.
8. Standard pre-printed terms & conditions of the tenderers shall not be considered valid.
9. Validity of offer shall be as per **Clause No. 7.0, "Instructions to Bidders" of GCC Rev 06.**
10. Unsolicited fresh/revised Price Bids shall not be entertained.
11. Purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any/all tender(s) in part or full without assigning any reason whatsoever.
12. Late tenders will be rejected.
13. Tenders and all correspondence thereof, shall be addressed to the undersigned by name & designation and sent at the following address:

Mr. KUNAL GANDHI, Sr. Engr./CMM M/s Bharat Heavy Electricals Ltd., Project Engineering Management, Power Project Engineering Institute, HRD & ESI Complex, Plot No 25, Sector-16 A, Noida-201301 Kind Attn: KUNAL GANDHI/ CMM E-MAIL: kunalgandhi@bhelpem.co.in Ph. No. 0120-4368574/ 9650183377	Mr. I P SINGH, SR MANAGER, CMM M/s Bharat Heavy Electricals Ltd., Project Engineering Management, Power Project Engineering Institute, HRD & ESI Complex, Plot No 25, Sector-16 A, Noida-201301 Kind Attn: I P SINGH/ CMM E-MAIL: indra@bhelpem.co.in Ph. No. 0120- 4218749, 09818989654
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14. **PRE-QUALIFICATION REQUIREMENT: -**
Bidders is requested to submit the documents satisfying the "TECHNICAL PRE-QUALIFYING REQUIREMENT" as per the conditions mentioned in the PQR.
Bids of only those bidders shall be evaluated who meet the Technical pre-qualifying requirements (if applicable).
15. Bidders to note that their bid shall be conditional subject to qualify PQR by registered vendors & non-registered vendors have to qualify PQR & get registered with PEM for the package.
For registration in PEM "Bidders needs to apply & get registered for subject package with PEM before P-2 (price bid opening) & hence you need to apply online for registration on PEM web portal & have to enclose

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acknowledgement with this effect with the bid documents else your bid will not be considered for evaluation"

16. **Bidders have to quote freight charges in percentage of their quoted ex-works prices for Indigenous items.**
17. Limit on quantity variation shall be plus 30% of Contract Value (Ex Works) till validity of RC. The Purchaser shall have the right to increase or decrease quantities and scope upto the above extent of value and Seller/ Contractor shall be bound to accept the same at the contracted prices without any escalation.
18. Project list is indicative only, BHEL may ask for delivery anywhere in India for any of the project added in the prospective project/ existing projects during RC period.
19. Bidder has to submit "NO DEVIATION CERTIFICATE FOR COMMERCIAL TERMS AND CONDITIONS AS PER GCC (06), SCC AND NIT". In case of deviations, bidder to clearly mention the same with their techno-commercial offer as per Point No-5 of NIT.
20. All the above Tender Documents shall automatically become a part of the Order/Contract after its finalization.
21. **The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website www.bhel.com.**
22. **"The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice."**
BHEL Fraud prevention policy is also uploaded in vendor's section on www.bhelpem.com.
23. **Bidders are requested to visit constantly our website to update them self for any technical or commercial change in the NIT.**
24. **All corrigenda, addenda, amendments, time extensions, clarifications etc. to the tender will be hosted on BHEL websites only (www.bhelpem.com, www.bhel.com & <https://bheleps.buyjunction.in>) under subject tender reference. Bidders are requested to visit our websites from time to time to keep themselves updated. **Bidders may go through the Sellers' manual & Help documents provided on E-Procurement Portal website & obtain required Digital Signature Certificate for participating in the subject Tender. For Bidders' convenience, the Helpdesk Nos. of E-Procurement Portal m-junction are also listed below:**
MJUNCTION HELPDESK Nos. 033-6601 1717, 9163348283 / 9163348284 / 9163348285 / 9163348286 / 8584008116 / 8584008205, eps.customercare@mjunction.in
CRM Contact Details:

Mr. Santosh Kumar - Cell No. 09717149600, santosh.kumar@mjunction.in

Ms. Rimi Ghosh – Cell No 09650044156, rimi.ghosh@mjunction.in**
25. **CIF allocation is not applicable for this tender. Bidder to quote accordingly.**
26. Bidders to submit their offers strictly in line with the enclosed price format.
27. Inspection shall be done by BHEL/ END CUSTOMER/Third party Agency (finalized by BHEL).
28. Any other taxes & duties applicable on the date of bid but not quoted by the bidders shall be to bidder account.
29. Delivery terms for dispatches shall be FOR Dispatch Station.
30. This enquiry is subject to Conditions/ limits if any imposed in PMD / Vendor registration.
31. Bidders participating through open tender will necessarily have to but class III DSCs issued by the certifying authorities in India. Basic procedure/ checklist is uploaded on www.bhel.com.
32. Non- registered bidder to submit the credentials required for Registration in BHEL PEM: -



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"Online Registration Portal is operational in BHEL. Non-registered Vendors, who wish to apply for registration with BHEL-PEM, have to apply through Online Registration Portal available at www.bhelpem.com - vendor section - Online Supplier Registration. All credentials and/or documents duly signed and stamped related to registration has to be uploaded on the website and submit the application for registration. One set of hard copy of the filled-up SRF downloaded from Online Registration Portal duly signed and stamped has to be submitted."

33. Purchaser reserves the right to split up the scope of the tender enquiry and place the orders for different scope/ items with different bidders and also increase or decrease the quantity.
34. BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

As a reminder to the bidders, system will flash following message (in RED Color) during the course of 'online sealed bid':

"Bidders to submit online sealed bid less than or equal to their envelope sealed bid already submitted to BHEL"

Detailed guidelines of reverse auction 2016 are available in "information section" of www.bhelpem.com, same are applicable for subject tender.

The Bidders has to quote the Single Price (i.e. Total Cost to BHEL) in Reverse Auction. Price are to be inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, ED + cess, CST against C-form/VAT, Freight as applicable, insurance charges, etc. including loading (if any). De-loading (if any) shall be done in line with SCC.

35. Vendors shall have to enter into Integrity Pact (IP) with BHEL. The Integrity pact shall be returned by the bidder along with their Techno-commercial Bid, duly filled & signed by the authorized signatory and will form part of the order. Only those vendors/bidders who enter into Integrity Pact with BHEL, would be qualified to participate in the bidding Process. (Refer Annexure-IX, as per GCC Rev-06). To oversee implementation of IP, Shri D.R.S. Chaudhary, IAS (Retd). has been appointed as IEM (Independent External Monitor) by BHEL.

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IMPORTANT INSTRUCTION TO BIDDERS IN CASE OF REVERSE AUCTION

The Bidders has to quote the Single Price (i.e. Total Cost to BHEL) in Reverse Auction i. e. Price mentioned in Column No. 19 for indigenous bidders with loading/de loading (if any). Price are to be inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, ED + cess, CST against C-form/VAT, Freight as applicable, including loading (if any). De-loading (if any) shall be done in line with NIT terms.

Following Condition in Reverse Auction shall be treated as follows:

Case-I (Taxes & duties and freight are identical in Reverse Auction & Conventional Price Bid)

Resolution: - Ordering shall be done on lower of the two bids (RA closing price & Conventional Price Bid). After successful completion of reverse auction L1 bidder shall be asked to submit break up in line with taxes & duties, freight quoted in their Conventional Price Bid.

Case-II (In case Bidder has quoted 'CST' in Conventional Price Bid and applicable Tax is 'VAT')

Resolution: - "Total Cost to BHEL shall be maintained by reducing proportion amount in Ex-works quoted by Bidder".

Case-III (In case Bidder has quoted 'VAT' in Conventional Price Bid and applicable Tax is 'CST')

Resolution: - Conventional Bid/RA quoted Prices shall be reduced and CST will be allowed.

Statutory variation shall be applicable.

Any new tax structure (like Goods & Services Tax) as and when implemented by the Government shall become applicable in addition to or in lieu of existing tax structure.

Note: - Applicable taxes & duties shall be determined as per location of works of bidder.

Kindly consider the same while quoting the tender.

36. L1 bidder will have to submit Bank Guarantee for each POs (irrespective of value) which will be placed under the Rate Contract finalised through this tender considering RA as original contract as per format mentioned in Annexure VI to NIT instead of format mentioned in GCC Rev 06
37. Bidder to note that all other terms and condition shall be strictly as per NIT, GCC Rev. 06 & SCC. In the event of any contradiction in the terms and conditions mentioned, the order of preference shall be NIT (this letter) / SCC / GCC Rev. 06.
38. "If any bidder uploads price bid in the unpriced section (techno-commercial attachment page) of the tender in e-procurement, in that case bidder(s) shall only be responsible for such mistake and any consequences thereof. Hence all bidders are requested to be more careful at the time of uploading the Unpriced and Price Bid for Part-I and Part-II respectively to avoid mismatch".

Note: Tenderer must submit UN-PRICED Price format duly filled mentioning the word "QUOTED" in place of actual price given in sealed price bid.

Thanking you,

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Yours faithfully,

For and on behalf of BHEL

(Signature of official with Name & Designation)

Enclosures:

- NIT (this letter itself)
- Annexure-I: Price Format
- Annexure-II: Special Conditions of Rate Contract (SCC).
- Annexure-III: List of prospective projects
- Annexure-IV: PQR (Pre-qualifying Requirement)
- Annexure-V: Technical Specification No. PE-TS-020-100-M001
- Annexure-VI Cost of Withdrawal sheet (Annexure-II of GCC Rev. 06) & PBG Format

				PRICE FORMAT																											
SL NO.	TYPE OF VALVE	SIZE mm (NB)	OPERATION	DESIGN		SERVICE	RATING, DESIGN & TESTING CODE	BODY,BONNET & DISC MATERIAL	HINGE PIN MATERIAL	BODY & DISC SEAT AND OTHER TRIM MATERIAL	END CONN	SPECIAL FEATURES	MATCHING PIPE OD X THKN		MAIN VALVES QUANTITY	+++COMMISSIONING SPARES			MAND. SPARES			UNIT PRICE EX-WORKS (DULY PACKED) (Rs)	TOTAL PRICE EX-WORKS (DULY PACKED) (Rs)	ED @ % (Including cess) (Rs.)	CST @ % (Rs) against form E	FREIGHT CHARGES @ % of Ex-work (Including Service Tax) (Rs.) (1)	TOTAL F.O.R. SITE PRICE (Rs.)	%CONTRIBUTION OF TOTAL QUANTITY OF A VALVE (MAIN VALVES) MENTIONED IN 16 W.R.T. TOTAL PRICE	%CONTRIBUTION OF TOTAL QUANTITY OF COMMISSIONING SPARES MENTIONED IN 17, 18, 19 REQUIRED FOR A PARTICULAR MAIN VALVE W.R.T. TOTAL PRICE	%CONTRIBUTION OF TOTAL QUANTITY OF MANDATORY SPARES MENTIONED IN 20,21,22 REQUIRED FOR A PARTICULAR MAIN VALVE W.R.T. TOTAL PRICE	
				PRESSURE KG/CM2(G)	TEMP (DEG °C)								BONNET/ COVER GASKET (NOS)	GLAND PACKING (SETS)		ACTUATOR O-RING AND SEAL (SETS)	DISC(Nos.)	BODY SEAT RING (SET)	BONNET GASKET (SET)												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
1	GV	150	MAN	8	60	ACW SYSTEM	#150 OF BSEN ISO 10434	DUPLEX SS (UNS 31803/ UNS 32205)	--	DUPLEX SS (UNS 31803/ UNS 32205)	FLANGED AS PER ASME B16.5 R/F	--	168.3	3.40	54	54	54	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	5.686	0.057	0		
2	GV	200	MAN	5.5/ 5/ 10	60	CW & SEA WATER INTAKE SYSTEM	#150 OF BSEN ISO 10434	DUPLEX SS (UNS 31803/ UNS 32205)	--	DUPLEX SS (UNS 31803/ UNS 32205)	FLANGED AS PER ASME B16.5 R/F	--	219.1	6.40	96	96	96	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	15.222	0.152	0		
3	GV	200	MO	10	60	PW SYSTEM	#150 OF BSEN ISO 10434	DUPLEX SS (UNS 31803/ UNS 32205)	--	DUPLEX SS (UNS 31803/ UNS 32205)	FLANGED AS PER ASME B16.5 R/F	OPEN /CLOSE TIME SHALL BE 40-60 SEC.	219.1	6.40	1	1	1	1	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.276	0.009	0		
4	GLV	25	MAN	7.5	60	SEA WATER INTAKE SYSTEM	#800 OF BSEN ISO 15761	DUPLEX SS (UNS 31803/ UNS 32205)	--	DUPLEX SS (UNS 31803/ UNS 32205)	SOCKET WELDED AS PER ASME B16.11	--	33.4	3.38	26	26	26	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.336	0.006	0		
5	GLV	50	MAN	8	60	ACW/ PLANT WATER SYSTEM	#800 OF BSEN ISO 15761	DUPLEX SS (UNS 31803/ UNS 32205)	--	DUPLEX SS (UNS 31803/ UNS 32205)	SOCKET WELDED AS PER ASME B16.11	--	60.8	4.50	35	35	35	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	1.403	0.011	0		
6	GLV	150	MAN	8	60	ACW SYSTEM	#150 OF BS 1873	DUPLEX SS (UNS 31803/ UNS 32205)	--	DUPLEX SS (UNS 31803/ UNS 32205)	FLANGED AS PER ASME B16.5 R/F	--	168.3	3.40	4	4	4	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.545	0.005	0		
7	NRV	200	AUTO	10	60	CW SYSTEM	#150 OF BS 1868	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	FLANGED AS PER ASME B16.5 R/F	--	219.1	6.40	4	4	--	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.789	0.004	0		
8	NRV	400	AUTO	10	60	PLANT WATER INTAKE SYSTEM	#150 OF BS 1868	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	FLANGED AS PER ASME B16.5 R/F	--	406.4	8.00	3	3	--	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	2.223	0.022	0		
9	NRV	800	AUTO	8	60	ACW SYSTEM	#150 OF API- 594	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	FLANGED AS PER ASME B16.5 R/F	--	813	10.00	4	4	--	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	14.517	0.138	0		
10	NRV	900	AUTO	5	60	CW SYSTEM	#150 OF API- 594	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	FLANGED AS PER ASME B16.5 R/F	--	914	10.00	3	3	--	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	13.675	0.131	0		
11	NRV	1000	AUTO	7.5	60	ACW SYSTEM	#150 OF API- 594	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	DUPLEX SS (UNS 31803/ UNS 32205)	FLANGED AS PER ASME B16.5 R/F	--	1016	10.00	4	4	--	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	22.38	0.215	0		
12	GV	25	MAN	10	60	ACW SYSTEM	#800 OF BSEN ISO 15761	DUPLEX SS	--	DUPLEX SS	SOCKET WELDED as per ASME B16.11	--	33.4	3.38	14	14	14	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.154	0.003	0		
13	GV	50	MAN	10	60	ACW & ETP SYSTEM	#800 OF BSEN ISO 15761	DUPLEX SS	--	DUPLEX SS	SOCKET WELDED as per ASME B16.11	--	60.3	3.91	53	53	53	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	1.806	0.014	0		
14	GV	150	MAN	8	60	ACW SYSTEM	#150 OF BSEN ISO 10434	DUPLEX SS	--	DUPLEX SS	FLANGED AS PER ASME B16.5 R/F	--	168.3	3.40	30	30	30	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	3.159	0.032	0		
15	GV	200	MAN	5.5/ 5/ 10	60	CW & SEA WATER INTAKE SYSTEM	#150 OF BSEN ISO 10434	DUPLEX SS	--	DUPLEX SS	FLANGED AS PER ASME B16.5 R/F	--	219.1	6.40	22	22	22	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	3.488	0.035	0		
15A	GLV	150	MAN	10	60	ACW SYSTEM	# 150 of BS 1873	DUPLEX SS	--	DUPLEX SS	FLANGED AS PER ASME B16.5 R/F	--	168.3	3.40	4	4	4	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.545	0.005	0		
16	GLV	200	MAN	10	60	ACW SYSTEM	# 150 of BS 1873	DUPLEX SS	--	DUPLEX SS	FLANGED AS PER ASME B16.5 R/F	--	219.1	6.40	10	10	10	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	2.081	0.021	0		
17	NRV	50	AUTO	10	60	ETP SYSTEM	#800 OF BSEN ISO 15761	DUPLEX SS	--	DUPLEX SS	SOCKET WELDED as per ASME B16.11	--	60.3	3.91	36	36	--	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	1.436	0.012	0		
18	HV	25	MAN	10	60	SW	#800 OF BSEN ISO 15761	FCS AS PER ASTM A-105	--	--	SOCKET WELDED as per ASME B16.11	GATE TYPE HOSE VALVE	34.2	4	538	538	538	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.592	0.033	0		
19	HV	25	MAN	10	60	SW	#800 OF BSEN ISO 15761	FCS AS PER ASTM A-105	--	--	SOCKET WELDED as per ASME B16.11	GLOBE TYPE HOSE VALVE	34.2	4.5	57	57	57	--	3	6	6	Derived	Derived	%To be quoted	%To be quoted	Derived	0.072	0.004	0.001		
20	GV	80	MAN	10,12	60	DMCW SYSTEM	# 150 of BSEN 10434	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	89.50	4.80	3	3	3	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.123	0.001	0		
21	GV	100	MAN	12,10	60	DMCW SYSTEM	# 150 of BSEN 10434	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	115.00	5.40	4	4	4	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	%To be quoted	Derived	0.227	0.002	0	
22	GV	150	MAN	10	60	DMCW SYSTEM	# 150 of BSEN 10434	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	166.50	5.40	4	4	4	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.421	0.004	0		
23	GV	200	MAN	10	60	DMCW SYSTEM	# 150 of BSEN 10434	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	219.10	6.40	2	2	2	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.317	0.003	0		
24	GLV	25	MAN	10,12	60	DMCW SYSTEM	# 800 of BSEN ISO 15761	SS 316L	--	SS 316L	SOCKET WELDED as per ASME B16.11	--	33.4,34.2	3.4, 4.0	56	56	56	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.302	0.012	0		
25	GLV	40	MAN	10	60	DMCW SYSTEM	# 800 of BSEN ISO 15761	SS 316L	--	SS 316L	SOCKET WELDED as per ASME B16.11	--	48.80	4.00	6	6	6	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.081	0.002	0		
26	GLV	50	MAN	10,12	60	DMCW SYSTEM	# 800 of BSEN ISO 15761	SS 316L	--	SS 316L	SOCKET WELDED as per ASME B16.11	--	60.8,60.3	4.5, 3.9	31	31	31	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.518	0.009	0		
27	GLV	50	MO	10	60	DMCW SYSTEM	# 800 of BSEN ISO 15761	SS 316L	--	SS 316L	SOCKET WELDED as per ASME B16.11	OPEN /CLOSE TIME SHALL BE 40-60 SEC.	60.3, 60.8	3.9, 4.5	2	2	2	2	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.151	0.001	0		
28	GLV	80	MAN	10,12	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	89.50	4.80	3	3	3	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.137	0.001	0		
29	GLV	100	MAN	10	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	115.00	5.40	1	1	1	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.074	0.001	0		
30	GLV	150	MAN	10	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	166.50	5.40	4	4	4	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.545	0.005	0		
31	GLV	150	MO	12	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	1. OPEN /CLOSE TIME SHALL BE 40-60 SEC. 2. INCHING TYPE	166.50	5.40	1	1	1	1	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.207	0.008	0		
32	GLV	200	MAN	10	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	219.10	6.40	2	2	2	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.416	0.004	0		
33	NRV	25	AUTO	10,12	60	DMCW SYSTEM	# 800 of BSEN ISO 15761	SS 316L	SS 316L	SS 316L	SOCKET WELDED as per ASME B16.11	--	33.40	3.40	2	2	--	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted	Derived	0.02	0	0		
34	NRV	300	AUTO	12	60	DMCW SYSTEM	# 150 of BS 1868	Equivalent casting grade of SS 316L grade	Equivalent casting grade of SS 316L grade	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	323.90	6.40	2	2	--	--	--	--	--	Derived	Derived	%To be							

35	NRV	500	AUTO	10	60	DMCW SYSTEM	# 150 of BS 1868	Equivalent casting grade of SS 316L grade	Equivalent casting grade of SS 316L grade	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 RJF	--	508.00	8.00	3	3	--	--	--	--	--	Derived	Derived	%To be quoted	%To be quoted		Derived	4.047	0.04	0
x														TOTAL	1124	1124	1063	4	3	6	6	Derived	TO BE QUOTED	%To be quoted	%To be quoted		Derived	98.987	1.012	0.001

NOTES
1. LEGENDS: MAN=MANUAL, MO=MOTORISED, GV=GATE VALVE, GLV=GLOBE VALVE, NRV=NON RETURN VALVE
2.+++ COMMISSIONING SPARES: a). ONE SET OF GLAND PACKING & BONNET GASKET FOR EACH GATE/GLOBE VALVE
b).ONE NO. OF COVER GASKET FOR SWING CHECK NON RETURN VALVE.
3.MAIN VALVE PRICES SHALL BE EXCLUSIVE OF COST OF COMMISSIONING SPARES PRICES.
4. BIDDER IS REQUIRED TO QUOTE UNIT PRICE OF EACH AND EVERY ITEMS UNDER COMMISSIONING SPARES SEPARATELY AND INDIVIDUALLY (i.e. PRICES OF ALL COMMISSIONING SPARES SHALL NOT BE CLUBBED/INCLUDED IN THE UNIT PRICES OF MAIN VALVES).
5.MANDATORY SPARES PRICES SHALL BE QUOTED BY BIDDER SEPARATELY.

