Pre-Qualification Requirements (PQR) to be met by New Vendors applying for registration for supply of Oil Throttle valves to Bharat Heavy Electricals Limited, Haridwar	Doc. No.: 4-11923-V8800 Rev00

A. For description of Oil Throttle Valves vendor shall refer document no. 4-11939-V8801.

B. ACCEPTANCE CRITERION FOR VENDOR for Oil Throttle Valve

1. Vendor should have experience of manufacturing, testing and supply of Oil Throttle valve, along with its flushing operation components, to **atleast three units** of power-plants[$] in a period of 7 years prior to applying in BHEL (i.e. Purchase Order shall be on or after 01.01.2015). For the said experience, the valves should have been used to perform the function of regulating lube oil flow to individual bearings of turbine-generator set and where all three units of power-plant have been commissioned/achieved-full-load as on date of issue of enquiry.

   [$] a power plant is defined as a steam/gas/nuclear power plant of rating ≥ 200MW

2. Vendor shall furnish its experience in Table-2 which satisfies the requirement in clause-1 above. However, for any two POs mentioned in Table-2 by vendor, vendor shall furnish following documents:-
   a. Customer/end-customer approved GA drawing/documents of Oil Throttle Valves along with docs of flushing operation components and characteristic curve.
   b. unpriced purchase orders.
   c. Dimensional check report.
   d. Acceptance certificate/ despatch documents

TABLE-2 (Vendor to fill this table and submit alongwith application)

Sl. No.	Item	Minimum acceptance Criteria	Data for 1st unit/ project	Data for 2nd unit/ project	Data for 3rd unit/ project
1	Whether the Oil Throttle Valve type is Globe type as per doc. 4-11939-V8801	YES			
2	Project Name with Rating in MW	≥ 200MW			
3	End customer Name				
4	Whether valve was manufactured at vendor's works	YES			
5	Whether valve was tested at vendor's works	YES			
6	Whether valve was supplied by vendor directly	YES			
7	Whether the Flushing Operation Components of Oil Throttle Valve is as per doc. 4-11939-V8801	YES			
8	PO No. and PO Date	PO date on or after 01.01.2015			
9	Whether the application of valve is regulating lube oil flow to turbine-generator bearings	YES			
10	Fluid	Oil			
11	Date of Commissioning/achieving full load of power-plant	On or before date of issuing of enquiry by BHEL			
12	Range of Flow in throttle valve in l/s				

13	Telephone numbers & Email IDs of End user/Customer				

NOTE:-

1. BHEL reserves the right to verify the information submitted by vendor. Submission of false/incorrect information shall lead to rejection of offer and shall be taken seriously by BHEL.
2. BHEL reserves the right to ask for more pertinent information /documents / clarifications. Vendor shall provide this information to BHEL in a timely manner so that project schedule doesnot hamper.
3. All the documents furnished to BHEL shall be in English language only. If the documents are not in English, then they must be accompanied with duly certified English translations of the same.
4. BHEL may visit the factory premises of the vendor for verification and other purposes, cost of which shall be borne by BHEL.
5. In case the vendor meets the acceptance criterion mentioned in this document, other technical details of these valves shall be furnished to them after signing of Non-Disclosure Agreement (NDA) or similar document between vendor and BHEL.
6. The responsibility for correct supply of item (as per BHEL spec) and correct functioning of item at BHEL site rests with item supplier. For this it is supplier's responsibility to understand BHEL's technical requirements completely.

25/4/22
Hardeep Singh Dogra
Mgr (STE-TL)

25/4/22
Sr. Manager (STE-TL)
Sh. Dhruv. Garg

25/4/22
SDGM (STE-TL)
Sh. Anuj Jain

Description of Oil Throttle Valve:-

Oil throttle valves are installed in lube oil supply line to turbine-generator bearings for regulating the flow of oil to each bearing of Steam Turbine & Generators.

Type of Valve: Globe Type. The plug of Oil Throttle valve is cylindrical is shape with openings cut into it across the length. The regulation of oil flow is achieved by rotating its stem. The stem has threads (counter-threads are in valve cover). When the stem is rotated, it moves up and down. Due to this up and down movement of stem and hence plug, the flow area available to fluid changes which allows for flow regulation.

Characteristic curves of the Valves are also to be supplied by valve supplier to BHEL. These curves are at different differential-pressures (ΔP) wherein valve opening (also known as piston travel) is shown in X-axis and flow is shown in Y-axis. These are also called as flow-lift characteristics. Characteristic curves are required for ΔP varying between 0.50bar to 3 bar. These curves are obtained by actual testing of the valve prototype. For illustration, refer Fig. 3.

Table 1: Technical Parameters

Sl. No.	Description	Value
1	Working Pressure	4 bar
2	Design pressure	8 bar
3	End Connection	Butt weld with pipe schedule 10S ASME B16.25-2003 Weld fig. 4
4	Working Fluid	Turbine Oil ISO VG46
5	Working temperature	50deg C
6	Max. Temperature	80deg C
7	Material of Construction (All parts in contact with oil)	SS Gr. 316L or 321 or equivalent
8	Mat. Of Construction (Gaskets/Orings etc)	Viton

For the purpose of this category in Gem Portal enquiry the above mentioned valve type and description is meant/defined and is to be understood/supplied by vendor. Other types of Oil Throttles like butterfly valves, disc valves, needle valves etc are not meant and not to be understood. Refer Figure 1 for Oil Throttle Valve.

The "flushing operation" is also supplied along with the valve for declaration of flushing in each individual line going to Turbine and Generator bearings. These are components which are used in flushing of the lube oil. Parts of flushing operation include flushing strainer, pin extractor, gaskets, flange, etc. Refer Figure 2 for Flushing Operation.

Some of the technical details of the valves required by BHEL are mentioned below:-

1. Range of flow, range of travel and range of differential pressure are mentioned in Table-1. Each throttle valve of a particular size shall work for the full range of differential pressure, flow & travel indicated in Table-1 against it. Eg. Nb50 valve shall work for range of oil flow from 0-80 m3/hr with range of travel from 0 -45 mm at different differential pressures ranging from 0.50-3.0 bar
2. The flushing operation as indicated in Figure -2 must be of basket type lined mesh stainless steel screen. Mesh size is 185 microns. The screen of strainer should be sandwiched between two perforated sheets.

Table-1: Overview of range of flow and range of piston travel of Oil Throttle Valve

	Valve size(Nb20)	Valve size(Nb25)	Valve size(Nb50)	Valve size(Nb65)	Valve size(Nb80)
Range of Oil flow (m3/hr).	0-18	0-18	0 - 80	0 - 100	0 - 150
Range of Travel of piston (mm)	0-25	0-25	0 - 45	0 - 48	0 - 62
Range of differential pressure across Oil Throttle Valve (bar)	0.50 – 3.0				

Note: This data gives only a general overview. This is not project specific data. For actual project specific value, refer project specific specification.

