



An ISO 9001 and ISO 50001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

MATERIALS MANAGEMENT

TITLE ELECTRICAL ACTUATORS FOR PANKI & UDANGUDI PROJECTS	Phone: +91 431 257 7446 Email : mohann@bhel.in
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	Reference Number: Enquiry 1702000045	Enquiry Date: 04.02.2020	Due date for submission of quotation: 15.02.2020
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You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order

BHEL commercial terms & conditions and all annexure can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units) Bharath Heavy Electricals Limited) under enquiry reference “1702000045”

Tenders should reach us before 10:00 hours on the due date
Technical bid will be opened at 10:05 hours on the due date
Tenders would be opened in presence of the tenderers who
have submitted their offers and who may like to be present.

Yours faithfully,
For **Bharath Heavy Electricals Limited**

(Kevin Ark Kumar)
Dy. Manager/MM/BOI

ANNEXURE – A

TECHNO - COMMERCIAL TERMS AND CONDITIONS

Description of the Material:		
BHEL Tender No. & Date		
GENERAL INFORMATION		
QUOTATIONS: Interested bidders / Suppliers shall submit their offer through e-Procurement mode at https://bhel.abcprocure.com Offers in any other mode will not be accepted. For Enterprise Procurement System (EPS) Bidders/Suppliers are requested to follow these steps. In case of any assistance, please contact for support in this link: https://bhel.abcprocure.com/EPROC/contactus The bidder has to keep track of any changes by viewing the addendum / Corrigendum's Issued by the Purchaser on time-to- time basis in the E-Procurement platform. The Company calling for tenders shall not be responsible for any claims/problems arising out of this.		
Sl. No.	Terms and conditions	Vendor's confirmation
1	Technical Offer: Shall be as per technical documents attached in the Enquiry or reference PO/ 's as mentioned. Deviations if any may be indicated in the Technical Deviation Format attached with the enquiry.	YES / NO
2	Firm Price: The quoted / finalised rates shall be Firm till execution of the supplies. Vendor has to quote price according to the requirement as detailed in the attached technical documents. Unless there is a change in technical specification from BHEL side, impact price will not be allowed. Vendor to quote rates according to the attached technical documents. In case of any pre-bid query, please contact: Dr. Kevin Ark Kumar, Dy.Manager/Materials Management /BOI Tel: 0431-2578109, email: kevin@bhel.in ; Mr. N Mohan, Asst./Engineer /Materials Management/BOI Tel: 0431-2577446, email: mohann@bhel.in and get your queries cleared before submitting the offer in EPS. Rates/ other price elements once quoted in the Enterprise Procurement System (EPS) cannot be changed after due date shall remain final.	Accepted / Not Accepted
3	Please refer Enquiry special instruction for item-wise or package basis details	Noted
4	Delivery term (Indigenous vendors): F.O.R Destination Basis: The quoted Rate shall be inclusive of Packing, Forwarding and Freight. Insurance will be on BHEL scope; <u>The destination is mentioned in the Enquiry</u>; you have to quote accordingly. Tender will be finalized on lowest cost to BHEL at destination basis. (Ex-Works, Freight to pay basis is not acceptable to BHEL.) Inco term (Foreign vendors) : Offer shall be submitted on CFR / Chennai Port Basis for Import by Sea (Successful L1 Bidder should provide break-up of prices such as Unit Price, Freight Charges after price bid opening)	Accepted / Not Accepted
5	Indigenous Vendor Payment terms (Non-MSE): Tick whichever of the below is applicable For despatches to Project Site: 100% NEFT after 60 days of Site Acknowledgement For despatches to Trichy Stores: 100% NEFT after 60 days of receipt & acceptance of material. ----- Payment terms for foreign vendors: 100% payment on CAD basis after 60 days from the date of receipt of documents. Bank Charges outside India are to be borne by vendor only and the bank charges within INDIA shall be borne by BHEL.	Accepted / Not Accepted
6	Deviation in Payment Terms: Any deviation in the above Payment Terms, any other conditions in payment terms or any other payment term will not be accepted and offers are liable to be commercially rejected.	Noted
7	Liquidated damages: Delivery of the goods specified in the purchase order should be made within the time prescribed. Failure to dispatch the materials in time as per the delivery quoted in our Purchase Order would make the supplier liable to an unconditional LD at the rate of 0.5% of the Total order value per week of the delay or part thereof subject to a maximum of 10% of the total order value.	Accepted / Not Accepted
8	Loading Criteria LD / Penalty: Any deviation on BHEL LD / Penalty clause, loading (Basic material Value) will be applied to the extent to which it is not agreed by the bidder. LD is for Total Order Value and not for undelivered goods. If LD for undelivered portion is only acceptable then a loading of 10% on Basic Material Value will be applied.	Accepted
9	Guarantee / Warranty Period : Guarantee clause 18 months from the date of supply or 12 months from the date of actual put in use, whichever is earlier.	Accepted / Not Accepted
10	Deviation in Guarantee / Warranty Period: No Deviation is permitted. If still vendor offered any deviation on the Guarantee / warranty period. Their offer will be rejected.	Accepted / Not Accepted
11	Delivery Period: BHEL standard delivery is Eight weeks from PO or as mentioned in the enquiry delivery schedule, whichever is earlier. In case of project orders, two weeks extra shall be given for submission of documents by vendor, for Engineering approval. For Spares orders document approval is not applicable. Vendor quoted delivery period shall include all activities i.e. manufacturing / production, Inspection, Packing, Forwarding and dispatch.	Accepted / Not Accepted
12	Risk purchase: If the supplier fails to deliver the goods within the delivery specified in the Purchase Order, BHEL will be entitled to terminate the contract / cancel the PO and to Purchase elsewhere, at the risk and cost of the seller, either the whole of the goods or any part which the supplier has failed to deliver or despatch within the delivery period mentioned in the PO. This clause is mandatory, for the vendor to accept, else the offer will be summarily rejected. If not acceptable, please mention the same in writing, in the next column.	Accepted

13	Validity: 120 days from techno commercial bid opening date	Accepted / Not Accepted
14	GST DETAILS, BHEL TRICHY GST No. 33AAACB4146P2ZL	Noted
15	Please mention your GSTIN Number	
16	HSN Codes for Quoted Material:	
17	Applicable GST Rate:	
18	Implementation of GST - Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GST registration no which should clearly mentioned in the offer. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering the offer. - Supplier shall mention their GSTN registration number in all their invoices and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no., then the Invoice No which is linked/uploaded in GSTN network shall be clearly indicated), item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, etc. - All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code). - A declaration to the effect that all invoice particulars are/were uploaded in the GSTN network/ portal & all tax liability as per GST rules and regulations have been and will be discharged, shall be mentioned in the invoice. If not mentioned in the invoice, a separate declaration shall be submitted as per the requirement of BHEL. - All documents like Mill Test Certificate, LR copy, Guarantee/Warranty certificate, work completion certificate, any other document mentioned in PO, shall be sent along with the vehicle/consignment. For all consignments received within the calendar month, input credit will be availed within that month in line with monthly returns filing cycle. In case of any discrepancy in the document or non-submission of documents mentioned in the PO, then BHEL will not be able to accept or account the material, in such case availing of tax credit will be deferred to next month or so. - In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the suppliers, within the calendar month notified by BHEL. For any such delay in availing of tax credit for reasons attributable to supplier (as mentioned above), interest (calculated @ SBI Base Rate + 6%) along with penalty if any will be deducted for the delayed period i.e. from the month of receipt till the month tax credit is availed, from the running bills	Noted (N/A for Foreign vendors)
19	Unregistered BHEL (Non-PMD) Temporary vendors for this item code should comply the following: - Supplier should submit the filled in supplier registration forms (SRF) available in the BHEL website https://supplier.bhel.in and the other required documents called for in the SRF. Application number of submitted SRF to be quoted in the offer submitted. - The hard copy of the submitted SRF shall be submitted to SDC Dept. before enquiry due date without fail. The same shall be scrutinized as per BHEL evaluation procedures - The contact details of SDC are as below: Ms. Nalini Subramanian, SDC / MM, 4th Floor, Building 24, BHEL, Trichy – 620014 Ph. No.: 0431-2577301, nalini.s@bhel.in - Only those one time vendors who have submitted SRF and indicate application number in offer will be evaluated technically. Further to the above only those one time vendors whose SRF evaluation successfully completed, price bid will be opened. If the above points are not complied, your offer will be rejected. Registered BHEL PMD vendors (for this item / Matl Gp) need not submit the SRF and this point is not applicable.	Accepted / Not Accepted
20	BENEFITS TO MSE VENDOR: MSE suppliers can avail the intended benefits only if they submit along with the offer, attested/notarized copies of either - Valid NSIC certificate or EM II certificate along with CA certificate applicable for the year, certifying quantum of investment in plant and machinery within the permissible limits as per the act for relevant status (MICRO or SMALL) where the deemed validity of EM II is over. OR Udyog Aadhaar Memorandum No. & CA Certificate applicable for the year, certifying quantum of investment in plant and machinery within the permissible limits as per the act for relevant status. Date to be reckoned for determining the deemed validity will be the last date of technical bid submission (Part 1 in case of two part 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, in case of any deficiency in the above required documents or in case the documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal even if submitted earlier. Documents should be notarized or attested by a Gazetted officer. For Package basis (Non-Splittable): - If L1 vendor is an MSE vendor entire project package will be ordered on L1 vendor. - If a Non MSE vendor is coming as L1, then L1 prices will be counteroffered on MSE vendor who is quoting price within the price band L1+15% and if they are agreeing, purchase order will be awarded for full/complete supply of total tendered value to MSE. - If more than one MSE vendors are available in the L1+15% price band then lowest of the MSE vendor will be selected for counteroffering. If lowest MSE vendor is not accepting it will be counteroffered to the next MSE vendor in the price band and so on. - Finally if none of the MSE vendor in the price band is not accepting, it will be ordered on L1 non MSE vendor.	Accepted / Not Accepted (N/A for Foreign vendors)