ANNEXURE-II

Special Condition of Rate Contract for Steel Gate/Globe/ NR Valves (Water System)

1. BHEL/PEM intends to enter into Rate Contract for the tendered different types of valves for a period of two years. The Rate Contract shall come into force from the date of issue of Purchase order for Rate Contract.
2. The items will be required against respective projects. Exact quantities and Project name shall be intimated while placing order for a specific project based on the Rate Contract.
3. The units rate for each item should be quoted inclusive of ex-works including packing & forwarding (excepted sea worthy packing) for tendered specifications/sizes as per price schedule format. Other elements of prices such as Excise Duty, Sales Tax, and freight charges (Including service tax) % of Ex-works are also to be indicated. Destination may be anywhere in India as per project requirement.
4. The freight charges shall be paid on percentage on ex-works prices or actual freight charges paid to transporter whichever is lower against production of documentary evidence. Vendor to quote freight charges as percentage (%) of ex-works price for destination anywhere in India.
5. Vendor to note that Excise Duty is payable on self manufacturing item only as per clause no 4.1.2 of GCC Rev 06 & hence for their BOI may quote Excise Duty is inclusive or Nil.
6. The prices shall remain firm during the period of two years.
7. Inspection of materials shall be carried out by BHEL / CQA and or by Customer or by an authorized agency at manufacture's works before dispatch, if required. Dispatch of material to be done, only after receipt of BHEL/Customer MDCC. It is responsibility of vendor to for obtain Material Dispatch Clearance Certificate (MDCC) from BHEL or CUSTOMER as required before dispatch of material.
8. Items have to be manufactured as per specification and supplied strictly in accordance with the approved BHEL / Customer's Drawings & Quality Plan. The items/ test certificate of items, which for any reason are not acceptable to BHEL / Customer, shall be required to be retested. No extra charge shall be payable on those account by BHEL.
9. Mode dispatch shall be by road through Schedule Bank/BHEL (PEM) approved transporters.
10. Other terms and conditions shall be as per Standard Technical specification no. PE-TS-020-100-M001 & GCC Rev 06, Enquiry letter.
11. Order shall be placed with CST for respective projects keeping FOR site price same, vendors to quote accordingly.
12. This enquiry is subject to Conditions/ limits if any imposed in PMD/ Vendor registration.
13. Tentative quantity is given in enquiry.
14. Bidders to submit offer for RC of said items ONLINE via e-Procurement System only. Complete tender in all respects duly signed & stamped on each and every page by the authorized signatory of the bidder as a token of acceptance of all the terms and conditions of tender.
15. The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendor/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL web site <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud as soon as it comes to their notice.



TENTATIVE LIST OF PROJECTS AND QUANTITIES OF
STEEL GATE/GLOBE/NRV FOR FRAMEWORK AGREEMENT: -

S. No.	Project Description
1	1x250 MW ROURKELA TPS EXPANSION
2	1x800 MW TANGEDCO NORTH CHENNAI TPP STAGE-III
3	1x800 MW APGENCO IBRAHIPATNAM (VIJAYWADA) TPS
4	2x800 MW TANGEDCO UPPUR STPP
5	2x660 MW TANGEDCO ENNORE SEZ STPP
6	1x800 MW SDSTPS KRISHNAPATNAM APPDCL TPP
7	5x800 MW YADADRI TPS



PRE - QUALIFYING REQUIREMENTS

DOCUMENT NO: PE-TS-020-100-M060

REVISION NO: 00, DATE: 30.03.2017

SHEET: 1 of 2

Enquiry No (To be filled by CMM):

Project: Framework Agreement

Package: STEEL(GATE/GLOBE/NRV)

CRITERIA FOR EVALUATION (TECHNICAL / FINANCIAL):**1. Technical Pre-Qualifying Requirements:**

1.1 The bidder should have designed, in-house manufactured, tested, inspected and supplied valves (as mentioned below) for use in a power plant or for similar application.

a. Steel Gate/Globe/NRV package

Category-A: Minimum size of 50NB with FCS/FSS/FAS/Duplex SS with #800 in a power plant/similar application.

Category-B: Minimum size of 200NB with CCS/CSS/CAS/Duplex SS with min. #150 in a power plant/similar application.

Supplier to fulfill the PQR of Gate, Globe and NRV packages for both the categories individually.

1.2 The item(s) mentioned in point 1.1 should have performed successfully for atleast one year. To establish meeting this requirement, the bidder shall conform to any one of the following clauses:

- (i) Execution of two purchase orders for different End-users with the item(s) performing successfully for one (1) year from date of commissioning. Different projects of a customer shall be considered as different End-users.
- (ii) Minimum one (1) repeat contract from two (2) different Purchasers (i.e. 2 Nos of Purchase orders from each purchaser). A contract shall be considered as repeat, when the second contract is given by the same purchaser after lapse of minimum one (1) year from supply completion of first contract.
- (iii) Execution of one (1) purchase order as per sl. no. (i) above from one End-user and one (1) repeat contract from another Purchaser as per sl. No. (ii) above.
- (iv) Three (3) repeat contracts from one (1) Purchaser. Second and third repeat contract shall be after lapse of minimum one (1) & two (2) years respectively from supply completion of first contract.

1.3 The bidder to furnish the following documents, as applicable, in support of the above:

PREPARED BY:

NAME: Govind Kr. Morye
DESIGNATION: Sr. Engr.
DEPT.: PS-PEM/ MPL

REVIEWED BY:

NAME: Sanjay Kumar
DESIGNATION: DGM
DEPT.: PS-PEM/ MPL

APPROVED BY:

NAME: JACOB JAMES
DESIGNATION: DM (MPL & IPDS)



PRE - QUALIFYING REQUIREMENTS

DOCUMENT NO: PE-TS-020-100-M060

REVISION NO: 00, DATE: 30.03.2017

SHEET: 2 of 2

- a) For point 1.2(i): Performance certificates from End-user (duly signed & dated) specifying that the product is performing successfully for one (1) year from date of commissioning along with correlated purchase order(s).
- b) For point 1.2 (ii) & (iv): Purchase order(s), Material dispatch clearance certificate (MDCC)/ Material receipt certificate (MRC)/Lorry receipt (LR).

Note: In case vendor has executed contract (s) for BHEL-PEM, internal assessment by BHEL-PEM shall be considered for evaluation for satisfactory performance. For this, vendor to submit a request along-with relevant documents.

1.4 In addition to above, bidder should have the following facilities for different type & material of max. size as per BHEL requirement as mentioned in data sheet-A of technical specification:

- a) Capability of designing and manufacturing of the item(s).
- b) In-house testing facilities for carrying out tests as per relevant standards & Quality plan. In case, the in-house testing facilities are not available, then bidder shall furnish undertaking that test(s) will be carried out from govt. approved lab or test house recognized by reputed customers.

Bidder to submit supporting documents (Purchase order (s), Certificate indicating capacity and details/ undertaking of manufacturing & testing facilities) for point (a) & (b) above.

1.5 To establish business continuity, bidder is required to submit at least two (2) Purchase order for any of the item(s) as specified in data sheet-A of technical specification with minimum size as mentioned below in last 3 (three) years prior to the date of bid submission defined by BHEL-PEM for each category.

Category-A: Minimum size of 15NB

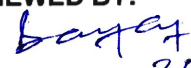
Category-B: Minimum size of 100NB

2. Supplier to also comply with general PQR available at internet site of BHEL-PEM.

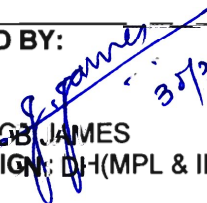
PREPARED BY:


30.03.17
NAME: Govind Kr. Morye
DESIGNATION: Sr. Engr.
DEPT.: PS-PEM/ MPL

REVIEWED BY:


30/3/17
NAME: Sanjay kumar
DESIGNATION: DGM
DEPT.: PS-PEM/ MPL

APPROVED BY:


30/3/17
NAME: JACOB JAMES
DESIGNATION: DH(MPL & IPDS)

FRAMEWORK AGREEMENT

TECHNICAL SPECIFICATION FOR STEEL GATE, GLOBE AND NON RETURN VALVES

SPECIFICATION NO. PE-TS-020-100-M001



**BHARAT HEAVY ELECTRICALS LIMITED, POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, INDIA**

	TECHNICAL SPECIFICATION STEEL GATE, GLOBE AND NON RETURN VALVES	SPECIFICATION NO. PE-TS-020-100-M001	
		SECTION: -	
		REV. NO.: 00	DATE: 21.03.2017
		SHEET 1 OF 1	

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2.	SECTION-II	i) DATA SHEET-A ii) QUALITY PLAN iii) COMPLIANCE SHEET iv) ACTUATOR DATA SHEET	11 11 1 10

	TECHNICAL SPECIFICATION STEEL GATE, GLOBE AND NON RETURN VALVES		SPECIFICATION NO. PE-TS-020-100-M001
			SECTION: -
		REV. NO.: 00	DATE:21.03.2017
		SHEET 1 OF 1	

SECTION-I

SPECIFIC TECHNICAL REQUIREMENTS

	SPECIFIC TECHNICAL REQUIREMENTS STEEL GATE, GLOBE AND NON RETURN VALVES	SPECIFICATION NO. PE-TS-020-100-M001	
		SECTION: I	
		REV. NO.: 00	DATE:21.03.2017
		Sheet 1 of 7	

1. GENERAL

- 1.1 The valves shall meet the technical requirements and conform to the requirements of Section-I and Data sheet-A of Section-II. However, in the event of contradictions between Section-I & Section-II/Data Sheet-A, Data Sheet-A will prevail.
- 1.2 The technical requirements for valves shall, in general, be as per the attached Data Sheet A of Section-II.

2. SCOPE OF SUPPLY

- 2.1 The valves complete with all accessories shall be supplied as per Data sheet-A of Section-I. For detail refer the same. Each valve (quantity and other details specified in Data Sheet-A) shall be complete with the following accessories.
- i) Lifting arrangement provision for handling i.e., lifting lugs, eye bolts etc.
 - ii) Actuators and limit switches as required to make valve complete in all respects.
- 2.2 Commissioning spares, if any.
- 2.3 Set of special tools and tackles if required for the maintenance, erection etc. of the equipment supplied.
- 2.4 Mandatory spares as applicable depending upon the project requirement.
- 2.5 Finish paints for touch-up painting of equipment after erection at site in sealed containers.

3. CODES AND STANDARDS

- 3.1 The design, material, construction, manufacture, inspection and testing of valves shall conform to the latest applicable codes and standards.

The design and testing of valves covered under this specification shall be governed by the following standards. However, the valves conform to other International Standards may be acceptable provided they are equivalent or superior to those listed below:

S.NO.	DESCRIPTION	DESIGN STANDARD	TESTING STANDARD
1	For Gate, Globe and Non-Return valves of sizes 50 mm and smaller	BS EN ISO 15761/ANSI B16.34	ISO 5208/ ASME B16.34
2	Gate valves of sizes 65 mm to 1050 mm.	BS EN ISO 10434/ANSI B16.34/ ANSI B16.10/API 600	ISO 5208/ API 598/ASME B16.34
3	Globe valves of sizes 65 mm to 400 mm.	BS:1873 /ANSI B16.34/ ANSI B16.10	BSEN ISO 12266/ ASME B16.34
4	Non-return valves of sizes 65 mm to 1000 mm.	BS:1868 /API-594/ANSI B16.34/ ANSI B16.10*	BSEN ISO 12266/ ASME B16.34

NOTE: *- Face to face dimension of NRV above 600NB size shall be referred from ANSI B16.47.

	SPECIFIC TECHNICAL REQUIREMENTS STEEL GATE, GLOBE AND NON RETURN VALVES		SPECIFICATION NO. PE-TS-020-100-M001
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- 3.2 In case of any conflict between the above codes/ standards and this specification, the latter shall prevail and in case of any further conflict in the matter, the interpretation of the specification by the Engineer shall be final and binding.

4. DESIGN REQUIREMENTS

- 4.1 The valves shall be used for services like steam, condensate water, feed water, D.M. Water, oil and gas unless otherwise specified in Data Sheet-A1. All valves shall be suitable for the service conditions i.e. flow, temperature and pressure under which they are required to operate and those performing similar duties shall be interchangeable with each other unless otherwise specified.
- 4.2 Valves coming under the purview of IBR shall satisfy all the conditions of IBR.
- 4.3 Unless otherwise specified, all valves of sizes up to and including 50 mm NB shall have a forged steel body & sizes 65 mm NB & above shall have cast steel body.

5. Materials

- 5.1 The materials of construction of main parts of the Gate, Globe, and non-return valves shall be as specified in Data Sheet-A.
- 5.2 The materials of construction of the remaining parts shall be as per the relevant standard governing the valves and to suit service conditions. These materials shall be subject to purchaser's approval.

6. CONSTRUCTIONAL FEATURES

- 6.1 End Connections:
- 6.1.1 Socket details of valves with socket welding ends shall be as per ANSI B16.11 and shall suit pipe size indicated in Data Sheet-A.
- 6.1.2 The edge profile for valves with butt welding ends shall be as per ANSI B16.25 and shall suit pipe size indicated in Data Sheet-A.
- 6.1.3 All valves with Flanged ends shall have raised face flanges and drilling details as per ANSI B16.5. For Rubber lined valves, face of flange shall be flat face.
- 6.2 Gate and Globe valves shall be of outside screw and yoke type with rising spindle and shall be capable of being closed against the design pressure.
- 6.3 All Gate, Globe and check valves shall have an arrow indicating the direction of flow cast or embossed on the valve body. The direction of flow for globe valves shall be from under to over the disc.
- 6.4 Gate and globe valves shall have back seating arrangement for replacement of packing while working under full working pressure.
- 6.5 Gate and globe valves of size 50 mm/NB and above shall be provided with position indicator unless otherwise specified.
- 6.6 For Globe valves of size 50 mm/NB and above, the disc shall be free to revolve on the spindle.
- 6.7 Globe valves for regulating duties shall be provided with spherical type disc or parabolic type disc and shall be capable of regulating the flow from zero flow to fully open. All regulating valves shall be designed to prevent erosion of valve discs and seats when the valves are operated partially opened.
- 6.8 Differential hardness shall be provided between seat and disc facings. Stellite thickness shall be minimum 3 mm unless otherwise specified.
- 6.9 All gate valves of 600 lbs. and higher-pressure rating shall have flexible wedge or parallel slide type of disc.
- 6.10 All valves of pressure rating up to 600 lbs. shall have bolted bonnet construction and 900 lbs. and above shall have bonnet construction of the pressure seal type.

	SPECIFIC TECHNICAL REQUIREMENTS STEEL GATE, GLOBE AND NON RETURN VALVES		SPECIFICATION NO. PE-TS-020-100-M001
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- 6.11 Eye bolts shall be provided to facilitate handling heavy valves or part of valves, where the weight is greater than 500 Kg.
- 6.12 Gate and globe valves shall be required with integral bypass valve, if specified in Data Sheet-A. Size of the integral bypass shall conform to MSS-SP-45 as a minimum standard.
- 6.13 All gate and globe valves shall be closed by rotating the hand wheel in the clockwise direction when looking at the face of the hand wheel. Where valves are not of the rising pattern, the hand wheel shall also be rotated in clockwise direction to close the valve when viewed from the outer end of the spindle. In case where the hand wheel is not directly attached to the valve spindle, suitable gearing shall be introduced to reconcile the above condition. The face of each hand wheel shall be clearly marked "Open" and "Shut" with arrows indicating the direction of rotation to which they refer. Each valve hand wheel shall be fitted with a circular nameplate of an approved material indicating the valve Tag No., duty or service condition intended and the function of the valve. For valves of smaller size, a permanent steel tag may be fixed on the valve body indicating the purchaser's valve Tag Number and service. The above are in addition to rating plates and labels being provided by the manufacturer.
- 6.14 All valves upto 50 mm shall have reduced sized ports and 65 mm and above shall have full sized Ports.
- 6.15 All valves shall be fitted with indicators so that it may be readily seen whether the valves are open or shut.
- 6.16 All Gate, globe and check valves shall be designed for reconditioning of seating surfaces and replacement of Stem & Disc without removing the valve body from pipe line.
- 6.17 Stop check valves shall have full floating and accurately guided discs.
- 6.18 The body seat for Swing check valves shall be inclined to such an angle to minimize chatter.
- 6.19 Check valves shall be provided with outside lever & counter weight if specified in Data Sheet A, for quick closing in case of low velocities so that a minimum pressure is required to open disc and that resistance to flow past the disc is minimized.