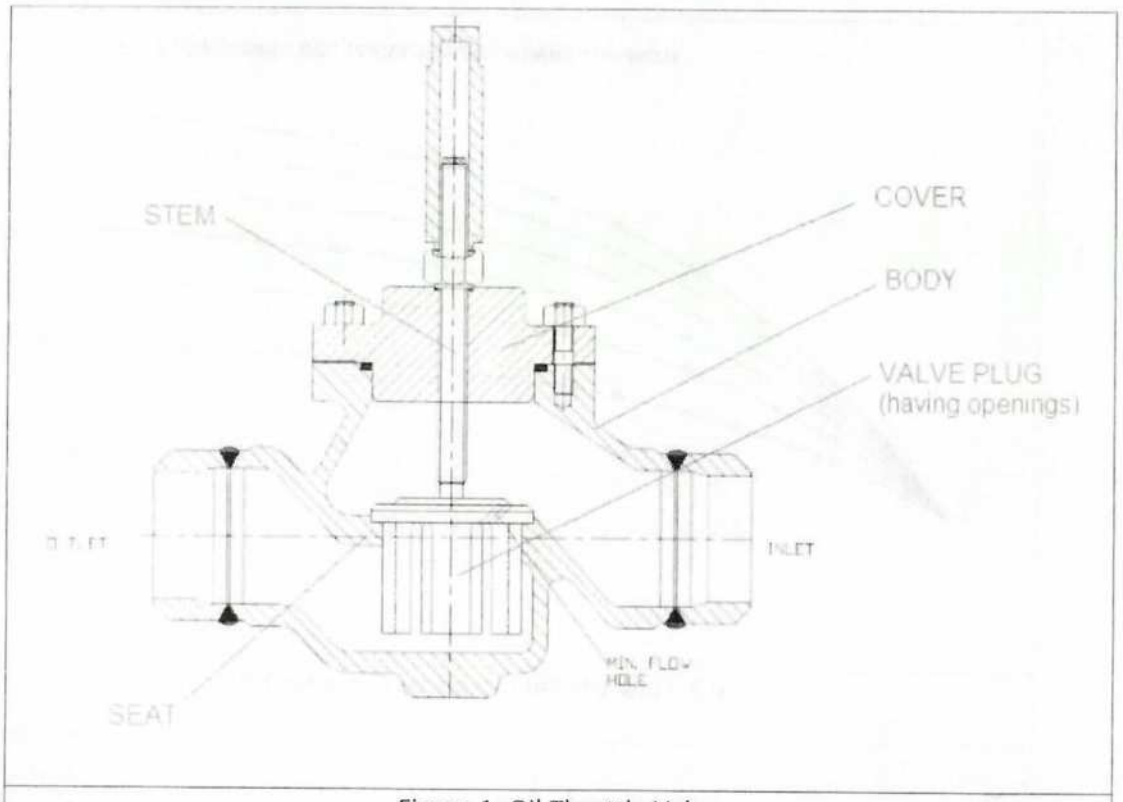


Figure 1: Oil Throttle Valve

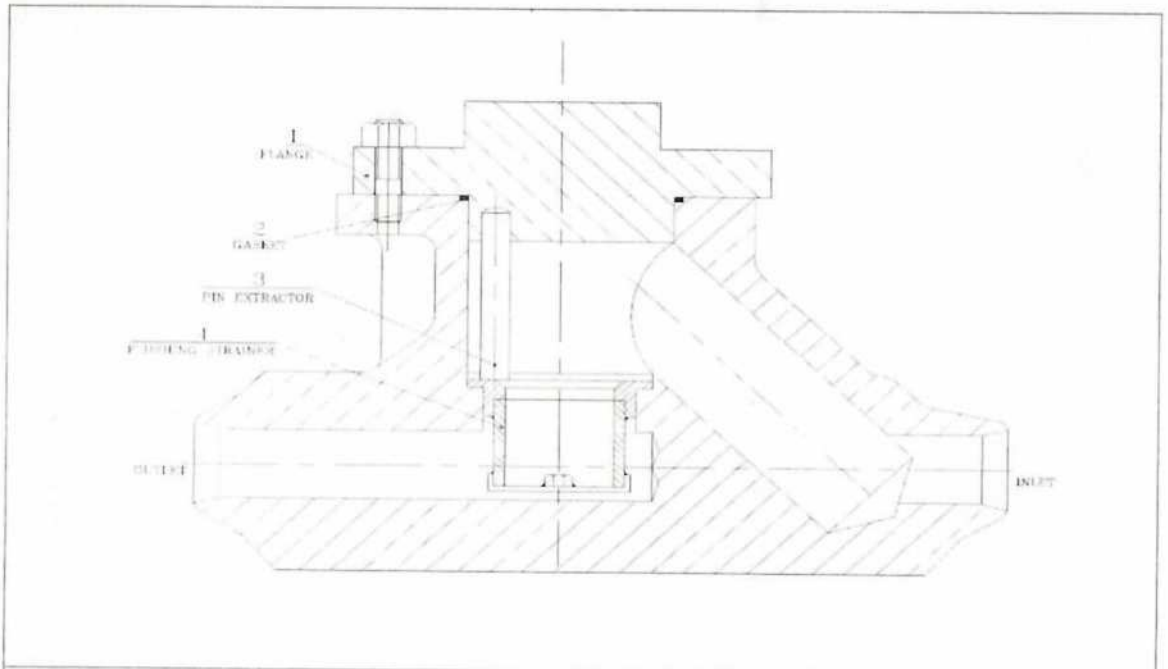


Figure 2: Flushing Operation Components

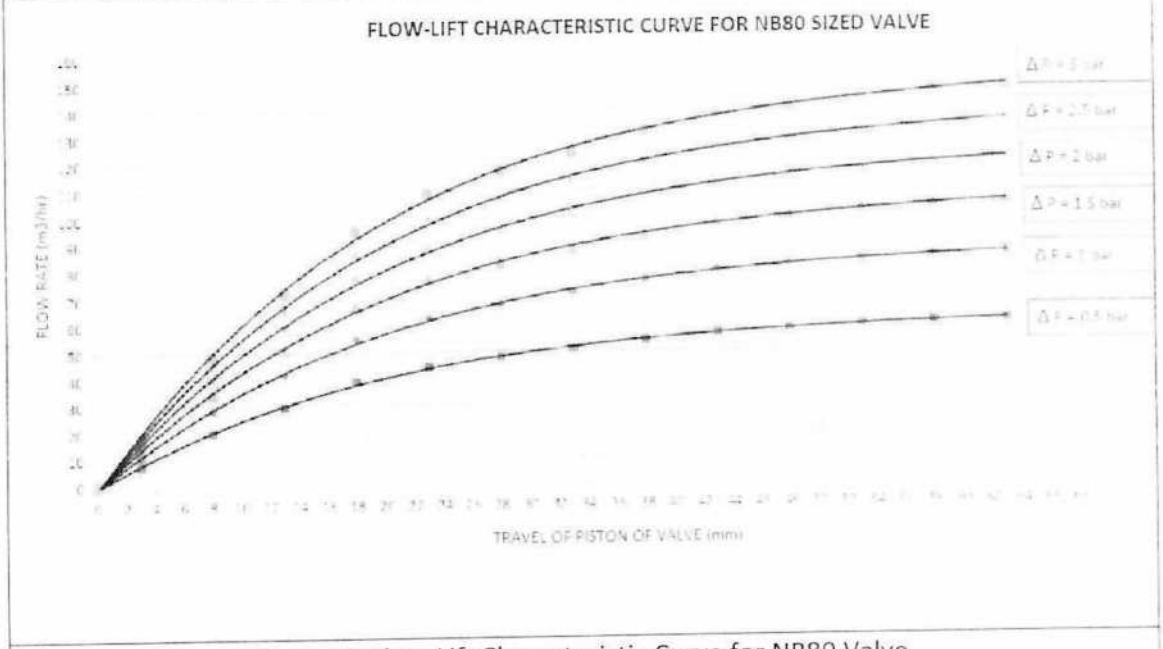


Figure 3: Flow-Lift Characteristic Curve for NB80 Valve

	PPX-BOI DEPARTMENT **BHARAT HEAVY ELECTRICALS LIMITED** **HEEP: HARDWAR-249 403 (Uttarakhand)**	**BHEL ref. No.: B/4066/2020/0026** **Package: Oil Throttle Valve** **Project: 2X660MW Khurja,1X660 MW Sagardighi, 3X800MW Patratu & 2X660MW Udangidi Projects.**

Material Details and Instruction to Bidders

E-PROCUREMENT: Please note that this tender enquiry has been issued through BHEL's e-procurement portal developed by NIC (https://eprocurebhel.co.in/), hence PAPER BID or BID THROUGH e-MAIL SHALL NOT BE ENTERTAINED FOR THIS TENDER. Please upload your bid in BHEL's e-procurement portal developed by NIC (https://eprocurebhel.co.in/).

1. SCOPE OF ENQUIRY

E-bids on NIC portal are invited from bidders for the supply of Oil Throttle Valves for 2X660MW Khurja,1X660 MW Sagardighi, 3X800MW Patratu & 2X660MW Udangidi Projects, as per requirement mentioned below:

Sl. no.	Project	Ref. No.	Item Description	Qty.	Lot	Delivery
1	2x660 MW Khurja	20200026	Mat code: W90311923267: DRG: 411923V8000 REV:00, OIL THROTTLE VALVE AS PER DOCUMENT AND DRGS. MENTIONED IN DOCUMENT NO. 4-11923-V8000	2 ST	Lot-1 Qty. 1 ST Lot-2 Qty. 1 ST	30/09/2022 30/10/2022
			Mat code: W99311923010: OIL THROTTLE VALVE OF SIZE NB80 WITH FLOW EQUAL TO FLOW APPLICABLE FOR THE PROJECT. VALVE SHALL BE SUPPLIED WITHOUT FLUSHING PART SIZE: NB80	4 Nos	Lot-3 Qty. 4 Nos.	03/04/2023
2	SAGARDIGHI UNIT-5:	20204815	Mat. Code: W90311923267: DRG: 411923V8000 REV:00, OIL THROTTLE VALVE AS PER DOCUMENT AND DRGS. MENTIONED IN DOCUMENT NO. 4-11923-V8000	1 ST	Lot-1 Qty. 1 ST	31/01/2023
			Mat code: W99311923028: DRG: 411923J1010 REV:00, OIL THROTTLE VALVE SPARES AS PER DOCUMENT AND DRGS. MENTIONED IN DOC. NO. 4-11923-J1010	1 ST	Lot-1 Qty. 1 ST	10/09/2023
3	3X800MW Patratu STPP	20190924	Mat Code: W90311923232: DRG: 411923S5000 REV:00, OIL THROTTLE VALVES AS PER DOCUMENT AND DRGS. MENTIONED IN DOCUMENT NO. 4-11923-S5000	3 ST	Lot-1 Qty. 1 ST Lot-1 Qty. 1 ST Lot-1 Qty. 1 ST	30/09/2022 30/10/2022 30/04/2023
4	2X660 MW Udangudi	20190924	Mat code: W90311923240: DRG: 411923W4000 REV:00, OIL THROTTLE VALVES AS PER DOCUMENT AND DRGS. MENTIONED IN DOCUMENT NO. 4-11923-W4000	2 ST	Lot-1 Qty. 1 ST Lot-1 Qty. 1 ST	30/10/2022 30/12/2022

2. Project Detail:

Project Name & Address	**2X660MW Khurja-1 &2** GENERAL MANAGER(PROJECTS) KHURJA STPP,THDC INDIA LIMITED, DIST- BULANDSAHAR, UTTAR PRADESH, PIN-203131
	1X660 MW Sagardighi STPP Deputy General Manager (I/C-Projects) Sagardighi Thermal Power Projects , P.O.-Manigram, Dist. Murshidabad PIN-742237, West Bengal, India
	SE/ PROJECTS 2X660MW UDANGUDI STPP STAGE-I TAMIL NADU GEN. & DIST. CORP. UDANGUDI, THOOTHUKUDI-628215, TAMIL NADU STATE
	3X800MW PATRATU UNIT-1, 2&3 GENERAL MANAGER(PROJ.),PATRATU STPP (3X800 MW), PATRATU VIDYUT UTPADAN NIGAM LTD. P.O.-PTPS, DIST- RAMGARH, JHARKHAND-829119

3. EARNEST MONEY DEPOSIT (EMD)

3.1 Interested vendors must submit their e-bid along with the proof of submission of following Earnest Money Deposit (EMD) details in BHEL's e-procurement portal.

Details	Amount In INR	Type
EMD	INR 2,00,000/- (INR Two Lacs)	Refundable

3.2 The EMD should be submitted in the form of demand draft / Pay Order/ Cash (as permissible under Income Tax Act). The Drafts shall be drawn in favor of "BHEL Hardwar". E- payment is also acceptable. For E-Payment, the RTGS details are as mentioned below:

Bank Details	SWIFT Details of bank	Contact Details of Banker
STATE BANK OF INDIA RANIPUR BRANCH, OPP: BHEL MAIN GATE, SECTOR-5, RANIPUR, HARIDWAR, UTTRAKHAND, INDIA PIN CODE : 249403	SWIFT NO : SBININBB225 CC ACCOUNT NO : 10667995458 IFSC CODE : SBIN0000586	Contact No. +91 1334 224201 +91 1334 226125 Fax:+91 1334 226512

Proof of EMD submission details must be uploaded on the e-procurement portal.

If EMD shall be submitted in the form of demand draft / Pay Order the same may be sent to following address

To,
THE HEAD OF MATERIAL MANAGEMENT,
Heavy Electrical Equipment Plant,
Bharat Heavy Electricals Limited,
Haridwar-249403 (Uttarakhand), India.

3.3 Bidders already registered at BHEL Hardwar (i.e. PMD Vendors) for this package are exempted from submission of EMD.

3.4 MSE suppliers /State Government PSU/Central Government PSU are exempted for submission of EMD. Micro and Small Enterprises (Registered under SSI, NSIC, Khadi Board, DIC etc.) are also exempted from submission of EMD.

"MSE Suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed at annexure-1 where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part-I bid). Non-submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents is found or the requisite documents are not submitted before price bid opening. The above require document are to be uploaded on the e-procurement portal. Documents should be notarized or attested by a Gazette officer."

3.5 It is clarified that benefits of MSE (such as EMD Waiver, Tender fee exemption, Price preference, Payment preference etc.) will be given only to those MSE Vendors who are manufacturers of offered items against the NIT. No MSE benefits shall be provided to Agents/Stockiest/Dealers/Traders etc. for the items offered but not manufactured by themselves.

3.6 The bidder whose bid is technically not accepted will be informed & EMD wherever submitted shall be refunded after the finalization of the contract. EMD shall be forfeited in the event of bidder opting out after tender opening within validity of offer.

4. PRE-QUALIFICATION REQUIREMENT (PQR)

The Pre-Qualification Requirements have been compiled and placed at <u>ANNEXURE-B1 (along with all Annexures-1,2,3,4,5&6 of PQR).</u> All the bidders should ensure submission of complete details and documents as called for in these requirements. The Offers submitted by the bidders would be scrutinized with respect to Pre-Qualification Requirements first. Techno- Commercial offer of only those bidders shall be evaluated who meet the Pre-Qualification Requirements.

5. SUBMISSION OF OFFER

Please note that this tender enquiry has been issued through BHEL's e-procurement portal developed by NIC (https://eprocurebhel.co.in/), hence PAPER BID or BID THROUGH e-MAIL SHALL NOT BE ENTERTAINED FOR THIS TENDER. Please upload your bid in BHEL's e-procurement portal developed by NIC (https://eprocurebhel.co.in/).

Please registered your firm on https://eprocurebhel.co.in/ to participate in tenders floated by BHEL.

In case of any difficulty faced while registering on BHEL's e-Procurement portal developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: support-eproc@nic.in. These details are also available on 'Contact Us' page of the portal.

5.1 Only English version or bilingual with one language as English, of all documents would be valid & binding.

5.2 Bidders are advised to read all the tender documents carefully. Any submission of tender by the bidder shall be deemed to have been done after careful study and examination of the tender documents and with full understanding of the implications thereof. The specifications/ Technical Requirements and terms & conditions shall be deemed to have been accepted unless otherwise specifically commented upon in 'Deviation' sheets by the bidder in his offer. Non-compliance with any of the requirements and instructions in the Tender Enquiry may result in rejection of the offer.

5.3 Name of vendor's dealing person with Contact No(s), Email ID and Address of correspondence shall be provided in the bid.

5.4 Tenders are to be uploaded on BHEL e-procurement portal **developed by NIC (https://eprocurebhel.co.in/)** in Two Parts and Part-I (Techno-Commercial Bid along with PQR, as detailed below) will be opened first. The offers are to be uploaded on or before the last date of submission of offer, as detailed on BHEL e-procurement portal for the tender:

[A] PART-I BID: PRE-QUALIFICATION REQUIREMENT (PQR) & TECHNO-COMMERCIAL BID

Following documents are an integral part of this tender enquiry and endorsed copies of these documents (duly signed and stamped on each page, as a token of acceptance) and reply for each clause of Annexure-A are to be necessarily submitted along with the 'Techno-Commercial Bid' (Part-I bid).
All these following documents shall be uploaded in the "Techno-commercial bid level" on BHEL e-procurement portal developed by NIC (https://eprocurebhel.co.in/). PAPER BID or BID THROUGH e-mail SHALL NOT BE ENTERTAINED FOR THIS TENDER ENQUIRY.

i. Proof of EMD submission details must be uploaded on the e-procurement portal.

ii. Please submit duly signed & stamped copy (each page) of the Pre- Qualification Requirements (PQR) with proper filled information and related supporting documents.
iii. Complete Technical offer with relevant drawings/ documents etc.
iv. Please submit duly signed & Stamped copy of replica of Price Bid (without prices) showing 'quoted" in place of price.
v. Please submit duly signed & Stamped copy (each page) of duly filled "Additional Terms and conditions and its clause wise supporting documents where required.
vi. Please submit duly signed & stamped copy (each page) of GISTC as provided along with Tender enquiry.
vii. Please submit duly signed & stamped copy (each page) of BHEL Technical specification and drawings applicable for respective projects.
viii. Please submit duly signed & stamped copy (each page) of "Instructions to bidder".

ix. Deviations if any are to be listed out separately. Please note that in case no- deviation sheet is received along with offer, it will be presumed that all terms and conditions mentioned in "INSTRUCTION TO BIDDERS, additional Terms & conditions of Tender enquiry as (Annexure-A) and "GISTC (General Instructions and Standard Terms & Conditions against Tender Enquiry)" shall be acceptable to you and your offer will be processed accordingly.

x. Any Deviation with reference to technical requirements/specification to be laid down on separate sheet along with the

cost of Withdrawal of such technical deviations (if any). Acceptance of such technical deviations would be at the discretion of BHEL.

[B] PART-II BID (PRICE-BID): BOQ

Prescribed BOQ shall be downloaded from online tender documents and after filling the relevant columns the same shall be uploaded by bidders. Please note that file name shall not be changed.

5.5 e- price bid shall be opened as per schedule given after technical evaluation.