	For Item wise evaluation (Splitable): If a Non MSE vendor is coming as L1, then L1 prices will be counteroffered on MSE vendor who is quoting price within the price band L1+15% and if they are agreeing, purchase order will be awarded for 25% of the tendered quantity. ➤ 3% reservation for women owned MSEs, within the above mentioned 25% reservation. ➤ 6.25% reservation from MSE owned by SC / ST entrepreneurs, within the above mentioned 25% reservation. In case of more than one such MSE, the supply shall be shared proportionately. Payment for MSE indigenous vendors will be as per MSMED Act, 2006.	
21	MSE VENDOR	YES / NO
22	IF MSE VENDOR PROVIDE UDYOG AADHAR MEMORANDUM No. (UAM)	
23	Definitions of MSEs owned by SC/ST is under: • In case of proprietorship firm, proprietor must be SC/ST. • In case of partnership firm, the SC/ST partners must be holding at least 51% shares in unit. In case of private limited companies, at least 51% share must be held by SC/ST promoters. Authorised Offices to Issue SC/ST certificate. The caste/Tribe/Community certificate issued by the following authorities in the prescribed form for SCs/STs can be considered. • District Magistrate / Additional District Magistrate / Collector / Deputy Commissioner / Additional Deputy Commissioner / Deputy Collector / 1st class stipendiary magistrate / Sub divisional Magistrate / Taluka Magistrate / Executive magistrate • Chief Presidency magistrate / Additional chief presidency magistrate/Presidency magistrate. • Revenue Officer not below the rank of Tehsildar. • Sub-Divisional officer of the area where the individual and / or his family normally resides. To avail the benefits of MSE under SC/ST category, the related documents as stated above should be submitted along with tender documents.	Accepted / Not Accepted (N/A for Foreign vendors)
24	Document Submission: Along with the offer: 1. Sub-delivery enquiry deviation format. 2. Filled-in/signed Commercial terms and conditions (this document) to be submitted. 3. Unpriced offer submitted through EPS shall contain minimum of above documents, without which offer will be summarily rejected. 4. If MSE vendor, Please attach UAM No. along with CA Certificate 5. All the technical documents which have been attached along with our enquiry i.e Specification, QP, Packing Procedure, Data Sheet signature to be endorsed on all pages with company seal.	Submitted/ Not Submitted
25	Any deviation on technical/QP/packing requirements shall specifically be indicated in the "sub-delivery enquiry deviation format" attached along with the enquiry. Deviations / clarifications declared elsewhere will not be evaluated. Also, any deviations from the commercial terms and conditions shall be clearly spelt out in this format itself. Deviations / clarifications declared elsewhere will not be evaluated. Deviations taken, if any, by vendor as per our requirement above shall be clearly got accepted by BHEL in writing during enquiry stage itself. In the event of an order no deviations, unless accepted clearly by BHEL in writing during enquiry stage will be entertained and all other techno-commercial requirements will be binding on successful bidder and failure to execute the terms will lead to disciplinary action by BHEL against the said bidder.	Accepted / Not Accepted
26	Enquiry as a package: Please refer the Special Instructions / General note in the EPS enquiry. If on package basis, partial quantity offer will be rejected.	Accepted / Not Accepted
27	While submitting price bid in the EPS, vendor shall not quote different prices for identical items listed in enquiry (main boilers & spares). In case different prices are quoted for same / identical items/ materials, lowest of the two will be considered for ordering.	Accepted
28	Vendor to submit unpriced bid along with the Part-I Bid in the EPS.	Attached / Not attached
29	Vendors who have registered themselves as MSE, cannot claim the benefits unless they submit the UAM No. along-with the EPS offer for each tender; failing which vendor shall not claim MSE benefits. (N/A for Foreign vendors)	Accepted / Not Accepted
30	Any pre-bid queries / clarification / document requirement etc. shall be asked within 3-4 days of floating tender in EPS. Tender due date extension will not be given without valid reason. Tender due date extension request has to be given before due date / time along-with a valid reason.	Noted
31	It has been observed that vendor gives confirmation to commercial terms & conditions specified in this Annexure and gives different terms & conditions in the unpriced bid / offer documents.	ACCEPTED
32	"Sub-Delivery Enquiry Deviation Format" is important document which has to be filled, (signed & sealed) with all the technical reference document detail and attached along with the offer in the EPS. In case of no deviations. Please mention NIL DEVIATION.	Attached / Not Attached
33	All the technical documents, if attached by BHEL along with the enquiry/ RFQ (Specification / Drawing / QP / Datasheet / Packing Procedure etc.) which are part of this e-tender, should bear your conformation / confirmation and sign with seal on each page. The same shall be scanned & attached as PDF files along with the offer for technical evaluation. (In case of Spares, reference PO is mentioned in the tender general notes, then technical documents need not be submitted, however, Deviation format mentioning the reference PO needs to be submitted)	Technical Docs Submitted / Not Submitted
34	Technical / commercial clarification, if any, will be initiated through EPS / email. Vendor to respond to the clarifications within 3 working days. If the vendor fails to respond, even after three reminders, then the vendor will be considered as non-responsive and is liable to be rejected. Please note that EPS generates auto email whenever clarification / tender event is scheduled. Vendor to keep track and respond immediately.	Noted

35	Fraud Prevention Policy Suppliers involving in fraudulent practices or delayed supply (or) non-Supply will be dealt with provision as indicated in "Guidelines for Suspension of Business Dealings with Suppliers / Contractors" which is hosted in website www.bhel.com. The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com. 1.0 Integrity commitment, performance of the contract and punitive action thereof: 1.1 Commitment by BHEL: BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in transparent and fair manner, and with equity. 1.2 Commitment by Bidder / Supplier / Contractor: 1.2.1. The bidder / supplier / contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India. 1.2.2. The bidder / supplier / contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issues from time to time by Govt. of India / BHEL. 1.2.3. The bidder / supplier / contractor will perform / execute the contract as per the contract terms & Conditions and will not default without any reasonable cause, which causes loss of business / money / reputation, to BHEL. If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then action may be taken against such bidder / supplier / contractor as per extant guidelines of the company available on www.bhel.com and / or under applicable legal provisions.	Noted
36	PO Acknowledgement: Within 7 days from the date of receipt of scanned PO copy through email.	Accepted
37	Document Submission after PO: Complete set of valid Documents as per BHEL format viz., Datasheet, GA drawing and QAP / RQP / VQP are to be submitted within 14 days from the date of receipt of PO (e-mail copy). If there is a delay in submission of valid documents within 14 days, the delay will be accounted for the calculation of LD.	Accepted
38	Inspection notice period: Vendor shall raise inspection call to Third Party Inspection Agency / BHEL at least three working days, prior to the proposed date of inspection.	Accepted
39	Vendor shall dispatch the consignment within 3 working days after getting dispatch clearance from BHEL, subsequent delay will be accounted for calculation of LD.	Accepted
40	In the event of PO, the reference date for LD calculation will be date of final inspection Agency's signed Inspection report / Test certificates for Ex-Works & FOB contracts. The reference date for F.O.R contracts will be Invoice date / Lorry way bill date LR date/ Railway Receipt date, whichever is later.	Accepted
43	For Foreign vendors: Exchange rate (TT selling rate of SBI) as on scheduled date of tender opening (part -I bid in case of two part bid) shall be considered for evaluation. Tender will be finalized on the basis of "TOTAL COST" basis to BHEL.	Noted
44	For Foreign vendors: Test certificate as applicable shall be submitted prior to despatch for our review and approval. Shipment shall be made only after obtaining despatch clearance from BHEL. All test certificates /Country of Origin Certificate etc are to be given free of cost.	Noted
45	Inspection & testing requirements: Inspection and testing requirements are to be carried out as per the specification and BHEL/customer approved QAP and all test certificates are to be submitted in complete set as indicated in our specification /QAP. In case of Vendor QP the same shall be submitted for approval along with the offer.	Noted
46	Repair & replacements: Within the guarantee period vendor has to replace / rectify the defective/ damaged items on free of cost within a reasonable time of reporting from our end. All incidental charges like freight, insurance and customs duty / GST are to vendor account only. The defective parts and components shall be collected by your Indian agent or / authorized person, only after completing the replacement / repairs. The defective parts / components will not be returned back to vendor works by us due to procedural problems.	Accepted
47	BHEL reserves the right to cancel / modify the tender, if the need so arises, without assigning any further notice or reason therefore.	Accepted