7. SPECIAL FEATURES OF VALVES

- 7.1 Extension spindle arrangement:
 - 7.1.1 Extension spindle/ chain operation to the valves shall be provided wherever required as specified in Data Sheet A.
 - 7.1.2 Where required as specified in Data Sheet A, valve yoke/spindles shall be lengthened so that the hand wheel is at a height of approximately one meter above the level of the floor or platform from which the valve is to be operated.
- 7.2 Locking arrangement

For valves that are to be kept locked in full "Open" or "Close" position, if specified in Data Sheet A, the locking arrangement shall be provided with a non-detachable locking arrangement.
- 7.3 Valves for Vacuum Service:
 - 7.3.1 Valves of size up to 50 NB and operating under vacuum shall be offered with long neck gland & special and deep gland packing in order to avoid ingress of atmospheric air entry to the system through gland of the valves. In such case the depth of the stuffing box shall be at least 25% more than the normal valves and suitable for vacuum service.

	SPECIFIC TECHNICAL REQUIREMENTS STEEL GATE, GLOBE AND NON RETURN VALVES	SPECIFICATION NO. PE-TS-020-100-M001	
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- 7.3.2 All valves of size 65NB and above and operating under vacuum conditions shall be provided with water sealed glands. Valves with sealed gland arrangement shall be required with 3/8" BSP connections duly plugged on both sides of the bonnet. Sealing water shall be supplied at 4 ata and 50°C, unless otherwise stated in Data sheet-A.
- 7.4 Valves with limit switch:
Valves with limit switches (as mentioned in Data sheet- A) shall be required only for indication or for interlocking with some equipment. Valves with such provision shall be offered with required number of limit switches for open/close position of the valve. The limit switches for this application shall have one normally open and one normally closed contact. The limit switches shall be cutler hammer/Siemens/Honeywell make and limit switch housing shall be weather proof. The limit switches shall also be wired to a terminal box.
- 7.5 Motorised Valves
- 7.5.1 The motorised valves shall be offered with the electric actuators of reputed make observing strict quality control and approved by reputed customers. A particular make and type of actuator shall be designed for the maximum differential working pressure. However, the stall torque of the selected actuators shall be minimum 1.5 times the valve unseating torque requirement at the maximum differential working pressure (design pressure) and required operating time as mentioned in Datasheet A.
- 7.5.2 Electric actuators shall be mounted directly on the valves.
- 7.5.3 In case integral bypass is provided to the main valve which is motorised, the integral bypass valve shall also be motorised. Actuator shall be provided with hand wheel also for manual operation.
- 7.5.4 The motors, gearing and disengaging hand wheel shall be adequate to open and close the valve under maximum differential pressure and shall be completely assembled on the respective valve and shop tested before shipment.
- 7.6 Steel Non return valves(NRV) with size greater than & equal to 600NB shall be provided with Hydraulic Dashpot arrangement. Dashpot shall be of reputed make observing strict quality control and approved by reputed customers.

8. MANUFACTURE OF VALVES

- 8.1 Valve castings shall be procured from foundries observing strict quality control and approved by reputed customers.
- 8.2 Particular care shall be taken to ensure that all foundry sand and loose material is properly removed from castings by fettling before the valve's manufacture is started.

9. LUBRICATION:

- 9.1 Provision shall be made for suitable lubrication wherever necessary to ensure a smooth easy operation and freedom from undue wear.
- 9.2 Where oil filled gear boxes are used they shall be provided with filling and drain plugs, oil level gauges or dip sticks. Housing for ball and roller bearings shall be packed with grease at the time of assembly.
- 9.3 Choice of oil and grease for all motor drives shall be based on ambient temperature of 60°C.
- 9.4 Type of oil/grease to be used and its annual consumption (based on 100 operations per year) shall be indicated by the bidder.

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10. QUALITY ASSURANCE, TESTING AND INSPECTION

- 10.1 The Quality Plans enclosed with this specification specify minimum quality control requirement. During contract stage vendor shall furnish these Quality Plans duly signed & stamped for their compliance. Quality plans shall be approved by BHEL and customer (If necessary). All inspection and testing shall be carried out by BHEL and customer (if necessary). In case inspection is by both BHEL and customer, then the inspection can be carried out jointly or separately, which will be informed later.
- 10.2 All valves shall be tested and inspected as per the approved quality plan. The minimum requirements are as indicated in attached quality plan. However, in case of order on the vendor, the QP shall be finalized by vendor with customer without any financial implications to meet customer project technical requirements.
- 10.3 Hydrostatic/Air Tests:
 - 10.3.1 Manually operated valves: All valves shall be tested hydraulically for strength, tightness of seats and tightness, of back seating at the pressures as mentioned in BSEN ISO 12266/ISO 5208/ API 598/ASME B16.34
 - 10.3.2 Motor operated Valves:
 - a. All the motor operated valves shall be tested hydraulically for seat/backseat with the motor actuator at a pressure as specified in the actuator data sheet of Data sheet-B.
 - b. Motorized valves shall also be tested hydraulically for body, seat and backseat at the pressures as mentioned in BSEN ISO 12266/ISO 5208/ API 598/ASME B16.34 with hand wheel on the actuator.
 - c. All electric actuators shall be tested for seat tightness test at 1.1 times of design/ operating pressure.
- 10.4 Gate and Globe valves seats shall also be tested on air at a pressure of 7kg/cm².
- 10.5 Dimensional and functional checks shall be carried out.
- 10.6 Valves coming under the purview of IBR shall be inspected by Independent Inspecting Authority approved by Indian Boiler Board and the test certificate in IBR form III-C duly countersigned by IBR approved authority shall be submitted.

11. PAINTING REQUIREMENT (FOR CARBON STEEL):

Non-Coastal locations:

Valve shall be painted externally after the necessary testing has been carried out. Just before the painting, valve bodies and other items shall be thoroughly cleaned with wire brush/hand tool (Sa1/St2/St3 as applicable). The valves shall be first painted with two coats of primer zinc Chromate to IS 2074 (alkyd medium) each coat of DFT minimum of 25 to 35 microns. Finish paint shall be of three (3) coats of synthetic enamel (alkyd medium) as per IS 2932 & each coat DFT of minimum 20-35 microns & the total DFT of primer & finish paint shall be 150 microns minimum. Colour shade of finished/final paint shall be shade no. 217 of IS 5 or Grey as per RAL 9002.

Coastal locations:

Valve shall be painted externally after the necessary testing has been carried out. Just before the painting, valve bodies and other items shall be thoroughly cleaned with wire brush/hand tool (Sa1/St2/St3 as applicable). For coastal environment the primer shall be two coats of epoxy red oxide zinc phosphate with each coat of DFT equal to 25-35 microns. Total DFT of primer coats 50 Microns minimum. This shall be followed by 2 coats of Intermediate coat (each coat 20-30 DFT) of Epoxy based TiO₂ pigmented paint with minimum. Total DFT of 50 microns shall be applied over primer painted surface. 2 finished coats (each coat 20-30 DFT) of Epoxy based finish paint of minimum DFT as 50 microns shall be applied over intermediate

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painted surface. Finished Paint color shade shall be grey as per RAL 9002. Total DFT of primer+Intermediate+Finish paint shall not be less than 150 microns in case coastal environment.

Valves shall be painted externally after the necessary testing has been carried out. Just before the painting, valve bodies and other items shall be degreased & thoroughly cleaned with wire brush/hand tool (Sa1/St2/St3 as applicable). The valves for temperature service shall be painted with four coats (each coat of 20 microns) of heat resistance aluminum paint to IS 13183 Gr II. Total DFT shall be minimum 80 microns.

12. PACKING INSTRUCTIONS:

- 12.1 Each valve shall be drained, cleaned, prepared and suitably protected in such a way so as to minimize the possibility of damage and deterioration during transit and storage.
- 12.2 The valve shall be dispatched in total assembled form.
- 12.3 Discs of all valves shall be properly secured while dispatching so that there is no risk of damage to the disc & seat.
- 12.4 Body ends shall be suitably sealed to protect them against damage during transit and storage.
- 12.5 A thin sheet steel circular blanking plate of a diameter 6mm less than the bolt holes inner P.C.D. shall be firmly fixed to the flange faces by the application of adhesive after first ensuring that the flange faces have been thoroughly degreased. A thin coat of adhesive shall be applied to the flange face and the blanking plate and then allowed to dry for 15-20 minutes. The coated face of the blanking plate should then be offered up to the face of the flange taking care that the plate is concentric with the flange. Firm pressure shall be applied to ensure intimate contact between plate and flange. A wooden blank should then be bolted to the flange using a minimum of 4 bolts.
- 12.6 Valve Tag Nos. shall be incorporated in all the dispatch documents.
- 12.7 Proper care shall be taken to avoid damage to the painted surface during transit.
- 12.8 All the valves shall be packed suitably in wooden cases in order to avoid damage during transit and also during storage at site in tropical climate conditions for a period of 15-18 months.

13. SPARES:

- a) **Mandatory Spares:** These shall be informed as per project specific requirement.
- b) Order for the spares may be placed simultaneously or otherwise at the option of purchaser.

14. DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER:

Bidder shall submit the following documents duly filled, signed and stamped along with the bid:

- a) Compliance sheet
- b) Documents as per the list indicated in the NIT.

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The above are the only documents which will be used for technical evaluation unless other documents are asked for during technical clarifications. Any other technical document enclosed with the bid shall be ignored for the purpose of technical evaluation. All other documents attached with the specification are for information of the vendor and no comments shall be marked on these.

15. DOCUMENTS TO BE SUBMITTED AFTER AWARD OF RATE CONTRACT:

- Complete cross sectional arrangement of the valve.
- Binding dimensions, dismantling clearances & weights.
- Bill of material incorporating all the materials of construction of various parts and also specifying the IS/BS/ASTM standards to which the materials conform to.
- Standard Quality Plan duly signed with bidder's company seal as a token of acceptance by the bidder.

The above drawings/ documents will be considered as reference documents for different projects PO which will be placed later.

16. EXCLUSIONS:

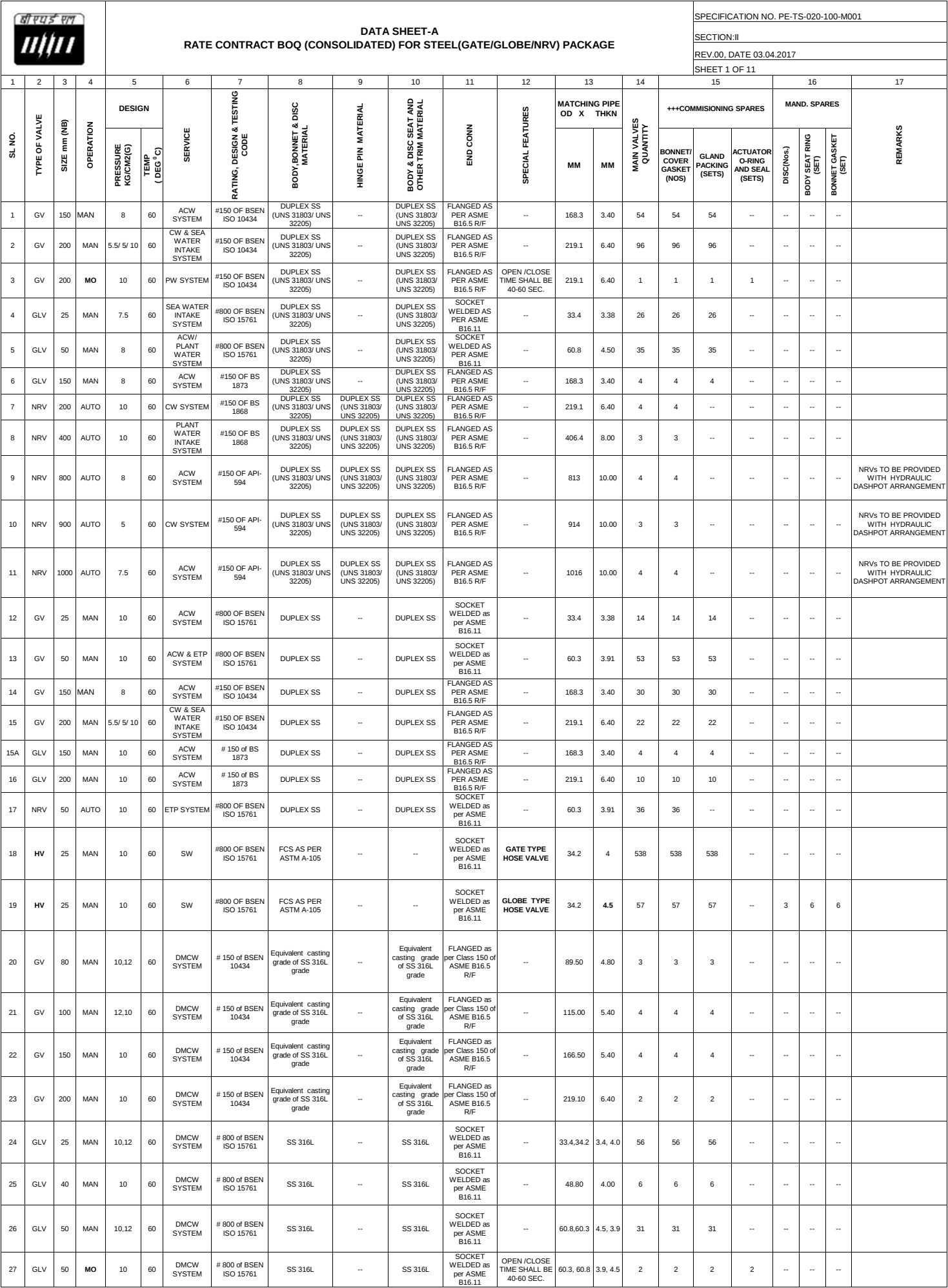
The following are excluded from the bidder's scope:

- Counter flanges and their nuts and bolts.
- Erection & Commissioning of equipment at site.

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SECTION-II

- DATA SHEET – A
- QUALITY PLAN
- ACTUATOR DATA SHEET
- COMPLIANCE SHEET



1	2	3	4	5		6	7	8	9	10	11	12	13		14	15			16			17
SL. NO.	TYPE OF VALVE	SIZE mm (NB)	OPERATION	DESIGN		SERVICE	RATING, DESIGN & TESTING CODE	BODY,BONNET & DISC MATERIAL	HINGE PIN MATERIAL	BODY & DISC SEAT AND OTHER TRIM MATERIAL	END CONN	SPECIAL FEATURES	MATCHING PIPE OD X THKN		MAIN VALVES QUANTITY	+++COMMISSIONING SPARES			MAND. SPARES			REMARKS
				PRESSURE KG/CM2(G)	TEMP (DEG C)								MM	MM		BONNET/COVER GASKET (NOS)	GLAND PACKING (SETS)	ACTUATOR O-RING AND SEAL (SETS)	DISC(Nos.)	BODY SEAT RING (SET)	BONNET GASKET (SET)	
28	GLV	80	MAN	10,12	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	89.50	4.80	3	3	3	--	--	--	--	
29	GLV	100	MAN	10	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	115.00	5.40	1	1	1	--	--	--	--	
30	GLV	150	MAN	10	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	166.50	5.40	4	4	4	--	--	--	--	
31	GLV	150	MO	12	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	1. OPEN /CLOSE TIME SHALL BE 40-60 SEC. 2. INCHING TYPE	166.50	5.40	1	1	1	1	--	--	--	
32	GLV	200	MAN	10	60	DMCW SYSTEM	# 150 of BS 1873	Equivalent casting grade of SS 316L grade	--	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	219.10	6.40	2	2	2	--	--	--	--	
33	NRV	25	AUTO	10,12	60	DMCW SYSTEM	# 800 of BSEN ISO 15761	SS 316L	SS 316L	SS 316L	SOCKET WELDED as per ASME B16.11	--	33.40	3.40	2	2	--	--	--	--	--	
34	NRV	300	AUTO	12	60	DMCW SYSTEM	# 150 of BS 1868	Equivalent casting grade of SS 316L grade	Equivalent casting grade of SS 316L grade	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	323.90	6.40	2	2	--	--	--	--	--	
35	NRV	500	AUTO	10	60	DMCW SYSTEM	# 150 of BS 1868	Equivalent casting grade of SS 316L grade	Equivalent casting grade of SS 316L grade	Equivalent casting grade of SS 316L grade	FLANGED as per Class 150 of ASME B16.5 R/F	--	508.00	8.00	3	3	--	--	--	--	--	
TOTAL															1124	1124	1063	4	3	6	6	

NOTES
1. LEGENDS: MAN=MANUAL, MO=MOTORISED, GV=GATE VALVE, GLV=GLOBE VALVE NRV=NON RETURN VALVE
2.+++ COMMISSIONING SPARES: a). ONE SET OF GLAND PACKING & BONNET GASKET FOR EACH GATE /GLOBE VALVE
b)ONE NO. OF COVER GASKET FOR SWING CHECK NON RETURN VALVE.
3.MAIN VALVE PRICES SHALL BE EXCLUSIVE OF COST OF COMMISSIONING SPARES PRICES.
4. BIDDER IS REQUIRED TO QUOTE UNIT PRICE OF EACH AND EVERY ITEMS UNDER COMMISSIONING SPARES SEPARATELY AND INDIVIDUALLY (i.e. PRICES OF ALL COMMISSIONING SPARES SHALL NOT BE CLUBBED/INCLUDED IN THE UNIT PRICES OF MAIN VALVES).
5.MANDATORY SPARES PRICES SHALL BE QUOTED BY BIDDER SEPARATELY.

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MATERIAL OF CONSTRUCTION
DUPLEX SS(UNS31803/UNS32205) GATE/GLOBE VALVES

SERVICE: SEA WATER

SL.N O	PART NAME	MATERIAL REQUIRED
1	BODY	DUPLEX SS(UNS31803/UNS32205)
2	BONNET/YOKE	DUPLEX SS(UNS31803/UNS32205)
3	WEDGE	DUPLEX SS(UNS31803/UNS32205)
4	STEM, BACK SEAT	DUPLEX SS(UNS31803/UNS32205)
5	BODY SEAT RING, WEDGE/DISC SEAT RING	DUPLEX SS(UNS31803/UNS32205) (BODY SEAT RING TO STELLITED.
6	YOKE SLEEVE	SS-316L
7	GLAND PACKING	GRAFOIL
8	GLAND	SS-316L
9	GLAND FLANGE	SS-316L
10	BOLTS	STEEL(ASTM A193 Gr.B7)
11	NUTS	STEEL(ASTM A 194 Gr.2H)
12	HANDWHEEL	MALLEABLE IRON OR EQUIVALENT
13	STEM PROTECTION COVER	PVC (TRANSPARENT)
14	GASKET	SWG (GRAFOIL)
15	Name plate (For valve tag nos.)	SS316 (2 MM THICK)

NOTE: 1. THIS DATA SHEET IS APPLICABLE FOR ITEMS GIVEN AT SL. NO. 1 TO 6 OF DATA SHEET-A.
2.MATERIALS FOR ITEMS NOT SPECIFIED ABOVE SHALL ALSO BE SUITBALE FOR SEA WATER APPLICATION.