5.6 Online **Part-I bid (Techno-Commercial bid along with PQR**) will be opened on Due Date and time specified in the online tender enquiry, or extension thereof. Incomplete offers are liable to be rejected.

5.7 **Techno-Commercial offer of only those bidders shall be evaluated who meet the Pre-Qualification Requirements mentioned in our Enquiry and who have submitted the EMD as stipulated in clause 3 above.**

5.8 After opening of the online techno-commercial offer, the offers would be evaluated by BHEL and acceptance shall be subject to End Customer approval. Online Price Bid shall be opened only of the Customer approved vendors.

5.9 After finalization of Techno-Commercial evaluation, offers of BHEL and Customer approved vendors who have qualified in techno-commercial offer shall be considered for Price Bid opening. After opening of online price bid BHEL SHALL BE RESORTING TO REVERSE AUCTION (RA) (GUIDELINES AS AVAILABLE ON www.bhel.com) FOR THIS TENDER. RA SHALL BE CONDUCTED AMONG ALL THE TECHNO-COMMERCIALLY QUALIFIED BIDDERS AS PER GUIDELINES FOR REVERSE AUCTION-2021.

5.10 All correspondence thereof, shall be addressed to the following persons:

Mr. Govind Singh Rawat Designation: Engineer (PPX-BOI) 4th Floor, Main Administrative Building HEEP, BHEL ,Hardwar- 249403 Uttarakhand, India Email ID: gsrawat@bhel.in Tel: +91 1334 28 1707	**Mr. Manoj Kumar** Designation: Manager (PPX-BOI) 4th Floor, Main Administrative Building HEEP, BHEL, Hardwar- 249403 Uttarakhand, India Email ID: manojy@bhel.in Tel: +91 1334 28 5773

5.11 BHEL prefers to deal directly with the principal manufacturers/OEM. However, if the OEM/ Principal insists on engaging the services of an agent, the same can be allowed only thru a tender specific authorization letter issued by the principal/OEM. The acceptance of any such offer would be at the discretion of BHEL.

As per directives of CENTRAL VIGILANCE COMMISSION, GOVERNMENT OF INDIA, one agent can not represent two or more suppliers or quote on their behalf in a particular tender. If so found at any stage, BHEL Hardwar is likely to cancel Enquiries / POs to such suppliers. Further, such Indian Agent is likely to be de-listed (Black listed for business from BHEL).

Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer/ supplier could bid directly but not both. In case bids are received from both the manufacturer/ supplier and the agent, bid received from the agent shall be ignored.

5.12 Vendors operating from BHEL quarters, unauthorized colonies on BHEL Land and Dharamshalas/ Hotels shall not be considered, hence such vendors need not apply.

6. RIGHT OF ACCEPTANCE

6.1 BHARAT HEAVY ELECTRICALS LIMITED HARIDWAR reserves the right to reject any or all the bids/quotations without assigning any reason thereof. BHEL also reserves the right to increase or decrease the tendered quantities. Bidders should be prepared to accept order for reduced quantity without any extra charges.

6.2 Any discount/ revised offer submitted by a bidder on its own shall be accepted provided it is received on or before the due date and time of offer/bid submission (Part-I) if system allow. The discount shall be applied on pro- rata basis to all items unless specified otherwise by the bidder. Conditional discounts shall not be considered for evaluation of tenders.

6.3 Unsolicited discounts/revised offers given after enquiry opening (i.e. Part-I bid opening) shall not be accepted.

6.4 In case there is no change in the technical scope and/or specifications and/or commercial terms & conditions, the bidder/s shall not be allowed to change his/their price bids after the due date (i.e. Part-I bid opening).

6.5 In case of changes in scope and/or technical specification and/or commercial terms & conditions, having price implications, techno-commercially acceptable bidders shall be asked by BHEL (after freezing the scope, technical specifications and commercial terms & conditions) to submit the impact of such changes on their price bid. A cut-off date and time shall be given to all the techno-commercially acceptable bidders to submit the impact on their price bids.

6.6 In the event of any bidder, after finalizing the technical specification & scope of supply, opting to revise and submit their latest price bid instead of submitting impact on their price bid asked by BHEL, then their latest price bid shall prevail. However in such condition their original price bid will necessarily be opened.

6.7 After technical & commercial examination of the offers received and clarifications obtained (if required), Part-II (Revised Price Bid/ Original Price Bid along with Price Impact and Discount, if any) shall be opened, for which the date and time shall be intimated to technically and commercially acceptable bidders in case of public opening. BHEL may opt to finalize the prices through Reverse Auction amongst technically and commercially acceptable bidders. BHEL reserves the right to open the earlier price bids, if any, submitted by the bidder(s), if required.

6.8 No correspondence shall be entertained from the tenderers after opening of Part-II (Price bid), except clarifications (if any) asked by BHEL in writing.

IMPORTANT NOTE:

Kindly ensure the timely submission of your offer (by 1345 Hrs IST on the due date) and note that Late Offers shall not be entertained under any circumstances.

For and on behalf of BHEL, Hardwar

	PPX-BOI DEPARTMENT **BHARAT HEAVY ELECTRICALS LIMITED** **HEEP: HARDWAR-249 403 (Uttarakhand)** **FAX: +91 1334 226084/226462** **TEL: +91 1334 28 5773/1707**	**BHEL ref. No.: B/4066/2020/0026** **Package: Oil Throttle Valve** **Project: 2X660MW Khurja,1X660 MW Sagardighi, 3X800MW Patratu & 2X660MW Udangidi Projects.**

Additional Terms and conditions of tender enquiry (In addition to General instructions and standard terms & conditions as enclosed).

E-PROCUREMENT: Please note that this tender enquiry has been issued through BHEL's e-procurement portal developed by NIC (https://eprocurebhel.co.in/), hence PAPER BID or BID THROUGH e-MAIL SHALL NOT BE ENTERTAINED FOR THIS TENDER. Please upload your e-bid in BHEL's e-procurement portal developed by NIC (https://eprocurebhel.co.in/).

Sl. No	Terms	Description	Confirmation of Vendors
1.	**Confirmation to General Instructions and standard terms & conditions**	Please submit signed and stamped copy of Confirmation to General Instructions and standard terms & conditions (enclosed) as your acceptance to these terms and conditions. Deviation to "General Instructions and standard terms & conditions", if any, shall be submitted along with offer in separate documents. Please note that in case no- deviation sheet of "General Instructions and standard terms & conditions", is received along with offer, it will be presumed that all terms and conditions mentioned in "General Instructions and standard terms & conditions" shall be acceptable to you and your offer will be processed accordingly.	
2.	**Compliance of 144 (xi) of GFRs-2017**	Terms & conditions for PPP-MII Order No. P-45021/ 2/ 2017-PP (BE-ll) dtd. 04/06/2020 AND RULE No. 144 (xi) of GFRs-2017, shall be as per enclosed Annexure-A1.	
3.	**Evaluation criteria**	The evaluation would be done for each project separately on the basis of total landed cost to BHEL up respective Project sites/ based on FOR respective site price (i.e. 2X660MW Khurja,1X660 MW Sagardighi, 3X800MW Patratu & 2X660MW Udangidi Projects site), considering all items and services covered in enquiry taken together.	
4.	**Basis of Quotation**	**For Indian Bidders:** Please quote your firm FOR prices including Packing, Freight and other charges (if any) up to BHEL respective project site (i.e. 2X660MW Khurja,1X660 MW Sagardighi, 3X800MW Patratu & 2X660MW Udangidi Projects site) (excluding TPI charges and Transit Insurance).	
		For Foreign Bidders: Please quote your firm prices on CFR NHAHVA SHEVA Port Mumbai including TPI charges. For evaluation (i.e. calculating total landed cost to BHEL upto up to respective project site) inland freight will be loaded in line with BHEL GISTC.	
5.	**Transit Insurance**	Transit insurance for both case (indigenous/Foreign) shall be arranging by BHEL. Please do not include in the basic price. Please confirm.	
6.	**Validity**	Confirm that the validity of the offer shall be 120 days from the due date of opening of Techno-Commercial offers.	
		Please note that BHEL reserves the right to ignore the offers quoting validity less than 120 days from EOD (Enquiry Opening Date).	
7.	**Engineering Document/ Document approval**	Drawings/Data sheets/documents as called for in the specifications (if any) shall be submitted for approval to BHEL for BHEL/customer approval within 30 days of purchase order. Any delay in delivery on account of late submission of drawings shall be to vendors account. BHEL will arrange the approval of the drawings/data sheets/ documents within 30 days of their receipt. In case of delay on account of BHEL, delivery shall be re-scheduled accordingly.	
8.	**Payment Terms**	Payment terms shall be as per GISTC. Please confirm your acceptance for the payment terms of GISTC. "Receipt and Acceptance" wherever referred in payment terms clause of GISTC may be treated as "Receipt of material at site".	
		In case of deviation in payment terms w.r.t. tender conditions, offer shall be evaluated after loading on account of deviation in payment terms as per extended rules of BHEL.	

(Signature of the Vendor with Seal)

9.	**Penalty Clause**	In case of delay in supply of material beyond the agreed contractual delivery, Penalty for Late Delivery would be applicable @ 0.5 % of the undelivered portion per week of delay or part thereof subject to a maximum of 10% of the total order value of each lot of each project (i.e. lot wise total value of each project). Please confirm.	
		In case of any deviation to the above penalty clause, BHEL reserves the right to load the offers to the extent to which it is not agreed by vendors (at offered value).	
10.	**Quality requirements & third party inspection**	VENDORS TO SUBMIT QUALITY PLAN IN ENCLOSED QAP FORMAT, IN LINE WITH ORDERING DOCUMENTS MENTIONED IN THE NIT FOR EACH PROJECT SEPERATELY. PLEASE CONFIRM.	
		FOR KHURJA PROJECT FOLLOWING CONDITIONS ARE ALSO APPLICABLE: 1.IN CASE OF FOREIGN VENDOR TESTING & CERTIFICATION AS PER ORDERING DOCUMENT. PLEASE CONFIRM. 2.IN CASE OF INDIGENOUS VENDOR, VENDOR TO SUBMIT QUALITY PLAN FOR BHEL APPROVAL. INSPECTION BY BHEL NOMINATED INSPECTION AGENCY BVIL AS PER BHEL APPROVED QP. PLEASE CONFIRM.	
		FOR SAGARDIGHI PROJECT FOLLOWING CONDITIONS ARE ALSO APPLICABLE: 1.AFTER PLACEMENT OF P.O. QP OF VENDOR SHALL BE FORWARDED TO CUSTOMER FOR APPROVAL. VENDOR TO SPECIFICALLY CONFIRM TO FOLLOW CUSTOMER APPROVED QP. PLEASE CONFIRM. 2. INSPECTION SHALL BE DONE BY BHEL NOMINATED INSPECTION AGENCY BVIL AND WBPDCL AS PER WBPDCL APPROVED QUALITY PLAN IN CASE OF INDIGENOUS VENDOR. PLEASE CONFIRM. 3.INSPECTION SHALL BE DONE BY THIRD PARTY INSPECTION AGENCY (LRS/TUV/BV) AND WBPDCL AS PER WBPDCL APPROVED QUALITY PLAN IN CASE OF FOREIGN VENDOR. PLEASE CONFIRM.	
		<u>For Indian Bidders:</u> Inspection charges by Third party inspection agency shall be to BHEL's account. BHEL shall pay directly to TPI, however for evaluation purpose, TPI charges would be loaded as per rate contract of BHEL with TPI. Please confirm. However, all coordination with TPI for arranging inspection shall be done by supplier. Please confirm.	
		<u>For Foreign Bidders:</u> The prices are to be quoted inclusive of Third Party Inspection Charges (By LRS/BVQI/TUV). The scope of inspection for Third Party Inspection Agency would be as per final Customer approved Quality Plan. The co-ordination with the Third Party Inspection Agencies would be the sole responsibility of the bidder. In case if nothing has been mentioned in your offer about the Third Party Inspection charges, the same would be considered to be inclusive in your quoted prices. The scope of Third Party Inspection may be considered as per Quality Plan *QA/BI/QP/006, REV.06 (enclosed)*.	
11.	**MDCC clause**	Please note that, material shall be dispatched only after issue of Material dispatch clearance certificate (MDCC) by BHEL. For issue of MDCC, you are required to submit all test certificates (TC) and inspection report of third party (IR) as per in two hard copies to us.	
12.	**Delivery**	Please note that material is required as per the deliveries mentioned in lot date of enquiry. Please quote your deliveries accordingly in no. of weeks from the date of PO including the time required for approval of documents.	