By signing this Annexure, the vendor consents that the terms & conditions accepted in this Annexure alone, shall be binding between BHEL and the Vendor; and no other terms mentioned, elsewhere in the Offer / Quotation will be considered / accepted by BHEL.

Pre-Qualification Requirement
(Continuous modulating duty electrical actuators)

- a) The offered electrical actuator models should meet the requirement of technical specification in full, should be of proven design and should have been supplied and commissioned in critical applications of thermal power plant in India, such as Primary Air Fan/Forced Draft fan/Induced Draft Fan blade pitch control, Induced Draft fan inlet damper control, Boiler Feed Pump Scoop control and the same shall be working satisfactorily for a period of minimum 2 years as on the date of techno-commercial bid opening.
- b) Vendor should have the capability for the design, engineering, manufacturing and supply of electrical actuators meeting the above criteria.
- c) Vendor should provide Commissioning, service support in India & supply of spares.
- d) Vendor to submit signed copy of reference list of projects, where the offered electrical actuator models (meeting the requirement of point-a), was supplied earlier. The reference list should contain the following details, Name of the projects, Capacity of the plant, location, model number of the actuator, application, year of commissioning and contact details etc.).



**BHARAT HEAVY ELECTRICALS LIMITED,
THIRUCHIRAPALLI-620 014**

CONTROLS & INSTRUMENTATION/FOSSIL BOILERS

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**TECHNICAL SPECIFICATION FOR
CONTINUOUS MODULATING ELECTRICAL ACTUATORS**

Specification Number: TCI : 315/HAA

Revision History

Rev. No.	Date	Description	Prepared	Reviewed	Approved
00 - 01	29-08-2017	Initial Release	-sd-	-sd-	-sd-
02	22-06-2018	Revisit	-sd-	-sd-	-sd-
03	08-11-2019	Revisit	<i>M. Hameed Javed</i>	<i>M. Hameed Javed</i>	<i>V. Madhavan</i>



Sl. No.	Details	Requirements
1.0	General	
1.1	Site Conditions	Ambient Temperature : 6° C to 50° C. Refer to point no. 2.4 for actuator design temperature. Relative Humidity : 95% Atmosphere : Tropical, dusty, salty, corrosive and highly polluted.
2.0	Actuator	
2.1	Actuator type	Continuous Modulating duty, electrical actuator, operated by 4-20 mA demand signal from the control system. Shall be electrical motor driven, consisting of suitable gear train mechanism with other accessories such as power supply, starter circuit, position controller, position feedback transmitter etc. Shall be Foot mounted, Lever operated type.
2.2	Application	Used in the critical application of FD/ID/PA fan blade pitch control, ID fan inlet vane control as applicable for the project. Hence, failure of any one or more electrical actuators will result in the reduction in power generation to half or total loss of power generation. For Blade pitch control, this electrical actuator provides the pilot action to the hydraulic control unit of the fans based on the demand signal, resulting in the change of blade angle.
2.3	Standards	Shall conform to EN-15714-2 or equivalent international standards for all requirements.
2.4	Construction	Shall be suitable for operation in hot, humid and tropical atmosphere, highly polluted places with coal dust and fly ash. Actuator enclosure shall be totally enclosed, dust tight, weather-proof construction meeting the requirements of IP-67. Shall be suitable for working in a temperature range, (-)20 °C to (+)60 °C. Shall be designed for mounting in any orientation without any lubricant leakage or operational difficulties.



Sl. No.	Details	Requirements
2.5	Manual operation	Provision for manual operation such as Hand wheel/Knob/Lever shall be provided for operating the actuator during emergency conditions, during loss of power supply.
3.0	Power Supply	
3.1	Power Supply	1 no. of power supply feeder of 415 V AC, 3 phase, 3 wire, 50Hz will be provided to each actuator present in the field. (Vendor to take care of separate hardware units in each actuator, to derive any other voltages that are required for the operation of the actuator).
3.2	Power supply variation	Voltage variation $\pm 10\%$, Frequency variation $\pm 5\%$, Combined voltage and frequency variation 10% . Actuator should perform without any problem, even under the above situations.
4.0	Design requirements	
4.1	Torque requirement	Shall develop the torque at the output shaft, as specified in the purchase enquiry.
4.2	Operating time of the actuator	The time taken for the actuator lever to move from full close to full open position and vice-versa at rated voltage and frequency, shall be within the time specified in the purchase enquiry.
4.3	Actuator output shaft - Angle of rotation & Lever length	The angle of rotation at the actuator side and the length of the actuator output lever shall be designed, based on the requirements of the operating time & angle of rotation at the load side as spelt in the purchase enquiry.
5.0	Motor	
5.1	Motor	The type of motor shall be Squirrel Cage Induction type with Variable Frequency drive or Permanent Magnet Synchronous motor or Brushless DC motor, as per the actuator design.
5.2	Duty Cycle	The duty cycle of the actuator motor shall be 3600 starts/hour or higher.



Sl. No.	Details	Requirements
5.3	Motor winding Insulation	Shall have class-F insulation with temperature rise limited to class-B, with tropicalisation suitable for the site conditions.
5.4	Temperature rise	Temperature rise of the motor shall be limited to 70° C over an ambient temperature of 50° C. Temperature rise in the motor winding shall be monitored and interlocked to the control circuit as applicable to the motor design.
6.0	Gear Mechanism	
6.1	Gear mechanism	Shall be provided with required gear train mechanism for the purpose of speed reduction. Shall be made out of suitable metal. The gear mechanism shall be suitable for continuous modulating duty and shall be designed suitably to achieve the actuator performance characteristics as indicated in clause no. 7.2. Self-locking feature has to be provided to prevent the drift due to the load acting on the actuator.
6.2	Lubricant	The gear train mechanism shall be either Oil or Grease lubricated.
7.0	Actuator Controls	
7.1	Features of the Actuator	Shall have the following minimum features : - Integral Starter module with Electronic reversing circuits. - Electronic positioner circuit. - Lockable Local/Remote selector switch. - Push buttons for local operation. - Adequate protection feature such as single phasing protection, over load protection etc. as applicable, shall be provided. - Indicating lamps/LED/LCD readout for status/fault and digital position indication shall be provided. - Potential free, common annunciation contact for various fault conditions. - Provision to diagnose the type of fault locally in the actuator.