	DATA SHEET-A STEEL GATE, GLOBE AND NON RETURN VALVES		SPECIFICATION NO. PE-TS-020-100-M001
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MATERIAL DATA SHEET
DUPLEX SS(UNS31803/UNS32205) NON RETURN VALVE

SERVICE: SEA WATER

<u>SL.NO</u>	<u>PART NAME</u>	<u>MATERIAL (REQUIRED)</u>
1	Body	DUPLEX SS(UNS31803/UNS32205)
2	Cover	DUPLEX SS(UNS31803/UNS32205)
3	Disc (Fully guided)	DUPLEX SS(UNS31803/UNS32205)
4	Disc nut/ washer	DUPLEX SS(UNS31803/UNS32205)
5	Body seat ring	DUPLEX SS(UNS31803/UNS32205)+ STELLITED
6	Gasket	SWG SS316 (GRAFOIL)
7	Bolts	ASTM A193 Gr. B7
8	Nuts	ASTM A 194 Gr.2H
9	Name plate (For valve tag nos.)	SS316 (2 mm Thick)

NOTE: 1. THIS DATA SHEET IS APPLICABLE FOR ITEMS GIVEN AT SL. NO. 7 TO 11 OF DATA SHEET-A.
2. MATERIALS FOR ITEMS NOT SPECIFIED ABOVE SHALL ALSO BE SUITABLE FOR SEA WATER APPLICATION.

	DATA SHEET-A STEEL GATE, GLOBE AND NON RETURN VALVES		SPECIFICATION NO. PE-TS-020-100-M001
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MATERIAL OF CONSTRUCTION
DUPLEX SS GATE/GLOBE VALVES

SERVICE: SEA WATER

SL.N O	PART NAME	MATERIAL REQUIRED
1	BODY	DUPLEX SS
2	BONNET/YOKE	DUPLEX SS
3	WEDGE	DUPLEX SS
4	STEM, BACK SEAT	DUPLEX SS
5	BODY SEAT RING, WEDGE/DISC SEAT RING	DUPLEX SS (BODY SEAT RING TO BE STELLITED)
6	YOKE SLEEVE	SS-316L
7	GLAND PACKING	GRAFOIL
8	GLAND	SS-316L
9	GLAND FLANGE	SS-316L
10	BOLTS	STEEL(ASTM A193 Gr.B7)
11	NUTS	STEEL(ASTM A 194 Gr.2H)
12	HANDWHEEL	MALLEABLE IRON OR EQUIVALENT
13	STEM PROTECTION COVER	PVC (TRANSPARENT)
14	GASKET	SWG (GRAFOIL)
15	Name plate	SS316 (2 MM THICK)

NOTE:

1. THIS DATA SHEET IS APPLICABLE FOR ITEMS GIVEN AT SL. No. 12 TO 16 OF DATA SHEET-A.
2. MATERIALS FOR ITEMS NOT SPECIFIED ABOVE SHALL ALSO BE SUITABLE FOR SEA WATER APPLICATION.
3. THE BIDDER SHALL CLEARLY SPECIFY THE GRADE OF DUPLEX SS MATERIAL CONSIDERED IN THE OFFER FOR THESE SL. Nos. ITEMS. THE BIDDER SHALL PROVIDE VALVES WITH SAME OR SUPERIOR GRADE DURING CONTRACT STAGE.
4. IF MATERIAL GRADE OFFERED FOR THESE SL. Nos. ITEMS ARE SAME AS SPECIFIED FOR ITEMS AT SL. Nos.1 TO 6 FOR SAME VALVE SIZE AND THE BIDDER QUOTES DIFFERENT PRICE FOR THESE VALVES, THE LOWER OF THE TWO SHALL BE CONSIDERED FOR THE ITEMS.

	DATA SHEET-A STEEL GATE, GLOBE AND NON RETURN VALVES	SPECIFICATION NO. PE-TS-020-100-M001	
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MATERIAL DATA SHEET
DUPLEX SS NON RETURN VALVE

SERVICE: SEA WATER

<u>SL.NO</u>	<u>PART NAME</u>	<u>MATERIAL (REQUIRED)</u>
1	Body	DUPLEX SS
2	Cover	DUPLEX SS
3	Disc (Fully guided)	DUPLEX SS
4	Disc nut/ washer	DUPLEX SS
5	Body seat ring	DUPLEX SS+ STELLITED
6	Gasket	SWG SS316 (GRAFOIL)
7	Bolts	ASTM A193 Gr. B7
8	Nuts	ASTM A 194 Gr.2H
9	Name plate (For valve tag nos.)	SS316 (2 mm Thick)

NOTE:

- 1.THIS DATA SHEET IS APPLICABLE FOR ITEM GIVEN AT SL. No. 17 OF DATA SHEET-A.
2. MATERIALS FOR ITEMS NOT SPECIFIED ABOVE SHALL ALSO BE SUITABLE FOR SEA WATER APPLICATION.
3. THE BIDDER SHALL CLEARLY SPECIFY THE GRADE OF DUPLEX SS MATERIAL CONSIDERED IN THE OFFER FOR THIS SL. NO. ITEM. THE BIDDER SHALL PROVIDE VALVES WITH SAME OR SUPERIOR GRADE DURING CONTRACT STAGE.

	DATA SHEET-A STEEL GATE, GLOBE AND NON RETURN VALVES		SPECIFICATION NO. PE-TS-020-100-M001
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MATERIAL DATA SHEET
(FORGED CARBON STEEL GATE/ GLOBE HOSE VALVE)

SERVICE: WATER

SL.NO	PART NAME	MATERIAL REQUIRED
1	BODY	FCS as per ASTM A 105
2	BONNET/YOKE/CAP, CHAIN	FCS as per ASTM A 105
3	WEDGE	FCS as per ASTM A 105
4	STEM, BACK SEAT	13 % Cr. SS as per ASTM A182 Gr.F6a (BACK SEAT STELLITE)
5	BODY SEAT RING, WEDGE SEAT RING (SCREWED)	13 % Cr. SS as per ASTM A182 Gr.F6a + STELLITE
6	GLOBE VALVE DISC	13 % Cr. SS as per ASTM A182 Gr.F6a + STELLITE
7	DISC HOLDER FOR GLOBE VALVE	13 % Cr. SS as per ASTM A182 Gr.F6a
8	YOKE SLEEVE	ASTM A439 Gr. D2/ AISI 316
9	GLAND PACKING	GRAPHITE WITH NON ASBESTOS FIBRE
10	GLAND	ASTM A276 T-410
11	GLAND FLANGE	FCS as per ASTM A 105
12	COVER & CHAIN (HOSE VALVE)	FCS as per ASTM A 105+ CHAIN CARBON STEEL
13	INDICATOR & INDICATING SCALE WITH FITTINGS	AISI316
14	BOLTS	ASTM A193 Gr. B7
15	NUTS	ASTM A 194 Gr.2H
16	HANDWHEEL	MALLEABLE IRON
17	STEM PROTECTION COVER	PVC(TRANSPARENT)
18	GASKET(CAP)	NATURAL RUBBER
19	PAINTING	PAINTING SHALL BE AS PER CLAUSE NO.11 OF TECH. SPEC.PE-TS-020-100-M001

NOTE: THIS DATA SHEET IS APPLICABLE FOR ITEMS GIVEN AT SL. No. 18 & 19 OF DATA SHEET-A.

	DATA SHEET-A STEEL GATE, GLOBE AND NON RETURN VALVES		SPECIFICATION NO. PE-TS-020-100-M001
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MATERIAL DATA SHEET
(FORGED STAINLESS STEEL GLOBE VALVE)

SERVICE: SEA WATER

SL.N O	PART NAME	MATERIAL REQUIRED
1	BODY	ASTM A182 Gr.F316L
2	BONNET/YOKE	ASTM A182 Gr.F316L (BOLTED)
3	BODY SEAT RING (SCREWED)	ASTM A182 Gr.F316L + STELLITE
4	STEM, BACK SEAT	ASTMA 182 Gr.F316L (BACK SEAT STELLITE)
5	DISC (CONICAL/TAPER PLUG)	ASTM A182 Gr.F316L + STELLITE
6	DISC HOLDER FOR GLOBE VALVE	ASTM A182 Gr.F316L + STELLITE
7	YOKE SLEEVE	ASTM A182 Gr.F316L
8	GLAND PACKING	GRAFOIL
9	GLAND	AISI 316L
10	GLAND FLANGE	AISI316L
11	INDICATOR & INDICATING SCALE WITH FITTINGS	AISI316L
12	BOLTS	ASTM A193 Gr.B7
13	NUTS	ASTM A 194 Gr.2H
14	HANDWHEEL	MALLEABLE IRON OR EQUIVALENT
15	STEM PROTECTION COVER	PVC (TRANSPARENT)
16	GASKET	SWG (GRAFOIL)
17	Name plate (For valve tag nos.)	SS316 (2 MM THICK)
18	Painting details	No painting needs to be done as these are stainless steel body valves

NOTE: 1. THIS DATA SHEET IS APPLICABLE FOR ITEMS GIVEN AT SL. No. 24 TO 27 OF DATA SHEET-A.

2. MATERIALS FOR ITEMS NOT SPECIFIED ABOVE SHALL ALSO BE SUITABLE FOR SEA WATER APPLICATION.

	DATA SHEET-A STEEL GATE, GLOBE AND NON RETURN VALVES	SPECIFICATION NO. PE-TS-020-100-M001	
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MATERIAL DATA SHEET
FORGED STAINLESS STEEL NON RETURN VALVE

SERVICE: SEA WATER

<u>SL.NO</u>	<u>PART NAME</u>	<u>MATERIAL (REQUIRED)</u>
1.	Body	ASTM A182 Gr.F316L
2.	Cover	ASTM A182 Gr.F316L
3.	Disc (Fully guided)	ASTM A182 Gr.F316L +STELLITE
4.	Disc nut/ washer	ASTM A182 Gr. F316L
5.	Body seat ring	ASTM A182 Gr. F316L+STELLITE
6.	Gasket	SWG SS316 (GRAFOIL)
7.	Bolts	ASTM A193 Gr.B7
8.	Nuts	ASTM A 194 Gr.2H
9.	Name plate	SS316 (2 mm Thick)
10.	Painting details	No painting needs to be done as these are stainless steel body valves

NOTE: 1. THIS DATA SHEET IS APPLICABLE FOR ITEMS GIVEN AT SL. No. 33 OF DATA SHEET-A.

2. MATERIALS FOR ITEMS NOT SPECIFIED ABOVE SHALL ALSO BE SUITABLE FOR SEA WATER APPLICATION.

	DATA SHEET-A STEEL GATE, GLOBE AND NON RETURN VALVES		SPECIFICATION NO. PE-TS-020-100-M001
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MATERIAL OF CONSTRUCTION
(CAST STAINLESS STEEL GATE/GLOBE VALVES)

SERVICE: SEA WATER

SL.N O	PART NAME	MATERIAL REQUIRED
1	BODY	EQUIVALENT CAST GRADE OF SS316L
2	BONNET/YOKE	EQUIVALENT CAST GRADE OF SS316L
3	WEDGE	EQUIVALENT CAST GRADE OF SS316L
4	STEM, BACK SEAT	ASTM A 479 TYPE 316L
5	BODY SEAT RING, WEDGE SEAT RING	ASTM A 479 TYPE 316L
6	YOKE SLEEVE	ASTM A 479 TYPE 316L
7	GLAND PACKING	GRAFOIL
8	GLAND	ASTM A 479 TYPE 316L
9	GLAND FLANGE	ASTM A 479 TYPE 316L
10	BOLTS	ASTM A193 Gr.B7
11	NUTS	ASTM A 194 Gr.2H
12	HANDWHEEL	MALLEABLE IRON OR EQUIVALENT
13	STEM PROTECTION COVER	PVC (TRANSPARENT)
14	GASKET	SWG (GRAFOIL)
15	Name plate	SS316 (2 MM THICK)

NOTE: 1. THIS DATA SHEET IS APPLICABLE FOR ITEMS GIVEN AT SL. No. 20 TO 23 & 28 TO 32 OF DATA SHEET-A.
2. MATERIALS FOR ITEMS NOT SPECIFIED ABOVE SHALL ALSO BE SUITABLE FOR SEA WATER APPLICATION.

	DATA SHEET-A STEEL GATE, GLOBE AND NON RETURN VALVES	SPECIFICATION NO. PE-TS-020-100-M001	
		SECTION : II	
		REV. NO.: 00	DATE: 22.03.2017
		Sheet 11 of 11	

MATERIAL DATA SHEET
CASTE STAINLESS STEEL NON RETURN VALVE

SERVICE: SEA WATER

<u>SL.NO</u>	<u>PART NAME</u>	<u>MATERIAL (REQUIRED)</u>
11.	Body	EQUIVALENT CAST GRADE OF SS316L
12.	Cover	EQUIVALENT CAST GRADE OF SS316L
13.	Disc (Fully guided)	EQUIVALENT CAST GRADE OF SS316L +STELLITE
14.	Disc nut/ washer	EQUIVALENT CAST GRADE OF SS316L
15.	Body seat ring	EQUIVALENT CAST GRADE OF SS316L +STELLITE
16.	Gasket	SWG SS316 (GRAFOIL)
17.	Bolts	ASTM A193 Gr.B7
18.	Nuts	ASTM A 194 Gr.2H
19.	Name plate	SS316 (2 mm Thick)
20.	Painting details	No painting needs to be done as these are stainless steel body valves

NOTE: 1. THIS DATA SHEET IS APPLICABLE FOR ITEMS GIVEN AT SL. No. 34 & 35 OF DATA SHEET-A.
2. MATERIALS FOR ITEMS NOT SPECIFIED ABOVE SHALL ALSO BE SUITABLE FOR SEA WATER APPLICATION.

 QUALITY PLAN		CUSTOMER:		PROJECT:		SPEC. NO. :PE-TS-020-100-M001				
		VENDOR:		QP NO./PE-QP-020-100-M004A		REV. DT.				
SHEET 3 OF 3		SYSTEM LP PIPING VALVES (COOLING WATER SYSTEMS)		ITEM: FORGED STEEL/DUPLEX SS GATE, GLOBE VALVE SIZE 25 TO 50 NB CL. 800, MANUAL/ MOTORISED		SECTION VOLUME				
S.N	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CAT E-GO RY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V	REMARKS

	2.MOTOR OPERATED VALVES	1.ASCENDING & DESCENDING LIFT CHARACTERISTIC	CR	ELECTRICAL	100%*	APPD. DRG./TECH. SPEC./IS9334	APPD. DRG./TECH. SPEC./IS9334	INSPN. REPORT	2	2.1	-	
		2.LIMIT/TORQUE SWITCH SETTING FOR OPENING AND CLOSING TIME	CR	ELECTRICAL	100%*	APPD. DRG./TECH. SPEC./IS9334	APPD. DRG./TECH. SPEC./IS9334	INSPN. REPORT	2	2.1	-	
5.0	COMPLETE VALVES	1. OVERALL DIMENSION	MA	MEAS	SAMP-LE	APPD.DRG	APP.DRG.	-DO-	2	2.1	-	
6.0	END CONNECTION DETAILS	1. DIMENSIONS	MA	MEAS.	100%	APPD. DRG. / RELV.STD	APPD. DRG. / RELV.STD	-DO-	2	2.1	-	
7.0	FINAL INSPECTION	1. CLEANLINESS & COMPLETENESS, NAME WITH VALVE TAG NOS.	MA	VISUAL	100%	APPD. DRG./TECH. SPEC.	APPD. DRG./TECH. SPEC.	INSPN. REPORT	2	2	-	
8.0	PACKING	AS PER BHEL TECH. SPEC	MA	VISUAL	100%	AS PER TECH.SPEC	AS PER BHEL TECH. SPEC	SOFT COPY OF PHOTOGRA PH	2	2	-	PHOTOGRAPH OF WOODEN CASES HAVING DULY PACKED VALVES TO BE FURNISHED TO BHEL,PEM FOR VERIFICATION TO OBTAIN MDCC.

ABBREVIATIONS
 CR = CRITICAL CHARACTERISTIC
 MA =MAJOR CHARACTERISTIC
 MI = MINOR CHARACTERISTIC
 PT= PENETRANT TEST,

P= PERFORMED BY
 1 = PURCHASER (BHEL)

W= WITNESSED BY
 2 = VENDOR

V = VERIFIED BY

NOTE: * 10% OR MIN. 2 Nos. AT RANDAM BY BHEL/CUSTOMER & 100% BY VENDOR FOR EACH TYPE, SIZE & RATING.