(Signature of the Vendor with Seal)

		If the delivery quoted by you does not meet BHEL's delivery requirement / revised delivery requirement as per site progress, you will be given a chance for reviewing your quoted delivery and inform revised delivery to BHEL. After this, if your delivery does not meet BHEL's required delivery / revised delivery as per site progress, BHEL reserve the right to reject your offer.	
		Please confirm date of LR/GR/RR/bill of Lading as applicable shall be considered as date of delivery.	
13.	**Guarantee**	The supplier shall Guarantee trouble free and satisfactory operation of the equipment for a period of 12 months from the date of installation and commissioning or 18 months from the date of dispatch from supplier works whichever is earlier. Please confirm.	
		If, during erection/commissioning and operation at site, any defect in any component is detected, purchaser's/owner's site representative shall prepare the assessment report and ca copy of the same shall be forwarded to the supplier. The supplier shall replace/rectify the concerned items free of charge. The supplier, of he so desired, may depute their representative to site at his own cost otherwise the report of purchaser's/owner's site representative shall be binding of supplier. Please confirm.	
14.	**Reverse Auction**	BHEL SHALL BE RESORTING TO REVERSE AUCTION (RA) (GUIDELINES AS AVAILABLE ON www.bhel.com) FOR THIS TENDER. RA SHALL BE CONDUCTED AMONG ALL THE TECHNO-COMMERCIALLY QUALIFIED BIDDERS. PRICE BIDS OF ALL TECHNO-COMMERCIALLY QUALIFIED BIDDERS SHALL BE OPENED AND SAME SHALL BE CONSIDERED AS INITIAL BIDS OF BIDDERS IN RA. IN CASE ANY BIDDER(S) DO (ES) NOT PARTICIPATE IN ONLINE REVERSE AUCTION, THEIR SEALED ENVELOPE PRICE BID ALONG WITH APPLICABLE LOADING, IF ANY, SHALL BE CONSIDERED FOR RANKING.	
15.	**Packing Instruction / Details**	VALVE ENDS, MACHINED AND UN MACHINED SURFACES ETC. SHALL BE PROTESTED AGAINST RUSTING AND CORROSION AND VALVE SHALL BE PACKED ACCORDING TO MODE OF TRANSPORT AND STORAGE IN TOP SHADE STORE GANTRY IN TROPIC CLIMATIC CONDITIONS FOR A PERIOD OF 8 TO 12 MONTHS. VALVE SHALL BE SUPPLIED WITH ALL ENDS OF VALVE BODY PROPERLY AND SUITABLY SEALED.PLEASE CONFIRM.	
		SUPPLIER SHALL KEEP TWO COPIES OF DRGS AND CURVES OF OIL THROTTLE VALVE INSIDE PACKING BOX AND MENTION THE SAME IN PACKING LIST ALSO. PLEASE CONFIRM.	
		FOR SAGARDIGHI PROJECT FOLLOWING CONDITIONS ARE ALSO APPLICABLE: 1. MAXIMUM 10 Nos of boxes are allowed to dispatch the complete quantity. 2. The SL.NO. of packing boxes shall be indicated by vendor from Box No. BHEL/HWR/BOI/921 to 930 on each box. 3. Vendor to submit packing list (Box wise) for BHEL Review before Dispatch.	
16.	**Operation & Maintenance Manual**	GUARANTEE CERTIFICATE REQUIRED. TEST CERTIFICATE REQUIRED. OPERATION AND MAINTENANCE MANUAL REQUIRED. WARRANTEE CERTIFICATE REQUIRED.	
17.	**Unit FOR price of General Spares List**	Please submit unit FOR price for all General Spares List Document no. 4-11923-S5001. Required quantity of each spare will be informed to vendors before opening of price bid (after consultation through indent amendment from Engg) and evaluation will be done with required quantity of respective projects. The same will also made part of tender conditions.	

(Signature of the Vendor with Seal)

GENERAL SPECIFICATION

OIL THROTTLE VALVE

PMD CATEGORY: BI 157

DOCUMENT NO.: 4-11923-S5100

00	10.06.19	HS DOGRA	First Revision release.
Rev No.	Date of Issue	Issued By	Description of revision

A. SCOPE OF THE DOCUMENT:

1. This document states general technical/ contractual requirements of Bharat Heavy Electricals Limited (hereafter referred to as BHEL) for the vendors to adhere to. For project specific data, refer document Project Specific Specification (PSS) 4-11923-XX000. This document must be read in addition to PSS.

B. ABOUT THE VALVE

1. Oil Throttle Valves are used to throttle/modify flow of lube oil entering into turbine-generator bearings.
2. Flushing Device: The throttle valves shall also be supplied alongwith flushing device mentioned further in the document.

C. REQUIREMENTS

1. Technical Parameters

Sl. No.	Description	Value
1	Working Pressure	4 bar
2	Design pressure	8 bar
3	End Connection	Butt weld with pipe schedule 10S ASME B16.25-2003 Weld fig. 4
4	Working Fluid	Turbine Oil ISO VG46
5	Working temperature	50deg C
6	Max. Temperature	80deg C
7	Material of Construction (All parts in contact with oil)	SS Gr. 316L or 321 or equivalent
8	Mat. Of Construction (Gaskets/Orings etc)	Viton

2. Each Throttle valve shall have a hole of min. dia inside its throttle so that even if the valve is closed, oil starvation does not happen in turbine bearings. The size of this hole is shown in drgs. below for each valve size.

3. Rating: Valve rating shall be selected by supplier based on working parameters and material mentioned above. Rating shall be as per ANSI B16.34.

4. Each valve shall be marked with an arrow on the body showing direction of flow. On the hand-wheel also there shall be direction indication for opening and closing.

5. Latest issue and amendments of all applicable international standards shall apply.

6. **Characteristic Curve:**

Valve supplier shall furnish characteristic curve where piston travel is plotted on x-axis and flow on y-axis.

Δp can vary from 0.25bar to 3.0bar.

Supplier shall furnish Curves for Δp = 0.25bar, 0.5bar, 1bar, 1.5bar, 2bar, 2.5bar and 3bar across the valve. These curves shall be furnished for each valve.

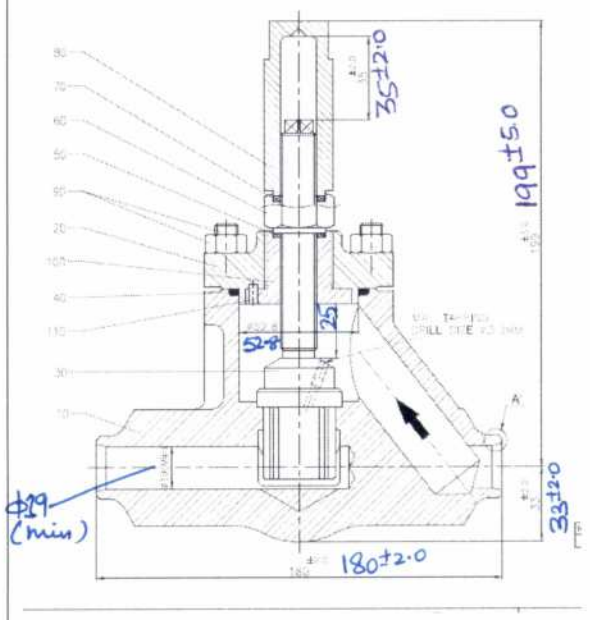
Range of piston travel is as per following table-1.

TABLE-1 (RANGE OF PISTON TRAVEL)		
Sl. No.	Valve Size	Range of Piston Travel (mm)
1	NB20	0 to 25
2	NB25	0 to 25
3	NB40	0 to 32
4	NB50	0 to 45
5	NB65	0 to 48
6	NB80	0 to 54

It may be noted that characteristic curves are an important document for BHEL site to adjust opening of oil throttle valve to adjust flow.

D. DRAWING OF OIL THROTTLE VALVE

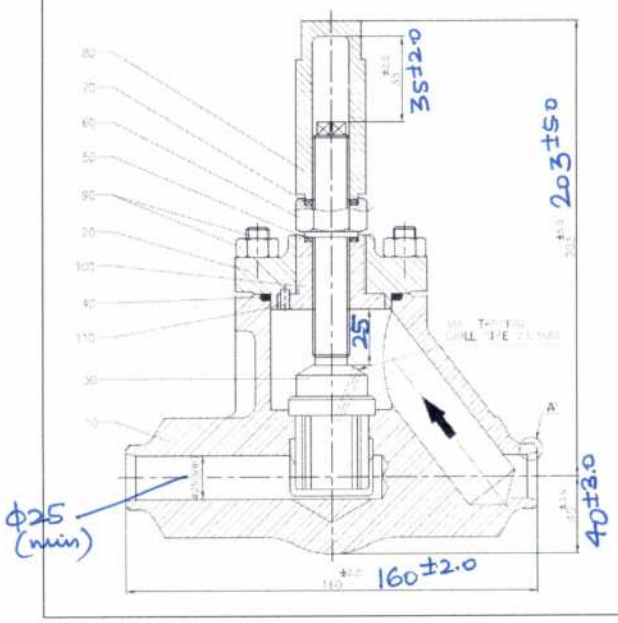
Fig. 1: THROTTLE VALVE NB20



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 3.3mm

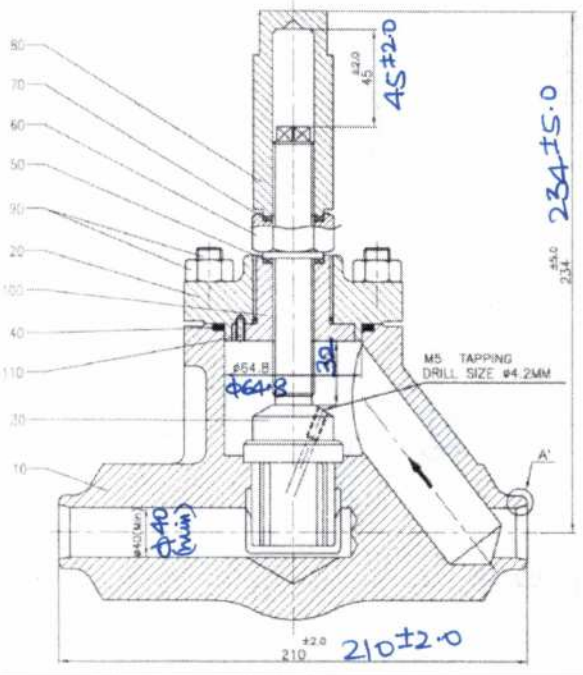
Fig. 2: THROTTLE VALVE NB25



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 3.3mm

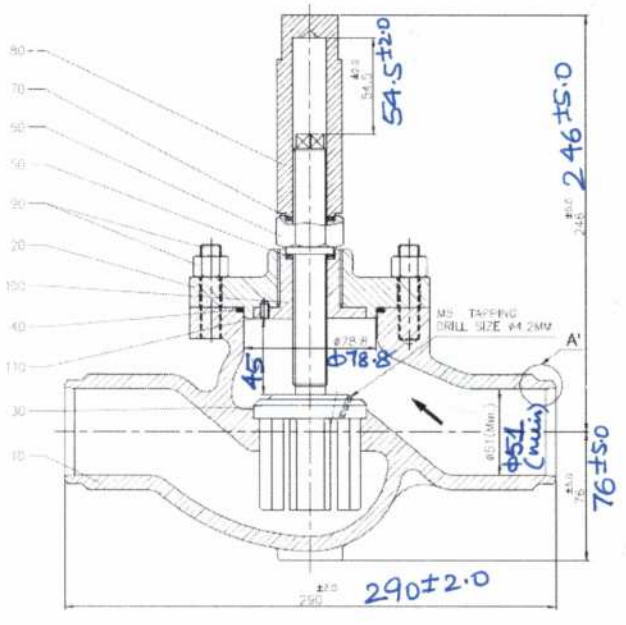
Fig. 3: THROTTLE VALVE NB40



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 4.2mm

Fig. 4: THROTTLE VALVE NB50

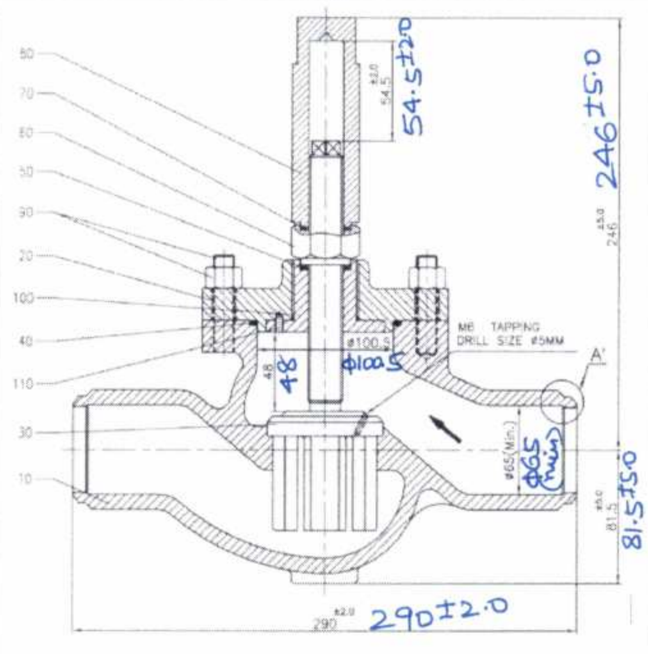


Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 4.2mm

Worked & Checked by	HS DOGRA (Dy. Mgr. STE-TL)	13/6/19
Approved by	A JAIN (Dy. Gen. Mgr. STE-TL)	
Agreed By	Sanjeev Bhardwaj (Sr. Engr. QAX-BOI)	13.06.19
	Name Signature	