Sl. No.	Details	Requirements
		i. Shall have SMART, non-intrusive facilities for calibration as applicable to actuator design. j. Vendor to supply necessary tools & kit for actuator calibration and diagnosis at site.
7.2	Actuator performance characteristics	a. Minimum input signal (Dead band) for which the actuator can respond: 0.5 % of full span. b. The actuator shall have STAYPUT characteristics on loss of the demand and feedback signal.
7.3	Position feedback transmitter	Non-contact type position sensor, shall be provided with isolated 4-20 mA DC current output to DCS.
7.4	Position limit sensing	Position limit sensing shall be made available and potential-free, contact shall be provided for Open, Close and 2 predefined intermediary positions respectively and all the contacts shall be terminated in the terminal box. Vendor to indicate the contact rating.
7.5	Torque Sensing	Actuator shall have provision for torque sensing and shall be interlocked to the control circuit. Actuator shall be provided with torque switches (as applicable to the actuator design) and the torque switch outputs for Open and Close positions shall be wired up to the terminal blocks.
7.6	Space heater	Actuator shall be provided with Space heater (as applicable to the actuator design) for the purpose of anti-condensation inside the actuator housing. If space heater is applicable, the power supply for the same shall be derived internally from the main power supply.
7.7	Local position indicator	Shall be provided.
8.0	Internal Wiring and Termination	
8.1	Internal wiring	Shall be done by using cables of suitable size with proper ferruling. Signal interface details shall be neatly affixed on to the cover/body.



Sl. No.	Details	Requirements
8.2	Termination of Power & Control Cable	1 no. Double compression type, Weather proof, Brass with Nickel plated, cable gland shall be provided for the power cable of OD – 16 mm. Either Cable glands or Plug & socket connectors as per the actuator design shall be provided for the termination of command and feedback signals. The cable entries shall be suitable for a cable of OD 16 mm (approx.).
8.3	Earth terminal	Shall be provided.
9.0	Output Levers and Linkage rod	
9.1	Linkage rod	Vendor to provide linkage rod of length as per the purchase enquiry, with suitable connecting mechanism at both sides (actuator and load side) for connecting the levers with the linkage rod. Vendor to provide 2 nos. of output lever of length as per the purchase enquiry (1 for connecting at the output shaft of the actuator and 1 for connecting at the output shaft of the load. The diameter of the output shaft of the load will be intimated during drawing approval stage).
9.2	Output Shaft and Output Lever	The orientation and rotation of the output shaft and lever has to be matched with the load, as per the drawing enclosed with Purchase Enquiry.
10.0	Finish	
10.1	Painting	All external Parts shall be finished and painted to produce a neat and durable surface using Epoxy based paint, which would prevent Corrosion & Rusting.
10.2	Asbestos free	The materials used in the actuator and its accessories, shall be free from asbestos.
11.0	Inspection & Testing	
11.1	Quality Plan	Vendor to submit the Vendor Quality Plan for review and approval by BHEL and Customer.



Sl. No.	Details	Requirements
11.2	Inspection & Testing	As per the technical specification, approved Data sheet and approved Quality Plan.

12.0	Documents to be submitted	
12.1	Documents to be submitted along with offer	a. Vendor has to submit “Sub-delivery Enquiry deviation form”, indicating “No-Deviation”, conforming to the requirements of the purchase enquiry in full. The references of the input documents such as technical specification & quality plan have to be indicated in the format. Any deviations shall only be indicated in the above form. Deviations indicated elsewhere in the offer will not be considered. b. Technical data sheet, as per BHEL’s format. c. Actuator catalogues, model decoding sheet, wiring drawing, GA drawings and Sizing Calculations. d. Vendor Quality Plan incorporating (Inspection at Raw material stage/In-process stage/Finished product stage, Routine tests and type tests.)
12.2	Documents to be submitted for approval after placement of Purchase order	a. Technical data sheet, as per BHEL’s format. b. GA Drawings with dimensional details. c. Wiring drawings. d. Vendor Quality Plan. Manufacturing shall be started only after the approval of the above documents.
12.3	O & M manuals	O & M manuals including all details required for operation, erection and commissioning–Soft copies in CDs shall be submitted to BHEL. 2 Sets of hard copies shall be sent to site along with actuator packing.
13.0	Packing	The packing shall be sea-worthy and shall meet Transport, environment, Storage and handling hazards, meeting the requirements as per relevant international standards.



14.0	Pre - Qualification requirement	Vendor should have supplied and commissioned similar products of suitable ratings to thermal power plant applications and the same shall be working satisfactorily for a period of minimum 2 years as on the date of techno-commercial bid opening. The bidder can offer and supply such equipment with collaboration or valid license agreement for design, engineering, manufacture and supply of such equipment in India provided the collaborator meets the above criteria.
15.0	Commissioning	Commissioning of the actuator shall be in vendor's scope. A commissioning protocol shall be signed by the customer, site & vendor on successful commissioning of the system and shall be submitted to BHEL-Trichy.
16.0	Spares	Supplier to indicate a list of recommended spares.

This technical specification covers only the basic requirements. However, vendor shall take care of all the requirements of the actuator to meet with the performance requirements and to ensure the completeness of the system.



BHARAT HEAVY ELECTRICALS LIMITED,
THIRUCHIRAPALLI-620 014

CONTROLS & INSTRUMENTATION/FOSSIL BOILERS

Page 1 of 8

Technical specification for
CONTINUOUS MODULATING ELECTRICAL ACTUATORS

Specification Number TCI:343

Revision History

Rev. No.	Date	Description	Prepared	Reviewed	Approved
			M. Muruga Prabu	M. Muruga Prabu	V. M. Selvaraaaj
00	09-11-2017	Initial Release	-sd-	-sd-	-sd-
01	02-08-2018	Revisit	-sd-	-sd-	-sd-
02	08-11-2019	Revisit	<i>M. Muruga Prabu</i>	<i>M. Muruga Prabu</i>	<i>V. M. Selvaraaaj</i>



Sl. No.	Details	Requirements
1.0	General	
1.1	Site Conditions	Ambient Temperature : 6° C to 50° C. Refer to Clause No. 2.4 for actuator design temperature. Relative Humidity : 95% Atmosphere : Tropical, dusty, salty, corrosive and highly polluted.
2.0	Actuator	
2.1	Actuator type	Continuous Modulating duty electrical actuator, operated by 4-20 mA demand signal from the control system. Shall be electrical motor driven, consisting of suitable gear train mechanism with other accessories such as power supply, starter circuit, position controller, position feedback transmitter etc. Shall be Foot mounted, Lever operated type.
2.2	Application	Used in the critical application of FD/ID/PA fan blade pitch control, ID fan inlet vane control as applicable for the project. Hence, failure of any one or more electrical actuators will result in the reduction in power generation to half or total loss of power generation. For Blade pitch control, this electrical actuator provides the pilot action to the hydraulic control unit of the fans based on the demand signal, resulting in the change of blade angle.
2.3	Standards	Shall conform to EN-15714-2 or equivalent international standard for all requirements.
2.4	Construction	Shall be suitable for operation in hot, humid, tropical atmosphere, highly polluted with coal dust and fly ash. Actuator enclosure shall be totally enclosed, dust tight, weather-proof construction meeting the requirements of IP-67. Shall be suitable for working in a temperature range of (-)20 °C to (+)60 °C. Shall be suitable for mounting in any orientation.
2.5	Manual operation	Provision for manual operation through Hand wheel/Knob/Lever shall be provided for operating the actuator during loss of power supply.



Sl. No.	Details	Requirements
3.0	Power Supply	
3.1	Power Supply	One power supply feeder of 415 V AC, 3 phase, 3 wire, 50Hz will be provided to each actuator. (Vendor to take care of separate hardware units in each actuator, to derive any other voltages that are required for the operation of the actuator).
3.2	Power variation supply	Voltage variation $\pm 10\%$, Frequency variation $\pm 5\%$, Combined voltage and frequency variation 10 %. Actuator should perform without any problem, even under the above situations.
4.0	Design requirements	
4.1	Torque requirement	Shall develop the torque at the output shaft, as specified in the purchase enquiry.
4.2	Operating time of the actuator	The time taken for the actuator lever to move from full close to full open position and vice-versa, shall be within the time specified in the purchase enquiry.
4.3	Actuator output shaft - Angle of rotation & Lever length	The angle of rotation at the actuator side and the length of the actuator output lever shall be designed, based on the requirements of the operating time & angle of rotation at the load side as spelt in the purchase enquiry.
5.0	Motor	
5.1	Motor	The type of motor shall be Squirrel Cage Induction type with Variable Frequency drive or Permanent Magnet Synchronous motor or Brushless DC motor, as per the actuator design.
5.2	Duty Cycle	The duty cycle of the actuator motor shall be 3600 starts/hour or higher.
5.3	Motor winding Insulation	Shall have class-F insulation with temperature rise limited to class-B, with tropicalisation suitable for the site conditions.
5.4	Temperature rise	Temperature rise of the motor shall be limited to 70° C over an ambient temperature of 50° C. Temperature rise in the motor winding shall be monitored and interlocked to the control circuit as applicable to the motor design.