BHEL		PARTICULARS		BIDDER/VENDOR	
Control by, name		NAME			
Signature		SIGNATURE			
24.3.19		DATE		BIDDER'S/ VENDOR'S COMPANY SEAL	

QUALITY PLAN				CUSTOMER:		PROJECT:		SPEC. NO. : PE-TS-020-100-M001	
				BIDDER/VENDOR:		OP NO. PE-QP-020-100-M004B		REV. DT.	
SHEET 2 OF 4				SYSTEM: POWER CYCLE/LP PIPING		ITEM: DUPLEX SS/ STEEL GATE/ GLOBE VALVE		SPEC. TITLE	
						(ABOVE 50NB SIZE)		SECTION	
S.NO.				COMPONENT/ OPERATION		CHARACTERISTICS CHECKED		CATE-GORY	
						TYPE/METHOD OF CHECK		EXTENT OF CHECK	
						REFERENCE DOCUMENT		ACCEPTANCE NORMS	
						FORMAT OF RECORD		AGENCY	
						P		W	
						V		REMARKS	

		7. IR,HV,IR 8.DEGREE OF PROTECTION 9. DESIGN VERIFICATION	MA MA MA	WATER, DUST TEST TYPE TEST	1/ TYPE 1/TYPE	TECH. SPEC./ APPD. DRG./ DATA SHEET/ IS:9334 -DO-	APPD. DRG./ DATA SHEET/ IS:9334 -DO-	3RD PARTY TEST CERT. TEST INSPN REPORT	3 3	- -	2,1 2,1	
2.0	SS/STELLITE DEPOSIT ON DISC & BODY SEAT, BACK SEAT	1. SURFACE DEFECTS 2. HARDNESS	CR MA	PT TESTING	100% 100%	ASTME:165 & TECH.SPEC. APP.DRG.	ANSI B16.34 & TECH.SPEC. APP. DRG./ ANSI B16.34	-DO- TEST CERT.	3/2 3/2	2 2	1 1	1
3.0	IN-PROCESS INSPECTION MACHINING OF ALL COMPONENTS INCLUDING BW ENDS	1. DIMENSIONS, WORKMANSHIP AND FINISH 2.SURFACE & SUB-SURFACE DEFECTS	MA CR	MEAS.,VISUAL 1. PT 2. MPI (ACCESSIBLE AREA OF BODY & BONNET)	100% 100%	MFG.DRG. ANSI B16.34 AND TECH. SPEC./	MFG.DRG. ANSI B16.34 AND TECH. SPEC.	LOG BOOK -DO-	3/2 3/2	- 2	- 1	- 1
3.1		3.SUB SURFACE DEFECTS (SPINDLE, BODY / DISCS SEAT RING)	CR	UT	100%	ANSI B16.34 AND TECH. SPEC./	ANSI B16.34 AND TECH. SPEC./	-DO-	3/2	2	1	1. IF DIA/THK IS EQUAL OR GREATER THAN 40 mm. 2. IF BODY/DISC SEATS THICKNESS EQUAL OR GREATER THAN 25 MM
3.2	WEDGE/DISC & SEAT RING, SPINDLE AND BACK SEAT	1. LAPPING	CR	BLUE MATCHING	100%	UNIFORM METAL TO METAL CONTACT		INSPN. REPORT	3/2	-	2,1	
4.0	ASSEMBLY	1. DIMENSIONS 2. WEAR TRAVEL 3. VALVE LIFT	MA MA MA	MEAS. MEAS. MEAS.	100% 100% 100%	APPD.DRG. -DO- -DO-	APPD.DRG. -DO- -DO-	-DO- -DO- -DO-	3/2 3/2 3/2	2,1 2,1 2,1	- - -	FOR GATE VALVES ONLY
5.0	TESTING	1. LEAK TIGHTNESS OF BODY 2. LEAK TIGHTNESS OF BACK SEAT AND SEAT 3. LEAK TIGHTNESS OF SEAT	CR CR CR	HYDRAULIC TEST HYDRAULIC TEST PNEUMATIC TEST	100%* 100%* 100%*	APPD. DRG./ TECH. SPEC. APPD. DRG./ TECH. SPEC. -DO	NO LEAKAGE LEAKAGE PERMISSIBLE AS PER API 598 -DO-	INSPN REPORT -DO-	3/2 3/2	2,1 2,1	- -	REFER NOTE REFER NOTE REFER NOTE
5.1	BODY, SEAT, BACK SEAT											

BHEL		PARTICULARS		BIDDER/VENDOR	
		NAME			
		SIGNATURE			
		DATE			
				BIDDER'S/ VENDOR'S COMPANY SEAL	

		QUALITY PLAN		CUSTOMER:		PROJECT:		SPEC. NO. : PE-TS-020-100-M001	
SHEET 3 OF 4		BIDDER/VENDOR:		SYSTEM:		QP NO. PE-QP-020-100-M004B		REV. DT.	
POWER CYCLE/LP PIPING		ITEM:		DUPLEX SS/ STEEL GATE/ GLOBE VALVE		SECTION		VOLUME	
(ABOVE 50NB SIZE)		REFERENCE DOCUMENT		ACCEPTANCE NORMS		FORMAT OF RECORD		AGENCY	
S.N.O.		COMPONENT/ OPERATION		CHARACTERISTICS CHECKED		CATE-GORY		TYPE/METHOD OF CHECK	
EXTENT OF CHECK		EXTENT OF CHECK		EXTENT OF CHECK		EXTENT OF CHECK		EXTENT OF CHECK	

5.2	SEAT & BACK SEAT FOR MOTORISED/ PNEU VALVES WITH ACTUATOR OPERATION AL	1. LEAK TIGHTNESS OF SEAT	CR	HYDRAULIC TEST	100%*	APPD. DRG./ TECH. SPEC.	-DO-	INSPN REPORT	3/2	2.1	-	
5.3	1. MANUALLY OPERATED VALVES	1. SMOOTH & FULL OPENING AND CLOSING	CR	MANUAL	100%*	TECH. SPEC. APP. DRG./	SMOOTH OPERATION OF VALVES & CLEAR BORE	INSPN. REPORT	3/2	2.1	-	
	2. MOTOR OPERATED VALVES	1. ASCENDING& DESCENDING LIFT CHARACTERISTIC 2. LIMIT/TORQUE SWITCH SETTING FOR OPENING AND CLOSING TIME	CR	ELEC.	100%*	TECH. SPEC./ IS:9334	APP. DRG./ TECH. SPEC./ IS:9334	INSPN. REPORT	3/2	2.1	-	
6.0	COMPLETE VALVES	1. OVERALL DIMENSION	MA	MEAS	SAMP-LE	APPD. DRG. / RELV. STD APPD. DRG./	APP. DRG.	INSP. REPORT	3/2	2.1	-	
7.0	END CONNECTION DETAILS	1. DIMENSIONS	MA	MEAS.	100%	APPD. DRG. / RELV. STD APPD. DRG./	APPD. DRG. / RELV. STD	INSPN. REPORT	3/2	2.1	-	
8.0	FINAL INSPECTION	1. CLEANLINESS & COMPLETENESS, NAME WITH VALVE TAG NOS.	MA	VISUAL	100%	DRG./TECH. SPEC.	TECH. SPEC.	INSPN. REPORT	3/2	2	2.1	
9.0	PAINTING	1. SURFACE PREPARATION 2. UNIFORMITY & THICKNESS	MI	VISUAL MEASUREMENT	100%	TECH. SPEC. -DO-	TECH. SPEC. -DO-	INSPN. REPORT	3/2	2	2.1	
10.0	PACKING	AS PER BHEL TECH. SPEC	MA	VISUAL	100%	AS PER TECH. SPEC	AS PER BHEL TECH. SPEC	SOFT COPY OF PHOTOGRA PH	3/2	-	2.1	PHOTOGRAPH OF WOODEN CASES HAVING DULY PACKED VALVES TO BE FURNISHED TO BHEL-PEM FOR VERIFICATION TO OBTAIN MDCC

ABBREVIATIONS

CR = CRITICAL CHARACTERISTIC P = PERFORMED BY MA = MAJOR CHARACTERISTIC 1 = PURCHASER (BHEL) 2 = VENDOR W = WITNESSED BY V = VERIFIED BY MI = MINOR CHARACTERISTIC 3 = SUB VENDOR OF THE VENDOR

PT= PENETRANT TEST, UT= ULTRASONIC TEST, RT= RADIOGRAPHIC TEST MPI=MAGNETIC PARTICAL INSPECTION.

BHEL		PARTICULARS		BIDDER/VENDOR	
<i>Chandigarh</i>		NAME			
		SIGNATURE			
		DATE		BIDDER'S/ VENDOR'S COMPANY SEAL	

		QUALITY PLAN		CUSTOMER:		PROJECT:		SPEC. NO. : PE-TS-020-100-M001		
		SHEET 4 OF 4		BIDDER/VENDOR:		QP NO. PE-QP-020-100-M004B		REV. DT.		
SYSTEM: POWER CYCLE/LP PIPING		ITEM: DUPLEX SS/ STEEL GATE/ GLOBE VALVE (ABOVE 50NB SIZE)		SPEC. TITLE		SECTION		VOLUME		
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V	REMARKS

NOTE :- A) MATERIAL TEST CERTIFICATES (IBR CERTIFICATES IN FORM III-C) WITH PROPER IDENTIFICATION AND CO-RELATION SHALL BE FURNISHED FOR BODY & BONNET FOR VALVES UNDER PERVIEW OF IBR.

B) FOR OTHERS PARTS MATERIAL TEST CERTIFICATES SHALL BE FURNISHED.

C) HYDRAULIC AND AIR TEST CERTIFICATES SHALL BE FURNISHED. FOR VALVES COMING UNDER IBR, TEST CERTIFICATES IN IBR FORM III-C SHALL BE FURNISHED.

* = 10% OR MIN. 2 Nos. AT RANDOM BY BHEL/CUSTOMER & 100% BY VENDOR FOR EACH TYPE, SIZE & RATING.

BHEL		PARTICULARS		BIDDER/VENDOR	
Ganind lxx.maye		NAME			
24.3.17		SIGNATURE			
		DATE		BIDDER'S/ VENDOR'S COMPANY SEAL	

QUALITY PLAN				CUSTOMER:			PROJECT:			SPEC. NO.: PE-TS-020-100-M001		
SHEET 1 OF 1				VENDOR:			QP NO.: PE-QP-020-100-M005A			REV. DT.		
SYSTEM: LP PIPING (WATER SYSTEM)				ITEM: FORGED STEEL/DUPLEX SS NON RETURN VALVES SIZE 15 TO 50 NB CLASS 800			SECTION			VOLUME		
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE-GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS		
									P	W	V	

1.0	MATERIALS	1. PHYSICAL, CHEMICAL PROPS.	MA	PHYS. CHEM. TESTS	1/HEAT	APPD. DRG./ TECH. SPEC.	APPD. DRG./ TECH. SPEC.	T.C.	-	-	2.1	CORRELATION RECD. FOR BODY & COVER. SOLUTION ANNEALING FOR STAINLESS STEEL
1.1	BODY, COVER, DISC,	2. HEAT TREATMENT	MA	REVIEW OF HT	100%	-DO-	-DO-	T.C RECORDS	-	-	2	
1.2	BODY, COVER & DISC	1. SURFACE DEFECTS	CR	PT	100%	ANSI B16.34/ TECH. SPEC.	ANSI B16.34/ TECH. SPEC.	INSPN REPORT	2	2	1	
2.0	IN PROCESS											
2.1	SS/STELLITE DEPO-SIT ON BODY SEAT RING, DISC/SEAT	1. SURFACE DEFECTS	CR	PENETRANT TEST	100%	ASTME-165	NO DEFECTS	TEST CERT.	2	2	1	
2.2	MACHINING OF ALL COMPONENTS	1. DIMENSIONS	MA	MEASUREMENT	100%	MFG. DRG.	MFG. DRG.	LOG BOOK	2	2	-	
		2. SURFACE & SUB-SURFACE DEFECTS	CR	PT	100%	ASTME-165	NO DEFECTS	INSPN. REPORT	2	2	-	
2.3	DISC. AND BODY SEAT RING ASSEMBLY	1. LAPPING	CR	BLUE MATCHING	100%	UNIFORM METAL TO METAL CONTACT	APPD. DRG. / TECH. SPEC.	TEST CERT.	2	2	-	
3.0	TESTING	1. DIMENSIONS (overall dimensions)	MA	MEASUREMENT	100%	APPD. DRG. / TECH. SPEC.	APPD. DRG. / TECH. SPEC.	INSPN. REPORT	2	2	-	
4.0	BODY	1. LEAK TIGHTNESS	CR	HYDRAULIC TEST	100%*	APPD. DRG. / TECH. SPEC.	NO LEAKAGE	TEST CERT.	2	2.1	-	
4.1	SEAT	1. LEAK TIGHTNESS	CR	HYDRAULIC TEST	100%*	-DO-	-DO-	-DO-	2	2.1	-	
5.0	END CONNECTION DETAILS	1. DIMENSIONS, VALVE TAG NOS	MA	MEASUREMENT/ VISUAL	100%*	APPD. DRG. / RELEVANT STANDARD	APPD. DRG. / RELEVANT STANDARD	-DO-	2	2.1	-	
6.0	PACKING	1. AS PER BHEL TECH. SPEC.	MA	VISUAL	100%	-DO-	-DO-	SOFT COPY OF PHOTOGRAPH	2	2	-	PHOTOGRAPH OF WOODEN CASES HAVING DULY PACKED VALVES TO BE FURNISHED TO BHEL-PEM FOR VERIFICATION TO OBTAIN MDCC

ABBREVIATIONS: CR = CRITICAL CHARACTERISTIC P = PERFORMED BY W = WITNESSED BY V = VERIFIED BY
MA = MAJOR CHARACTERISTIC 1 = PURCHASER (BHEL) 2 = VENDOR PT = PENETRANT TEST

NOTE: * = 10% OR MIN. 2 Nos. AT RANDOM BY BHEL/CUSTOMER & 100% BY VENDOR FOR EACH TYPE, SIZE & RATING.

BHEL		PARTICULARS		BIDDER/VENDOR	
Sd/-		NAME			
Sd/-		SIGNATURE			
24.3.17		DATE		BIDDER'S/ VENDOR'S COMPANY SEAL	



QUALITY PLAN

CUSTOMER:

BIDDER/VENDOR:

PROJECT:

QP NO: PE-QP-020-100-M005B

REV. DT.

SPEC. NO.: PE-TS-020-100-M001

SHEET 1 OF 3

SYSTEM: POWER CYCLE/LP PIPING

ITEM: DUPLES SS/STEEL NON RETURN VALVES

(ABOVE 50NB SIZE)

SECTION VOLUME

S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V	REMARKS		
1.0	MATERIALS											
1.1	BODY, COVER, BODY, SEAT RING, DISC, HINGE, HINGE PIN	1. PHYSICAL, CHEMICAL PROPS. 2. HEAT TREATMENT 3. SURFACE DEFECTS	MA MA MA	PHYS. CHEM. TESTS REVIEW OF HT CHART RECORDS VISUAL	1/HEAT 100% 100%	APPD. DRG./ TECH. SPEC. -DO- MSS-SP-55	APPD. DRG./ TECH. SPEC -DO- MSS-SP-55	T.C. HT INTERNAL INSPN. RECORDS INSPN. REPORT T.C.	3/2 3/2 3/2	2 2 2	1 2 1	CORRELATION REQD. FOR BODY & COVER. SOLUTION ANNEALING FOR STAINLESS STEEL
1.2	BODY, COVER, HINGE & DISC	a) <u>CASTINGS</u> 1.SUB-SURFACE DEFECTS 2. SURFACE DEFECTS	CR CR	RT / UT PT/MPI	100% 100%	ANSI B-16.34/ TECH. SPEC. ASTME 165/ ASTME 709.	ANSI B-16.34/ TECH. SPEC. -DO- -DO-	T.C. T.C.	3/2 3/2	2 2	1 1	RTION CHANGE OF SECTION FOR 1. ALL SS VALVES. RT FILM REVIEW BY BHEL
2.0	IN PROCESS	b) <u>FORGINGS</u> 1. SURFACE DEFECTS 2. SUB-SURFACE DEFECTS	CR CR	1. PT/MPI 2. UT	100% 100%	ANSI B16.34/ TECH. SPEC. -DO-	ANSI B16.34/ TECH. SPEC. -DO—	INSPN REPORT -DO-	3/2 3/2	2 2	1 1	1. .PT ALL SS VALVES
2.1	SS/STELLITE DEPO- SIT ON BODY SEAT	1.SURFACE DEFECTS	CR	PENETRANT TEST	100%	ASTME-165	NO DEFECTS	TEST CERT.	3/2	2	1	

BHEL

PARTICULARS

BIDDER/VENDOR

Signature of Bidder/Vendor

NAME

SIGNATURE

DATE

BIDDER'S/ VENDOR'S COMPANY SEAL



QUALITY PLAN

CUSTOMER:
BIDDER/VENDOR:

PROJECT:

OP NO: PE-QP-020-100-M005B

REV. DT.

SPEC. NO :PE-TS-020-100-M001

SHEET 2 OF 3

SYSTEM: POWER CYCLE/LP PIPING

ITEM: DUPLES S/STEEL NON RETURN VALVES
(ABOVE 50NB SIZE)

SPEC. TITLE

SECTION

VOLUME

S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V	REMARKS
-------	-------------------------	----------------------------	---------------	-------------------------	-----------------------	-----------------------	---------------------	------------------------	-----------------	---------

2.2	RING, DISC/SEAT MACHINING OF ALL COMPONENTS INCLUDING BW ENDS	2. HARDNESS 1. DIMENSIONS 2. SURFACE & SUB- SURFACE DEFECTS 3. SUB SURFACE DEFECTS (HINGE PIN, BODY & DISC SEAT RINGS)	MA MA CR	MEASUREMENT MEASUREMENT 1. PT 2. MPI (ACCESSIBLE AREA OF BODY & BONNET) UT	100% 100% 100%	APPD. DRG MFG. DRG. ASTME-165 ANSI B16.34 AND TECH. SPEC./	APPD. DRG/ ANSI B16.34 MFG. DRG. NO DEFECTS ANSI B16.34 AND TECH. SPEC./	TEST CERT. LOG BOOK INSPN. REPORT TEST CERT.	3/2 3/2 3/2 3/2	2 - 2 2	1 - 1 1	1. IF DIA/THK IS EQUAL OR GREATER THAN 40 mm. 2. IF BODY/DISC SEATS THICKNESS EQUAL OR GREATER THAN 25 MM
2.3	DISC. AND BODY SEAT RING ASSEMBLY	1. LAPPING 1. DIMENSIONS	CR MA	BLUE MATCHING 1. MEASUREMENT	100% 100%	UNIFORM METAL TO METAL CONTACT APPD. DRG. / TECH. SPEC.	APPD. DRG. / TECH. SPEC. NO LEAKAGE -DO-	TEST CERT. INSPN. REPORT TEST CERT.	3/2 3/2 3/2	-- 2 -	2,1 2 2,1	REFER NOTE REFER NOTE
4.0	TESTING BODY	1. LEAK TIGHTNESS	CR	HYDRAULIC TEST 1. AT SPECIFIED PRESSURE 2. AT 25% OF SEAT TEST PRESSURE	100%	APPD. DRG. / TECH. SPEC. -DO-	-DO-	TEST CERT. -DO-	3/2	-	2,1	REFER NOTE
4.2	SEAT	1. LEAK TIGHTNESS	CR	HYDRAULIC TEST 1. AT SPECIFIED PRESSURE	100%*	APPD. DRG. / TECH. SPEC. -DO-	-DO-	TEST CERT. -DO-	3/2	2,1	-	REFER NOTE
4.3	COMPLETE VALVE	PERFORMANCE	CR	OPERATION OF FLAP MEASUREMENT/ VISUAL	100%*	TECH. SPEC.	TECH. SPEC.	INSPN. REPORT -DO-	3/2	2,1	-	PHOTOGRAPH OF WOODEN CASES HAVING DULY PACKED VALVES TO BE FURNISHED TO BHEL-PEM FOR VERIFICATION TO OBTAIN MDCC
5.0	END CONNECTION DETAILS	1. DIMENSIONS, VALVE TAG NOS	MA	VISUAL	100%*	APPD. DRG. / RELEVANT STANDARD TECH. SPEC.	APPD. DRG. / RELEVANT STANDARD TECH. SPEC.	T.C.	3/2	2	1	For CS/AS body valves only.
6.0	PAINTING	1. QUALITY AND THICK- NESS OF PAINT	MA	VISUAL AND MEASUREMENT	100%	-DO-	-DO-	SOFT COPY OF PHOTOGRA PH	3/2	--	2,1	PHOTOGRAPH OF WOODEN CASES HAVING DULY PACKED VALVES TO BE FURNISHED TO BHEL-PEM FOR VERIFICATION TO OBTAIN MDCC
7.0	PACKING	1. AS PER BHEL TECH. SPEC.	MA	VISUAL	100%	-DO-	-DO-	SOFT COPY OF PHOTOGRA PH	3/2	--	2,1	PHOTOGRAPH OF WOODEN CASES HAVING DULY PACKED VALVES TO BE FURNISHED TO BHEL-PEM FOR VERIFICATION TO OBTAIN MDCC

BHEL

PARTICULARS

BIDDER/VENDOR

NAME

SIGNATURE

DATE

BIDDER'S/ VENDOR'S COMPANY SEAL

Approved by: *Handwritten signature*
24.3.17

		QUALITY PLAN				CUSTOMER:		PROJECT:		SPEC. NO. :PE-TS-020-100-M001	
		BIDDER/VENDOR:				Q.P NO: PE-QP-020-100-M005B		REV. DT.		SPEC. TITLE	
SHEET 3 OF 3		SYSTEM: POWER CYCLE/LP PIPING		ITEM: DUPLES SS/STEEL NON RETURN VALVES (ABOVE 50NB SIZE)		SECTION		VOLUME			
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V	REMARKS	

ABBREVIATIONS

CR = CRITICAL CHARACTERISTIC P = PERFORMED BY W = WITNESSED BY V = VERIFIED BY
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 PT = PENETRANT TEST, UT = ULTRASONIC TEST, RT = RADIOGRAPHIC TEST MPI = MAGNETIC PARTICAL INSPECTION.