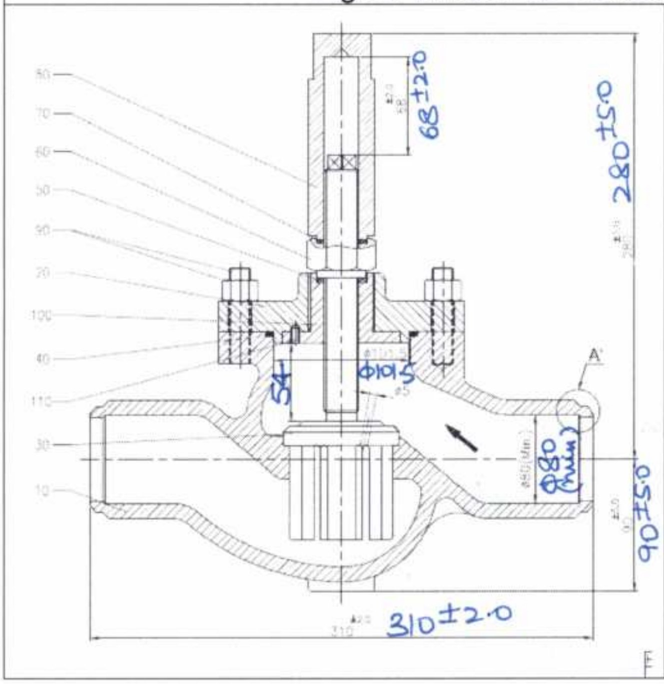
Fig. 5: THROTTLE VALVE NB65



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 5.0mm

Fig. 6: THROTTLE VALVE NB80



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 5.0mm

E. FLUSHING DEVICE

1. Flushing device is a name given to the following items as shown in Fig. 7:-
   a. Flange
   b. Gasket
   c. Pin extractor
   d. Flushing strainer
   e. A rod to remove flushing strainer (having threads at one end, refer Clause E.2.b below)

The above items shall be supplied alongwith throttle valve which shall be fitted by BHEL's site inside the valve body for oil flushing operation.
Item nos. 1 to 4 shall be supplied for each oil throttle valve.
Item no. 5 shall be supplied for each nut size (refer Clause E.2.b below).

2. Following points are noteworthy:-
   a. Flushing Strainer is a basket type of strainer having a lining of a mesh of size 185 microns. The mesh shall be sandwiched between two perforated sheets of thickness 1mm. This strainer shall be fitted on valve seat and pin extractor ensures that this flushing strainer doesnot get lifted up from its seat when oil flows.
   b. Refer the item marked as "nut" in Fig. 7. This nut shall be welded at bottom of flushing strainer. A rod shall be supplied by valve supplier which shall have threads at one end so that when the flushing strainer is to be removed, the threaded end of the rod shall be tightened in the nut and the flushing strainer is taken out.

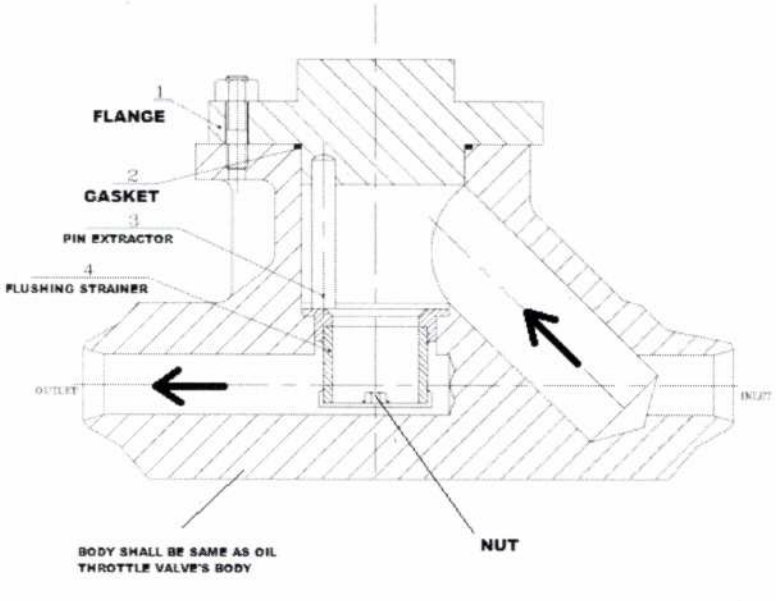


Fig. 7: Flushing Device (general view)

F. DOCUMENTS TO BE SUBMITTED BY SUPPLIER

1. During Technical Scrutiny along with offer
   a. One set, in hard copy, of GA drgs. of each valve-size and flushing device for each size offered

2. After placement of Purchase order
   a. One set, in soft copy, of GA drgs. of each valve, flushing device and characteristic curves for each size offered.

G. INSPECTION AND TESTING

1. The manufacturer shall conduct all tests required to ensure that all the components of the valve offered
   a. Conform to the requirements of the specification.
   b. Conform to requirements of application.
   c. And are in compliance with the requirements of applicable codes and standards.

2. The bidder shall submit quality plan along with offer.

3. The particulars of the proposed shop tests and procedure for the test shall be submitted to BHEL/its customer for approval along with quality plan.

4. The equipment shall be dispatched only after inspection and clearance of material by BHEL/its customer and approval of test certificated by BHEL/its customer.

5. Tests

The minimum test/check to be carried out on the valve, as envisaged by BHEL, are given below. This is, however, not intended to form a comprehensive testing programme as it is supplier's responsibility to prepare a detailed quality plan which shall also include tests, checks carried out by supplier as a part of their normal practice. This quality plan is subject to approval of BHEL/its customer. BHEL/its customer reserves the right to ask for any more check at the time of quality plan finalization.

The following tests shall be carried out during various stages of manufacturing at manufacturer's works on each of the complete valve and its flushing device:-

a. **NDT:** DPT on valve body, cover, stem, seat, flushing part and all welded joints to check for surface defects.

b. Welding of screen with perforated sheet shall be tested as per supplier standard practice.

c. **Dimensional Check:** Check for dimensional measurement shall be done.

d. **Function Test:** Smooth opening and closing of valve shall be ensured by functional test.

e. For any new valve, where characteristic curve is not available with the supplier, supplier shall prepare a test setup and produce characteristic curve thru actual testing.

f. **Material Testing:** The material of each component shall be tested as per relevant specification for its chemical composition and mechanical properties viz Yield Strength, impact, percent elongation etc. Material certificates shall be submitted as part of Quality documentation

g. **Hydrostatic Test:** Hydraulic Test shall be carried out on each valve. After hydraulic test all internal shall be wiped, cleaned and dried. Body shall be tested hydraulically in accordance with test P10 according to EN 12266 Part 1. Valve body shall be subjected to hydro test at 10bar for 15 mins. Test certificates mentioning about test pressure and duration of test alongwith following information shall be furnish to purchaser:-
   a. Valve KKS Tag
   b. Type of Valve
   c. Valve Size
   d. Name of manufacturer
   e. Project Name
   f. Date of testing

h. Color matching of valve seat and plug in case of metal to metal contact.

H. CLEANING AND SURFACE PROTECTION

Unmachined surfaces shall be blast cleaned to remove any rust/ dust.

I. PACKING

Valve ends, machined and unmachined surfaces etc. shall be protested against rusting and corrosion and valve shall be packed according to mode of transport and storage in top shade store gantry in tropic climatic conditions for a period of 8-12 months. Valve shall be supplied with all ends of valve body properly and suitably sealed.

J. GUARANTEE

The supplier shall guarantee trouble free and satisfactory operation of the equipment for a period of 12 months after installation and commissioning or 18 monthts from the date of dispatch from supplier's works.

If, during erection/commissioning, and operation at site, any defect in any component is detected, purchaser's/owner's site representative shall prepare the assessment report and a copy of the same shall be forwarded to the supplier. The supplier shall replace /rectify the concerned items free of charge. The supplier, of he so desired, may depute his representative to site at his own cost otherwise the report of purchaser's/owner's site representative shall be binding of supplier.

K. MISCELLANEOUS REQUIREMENTS

1. The following shall be printed/painted on the valve for easy identification:
   a. KKS TAG
   b. Valve size
   c. PO Number

ही एच ई एल BHEL	**OIL THROTTLE VALVE** **PROJECT SPECIFIC SPECIFICATION**	**DOCUMENT No.** **4-11923-V8000** **Rev 00**
PROJECT: 660MW KHURJA		

A. SCOPE OF THE DOCUMENT:

1. This document states the size and flow requirement of Oil Throttle Valve. For other requirements please refer the document General Specification of Oil Throttle Valve doc. no. 4-11923-S5100.

B. REQUIREMENTS

Sl. No.	Valve KKS TAG No.	Valve Size	Quantity (number)	Flow rate passing thru the valve (liter per second)
1	MAV42AA251	NB25	1	0.76
2	MAV42AA253	NB80	1	12.07
3	MAV42AA255	NB50	1	4.55
4	MAV42AA257	NB50	1	5.39
5	MAV42AA259	NB50	1	6.01
6	MAV44AA251	NB50	1	5.86
7	MAV44AA253	NB50	1	5.86
8	MAV46AA251	NB20	1	0.5

Worked by	HS DOGRA	07/05/2020.
Checked by	A JAIN	7/5/2020
Approved by	SK GUPTA	
	Name	Signature
Deptt.	STE-TL	

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN		TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	QP NO.		
			DATED		
		DRG. NO.	AS PER PO		
		SPEC.	AS PER PO		
		REV	Page 1 of 1		

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
										S	B	C	
1	2	3	4	5	6	7	8	9	D	10			11

		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. S: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY C: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY

GENERAL SPECIFICATION

OIL THROTTLE VALVE

PMD CATEGORY: BI 157

DOCUMENT NO.: 4-11923-S5100

00	10.06.19	HS DOGRA	First Revision release.
Rev No.	Date of Issue	Issued By	Description of revision

A. SCOPE OF THE DOCUMENT:

1. This document states general technical/ contractual requirements of Bharat Heavy Electricals Limited (hereafter referred to as BHEL) for the vendors to adhere to. For project specific data, refer document Project Specific Specification (PSS) 4-11923-XX000. This document must be read in addition to PSS.

B. ABOUT THE VALVE

1. Oil Throttle Valves are used to throttle/modify flow of lube oil entering into turbine-generator bearings.
2. Flushing Device: The throttle valves shall also be supplied alongwith flushing device mentioned further in the document.

C. REQUIREMENTS

1. Technical Parameters

Sl. No.	Description	Value
1	Working Pressure	4 bar
2	Design pressure	8 bar
3	End Connection	Butt weld with pipe schedule 10S ASME B16.25-2003 Weld fig. 4
4	Working Fluid	Turbine Oil ISO VG46
5	Working temperature	50deg C
6	Max. Temperature	80deg C
7	Material of Construction (All parts in contact with oil)	SS Gr. 316L or 321 or equivalent
8	Mat. Of Construction (Gaskets/Orings etc)	Viton

2. Each Throttle valve shall have a hole of min. dia inside its throttle so that even if the valve is closed, oil starvation does not happen in turbine bearings. The size of this hole is shown in drgs. below for each valve size.

3. Rating: Valve rating shall be selected by supplier based on working parameters and material mentioned above. Rating shall be as per ANSI B16.34.

4. Each valve shall be marked with an arrow on the body showing direction of flow. On the hand-wheel also there shall be direction indication for opening and closing.

5. Latest issue and amendments of all applicable international standards shall apply.

6. **Characteristic Curve:**

Valve supplier shall furnish characteristic curve where piston travel is plotted on x-axis and flow on y-axis.

Δp can vary from 0.25bar to 3.0bar.

Supplier shall furnish Curves for Δp = 0.25bar, 0.5bar, 1bar, 1.5bar, 2bar, 2.5bar and 3bar across the valve. These curves shall be furnished for each valve.

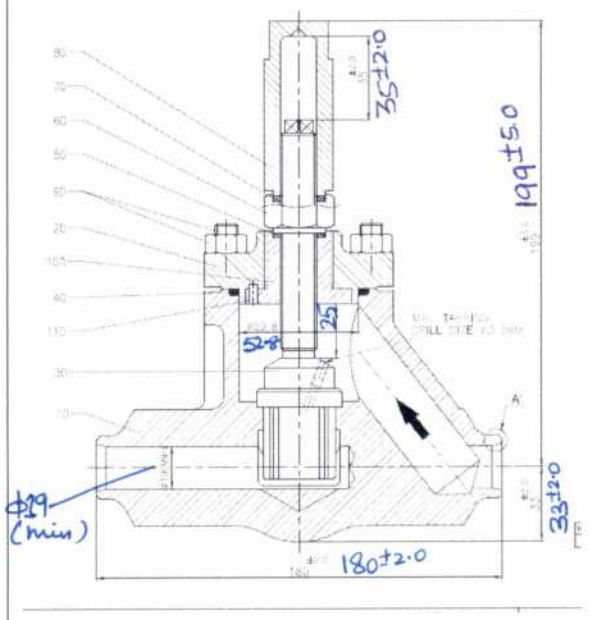
Range of piston travel is as per following table-1.