Sl. No.	Details	Requirements
6.0	Gear Mechanism	
6.1	Gear mechanism	Shall be provided with required gear train mechanism for the purpose of speed reduction. Shall be made out of suitable metal. The gear mechanism shall be suitable for continuous modulating duty and shall be designed suitably to achieve the actuator performance characteristics as indicated against Clause No. 8.1. Self-locking feature has to be provided to prevent the drift in output shaft, due to the load.
6.2	Lubricant	The gear train mechanism shall be either Oil or Grease lubricated.
7.0	Actuator Controls	
7.1	Basic features of the Actuator	The actuator shall have the following minimum features : a. Integral Starter module with Electronic reversing circuits. b. Electronic positioner circuit. c. Lockable Local/Remote selector switch. d. Push buttons for local operation. e. Adequate protection feature such as single phasing protection, over load protection etc. as applicable, shall be provided. f. Indicating LEDs, LCD readout for status/fault annunciation, digital position indication shall be provided. g. Potential free, common annunciation contact for various fault conditions. Potential free relay contact shall be provided in the actuator which shall be programmed for any of the functions.
7.2	Position feedback transmitter	Non-contact type position sensor shall be used for position control and to derive isolated 4-20 mA DC current output to DCS.
7.3	Position limit sensing	Position limit sensing shall be made available and potential-free, contact shall be provided for Open, Close and 2 predefined intermediary positions respectively and all the contacts shall be terminated in the terminal box. Vendor to indicate the contact rating.



Sl. No.	Details	Requirements
7.4	Torque Sensing	Actuator shall have provision for torque sensing and shall be interlocked to the control circuit. Actuator shall be provided with torque switches (as applicable to the actuator design) and the torque switch outputs for Open and Close positions shall be wired up to the terminal blocks.
7.5	Space heater	Actuator shall be provided with Space heater (as applicable to the actuator design) for the purpose of anti-condensation inside the actuator housing. If space heater is applicable, the power supply for the same shall be derived internally from the main power supply.
7.6	Local indicator position	Shall be provided.
7.7	Calibration and Fault diagnosis facilities	The actuator shall have provision for calibration and fault diagnosis, using Handheld calibrator or through a local/remote connected PC, using communication protocols such as HART or profibus etc. Necessary modem/connecting devices shall also be provided along with the actuator for performing calibration and fault diagnosis from a Laptop/PC through wireless mode. Latest version of Diagnostic/ configuration/ parameterization software shall be provided along with the actuator in a CD/DVD format.
7.8	Data logging facilities.	Shall have Data logging facility to store and enable download of historical actuator data.
8.0	Actuator performance characteristics	
8.1	Minimum input signal (Dead band) for which the actuator can respond	0.5 % of full span.
8.2	Action on loss of demand / feedback signal	Stay put



Sl. No.	Details	Requirements
9.0	Internal Wiring and Termination	
9.1	Internal wiring	Shall be done by using cables of suitable size with proper ferruling. Signal interface details shall be neatly affixed on to the cover/body.
9.2	Termination of Power & Control Cable	1 no. Double compression type, Weather proof, Brass with Nickel plated, cable gland shall be provided for the power cable of OD – 16 mm. Either Cable glands or Plug & socket connectors as per the actuator design shall be provided for the termination of command and feedback signals. The cable entries shall be suitable for a cable of OD 16 mm (approx.).
9.3	Earth terminal	Shall be provided.
10.0	Output Levers and Linkage rod	
10.1	Linkage rod	Vendor to provide linkage rod of length as per the purchase enquiry, with suitable connecting mechanism at both sides (actuator and load side) for connecting the levers with the linkage rod. Vendor to provide 2 nos. of output lever of length as per the purchase enquiry (1 for connecting at the output shaft of the actuator and 1 for connecting at the output shaft of the load. The diameter of the output shaft of the load will be intimated during drawing approval stage).
10.2	Orientation of Output Shaft and Output Lever	The orientation and rotation of the output shaft and lever has to be matched with the load, as per the drawing enclosed with Purchase Enquiry.
11.0	Finish	
11.1	Painting	All external Parts shall be finished and painted to produce a neat and durable surface using Epoxy based paint, which would prevent Corrosion & Rusting.



Sl. No.	Details	Requirements
11.2	Asbestos free	The materials used in the actuator and its accessories, shall be free from asbestos.
12.0	Inspection & Testing	
12.1	Quality Plan	Vendor to submit the Vendor Quality Plan along with the offer for review and approval by BHEL and Customer.
12.2	Inspection & Testing	Inspection shall be carried out as per technical specification, approved data sheet & drawings and approved Quality Plan.
13.0	Documents to be submitted	
13.1	Documents to be submitted along with offer	a. Vendor has to submit "Sub-delivery Enquiry deviation form", indicating No-Deviation, in case of no deviation, with respect to the requirements indicated in the purchase enquiry. The references of the technical specification has to be indicated in the format. Deviations shall only be indicated in the above form. Deviations indicated elsewhere in the offer will not be considered. b. Technical data sheet, as per BHEL's format. c. Catalogues, model decoding sheet, wiring drawing, GA drawings and Sizing Calculations. d. Vendor Quality Plan incorporating (Inspection at Raw material stage/In-process stage/Finished product stage, Routine tests and type tests).
13.2	Documents to be submitted for approval after placement of Purchase order	a. Technical data sheet, as per BHEL's format. b. GA Drawings with dimensional details. c. Wiring drawings. d. Vendor Quality Plan. Manufacturing shall be started only after the approval of the above documents.



Sl. No.	Details	Requirements
13.3	O & M manuals	O & M manuals including all details required for operation, erection and commissioning – Soft copies in CDs shall be submitted to BHEL. 2 Sets of hard copies shall be sent to site along with actuator packing.
14.0	Packing	The packing shall be sea-worthy and shall meet Transport, environment, Storage and handling hazards, meeting the requirements as per relevant international standards.
15.0	Pre - Qualification requirement	Vendor should have supplied and commissioned similar products of suitable ratings to thermal power plant applications and the same shall be working satisfactorily for a period of minimum 2 years as on the date of techno-commercial bid opening. The bidder can offer and supply such equipment with collaboration or valid license agreement for design, engineering, manufacture and supply of such equipment in India provided the collaborator meets the above criteria.
16.0	Commissioning	Commissioning of the actuator shall be in vendor's scope. A commissioning protocol shall be signed by the customer, site & vendor on successful commissioning of the system and shall be submitted to BHEL-Trichy.
17.0	Spares	Supplier to indicate a list of recommended spares.

This technical specification covers only the basic requirements. However, vendor shall take care of all the requirements of the actuator to meet with the performance requirements and to ensure the completeness of the system.