NOTE: A) MATERIAL TEST CERTIFICATES (IBR CERTIFICATES IN FORM III-C) WITH PROPER IDENTIFICATION AND CO-RELATION SHALL BE FURNISHED FOR BODY & BONNET FOR VALVES UNDER PERVIEW OF IBR.

B) FOR OTHERS PARTS MATERIAL TEST CERTIFICATES SHALL BE FURNISHED.

C) HYDRAULIC AND AIR TEST CERTIFICATES SHALL BE FURNISHED. FOR VALVES COMING UNDER IBR, TEST CERTIFICATES IN IBR FORM III-C SHALL BE FURNISHED.

* = 10% OR MIN. 2 Nos. AT RANDOM BY BHEL/CUSTOMER & 100% BY VENDOR FOR EACH TYPE, SIZE & RATING.

BHEL		PARTICULARS		BIDDER/VENDOR	
		NAME			
		SIGNATURE			
		DATE			
				BIDDER'S/ VENDOR'S COMPANY SEAL	

		SPECIFICATION FOR MOTORISED VALVE ACTUATOR STEEL GLOBE VALVE (WATER SERVICE) FRAMEWORK AGREEMENT		SPECIFICATION NO.: PE-TS-020-145-1007	
				SECTION II	
				REV. NO.	DATE:
				00	23.03.2017
		SHEET	1	OF	3
Data Sheet A & B					
DATA SHEET-A (TO BE FILLED BY PURCHASER)				DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	
GENERAL*	* PROJECT	FRAMEWORK AGREEMENT			
	OFFER REFERENCE				
	* TAG NO. SERVICE				
	* DUTY	☐ ON / OFF ☒ INCHING			
	* LINE SIZE (inlet/outlet): MATERIAL	AS PER DATASHEET-A		AS PER DATASHEET-A	
	* VALVE TYPE	☒ GLOBE ☐ GATE ☐ REG. GLOBE ☐ BUTTERFLY			
	* OPENING / CLOSING TIME	AS PER DATASHEET-A		AS PER DATASHEET-A	
	* WORKING PRESSURE				
	AMBIENT CONDITION	SHALL BE SUITABLE FOR CONTINUOUS OPERATION UNDER AN AMBIENT TEMP. OF 0-55 DEG C AND RELATIVE HUMIDITY OF 0-95%			
	VALVE SEAT TEST PRESS	BIDDER TO SPECIFY			
	REQUIRED VALVE TORQUE	BIDDER TO SPECIFY			
	ACTUATOR RATED TORQUE	BIDDER TO SPECIFY			
CONSTRUCTION AND SIZING	CONSTRUCTION	TOTALLY ENCLOSED, WEATHER PROOF, IP:68			
	MECHANICAL POSITION INDICATOR	TO BE PROVIDED FOR 0-100% TRAVEL			
	BEARINGS	DOUBLE SHIELDED, GREASE LUBRICATED ANTI-FRICTION.			
	GEAR TRAIN FOR LIMIT SWITCH/TORQUE SWITCH OPERATION	METAL (NOT FIBRE GEARS). SELF-LOCKING TO PREVENT DRIFT UNDER TORQUE SWITCH SPRING PRESSURE WHEN MOTOR IS DE-ENERGIZED.			
	SIZING	OPEN/CLOSE AT RATED SPEED AGAINST DESIGNED DIFFERENTIAL PRESSURE AT 85% OF RATED VOLTAGE. FOR ISOLATING SERVICE THREE SUCCESSIVE OPEN-CLOSE OPERATIONS OR 15 MINS. WHICHEVER IS HIGHER. FOR INCHING SERVICE-150 STARTS/HR MINIMUM			
HANDWHEEL	* REQUIRED	☒ YES ☐ NO			
	* ORIENTATION	☐ TOP MOUNTED ☐ SIDE MOUNTED			
	*TO DISENGAGE AUTOMATICALLY DURING MOTOR OPERATION.				
ELECTRIC ACTUATOR	ACTUATOR MAKE/MODEL	BIDDER TO SPECIFY			
	MOTOR MAKE / MODEL / TYPE / RATING (KW)	BIDDER TO SPECIFY			
	@ MOTOR TYPE	SQUIRREL CAGE INDUCTION MOTOR, STARTING CURRENT LIMITED TO SIX TIMES THE RATED CURRENT- INCLUSIVE OF I.S. TOLERANCE			
	ACTUATOR APPLICABLE WIRING DIAGRAM	☒ ENCLOSED (BIDDER TO CONFIRM) A: ☐ DRG. NO. 3-V-MISC-24227 R00 B: ☐ DRG. NO. 3-V-MISC-24283 R00 THE ABOVE WIRING DIAGRAMS ARE TYPICAL. THE TYPE OF WIRING DIAGRAM WOULD BE DECIDED DURING DETAIL ENGINEERING, SINCE IT IS PROJECT SPECIFIC. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.			
	COLOUR SHADE**	☐ BLUE (RAL 5012) ☐			
	PAINT TYPE (## Refer Notes)	☐ ENAMEL ☒ EPOXY ☐			
	SHAFT RPM	BIDDER TO SPECIFY			
	OLR SET VALUE	BIDDER TO SPECIFY			
	@ STARTING / FULL LOAD CURRENT	BIDDER TO SPECIFY			
	NO. OF REV FOR FULL TRAVEL	BIDDER TO SPECIFY			
	@ PWR SUPP TO MTR / STARTER**	415V, 3PH, AC, 3 wire or 4 wire			
	@ CONTROL VOLTAGE REQUIREMENT	TO BE DERIVED FROM THE POWER SUPPLY TO THE STARTER ☐ 230 V ☐ 110 V			

■ - THIS MEANS APPLICABLE

** IT WOULD BE DECIDED DURING DETAIL ENGINEERING, SINCE IT IS PROJECT SPECIFIC. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.

		SPECIFICATION FOR MOTORISED VALVE ACTUATOR STEEL GLOBE VALVE (WATER SERVICE) FRAMEWORK AGREEMENT		SPECIFICATION NO.: PE-TS-020-145-1007	
				SECTION II	
				REV. NO.	DATE:
				00	23.03.2017
		SHEET	2	OF	3
Data Sheet A & B					
DATA SHEET-A (TO BE FILLED BY PURCHASER)				DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	
INTEGRAL STARTER	@ ENCLOSURE CLASS OF MOTOR	☒ IP 68 ☐ FLAME PROOF			
	@ INSULATION CLASS	CLASS-F TEMP. RISE LIMITED TO CLASS-B			
	@ WINDING TEMP PROTECTION	☒ THERMOSTAT (3 Nos., 1 IN EACH PHASE) ☐ _____			
	SINGLE PHASE / WRONG PHASE SEQUENCE PROTECTION	REQUIRED			
	INTEGRAL STARTER	☒ REQUIRED ☐ NOT REQUIRED			
	TYPE OF SWITCHING DEVICE	☒ CONTACTORS ☐ THYRISTORS			
	TYPE	☒ CONVENTIONAL ☐ SMART (NON-INTRUSIVE)			
	IF SMART				
	— a) SERIAL LINK INTERFACE	☐ INTEGRAL ☐ FIELD MOUNTED			
	— b) SERIAL LINK PROTOCOL	☐ FOUNDATION FIELD BUS ☐ PROFIBUS ☐ DEVICE NET ☐ _____			
	— c) SERIAL LINK MEDIA	☐ TWISTED PAIR Cu CBL ☐ CO-AXIAL Cu CBL ☐ OFG			
	— d) HAND HELD PROGRAMMER	☐ REQUIRED ☐ NOT REQUIRED			
	— e) TYPE OF HAND HELD PROGRAMMER	☐ BLUETOOTH ☐ INFRARED ☐ _____			
	— f) MASTER STATION	☐ REQUIRED ☐ NOT REQUIRED			
	— g) MASTER STN INTERFACE WITH DCS	☐ MODBUS ☐ TCP/IP			
	— h) DETAILS OF SPECIAL CABLE	☐ ENCLOSED ☐ NOT REQUIRED			
	STEP DOWN CONT. TRANSFORMER	☒ REQUIRED			
	OPEN / CLOSE PB	☒ REQUIRED ☐ NOT REQUIRED			
	STOP PB	☒ REQUIRED ☐ NOT REQUIRED			
	INDICATING LAMPS	☒ REQUIRED ☐ NOT REQUIRED			
LOCAL REMOTE S/S	☒ REQUIRED ☐ NOT REQUIRED				
STATUS CONTACTS FOR MONITORING	☒ REQUIRED ☐ NOT REQUIRED				
INTEGRAL STARTER DISTURBED SIGNAL	REQUIRED (MOTOR THERMOSTAT TRIP, O/L RELAY OPERATED, CONT./POWER SUPPLY FAILED, PHASE LOSS, S/S IN LOCAL or OFF MODE, STOP PB OPTD, TORQUE OPEN/CLOSE CUTOFF)				
INTERPOSING RELAY/OPTO COUPLER (Applicable for integral Starter)	TYPE OF ISOLATING DEVICE**	☐ INTERPOSING RELAY ☐ OPTO COUPLER ☒ EITHER TO BE DECIDED			
	QUANTITY	☒ 2 NOs. ☐ 3 NOs.			
	DRIVING VOLTAGE	☒ 20.5 – 24V DC ☐ _____ V DC			
	DRIVING CURRENT	☒ 125mA MAX ☐ _____ mA MAX			
	LOAD RESISTANCE	☒ > 192 ohms - <25 k ohms ☐ > _____ ohms - < _____ ohms			
TORQUE SWITCH (Not Applicable for Smart Actuator) (\$\$ Refer Notes)	MFR & MODEL NO.	BIDDER TO SPECIFY			
	OPEN / CLOSE	☒ 1 No. ☐ 2Nos. / ☒ 1 No. ☐ 2Nos			
	CONTACT TYPE	2 NO + 2 NC			
	RATING	5A 240V AC AND 0.5A 220V DC			
	CALIBRATED KNOBS(OPEN&CLOSE TS)	REQUIRED FOR SETTING DESIRED TORQUE			
	ACCURACY	+3% OF SET VALUE			
LIMIT SWITCH (Not Applicable for Smart Actuator) (\$\$ Refer Notes)	MFR & MODEL NO.	BIDDER TO SPECIFY			
	OPEN : INT : CLOSE	☒ 1 No. ☐ 2 Nos.	2 Nos. (ADJ.)	☒ 1 No. ☐ 2Nos.	
	CONTACT TYPE	2 NO + 2 NC			
	RATING (AC / DC)	5A 240V AC AND 0.5A 220V DC			

☒ - THIS MEANS APPLICABLE

** IT WOULD BE DECIDED DURING DETAIL ENGINEERING, SINCE IT IS PROJECT SPECIFIC. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.

	SPECIFICATION FOR MOTORISED VALVE ACTUATOR STEEL GLOBE VALVE (WATER SERVICE) FRAMEWORK AGREEMENT		SPECIFICATION NO.: PE-TS-020-145-1007	
			SECTION II	
	REV. NO.	00	DATE: 23.03.2017	
	SHEET	3	OF	3
Data Sheet A & B				
DATA SHEET-A (TO BE FILLED BY PURCHASER)			DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	

POSITION TRANSMITTER	POSITION TRANSMITTER (For inching duty & other specific applications)	☒ REQUIRED ☐ NOT REQUIRED	
	MFR & MODEL NO.	BIDDER TO SPECIFY	
	TYPE	☐ ELECTRONIC (2 WIRE) R/I CONVERTER ☒ ELECTRONIC (2 WIRE) CONTACTLESS	
	SUPPLY	☒ 24V DC ☐	
	OUTPUT	☒ 4-20mA	
	ACCURACY	± 1% FS	
SPACE HEATER	@SPACE HEATER	REQUIRED	
	@ POWER SUPPLY (NON INTEGRAL)	230V AC, 1 PH., 50 Hz	
	@ POWER SUPPLY (INTEGRAL)	BIDDER TO SPECIFY	
	@ RATING		
TERMINAL BOX	ACTUATOR/MOTOR TERMINAL BOX	REQUIRED	
	ENCL CLASS ACTUATOR/MOTOR T.B.	@ ☒ IP 68 @ ☐	
	@ EARTHING TERMINAL	REQUIRED	
	PLUG & SOCKET** (FOR COMMD, LS/TS FEED BACK, PoT)	☐ REQUIRED ☐ NOT REQUIRED ☐ 2 NOS. ☐	
CABLE GLANDS	@ POWER CABLE GLAND	SIZE AND NOS. ARE PROJECT SPECIFIC AND WILL BE INFORMED LATER. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.	
	@ SPACE HEATER CABLE GLAND		
	OTHER CONTROL CABLE GLANDS-1		
	OTHER CONTROL CABLE GLANDS-2		
WEIGHT	TOTAL WEIGHT (ACTUATOR + ACCESSORIES)	BIDDER TO SPECIFY	_____ Kg.

NOTES:

- SCOPE:** DESIGN, MANUFACTURE, INSPECTION, TESTING AND DELIVERY TO SITE OF ELECTRIC ACTUATOR FOR INCHING OR OPEN / CLOSE DUTY.
- CODES & STANDARDS:** DESIGN AND MATERIALS USED SHALL COMPLY WITH THE RELEVANT LATEST NATIONAL AND INTERNATIONAL STANDARD. AS A MINIMUM, THE FOLLOWING STANDARDS SHALL BE COMPLIED WITH:
IS-9334, IS-2147, IS-2148, IS-325, IS-2959, IS-4691 AND IS-4722
- TEMPERATURE RISE SHALL BE RESTRICTED TO 70 DEG. C FOR AMBIENT TEMPERATURE OF 50 DEG C.
- CABLE GLANDS OF DOUBLE COMPRESSION TYPE, BRASS MATERIAL SHALL BE PROVIDED.
- THE TORQUE SWITCHES SHALL BE PROVIDED WITH MECHANICAL LATCHING DEVICE TO PREVENT OPERATION WHEN UNSEATING FROM THE END POSITIONS. THE LATCHING DEVICE SHALL UNLATCH AS SOON AS THE VALVE LEAVES THE END POSITION. IF SUCH PROVISION IS NOT POSSIBLE, THE TORQUE SWITCHES SHALL BE BYPASSED BY END-POSITION LIMIT SWITCHES WHICH OPENS ON VALVE LEAVING END POSITION. THESE LIMIT SWITCHES ARE ADDITIONAL TO THE NUMBER OF LIMIT SWITCHES SPECIFIED ELSEWHERE.
- THE MOTOR SHALL OPERATE SATISFACTORILY UNDER THE +/- 10% SUPPLY VOLTAGE VARIATION AT RATED FREQUENCY, -5% TO +3% VARIATION IN FREQUENCY AT RATED SUPPLY VOLTAGE, SIMULTANEOUS VARIATION IN VOLTAGE & FREQUENCY THE SUM OF ABSOLUTE PERCENTAGE NOT EXCEEDING 10%.
- THE MOTOR SHALL BE SUITABLE FOR DIRECT ON LINE STARTING.
- ACTUATOR SHALL HAVE HARDWIRED CONTACTS FOR FOLLOWING SIGNALS (a) ACTUATOR IN LOCAL MODE (b) ACTUATOR IN REMOTE MODE
- 2 No. OF EARTHING TERMINALS SHALL BE PROVIDED FOR THE MOTOR BODY EARTHING.

\$\$ TORQUE SWITCH & LIMIT SWITCH SHALL ACT INDEPENDENT OF EACH OTHER. TANDEM OPERATION IS NOT ACCEPTABLE.

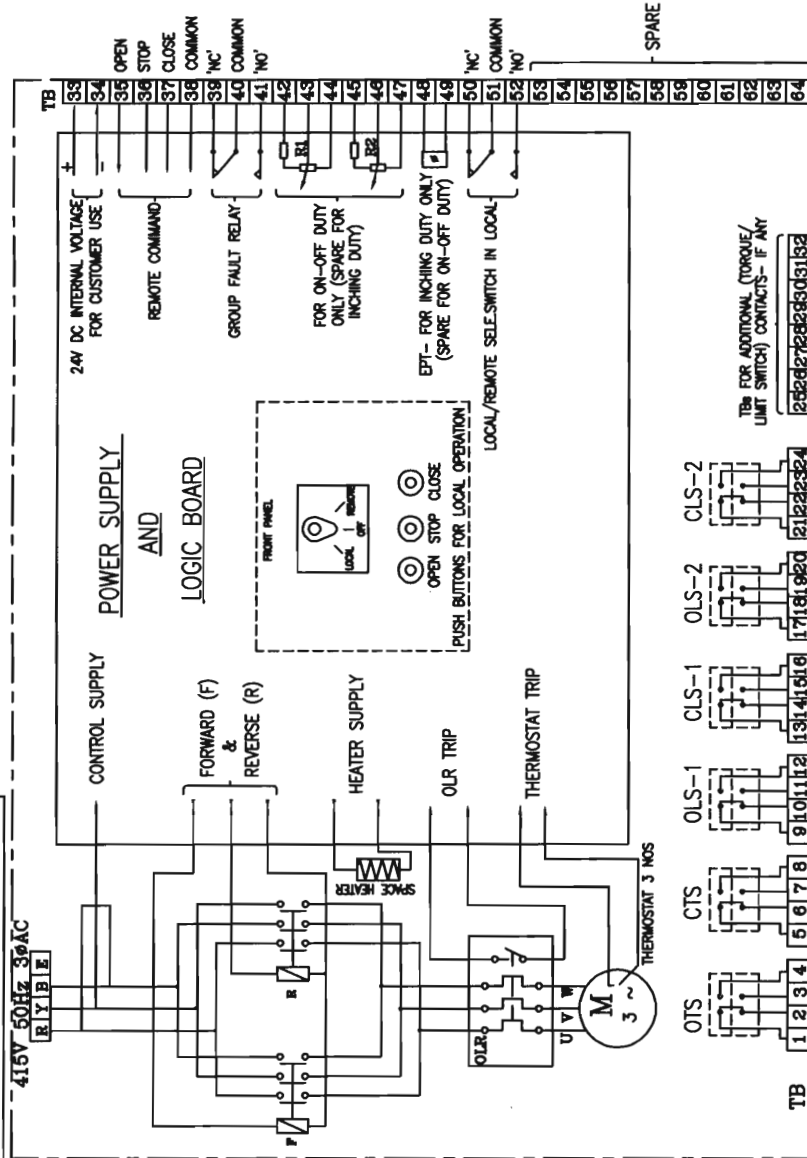
NOTES* = TO BE FILLED BY MPL (LEAD AGENCY). @ = TO BE FILLED BY ES

☒ - THIS MEANS APPLICABLE

** IT WOULD BE DECIDED DURING DETAIL ENGINEERING, SINCE IT IS PROJECT SPECIFIC. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.