TABLE-1 (RANGE OF PISTON TRAVEL)		
Sl. No.	Valve Size	Range of Piston Travel (mm)
1	NB20	0 to 25
2	NB25	0 to 25
3	NB40	0 to 32
4	NB50	0 to 45
5	NB65	0 to 48
6	NB80	0 to 54

It may be noted that characteristic curves are an important document for BHEL site to adjust opening of oil throttle valve to adjust flow.

D. DRAWING OF OIL THROTTLE VALVE

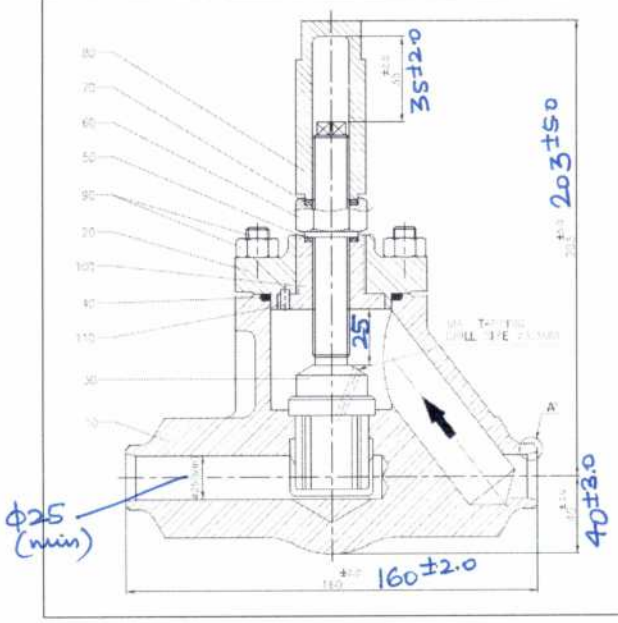
Fig. 1: THROTTLE VALVE NB20



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 3.3mm

Fig. 2: THROTTLE VALVE NB25



Item No.: Description
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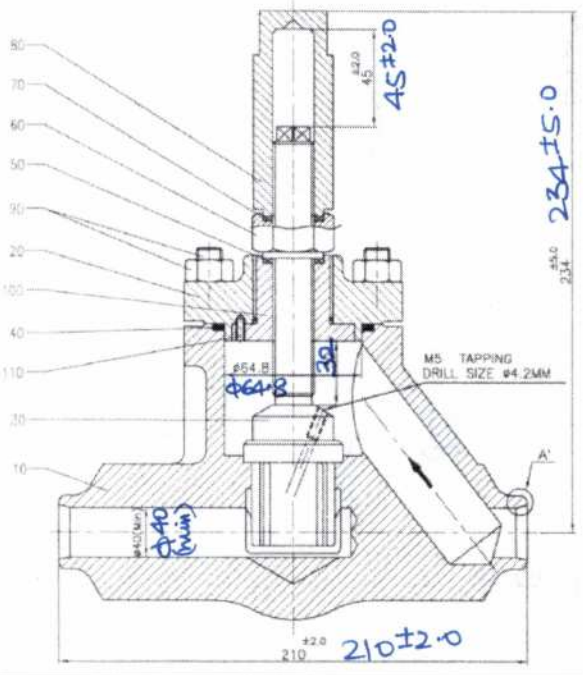
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 3.3mm

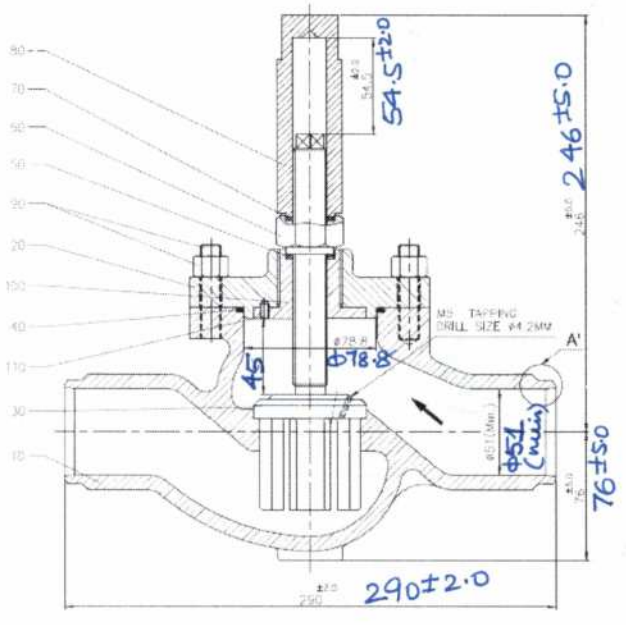
Fig. 3: THROTTLE VALVE NB40



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 4.2mm

Fig. 4: THROTTLE VALVE NB50

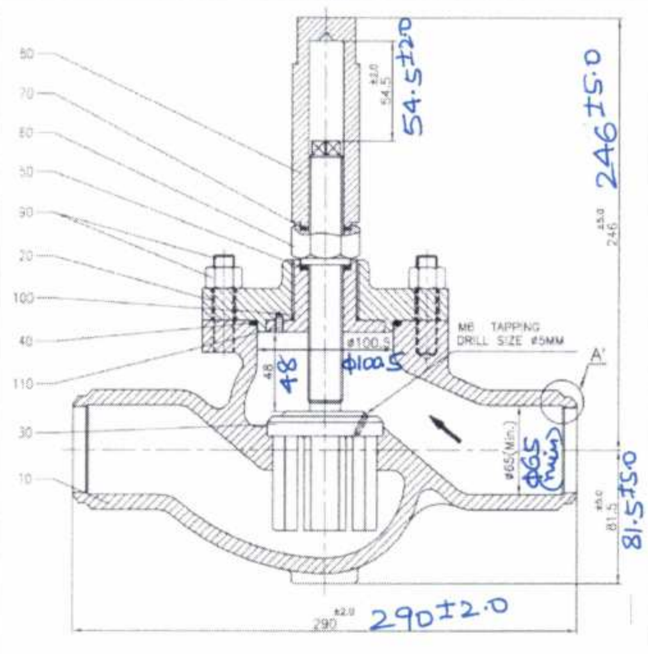


Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 4.2mm

Worked & Checked by	HS DOGRA (Dy. Mgr. STE-TL)	13/6/19
Approved by	A JAIN (Dy. Gen. Mgr. STE-TL)	
Agreed By	Sanjeev Bhardwaj (Sr. Engr. QAX-BOI)	13.06.19
	Name Signature	

Fig. 5: THROTTLE VALVE NB65

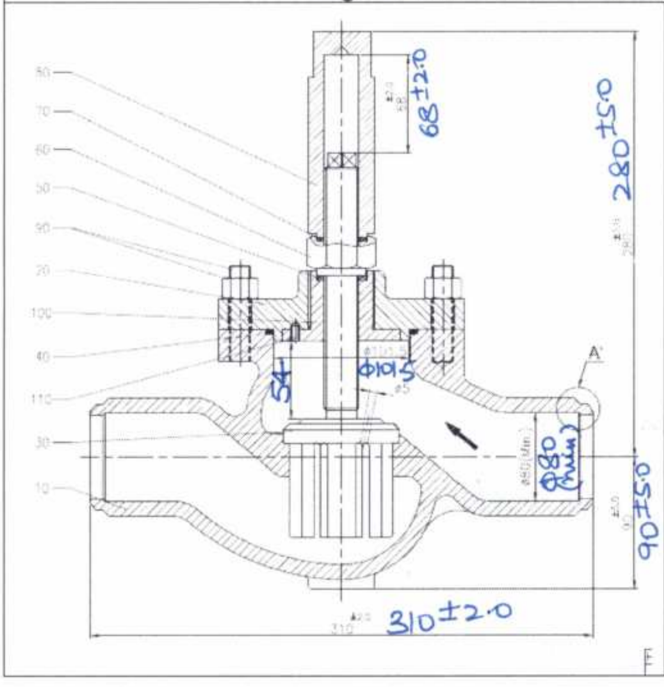


Item No.: Description

Item No.	Description
10:	Body
20:	Cover
30:	Throttle
40:	Cover Oring/gasket
50:	Gasket
60:	Nut
70:	Gasket
80:	Capped Nut
90:	Cover stud & Nut
100:	Cover Bush
110:	Grub Screw

Min. hole size to prevent oil starvation = ϕ 5.0mm

Fig. 6: THROTTLE VALVE NB80



Item No.: Description

Item No.	Description
10:	Body
20:	Cover
30:	Throttle
40:	Cover Oring/gasket
50:	Gasket
60:	Nut
70:	Gasket
80:	Capped Nut
90:	Cover stud & Nut
100:	Cover Bush
110:	Grub Screw

Min. hole size to prevent oil starvation = ϕ 5.0mm

E. FLUSHING DEVICE

1. Flushing device is a name given to the following items as shown in Fig. 7:-
   a. Flange
   b. Gasket
   c. Pin extractor
   d. Flushing strainer
   e. A rod to remove flushing strainer (having threads at one end, refer Clause E.2.b below)

The above items shall be supplied alongwith throttle valve which shall be fitted by BHEL's site inside the valve body for oil flushing operation.
Item nos. 1 to 4 shall be supplied for each oil throttle valve.
Item no. 5 shall be supplied for each nut size (refer Clause E.2.b below).

2. Following points are noteworthy:-
   a. Flushing Strainer is a basket type of strainer having a lining of a mesh of size 185 microns. The mesh shall be sandwiched between two perforated sheets of thickness 1mm. This strainer shall be fitted on valve seat and pin extractor ensures that this flushing strainer doesnot get lifted up from its seat when oil flows.
   b. Refer the item marked as "nut" in Fig. 7. This nut shall be welded at bottom of flushing strainer. A rod shall be supplied by valve supplier which shall have threads at one end so that when the flushing strainer is to be removed, the threaded end of the rod shall be tightened in the nut and the flushing strainer is taken out.

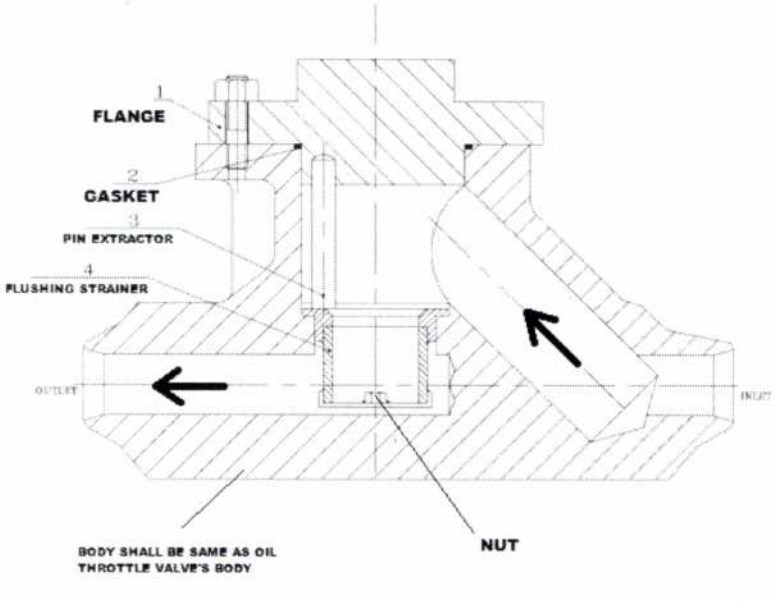


Fig. 7: Flushing Device (general view)

F. DOCUMENTS TO BE SUBMITTED BY SUPPLIER

1. During Technical Scrutiny along with offer
   a. One set, in hard copy, of GA drgs. of each valve-size and flushing device for each size offered

2. After placement of Purchase order
   a. One set, in soft copy, of GA drgs. of each valve, flushing device and characteristic curves for each size offered.

G. INSPECTION AND TESTING

1. The manufacturer shall conduct all tests required to ensure that all the components of the valve offered
   a. Conform to the requirements of the specification.
   b. Conform to requirements of application.
   c. And are in compliance with the requirements of applicable codes and standards.

2. The bidder shall submit quality plan along with offer.

3. The particulars of the proposed shop tests and procedure for the test shall be submitted to BHEL/its customer for approval along with quality plan.

4. The equipment shall be dispatched only after inspection and clearance of material by BHEL/its customer and approval of test certificated by BHEL/its customer.

5. Tests

The minimum test/check to be carried out on the valve, as envisaged by BHEL, are given below. This is, however, not intended to form a comprehensive testing programme as it is supplier's responsibility to prepare a detailed quality plan which shall also include tests, checks carried out by supplier as a part of their normal practice. This quality plan is subject to approval of BHEL/its customer. BHEL/its customer reserves the right to ask for any more check at the time of quality plan finalization.