Bharat Heavy Electricals, Limited Controls & Instrumentation/Fossil Boilers

CI: PANKI: ACT: DS/Rev. 00
31-10-2019

ELECTRICAL ACTUATOR DATASHEET FOR PA/FD/ID FAN APPLICATIONS

Project PANKI
Customer Number 1728
Rating 1 x 660 MW

FD Fan Blade Pitch Control Application

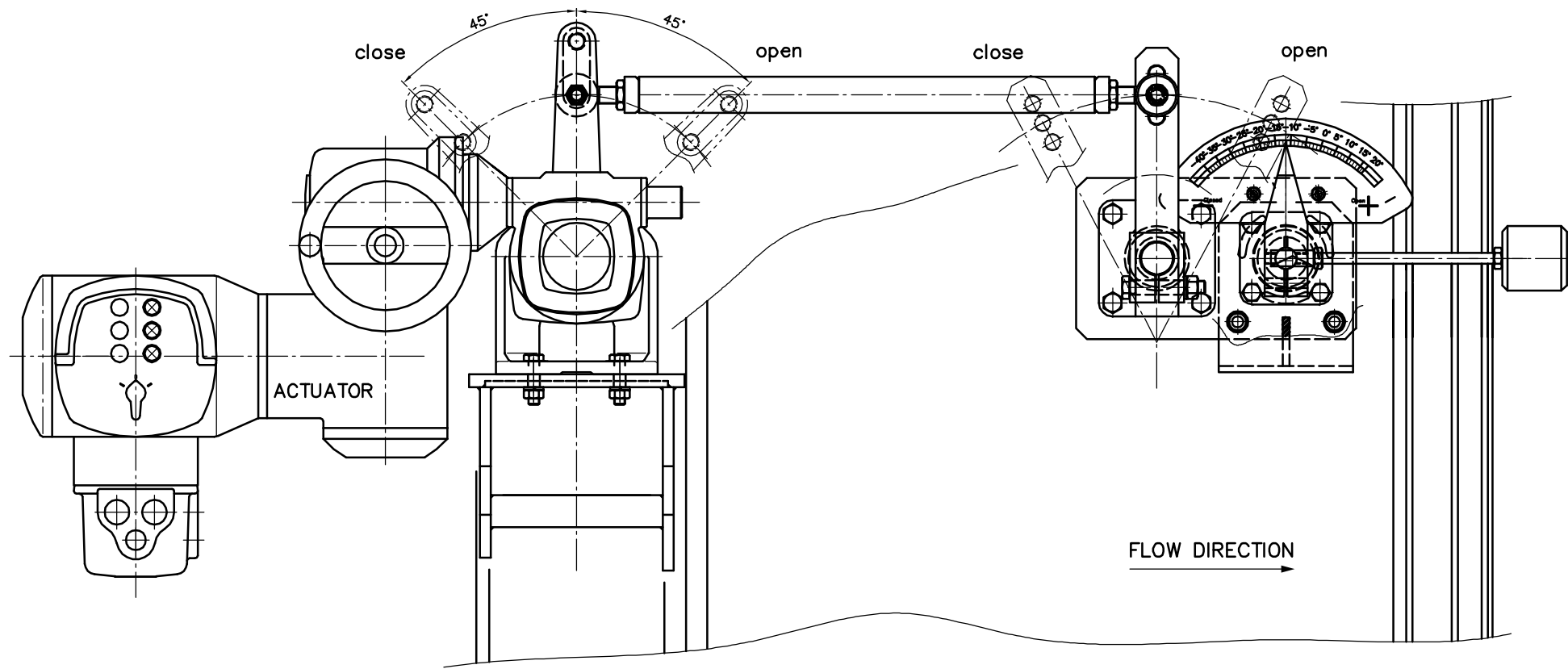
1. Tag Nos.: 10HLB10AA101, 10HLB15AA101
2. Minimum continuous torque: 10 kgm.
3. Angle of rotation required at the load lever: 88.4 degrees.
4. Load lever (Output lever at load side) radius: 152 mm.
5. Operating time: 30 to 35 seconds.
6. Vendor to select the Actuator crank arm rotation angle and the Radius of the Actuator crank arm lever (output lever at actuator side), based on the requirements of the operating time and load lever radius and rotation.
7. Mounting: Fan Casing mounted.
8. Actuator mounting arrangement shall as per the drawing "Actuator Orientation - Style 01".
9. Requirement of Linkage Accessories
 - 1 no. of actuator crank arm lever and 1 no. of load lever (output lever at load side) of lengths as indicated above.
 - 2 nos. of ball and socket connecting mechanisms for connecting the linkage rod with the levers.
 - 1 no. of Linkage rod of length 350 ± 50 mm for connecting the Load lever and actuator crank arm lever.

ID Fan Blade Pitch Control Application

1. Tag Nos.: 10HNC10AA101, 10HNC15AA101
2. Minimum continuous torque: 10 kgm.
3. Angle of rotation required at the load lever: 64.4 degrees.
4. Load lever (Output lever at load side) radius: 199 mm.
5. Operating time: 30 to 35 seconds.
6. Vendor to select the Actuator crank arm rotation angle and the Radius of the Actuator crank arm lever (output lever at actuator side), based on the requirements of the operating time and load lever radius and rotation.
7. Mounting: Fan Casing mounted.
8. Actuator mounting arrangement shall as per the drawing "Actuator Orientation - Style 02".
9. Requirement of Linkage Accessories: -
 - 1 no. of actuator crank arm lever and 1 no. of load lever (output lever at load side) of lengths as indicated above
 - 2 nos. of ball and socket connecting mechanisms for connecting the linkage rod with the levers.
 - 1 no. of Linkage rod of length: 655 ± 50 mm for connecting the Load lever and actuator crank arm lever.

PA Fan Blade Pitch Control Application

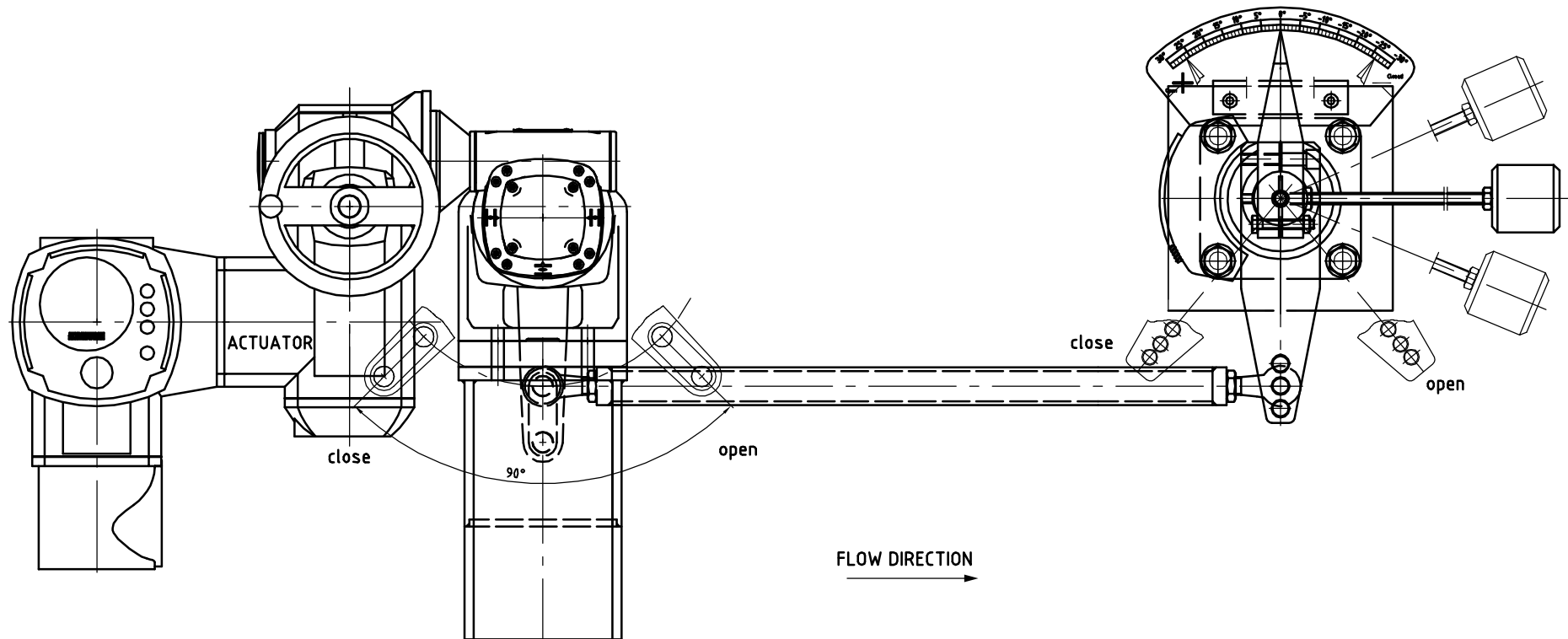
1. Tag Nos.: 10HFE10AA101, 10HFE15AA101
2. Minimum continuous torque: 10 kgm.
3. Angle of rotation required at the load lever: 72.2 degrees.
4. Load lever (Output lever at load side) radius: 180 mm.
5. Operating time: 30 to 35 seconds.
6. Vendor to select the Actuator crank arm rotation angle and the Radius of the Actuator crank arm lever (output lever at actuator side), based on the requirements of the operating time and load lever radius and rotation.
7. Mounting: Fan Casing mounted.
8. Actuator mounting arrangement shall as per the drawing "Actuator Orientation - Style 01".
9. Requirement of Linkage Accessories
 - 1 no. of actuator crank arm lever and 1 no. of load lever (output lever at load side) of lengths as indicated above.
 - 2 nos. of ball and socket connecting mechanisms for connecting the linkage rod with the levers.
 - 1 no. of Linkage rod of length 400 ± 50 mm for connecting the Load lever and actuator crank arm lever.