3-V-MISC-24227

ON DRAWING



SWITCH TERMINALS FOR CUSTOMER USE

NOTE:-

1. ALL TORQUE AND LIMIT SWITCHES (OTS, CTS, OLS1&2, CLS1&2) ARE WITH 2NO+2NC CONTACTS '1NO+1NC' IS TERMINATED IN TBS 1-24, REMAINING CONTACTS ARE FOR INTERNAL USE.
2. ANY SPARE CONTACTS WHICH ARE NOT USED INTERNALLY ARE TO BE TERMINATED IN TBS 25-32
3. CTS - TORQUE SWITCHES FOR CW ROTATION (CLOSE)
4. OTS - TORQUE SWITCHES FOR CCW ROTATION (OPEN)
5. OLS-1, OLS-2 - LIMITSWITCHES FOR POSITION OPEN
6. CLS-1, CLS-2 - LIMITSWITCHES FOR POSITION CLOSE
7. EPT - ELECTRONIC POSITION TRANSMITTER (POTENTIOMETRIC TYPE, FOR INCHING DUTY)
8. R1-R2-POTENTIOMETER 2 x 100 OHMS (FOR ON-OFF DUTY)
9. FOR COMMANDS & EPT EITHER INTERNALLY GENERATED 24 VDC OR EXTERNAL SUPPLY OF 24VDC CAN BE USED
10. M - MOTOR 3Φ 415V 50 Hz AC SUPPLY

CONTACT DEVELOPMENT DIAGRAM

OTS	1-2	OPEN AT OVER TORQUE DURING OPENING TRAVEL
CTS	3-4	CLOSE AT OVER TORQUE DURING OPENING TRAVEL
	5-6	OPEN AT OVER TORQUE DURING CLOSING TRAVEL
	7-8	CLOSE AT OVER TORQUE DURING CLOSING TRAVEL
OLS-1	9-10	
OLS-2	11-12	
CLS-1	13-14	
CLS-2	15-16	
	17-18	
	19-20	
	21-22	
	23-24	
SWITCH NO.	TERMINAL NO.	VALUE POSITION
	FULL OPEN	INTERMEDIATE
	FULL CLOSE	

INDICATES CONTACT CLOSED
INDICATES CONTACT OPEN

CONTACT RATING: 5A AT 250V AC & 0.5A AT 220V DC

SETTING PROCEDURE OF POSITION LIMIT AND TORQUE SWITCH

VALVES	OPEN			CLOSE		
	MAIN	BACK UP	MAIN	BACK UP	MAIN	BACK UP
GATE VALVE OF 100 mm AND ABOVE IN 1500 CL AND ABOVE RATINGS	CLS	OTS *	CLS	OTS	CLS	CTS
ALL OTHER GATE & GLOBE VALVES	CLS	OTS *	CLS	OTS	CLS	CTS
* - CLS NOT TO BE CONNECTED IN TRIP CIRCUIT						
* - BYPASS OTS FOR INITIAL 5% OF TRAVEL (FOR GATE VALVES ONLY)						

TYPE OF PRODUCT ELECTRICAL VALVE ACTUATORS (AC) WITH INTEGRAL STARTERS
OR NAME OF CUSTOMER/PROJECT

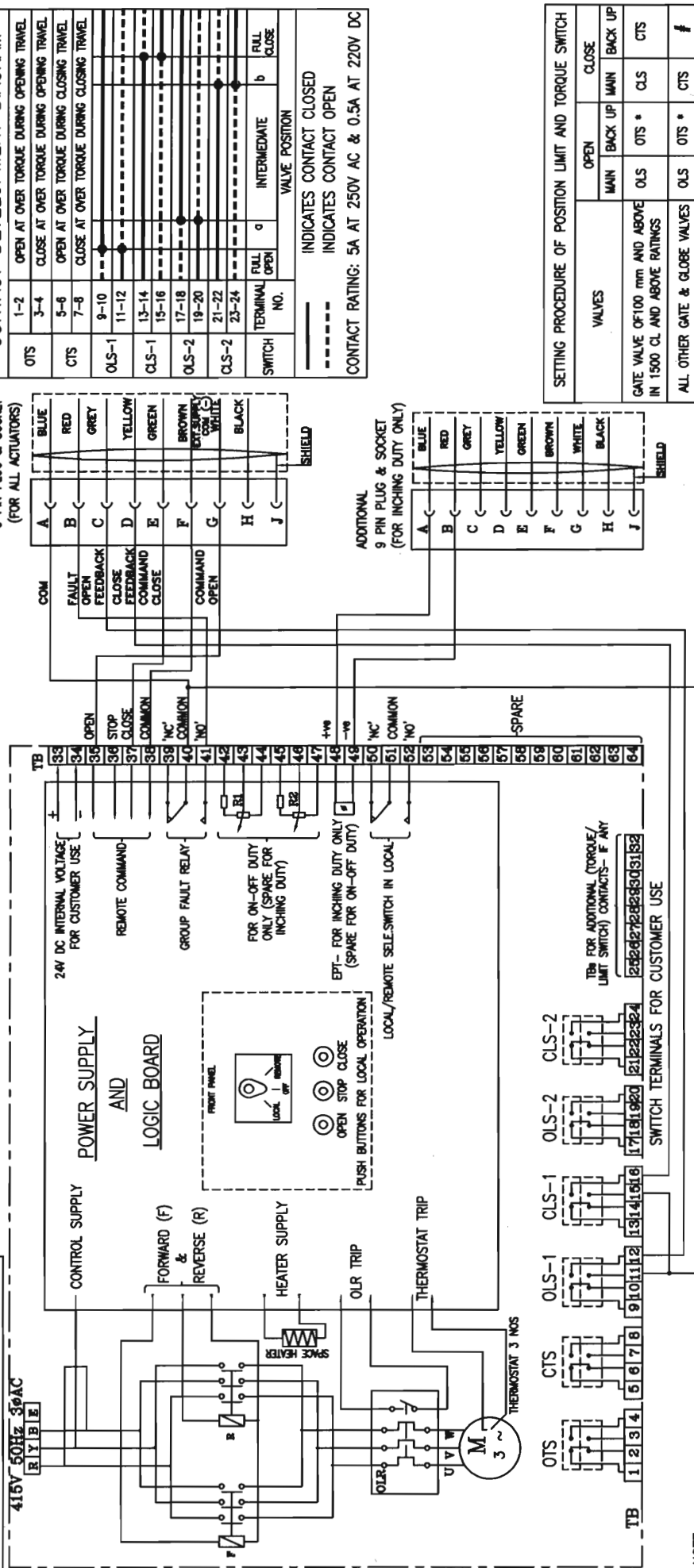


BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT,
THROCKENHALL-880014.

DEPT	VL	SCALE	WEIGHT (KG)	REFERENCE INFORMATION	DATE	NO. OF VAL
365-121					07.10.04	
CODE	REV	SCALE	WEIGHT (KG)	REFERENCE INFORMATION	DATE	NO. OF VAL
					07.10.04	
TITLE	WIRING DIAGRAM (TERMINAL PLAN)	FOR ACTUATOR WITH INTEGRAL STARTER	U 01	DRAWING NO.	REV	
				3-V-MISC-24227	0	

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

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ON ENCLAVE



NOTE:-

1. ALL TORQUE AND LIMIT SWITCHES (OTS, CTS, OLS1&2, CLS1&2) ARE WITH 2NO+2NC CONTACTS '1NO+1NC' IS TERMINATED IN TBS 1-24, REMAINING CONTACTS ARE FOR INTERNAL USE. ANY SPARE CONTACTS WHICH ARE NOT USED INTERNALLY ARE TO BE TERMINATED IN TBS 25-32
2. CTS - TORQUE SWITCHES FOR CW ROTATION (CLOSE)
3. OTS - TORQUE SWITCHES FOR CCW ROTATION (OPEN)
4. OLS-1, OLS-2 - LIMITSWITCHES FOR POSITION OPEN
5. CLS-1, CLS-2 - LIMITSWITCHES FOR POSITION CLOSE
6. EPT - ELECTRONIC POSITION TRANSMITTER (CONTACTLESS TYPE, FOR INCHING DUTY)
7. R1-R2-POTENTIOMETER 2 x 100 OHMS (FOR ON-OFF DUTY)
8. FOR COMMANDS & EPT EITHER INTERNALLY GENERATED 24 VDC OR EXTERNAL SUPPLY OF 24VDC CAN BE USED
9. M - MOTOR 3φ 415V 50 Hz AC SUPPLY
10. TORQUE SWITCH BYPASS WITH LIMITSWITCH BOTH ON OPEN & CLOSE DIRECTION TO BE DONE INTERNALLY.

CONTACT DEVELOPMENT DIAGRAM			
OTS	1-2	OPEN AT OVER TORQUE DURING OPENING TRAVEL	
	3-4	CLOSE AT OVER TORQUE DURING OPENING TRAVEL	
CTS	5-6	OPEN AT OVER TORQUE DURING CLOSING TRAVEL	
	7-8	CLOSE AT OVER TORQUE DURING CLOSING TRAVEL	
OLS-1	9-10		
	11-12		
CLS-1	13-14		
	15-16		
OLS-2	17-18		
	19-20		
CLS-2	21-22		
	23-24		
SWITCH	TERMINAL NO.	VALVE POSITION	
		FULL OPEN	INTERMEDIATE
		FULL CLOSE	

INDICATES CONTACT CLOSED
INDICATES CONTACT OPEN

CONTACT RATING: 5A AT 250V AC & 0.5A AT 220V DC

SETTING PROCEDURE OF POSITION LIMIT AND TORQUE SWITCH			
VALVES	OPEN		CLOSE
	MAIN	BACK UP	BACK UP
GATE VALVE OF 100 mm AND ABOVE IN 1500 CL AND ABOVE RATINGS	OLS	OTS *	CLS
ALL OTHER GATE & GLOBE VALVES	OLS	OTS *	CLS
* - CLS NOT TO BE CONNECTED IN TRIP CIRCUIT			
# - BYPASS OTS FOR INITIAL 5% OF TRAVEL (FOR GATE VALVES ONLY)			

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		ELECTRICAL VALVE ACTUATORS (AC) WITH INTEGRAL STARTERS FOR NTPC PROJECTS (DRAWN FOR INTERMEDIATE POSITION OF VALVES)	
BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT, THEROCHAPALLI-880014.		NAME N.P.ESWAR	SIGN N.P.
DRN CED	DATE 17.03.05	VALR D.DINAKARAN	DATE 17.03.05
APPD KARUNACHALAM	DATE 17.03.05	REFERENCE INFORMATION	
DEPT 365-121	SCALE NTS	WEIGHT (KG)	
CODE			
TITLE	WIRING DIAGRAM (TERMINAL PLAN)		
FOR ACTUATOR WITH INTEGRAL STARTER WITH PLUG & SOCKET FOR NTPC PROJECTS			
CARD CODE U 01	DRAWING NO. 3-V-MISC-24283	REV 0	Size A3

CAUTION: The information in this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

	SPECIFICATION FOR MOTORISED VALVE ACTUATOR STEEL GATE VALVE (WATER SERVICE) FRAMEWORK AGREEMENT		SPECIFICATION NO.: PE-TS-020-145-I007	
			SECTION II	
			REV. NO. 00	DATE: 23.03.2017
			SHEET 1	OF 3
Data Sheet A & B				
DATA SHEET-A (TO BE FILLED BY PURCHASER)			DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	
GENERAL*	* PROJECT	FRAMEWORK AGREEMENT		
	OFFER REFERENCE			
	* TAG NO. SERVICE			
	* DUTY	☒ ON / OFF ☐ INCHING		
	* LINE SIZE (inlet/outlet): MATERIAL	AS PER DATASHEET-A	AS PER DATASHEET-A	
	* VALVE TYPE	☐ GLOBE ☒ GATE ☐ REG. GLOBE ☐ BUTTERFLY		
	* OPENING / CLOSING TIME	AS PER DATASHEET-A	AS PER DATASHEET-A	
	* WORKING PRESSURE			
	AMBIENT CONDITION	SHALL BE SUITABLE FOR CONTINUOUS OPERATION UNDER AN AMBIENT TEMP. OF 0-55 DEG C AND RELATIVE HUMIDITY OF 0-95%.		
	VALVE SEAT TEST PRESS	BIDDER TO SPECIFY		
	REQUIRED VALVE TORQUE	BIDDER TO SPECIFY		
	ACTUATOR RATED TORQUE	BIDDER TO SPECIFY		
CONSTRUCTION AND SIZING	CONSTRUCTION	TOTALLY ENCLOSED, WEATHER PROOF, IP:68		
	MECHANICAL POSITION INDICATOR	TO BE PROVIDED FOR 0-100% TRAVEL		
	BEARINGS	DOUBLE SHIELDED, GREASE LUBRICATED ANTI-FRICTION.		
	GEAR TRAIN FOR LIMIT SWITCH/TORQUE SWITCH OPERATION	METAL (NOT FIBRE GEARS). SELF-LOCKING TO PREVENT DRIFT UNDER TORQUE SWITCH SPRING PRESSURE WHEN MOTOR IS DE-ENERGIZED.		
	SIZING	OPEN/CLOSE AT RATED SPEED AGAINST DESIGNED DIFFERENTIAL PRESSURE AT 85% OF RATED VOLTAGE. FOR ISOLATING SERVICE THREE SUCCESSIVE OPEN-CLOSE OPERATIONS OR 15 MINS. WHICHEVER IS HIGHER.		
HANDWHEEL	* REQUIRED	☒ YES ☐ NO		
	* ORIENTATION	☐ TOP MOUNTED ☐ SIDE MOUNTED		
	*TO DISENGAGE AUTOMATICALLY DURING MOTOR OPERATION.			
ELECTRIC ACTUATOR	ACTUATOR MAKE/MODEL	BIDDER TO SPECIFY		
	MOTOR MAKE / MODEL / TYPE / RATING (KW)	BIDDER TO SPECIFY		
	@MOTOR TYPE	SQUIRREL CAGE INDUCTION MOTOR, STARTING CURRENT LIMITED TO SIX TIMES THE RATED CURRENT- INCLUSIVE OF I.S. TOLERANCE		
	ACTUATOR APPLICABLE WIRING DIAGRAM	☒ ENCLOSED (BIDDER TO CONFIRM) A: ☐ DRG. NO. 3-V-MISC-24227 R00 B: ☐ DRG. NO. 3-V-MISC-24283 R00 THE ABOVE WIRING DIAGRAMS ARE TYPICAL. THE TYPE OF WIRING DIAGRAM WOULD BE DECIDED DURING DETAIL ENGINEERING, SINCE IT IS PROJECT SPECIFIC. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.		
	COLOUR SHADE**	☐ BLUE (RAL 5012) ☐		
	PAINT TYPE (## Refer Notes)	☐ ENAMEL ☒ EPOXY ☐		
	SHAFT RPM	BIDDER TO SPECIFY		
	OLR SET VALUE	BIDDER TO SPECIFY		
	@STARTING / FULL LOAD CURRENT	BIDDER TO SPECIFY		
	NO. OF REV FOR FULL TRAVEL	BIDDER TO SPECIFY		
	@ PWR SUPP TO MTR / STARTER**	415V, 3PH, AC, 3 wire or 4 wire		
	@ CONTROL VOLTAGE REQUIREMENT	TO BE DERIVED FROM THE POWER SUPPLY TO THE STARTER ☐ 230 V ☐ 110 V		

☒ - THIS MEANS APPLICABLE

** IT WOULD BE DECIDED DURING DETAIL ENGINEERING, SINCE IT IS PROJECT SPECIFIC. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.



**SPECIFICATION
FOR
MOTORISED VALVE ACTUATOR
STEEL GATE VALVE (WATER SERVICE)
FRAMEWORK AGREEMENT**

SPECIFICATION NO.: PE-TS-020-145-1007

SECTION II

REV. NO.