The following tests shall be carried out during various stages of manufacturing at manufacturer's works on each of the complete valve and its flushing device:-

a. **NDT:** DPT on valve body, cover, stem, seat, flushing part and all welded joints to check for surface defects.

b. Welding of screen with perforated sheet shall be tested as per supplier standard practice.

c. **Dimensional Check:** Check for dimensional measurement shall be done.

d. **Function Test:** Smooth opening and closing of valve shall be ensured by functional test.

e. For any new valve, where characteristic curve is not available with the supplier, supplier shall prepare a test setup and produce characteristic curve thru actual testing.

f. **Material Testing:** The material of each component shall be tested as per relevant specification for its chemical composition and mechanical properties viz Yield Strength, impact, percent elongation etc. Material certificates shall be submitted as part of Quality documentation

g. **Hydrostatic Test:** Hydraulic Test shall be carried out on each valve. After hydraulic test all internal shall be wiped, cleaned and dried. Body shall be tested hydraulically in accordance with test P10 according to EN 12266 Part 1. Valve body shall be subjected to hydro test at 10bar for 15 mins. Test certificates mentioning about test pressure and duration of test alongwith following information shall be furnish to purchaser:-
   a. Valve KKS Tag
   b. Type of Valve
   c. Valve Size
   d. Name of manufacturer
   e. Project Name
   f. Date of testing

h. Color matching of valve seat and plug in case of metal to metal contact.

H. CLEANING AND SURFACE PROTECTION

Unmachined surfaces shall be blast cleaned to remove any rust/ dust.

I. PACKING

Valve ends, machined and unmachined surfaces etc. shall be protested against rusting and corrosion and valve shall be packed according to mode of transport and storage in top shade store gantry in tropic climatic conditions for a period of 8-12 months. Valve shall be supplied with all ends of valve body properly and suitably sealed.

J. GUARANTEE

The supplier shall guarantee trouble free and satisfactory operation of the equipment for a period of 12 months after installation and commissioning or 18 monthts from the date of dispatch from supplier's works.

If, during erection/commissioning, and operation at site, any defect in any component is detected, purchaser's/owner's site representative shall prepare the assessment report and a copy of the same shall be forwarded to the supplier. The supplier shall replace /rectify the concerned items free of charge. The supplier, of he so desired, may depute his representative to site at his own cost otherwise the report of purchaser's/owner's site representative shall be binding of supplier.

K. MISCELLANEOUS REQUIREMENTS

1. The following shall be printed/painted on the valve for easy identification:
   a. KKS TAG
   b. Valve size
   c. PO Number

A. SCOPE OF THE DOCUMENT:

1. This document states the size and flow requirement of Oil Throttle Valve. For other requirements please refer the document General Specification of Oil Throttle Valve doc. no. 4-11923-S5100.

B. REQUIREMENTS

Sl. No.	Valve KKS TAG No.	Valve Size	Quantity (number)	Flow rate passing thru the valve (liter per second)
1	MAV42AA251	NB25	1	0.76
2	MAV42AA253	NB80	1	12.07
3	MAV42AA255	NB50	1	4.55
4	MAV42AA257	NB50	1	5.39
5	MAV42AA259	NB50	1	6.01
6	MAV44AA251	NB50	1	5.86
7	MAV44AA253	NB50	1	5.86
8	MAV46AA251	NB20	1	0.5

A. SCOPE OF THE DOCUMENT:

1. This document states the requirement of spares of above mentioned project.

B. REQUIREMENTS

a. The technical parameters, quantity, size etc of valves in spares shall be same as valves in Main Supply supplied vide document no. 4-11923-V8000.

b. Scope of supply: Complete valve i.e Body and other replacement items such as cover, throttle, Orings, Gaskets, Nuts, Bolts, washers, bush, screws, studs etc. shall be in scope of supply.
Flushing device components shall NOT be in scope of supply.

c. The valves/components in spares shall be totally replaceable with main supply.

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN		TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	QP NO.		
			DATED		
		DRG. NO.	AS PER PO		
		SPEC.	AS PER PO		
		REV	Page 1 of 1		

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
										S	B	C	
1	2	3	4	5	6	7	8	9	D	10			11

		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. S: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY C: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY

GENERAL SPECIFICATION

OIL THROTTLE VALVE

PMD CATEGORY: BI 157

DOCUMENT NO.: 4-11923-S5100

00	10.06.19	HS DOGRA	First Revision release.
Rev No.	Date of Issue	Issued By	Description of revision

A. SCOPE OF THE DOCUMENT:

1. This document states general technical/ contractual requirements of Bharat Heavy Electricals Limited (hereafter referred to as BHEL) for the vendors to adhere to. For project specific data, refer document Project Specific Specification (PSS) 4-11923-XX000. This document must be read in addition to PSS.

B. ABOUT THE VALVE

1. Oil Throttle Valves are used to throttle/modify flow of lube oil entering into turbine-generator bearings.
2. Flushing Device: The throttle valves shall also be supplied alongwith flushing device mentioned further in the document.

C. REQUIREMENTS

1. Technical Parameters

Sl. No.	Description	Value
1	Working Pressure	4 bar
2	Design pressure	8 bar
3	End Connection	Butt weld with pipe schedule 10S ASME B16.25-2003 Weld fig. 4
4	Working Fluid	Turbine Oil ISO VG46
5	Working temperature	50deg C
6	Max. Temperature	80deg C
7	Material of Construction (All parts in contact with oil)	SS Gr. 316L or 321 or equivalent
8	Mat. Of Construction (Gaskets/Orings etc)	Viton

2. Each Throttle valve shall have a hole of min. dia inside its throttle so that even if the valve is closed, oil starvation does not happen in turbine bearings. The size of this hole is shown in drgs. below for each valve size.

3. Rating: Valve rating shall be selected by supplier based on working parameters and material mentioned above. Rating shall be as per ANSI B16.34.

4. Each valve shall be marked with an arrow on the body showing direction of flow. On the hand-wheel also there shall be direction indication for opening and closing.

5. Latest issue and amendments of all applicable international standards shall apply.

6. **Characteristic Curve:**

Valve supplier shall furnish characteristic curve where piston travel is plotted on x-axis and flow on y-axis.

Δp can vary from 0.25bar to 3.0bar.

Supplier shall furnish Curves for Δp = 0.25bar, 0.5bar, 1bar, 1.5bar, 2bar, 2.5bar and 3bar across the valve. These curves shall be furnished for each valve.

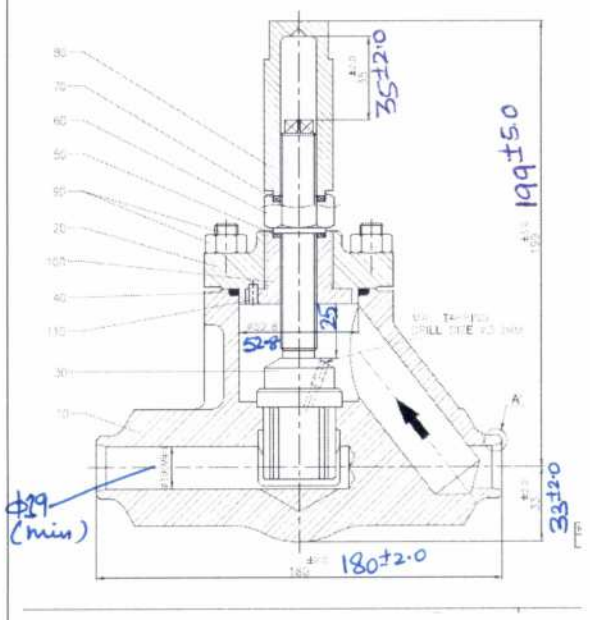
Range of piston travel is as per following table-1.

TABLE-1 (RANGE OF PISTON TRAVEL)		
Sl. No.	Valve Size	Range of Piston Travel (mm)
1	NB20	0 to 25
2	NB25	0 to 25
3	NB40	0 to 32
4	NB50	0 to 45
5	NB65	0 to 48
6	NB80	0 to 54

It may be noted that characteristic curves are an important document for BHEL site to adjust opening of oil throttle valve to adjust flow.

D. DRAWING OF OIL THROTTLE VALVE

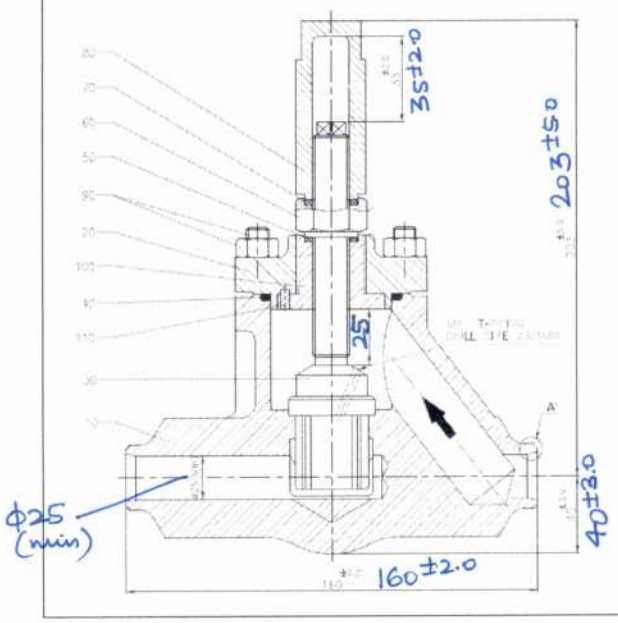
Fig. 1: THROTTLE VALVE NB20



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 3.3mm

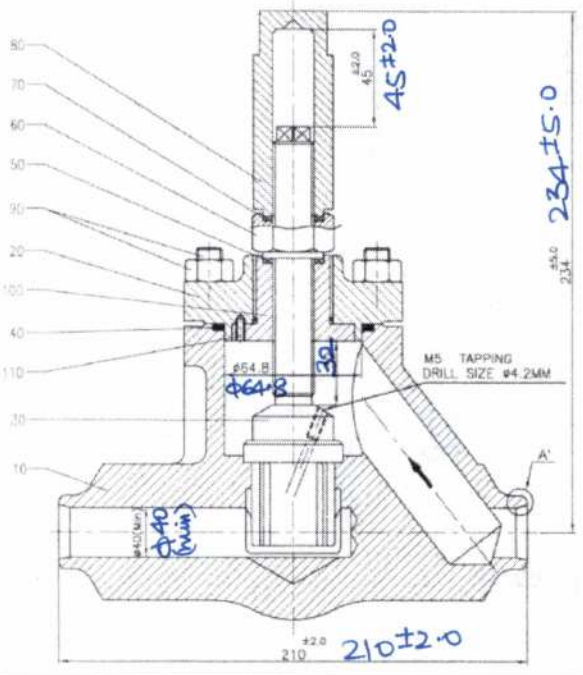
Fig. 2: THROTTLE VALVE NB25



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 3.3mm

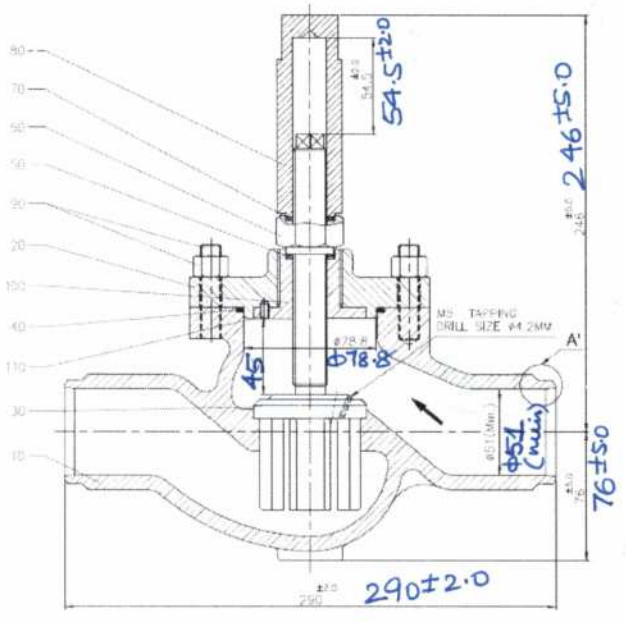
Fig. 3: THROTTLE VALVE NB40



Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 4.2mm

Fig. 4: THROTTLE VALVE NB50

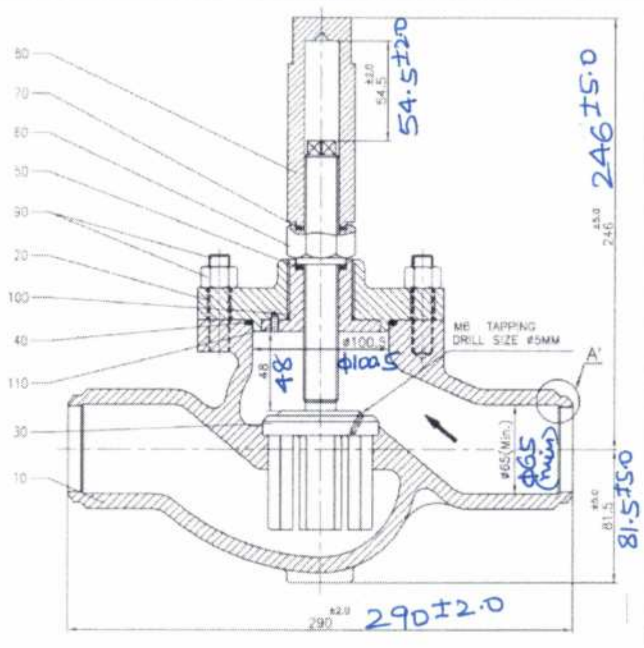


Item No.: Description
10: Body
20: Cover
30: Throttle
40: Cover Oring/gasket
50: Gasket
60: Nut
70: Gasket
80: Capped Nut
90: Cover stud & Nut
100: Cover Bush
110: Grub Screw