NOTE:

01. ACTUATOR LEVER IS IN THE OPPOSITE SIDE
02. ACTUATOR OPEN IS IN THE CLOCKWISE DIRECTION AS PER THE ABOVE VIEW.
03. REFER E, C & I INPUT FOR PARTICULAR PROJECT FOR LEVER RADIUS.
04. ACTUATOR OPEN/CLOSE DIRECTION SHALL MATCH WITH BLADE OPEN/CLOSE DIRECTION AS SHOWN IN THE DRAWING.

DRN.	P.SARAVANAN	21.06.17	TITLE
CHD.	PRASANNA	21.06.17	ACTUATOR ORIENTATION (STYLE-01)
APPD.	P.M.JAVID	21.06.17	



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03. REFER E, C & I INPUT FOR PARTICULAR PROJECT FOR LEVER RADIUS.
04. ACTUATOR OPEN/CLOSE DIRECTION SHALL MATCH WITH BLADE OPEN/CLOSE DIRECTION AS SHOWN IN THE DRAWING.

DRN.	P.SARAVANAN	21.06.17	TITLE
CHD.	PRASANNA	21.06.17	ACTUATOR ORIENTATION (STYLE-02)
APPD.	P.M.JAVID	21.06.17	



Bharat Heavy Electricals, Limited

Controls & Instrumentation/Fossil Boilers

CI: UDANGUDI: ACT: DS/Rev. 00

31-10-2019

ELECTRCAL ACTUATOR DATASHEET FOR PA/FD/ID FAN APPLICATIONS & MANDATORY SPARES REQUIREMENT

Project UDANGUDI
Customer Number 1729 & 1730
Rating 2 x 660 MW

FD Fan Blade Pitch Control Application

1. Tag Nos.: 10HLB10AA101, 10HLB15AA101
2. Minimum continuous torque: 10 kgm.
3. Angle of rotation required at the load lever: 82.4 degrees.
4. Load lever (Output lever at load side) radius: 161 mm.
5. Operating time: 30 to 35 seconds.
6. Vendor to select the Actuator crank arm rotation angle and the Radius of the Actuator crank arm lever (output lever at actuator side), based on the requirements of the operating time and load lever radius and rotation.
7. Mounting: Fan Casing mounted.
8. Actuator mounting arrangement shall as per the drawing "Actuator Orientation - Style 01".
9. Requirement of Linkage Accessories
 - 1 no. of actuator crank arm lever and 1 no. of load lever (output lever at load side) of lengths as indicated above.
 - 2 nos. of ball and socket connecting mechanisms for connecting the linkage rod with the levers.
 - 1 no. of Linkage rod of length 340 ± 50 mm for connecting the Load lever and actuator crank arm lever.

ID Fan Blade Pitch Control Application

1. Tag Nos.: 10HNC10AA101, 10HNC15AA101
2. Minimum continuous torque: 10 kgm.
3. Angle of rotation required at the load lever: 64.4 degrees.
4. Load lever (Output lever at load side) radius: 200 mm.
5. Operating time: 30 to 35 seconds.
6. Vendor to select the Actuator crank arm rotation angle and the Radius of the Actuator crank arm lever (output lever at actuator side), based on the requirements of the operating time and load lever radius and rotation.
7. Mounting: Fan Casing mounted.
8. Actuator mounting arrangement shall as per the drawing "Actuator Orientation - Style 02".
9. Requirement of Linkage accessories
 - 1 no. of actuator crank arm lever and 1 no. of load lever (output lever at load side) of lengths as indicated above
 - 2 nos. of ball and socket connecting mechanisms for connecting the linkage rod with the levers.
 - 1 no. of Linkage rod of length: 690 ± 50 mm for connecting the Load lever and actuator crank arm lever.

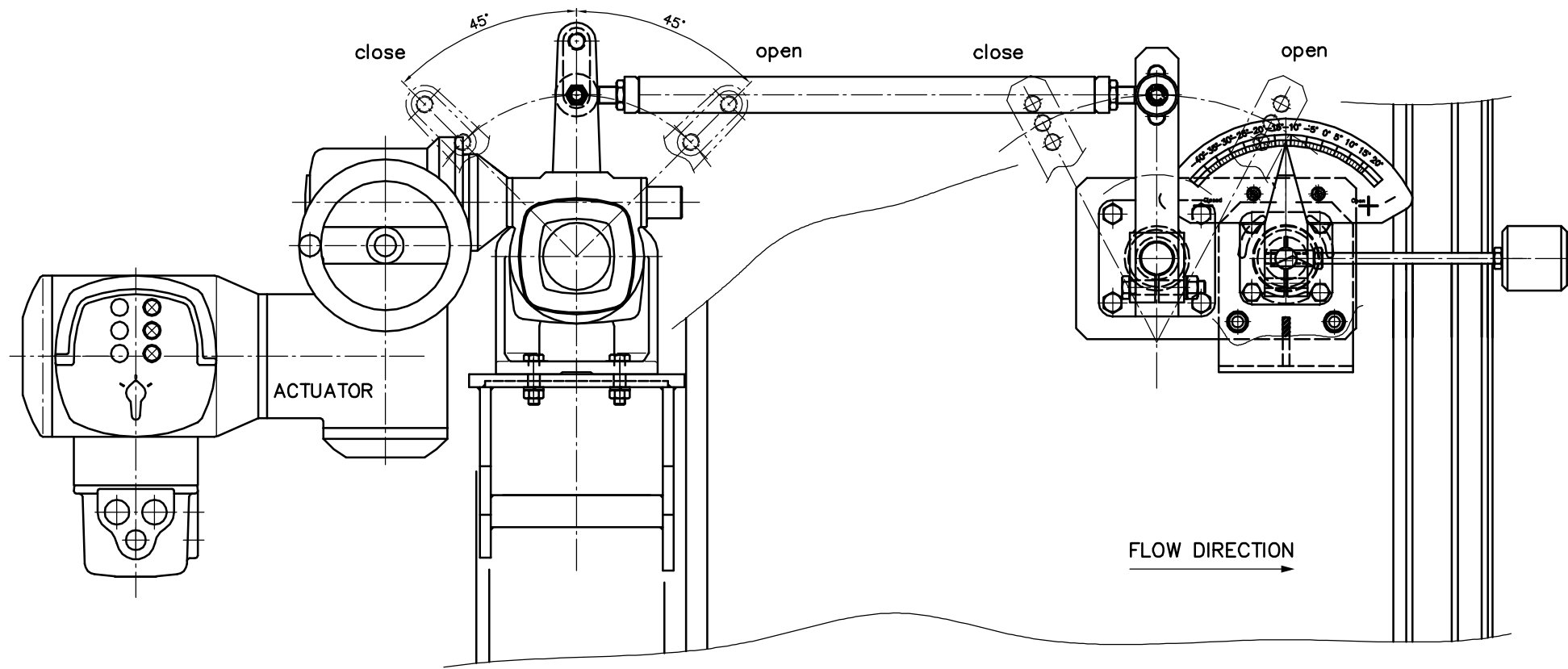
PA Fan Blade Pitch Control Application

1. Tag Nos.: 10HFE10AA101, 10HFE15AA101
2. Minimum continuous torque: 10 kgm.
3. Angle of rotation required at the load lever: 76.6 degrees.
4. Load lever (Output lever at load side) radius: 171 mm.
5. Operating time: 30 to 35 seconds.
6. Vendor to select the Actuator crank arm rotation angle and the Radius of the Actuator crank arm lever (output lever at actuator side), based on the requirements of the operating time and load lever radius and rotation.
7. Mounting: Fan Casing mounted.
8. Actuator mounting arrangement shall as per the drawing "Actuator Orientation - Style 01".
9. Requirement of Linkage Accessories
 - 1 no. of actuator crank arm lever and 1 no. of load lever (output lever at load side) of lengths as indicated above.
 - 2 nos. of ball and socket connecting mechanisms for connecting the linkage rod with the levers.
 - 1 no. of Linkage rod of length 480 ± 50 mm for connecting the Load lever and actuator crank arm lever.

Mandatory Spares – For Fan Blade Pitch Control Application

1. Minimum continuous torque: 10 kgm.
2. Operating time: 30 to 35 seconds.
3. Application: Fan Blade Pitch Control.
4. Mounting: Fan Casing mounted.
5. Angle of rotation required at the actuator side: 0 to (60 - 90) degrees. Will be set as per the rotation required at the load side. (FD fan - 82.4, ID fan - 64.4, PA fan - 76.6 degrees)
6. Requirement of Linkage Accessories
 - 1 no. Actuator crank arm (output lever) of radius, adjustable from 160 to 200mm. The required length will be set at site to achieve the required torque and angle of rotation at the fan side.
 - 1 no. of ball and socket connecting mechanism, shall be fitted with the actuator output lever.