00

DATE:

23.03.2017

SHEET

2

OF

3

Data Sheet A & B

DATA SHEET-A
(TO BE FILLED BY PURCHASER)

DATA SHEET-B
(TO BE FILLED-UP BY BIDDER)

	@ ENCLOSURE CLASS OF MOTOR	☒ IP 68 ☐ FLAME PROOF	
	@ INSULATION CLASS	CLASS-F TEMP. RISE LIMITED TO CLASS-B	
	@ WINDING TEMP PROTECTION	☒ THERMOSTAT (3 Nos., 1 IN EACH PHASE) ☐ _____	
	SINGLE PHASE / WRONG PHASE SEQUENCE PROTECTION	REQUIRED	
INTEGRAL STARTER	INTEGRAL STARTER	☒ REQUIRED ☐ NOT REQUIRED	
	TYPE OF SWITCHING DEVICE	☒ CONTACTORS ☐ THYRISTORS	
	TYPE	☒ CONVENTIONAL ☐ SMART (NON-INTRUSIVE)	
	IF SMART		
	— a) SERIAL LINK INTERFACE	☐ INTEGRAL ☐ FIELD MOUNTED	
	— b) SERIAL LINK PROTOCOL	☐ FOUNDATION FIELD BUS ☐ PROFI BUS ☐ DEVICE NET ☐ _____	
	— c) SERIAL LINK MEDIA	☐ TWISTED PAIR Cu CBL ☐ CO AXIAL Cu CBL ☐ OFC	
	— d) HAND HELD PROGRAMMER	☐ REQUIRED ☐ NOT REQUIRED	
	— e) TYPE OF HAND HELD PROGRAMMER	☐ BLUETOOTH ☐ INFRARED ☐ _____	
	— f) MASTER STATION	☐ REQUIRED ☐ NOT REQUIRED	
	— g) MASTER STN INTERFACE WITH DCS	☐ MODBUS ☐ TCP/IP	
	— h) DETAILS OF SPECIAL CABLE	☐ ENCLOSED ☐ NOT REQUIRED	
	STEP DOWN CONT. TRANSFORMER	☒ REQUIRED	
	OPEN / CLOSE PB	☒ REQUIRED ☐ NOT REQUIRED	
	STOP PB	☒ REQUIRED ☐ NOT REQUIRED	
	INDICATING LAMPS	☒ REQUIRED ☐ NOT REQUIRED	
	LOCAL REMOTE S/S	☒ REQUIRED ☐ NOT REQUIRED	
	STATUS CONTACTS FOR MONITORING	☒ REQUIRED ☐ NOT REQUIRED	
	INTEGRAL STARTER DISTURBED SIGNAL	REQUIRED (MOTOR THERMOSTAT TRIP, O/L RELAY OPERATED, CONT./POWER SUPPLY FAILED, PHASE LOSS, S/S IN LOCAL or OFF MODE, STOP PB OPTD, TORQUE OPEN/CLOSE CUTOFF)	
	INTERPOSING RELAY/OPTO COUPLER (Applicable for integral Starter)	TYPE OF ISOLATING DEVICE**	☐ INTERPOSING RELAY ☐ OPTO COUPLER ☒ EITHER TO BE DECIDED
QUANTITY		☒ 2 NOs. ☐ 3 NOs.	
DRIVING VOLTAGE		☒ 20.5 – 24V DC ☐ _____ V DC	
DRIVING CURRENT		☒ 125mA MAX ☐ _____ mA MAX	
LOAD RESISTANCE		☒ > 192 ohms - <25 k ohms ☐ > _____ ohms - < _____ ohms	
TORQUE SWITCH (Not Applicable for Smart Actuator) (\$\$ Refer Notes)	MFR & MODEL NO.	BIDDER TO SPECIFY	
	OPEN / CLOSE	☒ 1 No. ☐ 2Nos. / ☒ 1 No. ☐ 2Nos	
	CONTACT TYPE	2 NO + 2 NC	
	RATING	5A 240V AC AND 0.5A 220V DC	
	CALIBRATED KNOBS(OPEN&CLOSE TS)	REQUIRED FOR SETTING DESIRED TORQUE	
	ACCURACY	+3% OF SET VALUE	
LIMIT SWITCH (Not Applicable for Smart Actuator) (\$\$ Refer Notes)	MFR & MODEL NO.	BIDDER TO SPECIFY	
	OPEN : INT : CLOSE	☒ 1 No. ☐ 2 Nos.	2 Nos. (ADJ.) ☒ 1 No. ☐ 2Nos.
	CONTACT TYPE	2 NO + 2 NC	
	RATING (AC / DC)	5A 240V AC AND 0.5A 220V DC	

■ - THIS MEANS APPLICABLE

** IT WOULD BE DECIDED DURING DETAIL ENGINEERING, SINCE IT IS PROJECT SPECIFIC. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.

	SPECIFICATION FOR MOTORISED VALVE ACTUATOR STEEL GATE VALVE (WATER SERVICE) FRAMEWORK AGREEMENT		SPECIFICATION NO.: PE-TS-020-145-1007	
			SECTION II	
			REV. NO. 00	DATE: 23.03.2017
			SHEET 3	OF 3
Data Sheet A & B				
DATA SHEET-A (TO BE FILLED BY PURCHASER)			DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	

POSITION TRANSMITTER	POSITION TRANSMITTER (For inching duty & other specific applications)	☒ REQUIRED ☐ NOT REQUIRED	
	MFR & MODEL NO.	BIDDER TO SPECIFY	
	TYPE	☐ ELECTRONIC (2 WIRE) R/I CONVERTER ☒ ELECTRONIC (2 WIRE) CONTACTLESS	
	SUPPLY	☒ 24V DC ☐	
	OUTPUT	☒ 4-20mA	
	ACCURACY	$\pm 1\%$ FS	
SPACE HEATER	@SPACE HEATER	REQUIRED	
	@ POWER SUPPLY (NON INTEGRAL)	230V AC, 1 PH., 50 Hz	
	@ POWER SUPPLY (INTEGRAL)	BIDDER TO SPECIFY	
	@ RATING		
TERMINAL BOX	ACTUATOR/MOTOR TERMINAL BOX	REQUIRED	
	ENCL CLASS ACTUATOR/MOTOR T.B.	@ ☒ IP 68 @ ☐	
	@ EARTHING TERMINAL	REQUIRED	
	PLUG & SOCKET** (FOR COMM, LS/TS FEED BACK, PoT)	☐ REQUIRED ☐ NOT REQUIRED ☐ 2 NOS. ☐	
CABLE GLANDS	@ POWER CABLE GLAND	SIZE AND NOS. ARE PROJECT SPECIFIC AND WILL BE INFORMED LATER. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.	
	@ SPACE HEATER CABLE GLAND		
	OTHER CONTROL CABLE GLANDS-1		
	OTHER CONTROL CABLE GLANDS-2		
WEIGHT	TOTAL WEIGHT (ACTUATOR + ACCESSORIES)	BIDDER TO SPECIFY	_____ Kg.

NOTES:

- SCOPE:** DESIGN, MANUFACTURE, INSPECTION, TESTING AND DELIVERY TO SITE OF ELECTRIC ACTUATOR FOR INCHING OR OPEN / CLOSE DUTY.
- CODES & STANDARDS:** DESIGN AND MATERIALS USED SHALL COMPLY WITH THE RELEVANT LATEST NATIONAL AND INTERNATIONAL STANDARD. AS A MINIMUM, THE FOLLOWING STANDARDS SHALL BE COMPLIED WITH: IS-9334, IS-2147, IS-2148, IS-325, IS-2959, IS-4691 AND IS-4722
- TEMPERATURE RISE SHALL BE RESTRICTED TO 70 DEG. C FOR AMBIENT TEMPERATURE OF 50 DEG C.
- CABLE GLANDS OF DOUBLE COMPRESSION TYPE, BRASS MATERIAL SHALL BE PROVIDED.
- THE TORQUE SWITCHES SHALL BE PROVIDED WITH MECHANICAL LATCHING DEVICE TO PREVENT OPERATION WHEN UNSEATING FROM THE END POSITIONS. THE LATCHING DEVICE SHALL UNLATCH AS SOON AS THE VALVE LEAVES THE END POSITION. IF SUCH PROVISION IS NOT POSSIBLE, THE TORQUE SWITCHES SHALL BE BYPASSED BY END-POSITION LIMIT SWITCHES WHICH OPENS ON VALVE LEAVING END POSITION. THESE LIMIT SWITCHES ARE ADDITIONAL TO THE NUMBER OF LIMIT SWITCHES SPECIFIED ELSEWHERE.
- THE MOTOR SHALL OPERATE SATISFACTORILY UNDER THE $\pm 10\%$ SUPPLY VOLTAGE VARIATION AT RATED FREQUENCY, -5% TO $+3\%$ VARIATION IN FREQUENCY AT RATED SUPPLY VOLTAGE, SIMULTANEOUS VARIATION IN VOLTAGE & FREQUENCY THE SUM OF ABSOLUTE PERCENTAGE NOT EXCEEDING 10%.
- THE MOTOR SHALL BE SUITABLE FOR DIRECT ON LINE STARTING.
- ACTUATOR SHALL HAVE HARDWIRED CONTACTS FOR FOLLOWING SIGNALS (a) ACTUATOR IN LOCAL MODE (b) ACTUATOR IN REMOTE MODE
- 2 No. OF EARTHING TERMINALS SHALL BE PROVIDED FOR THE MOTOR BODY EARTHING.

\$\$ TORQUE SWITCH & LIMIT SWITCH SHALL ACT INDEPENDENT OF EACH OTHER. TANDEM OPERATION IS NOT ACCEPTABLE.

NOTES* = TO BE FILLED BY MPL (LEAD AGENCY). @ = TO BE FILLED BY ES

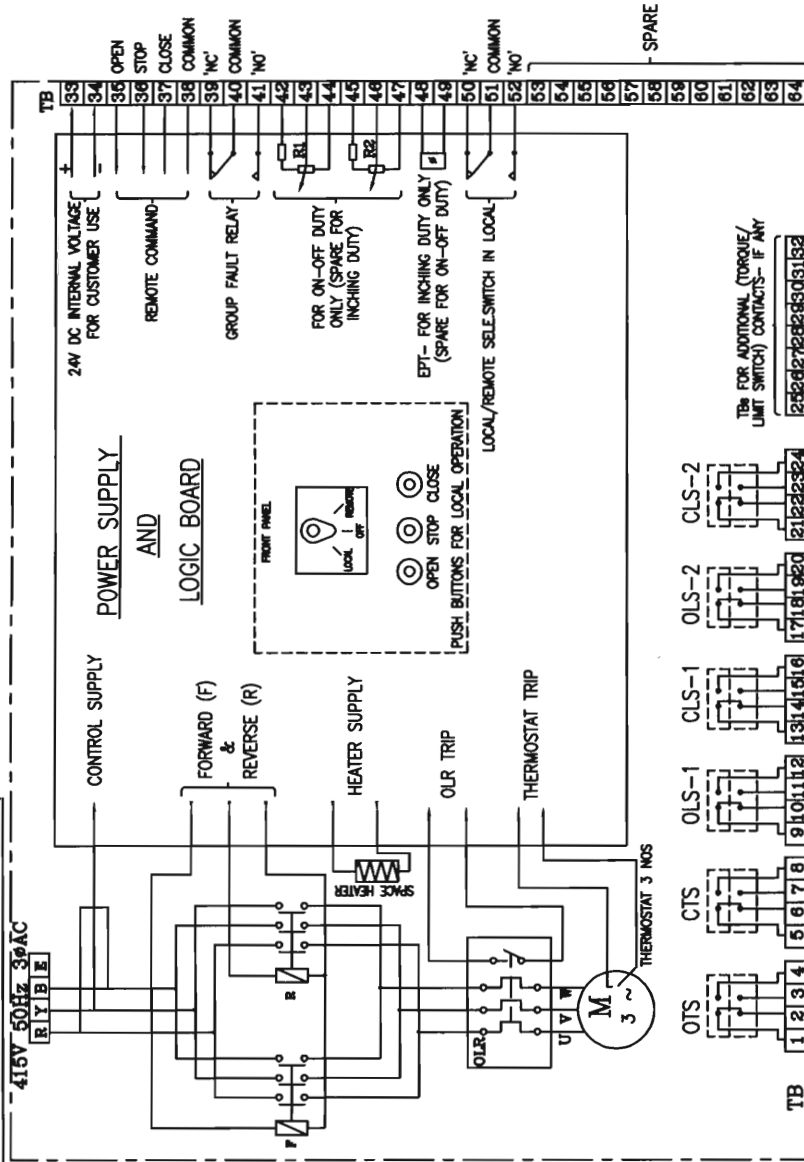
☒ - THIS MEANS APPLICABLE

** IT WOULD BE DECIDED DURING DETAIL ENGINEERING, SINCE IT IS PROJECT SPECIFIC. HOWEVER, NO COST IMPLICATION SHALL BE ENTERTAINED.

ALL DIMENSIONS ARE IN MILLIMETRES. FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP / QP.

3-V-MISC-24227

ON DRAWING



SWITCH TERMINALS FOR CUSTOMER USE

NOTE:-

1. ALL TORQUE AND LIMIT SWITCHES (OTS, CTS, OLS1&2, CLS1&2) ARE WITH 2NO+2NC CONTACTS '1NO+1NC' IS TERMINATED IN TBS 1-24, REMAINING CONTACTS ARE FOR INTERNAL USE.
2. ANY SPARE CONTACTS WHICH ARE NOT USED INTERNALLY ARE TO BE TERMINATED IN TBS 25-32
3. CTS - TORQUE SWITCHES FOR CW ROTATION (CLOSE)
4. OLS - TORQUE SWITCHES FOR CCW ROTATION (OPEN)
5. OLS-1, OLS-2 - LIMITSWITCHES FOR POSITION OPEN
6. CLS-1, CLS-2 - LIMITSWITCHES FOR POSITION CLOSE
7. EPT - ELECTRONIC POSITION TRANSMITTER (POTENTIOMETRIC TYPE, FOR INCHING DUTY)
8. R1-R2-POTENTIOMETER 2 x 100 OHMS (FOR ON-OFF DUTY)
9. FOR COMMANDS & EPT EITHER INTERNALLY GENERATED 24 VDC OR EXTERNAL SUPPLY OF 24VDC CAN BE USED
10. M - MOTOR 3 ϕ 415V 50 Hz AC SUPPLY

CONTACT DEVELOPMENT DIAGRAM

OTS	1-2		OPEN AT OVER TORQUE DURING OPENING TRAVEL	
	3-4		CLOSE AT OVER TORQUE DURING OPENING TRAVEL	
CTS	5-6		OPEN AT OVER TORQUE DURING CLOSING TRAVEL	
	7-8		CLOSE AT OVER TORQUE DURING CLOSING TRAVEL	
OLS-1	9-10		◆	
	11-12		◆	
CLS-1	13-14			◆
	15-16			
OLS-2	17-18		◆	
	19-20		◆	
CLS-2	21-22			◆
	23-24			◆
SWITCH	TERMINAL NO.		VALVE POSITION	
	FULL OPEN		INTERMEDIATE b FULL CLOSE	

DRAWING NO. 3-V-MISC-24283



- | | | |
|------|------|-----------------------|
| REV# | DATE | ALTERED
CED & APPD |
|------|------|-----------------------|
1. ALL TORQUE AND LIMIT SWITCHES (OTS,CTS,OLS1&2, CLS1&2) ARE WITH 2NO+2NC CONTACTS '1NO+1NC' IS TERMINATED IN TBS 1-24, REMAINING CONTACTS ARE FOR INTERNAL USE.
ANY SPARE CONTACTS WHICH ARE NOT USED INTERNALLY ARE TO BE TERMINATED IN TBS 25-32
 2. CTS - TORQUE SWITCHES FOR CW ROTATION (CLOSE)
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 4. OLS-1, OLS-2 - LIMITSWITCHES FOR POSITION OPEN
 5. CLS-1, CLS-2 - LIMITSWITCHES FOR POSITION CLOSE
 6. EPT - ELECTRONIC POSITION TRANSMITTER
(CONTACTLESS TYPE, FOR INCHING DUTY)
 7. R1-R2-POTENTIOMETER 2 x 100 OHMS (FOR ON-OFF DUTY)
 8. FOR COMMANDS & EPT EITHER INTERNALLY GENERATED 24 VDC OR EXTERNAL SUPPLY OF 24VDC CAN BE USED
 9. M - MOTOR 3ø 415V 50 Hz AC SUPPLY
 10. TORQUE SWITCH BYPASS WITH LIMITSWITCH BOTH ON OPEN & CLOSE DIRECTION TO BE DONE INTERNALLY.

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT				ELECTRICAL VALVE ACTUATORS (AC) WITH INTEGRAL STARTERS FOR NTPC PROJECTS (DRAWN FOR INTERMEDIATE POSITION OF VALVES)													
365-121				BHARAT HEAVY ELECTRICALS LTD., HIGH PRESSURE BOILER PLANT. UNIT: THERCOBAPALL-680014.				DBN CHD		NAME N.P.ESWAR D.DINAKARAN		SIGN N.P D.D		DATE 17.03.05 17.03.05		NO. OF VAR.	
DEPT CODE		-				SCALE NTS		WEIGHT (KG).		APPD KARUNACHALAM		REFERENCE INFORMATION				NO. OF THUMB	
TITLE				WIRING DIAGRAM (TERMINAL PLAN) FOR ACTUATOR WITH INTEGRAL STARTER WITH PLUG & SOCKET FOR NTPC PROJECTS								DRAWING NO.				REV	
												3-V-MISC-24283				0	

Size A3

	COMPLIANCE SHEET STEEL GATE/GLOBE/NRV- WATER SERVICE	SPECIFICATION NO. PE-TS-020-100-M016	
		SECTION : II	
		REV. NO.: 00	DATE: 23.03.2017
		Sheet 1 of 1	

A. I hereby comply/not comply (*) to all the requirements of this technical specification in totality.

In case the bidder does not comply to the technical specification, the deviations shall be explicitly listed in the technical deviation sheet of GCC. Deviations listed in technical deviation sheet shall only be considered.

**B. Specify DUPLEX SS grade for items at Sl. No. 12 to 17 of Data Sheet-A.
 (*- THE BIDDER SHALL PROVIDE VALVES WITH THE SAME OR SUPERIOR GRADE DURING CONTRACT STAGE)**

Name of Bidder / Authorized Representative :-

Designation :-

Signature :-

Company Seal :-

Date :-

ANNEXURE-II: DEVIATION SHEET (COST OF WITHDRAWAL)**PROJECT:-****PACKAGE:-****TENDER ENQUIRY REFERENCE:-****NAME OF VENDOR:-**

SL NO	VOULME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION/ TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF WITHDRAWAL OF DEVIATION	REFERENCE OF PRICE SCHEDULE ON WHICH COST OF WITHDRAWAL OF DEVIATION IS APPLICABLE	NATURE OF COST OF WITHDRAWAL OF DEVIATION (POSITIVE/ NEGATIVE)	REASON FOR QUOTING DEVIATION
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TECHNICAL DEVIATIONS

COMMERCIAL DEVIATIONS

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATIONS	SIGN & DATE	
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NOTES:

- For self manufactured items of bidder, cost of withdrawal of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
- For directly dispatchable items, cost of withdrawal of deviation will be applicable on the basic price including taxes, duties & freight.
- All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
- Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
- Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawal of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable.
- Bidder shall furnish price copy of above format along with price bid.
- The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
- Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
- For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawal of deviation loading as per Annexure-VIII of GCC, Rev-06 will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawal of deviation shall be taken as NIL.
- Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.
- All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
- Cost of withdrawal is to be given separately for each deviation. In no event bidder should club cost of withdrawal of more than one deviation else cost of withdrawal of such deviations which have been clubbed together shall be considered as NIL.
- In case nature of cost of withdrawal (positive/negative) is not specified it shall be assumed as positive.
- In case of discrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited ¹ (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) having its registered office at _____ ² hereinafter referred to as the 'Contractor/Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (hereinafter called the 'Contract') and the Contractor having agreed to provide a Contract Performance Guarantee, equivalent to% (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we,, (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount Rs ----- (Rupees -----) without any demur, immediately on a demand from the Employer, .

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/ Supplier in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the contractors/supplier shall have no claim against us for making such payment.

We thebank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall remain in force upto and including.....⁶ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the⁷we shall be discharged from all liabilities under this guarantee thereafter.

We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed.....⁸
- b) This Guarantee shall be valid up to⁹
- c) Unless the Bank is served a written claim or demand on or before¹⁰ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Dated.....

Place of Issue.....

¹ NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ PROJECT/SUPPLY DETAILS

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

⁸ BG AMOUNT IN FIGURES AND WORDS.

⁹ VALIDITY DATE

¹⁰ DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 2/3 months after validity date.
2. In Case of Bank Guarantees submitted by Foreign Vendors-
 - a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
 - b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 **In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank** (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.
 - b.4 The BG should clearly specify that the demand or other document can be presented in electronic form.