Min. hole size to prevent oil starvation = ϕ 4.2mm

Worked & Checked by	HS DOGRA (Dy. Mgr. STE-TL)	13/6/19
Approved by	A JAIN (Dy. Gen. Mgr. STE-TL)	
Agreed By	Sanjeev Bhardwaj (Sr. Engr. QAX-BOI)	13.06.19
	Name Signature	

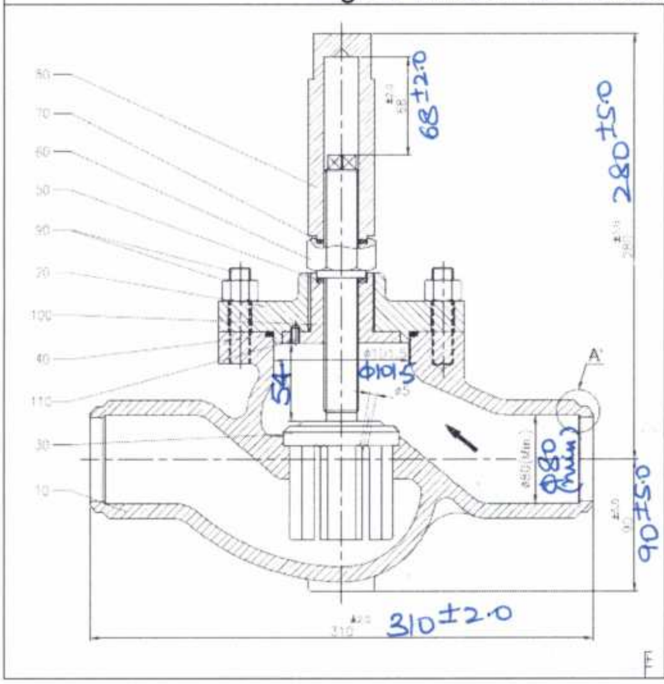
Fig. 5: THROTTLE VALVE NB65



Item No.:	Description
10:	Body
20:	Cover
30:	Throttle
40:	Cover Oring/gasket
50:	Gasket
60:	Nut
70:	Gasket
80:	Capped Nut
90:	Cover stud & Nut
100:	Cover Bush
110:	Grub Screw

Min. hole size to prevent oil starvation = ϕ 5.0mm

Fig. 6: THROTTLE VALVE NB80



Item No.:	Description
10:	Body
20:	Cover
30:	Throttle
40:	Cover Oring/gasket
50:	Gasket
60:	Nut
70:	Gasket
80:	Capped Nut
90:	Cover stud & Nut
100:	Cover Bush
110:	Grub Screw

Min. hole size to prevent oil starvation = ϕ 5.0mm

Worked & Checked by	HS DOGRA (Dy. Mgr. STE-TL)	13/6/19
Approved by	A JAIN (Dy. Gen. Mgr. STE-TL)	
Agreed By	Sanjeev Bhardwaj (Sr. Engr. QAX-BOI)	13.06.19
	Name	Signature

E. FLUSHING DEVICE

1. Flushing device is a name given to the following items as shown in Fig. 7:-
   a. Flange
   b. Gasket
   c. Pin extractor
   d. Flushing strainer
   e. A rod to remove flushing strainer (having threads at one end, refer Clause E.2.b below)

The above items shall be supplied alongwith throttle valve which shall be fitted by BHEL's site inside the valve body for oil flushing operation.
Item nos. 1 to 4 shall be supplied for each oil throttle valve.
Item no. 5 shall be supplied for each nut size (refer Clause E.2.b below).

2. Following points are noteworthy:-
   a. Flushing Strainer is a basket type of strainer having a lining of a mesh of size 185 microns. The mesh shall be sandwiched between two perforated sheets of thickness 1mm. This strainer shall be fitted on valve seat and pin extractor ensures that this flushing strainer doesnot get lifted up from its seat when oil flows.
   b. Refer the item marked as "nut" in Fig. 7. This nut shall be welded at bottom of flushing strainer. A rod shall be supplied by valve supplier which shall have threads at one end so that when the flushing strainer is to be removed, the threaded end of the rod shall be tightened in the nut and the flushing strainer is taken out.

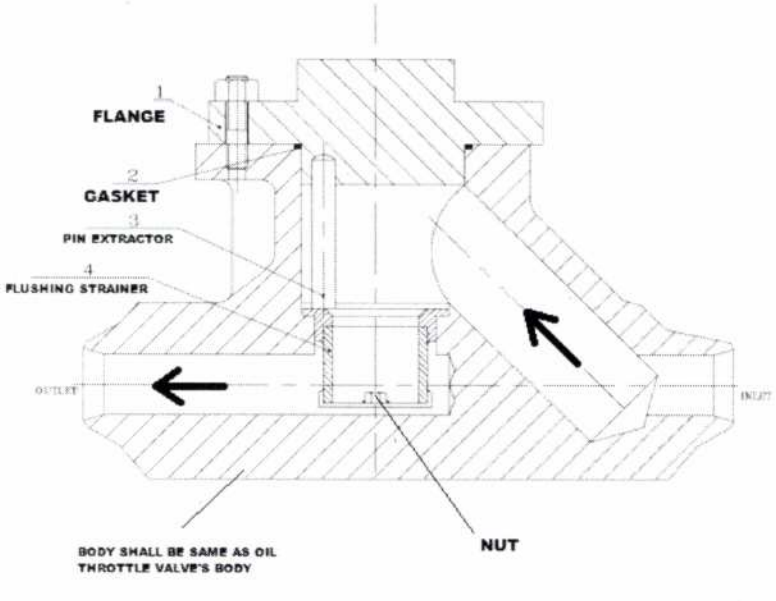


Fig. 7: Flushing Device (general view)

F. DOCUMENTS TO BE SUBMITTED BY SUPPLIER

1. During Technical Scrutiny along with offer
   a. One set, in hard copy, of GA drgs. of each valve-size and flushing device for each size offered

2. After placement of Purchase order
   a. One set, in soft copy, of GA drgs. of each valve, flushing device and characteristic curves for each size offered.

G. INSPECTION AND TESTING

1. The manufacturer shall conduct all tests required to ensure that all the components of the valve offered
   a. Conform to the requirements of the specification.
   b. Conform to requirements of application.
   c. And are in compliance with the requirements of applicable codes and standards.

2. The bidder shall submit quality plan along with offer.

3. The particulars of the proposed shop tests and procedure for the test shall be submitted to BHEL/its customer for approval along with quality plan.

4. The equipment shall be dispatched only after inspection and clearance of material by BHEL/its customer and approval of test certificated by BHEL/its customer.

5. Tests

The minimum test/check to be carried out on the valve, as envisaged by BHEL, are given below. This is, however, not intended to form a comprehensive testing programme as it is supplier's responsibility to prepare a detailed quality plan which shall also include tests, checks carried out by supplier as a part of their normal practice. This quality plan is subject to approval of BHEL/its customer. BHEL/its customer reserves the right to ask for any more check at the time of quality plan finalization.

The following tests shall be carried out during various stages of manufacturing at manufacturer's works on each of the complete valve and its flushing device:-

a. **NDT:** DPT on valve body, cover, stem, seat, flushing part and all welded joints to check for surface defects.

b. Welding of screen with perforated sheet shall be tested as per supplier standard practice.

c. **Dimensional Check:** Check for dimensional measurement shall be done.

d. **Function Test:** Smooth opening and closing of valve shall be ensured by functional test.

e. For any new valve, where characteristic curve is not available with the supplier, supplier shall prepare a test setup and produce characteristic curve thru actual testing.

f. **Material Testing:** The material of each component shall be tested as per relevant specification for its chemical composition and mechanical properties viz Yield Strength, impact, percent elongation etc. Material certificates shall be submitted as part of Quality documentation

g. **Hydrostatic Test:** Hydraulic Test shall be carried out on each valve. After hydraulic test all internal shall be wiped, cleaned and dried. Body shall be tested hydraulically in accordance with test P10 according to EN 12266 Part 1. Valve body shall be subjected to hydro test at 10bar for 15 mins. Test certificates mentioning about test pressure and duration of test alongwith following information shall be furnish to purchaser:-
   a. Valve KKS Tag
   b. Type of Valve
   c. Valve Size
   d. Name of manufacturer
   e. Project Name
   f. Date of testing

h. Color matching of valve seat and plug in case of metal to metal contact.

H. CLEANING AND SURFACE PROTECTION

Unmachined surfaces shall be blast cleaned to remove any rust/ dust.

I. PACKING

Valve ends, machined and unmachined surfaces etc. shall be protested against rusting and corrosion and valve shall be packed according to mode of transport and storage in top shade store gantry in tropic climatic conditions for a period of 8-12 months. Valve shall be supplied with all ends of valve body properly and suitably sealed.

J. GUARANTEE

The supplier shall guarantee trouble free and satisfactory operation of the equipment for a period of 12 months after installation and commissioning or 18 monthts from the date of dispatch from supplier's works.

If, during erection/commissioning, and operation at site, any defect in any component is detected, purchaser's/owner's site representative shall prepare the assessment report and a copy of the same shall be forwarded to the supplier. The supplier shall replace /rectify the concerned items free of charge. The supplier, of he so desired, may depute his representative to site at his own cost otherwise the report of purchaser's/owner's site representative shall be binding of supplier.

K. MISCELLANEOUS REQUIREMENTS

1. The following shall be printed/painted on the valve for easy identification:
   a. KKS TAG
   b. Valve size
   c. PO Number

भा ए च इ ए ल BHEL	**OIL THROTTLE VALVE** **PROJECT SPECIFIC SPECIFICATION**	**DOCUMENT No.** **4-11923-W4000** **Rev 00**
PROJECT: [redacted] 660MW UDANGUDI		

A. SCOPE OF THE DOCUMENT:

1. This document states the size and flow requirement of Oil Throttle Valve. For other requirements please refer the document General Specification of Oil Throttle Valve doc. no. 4-11923-S5100.

B. REQUIREMENTS

Sl. No.	Valve KKS TAG No.	Valve Size	Quantity (number)	Flow rate passing thru the valve (liter per second)
1	MAV42AA251	NB25	1	1.5
2	MAV42AA253	NB80	1	12.07
3	MAV42AA255	NB50	1	4.55
4	MAV42AA257	NB50	1	6.01
5	MAV42AA259	NB50	1	5.39
6	MAV44AA251	NB50	1	5.86
7	MAV44AA253	NB50	1	5.86
8	MAV46AA251	NB20	1	0.5

Worked by	HS DOGRA	[signature] 7.6.19
Checked by	A JAIN	[signature] 7/6/19
Approved by	SK GUPTA	
	Name	Signature
Deptt.	**STE-TL**	

भेल BHEL	**OIL THROTTLE VALVE** **PROJECT SPECIFIC SPECIFICATION**	**DOCUMENT No.** **4-11923-S5000** **Rev 00**
PROJECT: 800MW PATRATU		

A. SCOPE OF THE DOCUMENT:

1. This document states the size and flow requirement of Oil Throttle Valve. For other requirements please refer the document General Specification of Oil Throttle Valve doc. no. 4-11923-S5100.

B. REQUIREMENTS

Sl. No.	Valve KKS TAG No.	Valve Size	Quantity (number)	Flow rate passing thru the valve (liter per second)
1	MAV42AA251	NB25	1	1.5
2	MAV42AA253	NB80	1	12.07
3	MAV42AA255	NB50	1	5.39
4	MAV42AA257	NB50	1	7.41
5	MAV44AA251	NB65	1	9.94
6	MAV44AA253	NB65	1	9.94
7	MAV46AA251	NB20	1	0.5

Worked by	HS DOGRA	(signature) 7.6.19
Checked by	A JAIN	(signature) 7/6/19
Approved by	SK GUPTA	
	Name	Signature
Deptt.	**STE-TL**	

A. SCOPE OF THE DOCUMENT:

1. This document is general spares list. Vendors to furnish prices of each valve size separately. The quantity of each valve-size, required by BHEL as spare, shall be informed before opening of price bid.

B. List

Sl. No.	Valve Size	Price furnish by vendor
1	NB20	
2	NB25	
3	NB50	
4	NB65	
5	NB80	