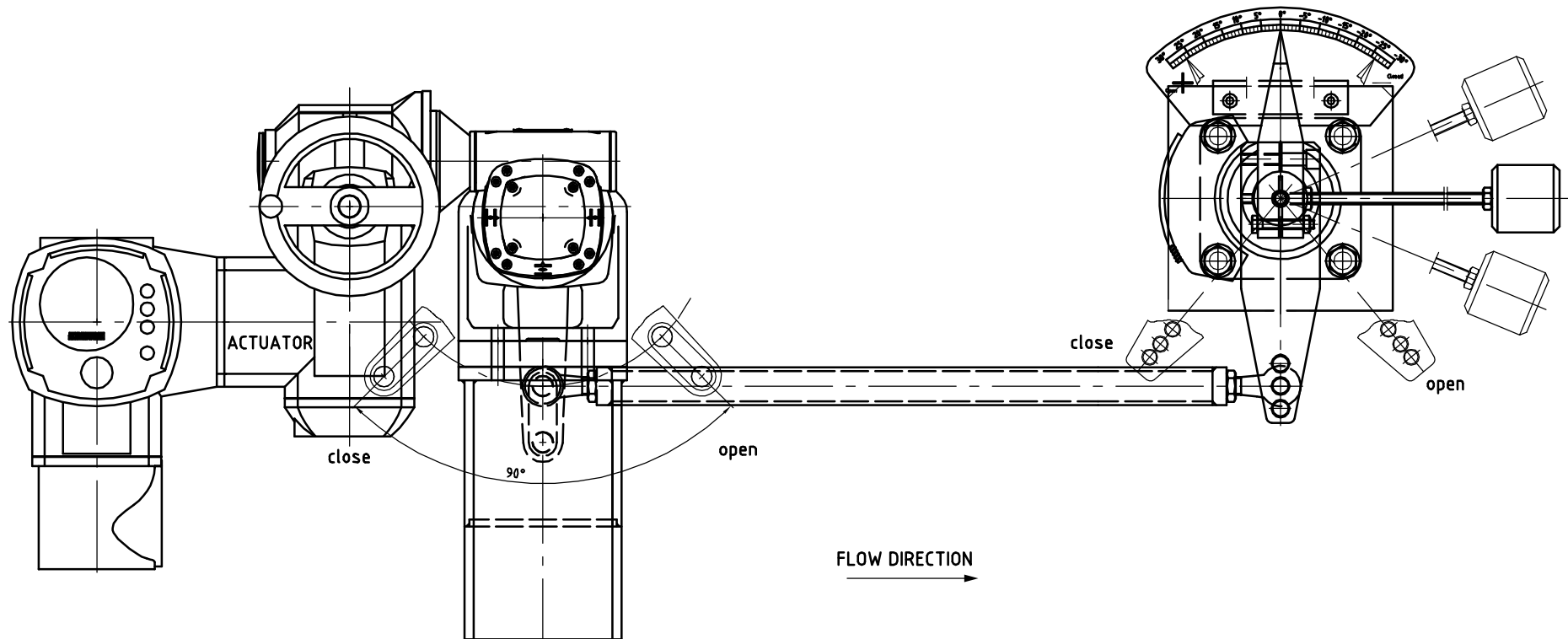
The make and model number offered for mandatory spares requirement, shall match with the items furnished under main supply.



NOTE:

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02. ACTUATOR OPEN IS IN THE CLOCKWISE DIRECTION AS PER THE ABOVE VIEW.
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04. ACTUATOR OPEN/CLOSE DIRECTION SHALL MATCH WITH BLADE OPEN/CLOSE DIRECTION AS SHOWN IN THE DRAWING.

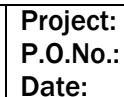
DRN.	P.SARAVANAN	21.06.17	TITLE
CHD.	PRASANNA	21.06.17	ACTUATOR ORIENTATION (STYLE-01)
APPD.	P.M.JAVID	21.06.17	



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DRN.	P.SARAVANAN	21.06.17	TITLE
CHD.	PRASANNA	21.06.17	ACTUATOR ORIENTATION (STYLE-02)
APPD.	P.M.JAVID	21.06.17	



	M - Manufacturer/Sub-Vendor; B - BHEL / TPI ; C - Customer / TPI P - Perform; W - Witness V - Verification;		
Signature of Manufacturer/Sub-Vendor		Name & Signature of Customer approving authority	Name & Signature of BHEL approving authority

	Manufacturer Address	QUALITY PLAN FOR Xxxx	QP No.:	Project:
			Rev: yy Date: zz/zz/zz	P.O.No.: Date:

Sl. No	Component & Operation	Characteristics	Class	Type of Check	Quantum of check		Ref Doc. & Acceptance STD	Format of record	AGENCY			REMARKS
					M	B/C			M	B	C	
C	FINAL INSPECTION											
1	ROUTINE TEST											
2	TYPE TEST											

NOTE: 1. TYPE TEST CERTIFICATE DONE ON SIMILAR EQUIPMENT SHALL BE SUBMITTED FOR BHEL/TPI VERIFICATION. THE VALIDITY OF TC SHALL BE 5 YEARS

	M - Manufacturer/Sub-Vendor; B - BHEL / TPI ; C - Customer / TPI P - Perform; W - Witness V - Verification;		
Signature of Manufacturer/Sub-Vendor		Name & Signature of Customer approving authority	Name & Signature of BHEL approving authority



429-024

PURCHASE / MM / FB
SUB DELIVERY - ENQUIRY - DEVIATION

Page

OF

SCHEDULE OF DEVIATION TO
SUB - DELIVERY ENQUIRY No.

DATE

DESCRIPTION			
SPECIFICATION		DRG. No.	
QUALITY PLAN			
DOCUMENT REFERENCE	BHEL ENQ. CALLED FOR	FIRM'S ALTERNATE OFFER	

CERTIFIED THAT OTHER THAN THE ABOVE DEVIATIONS, WE ARE ACCEPTING ALL THE OTHER SPECIFICATIONS AND REQUIREMENTS IN FULL TO YOUR ENQUIRY

STATION :

DATE :

SIGNATURE OF FIRM'S REPRESENTATIVE

FIRM SEAL

- NOTE: 1. Deviations should be taken only in the extreme case.
2. If necessary, use additional sheets with page control number.

ANNEXURE TO TENDER DOCUMENT

(TO BE SUBMITTED ON CHARTERED ACCOUNTANT LETTER HEAD)

This is to Certify that M/s
..... (herein after referred to as 'company') having its registered office at
..... is registered under MSMED Act 2006, Entrepreneur Memorandum No.
(Part – II) OR (UAN)..... Dtd:, Category: (Micro
/ Small). (Copy enclosed).

Further Verified from the Books of Accounts that the investment of the company as per the latest audited financial
year as per MSMED Act 2006 is as follows:

1. For Manufacturing Enterprises: Investment in plant and machinery (i.e. original cost excluding land and
building and the items specified by the Ministry of Small Scale Industries vide its notification No. S.O.1722
(E) dated October 5, 2006:
₹ Lakhs

2. For Service Enterprises: Investment in equipment (original cost excluding land and building and furniture,
fittings and other items not directly related to the service rendered or as may be notified under MSMED
Act, 2006:
₹ Lakhs

(Strike off whichever is not applicable)

The above investment of Lakhs is within permissible limit of Lakhs
for..... Micro / Small (Strike off whichever is not applicable) Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/Small) (Strike off whichever is not applicable)
and the date of graduation of such enterprise from its original category is (dd/mm/yyyy) which is within
the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O.
No. 3322 (E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name –

Membership Number –

Seal of Chartered Accountant

/ On Bidder's office letter pad /

Self-Declaration

Enquiry No.	
Enquiry Date	

In line with Government public procurement order Number P-45021/2/2017-B.E-II dated 15.06.2017, and further modified order dt. 28.05.2018,

I / We hereby declare that I / We are a "Local Supplier" meeting the requirement of minimum local content (.....%) defined in the above government notification for the goods against above mentioned enquiry Number.

Details of location at which local value addition will be made is as follows:

Door No.	
Street / Address 1	
Street / Address 2	
District	
State	
Country	
PIN Code	

We also understand that the false declarations will be considered as breach of Integrity and liable for action.

For Company Name:

Seal:

Signature:

Date:

Place:

(Please fill all the yellow color field)