

2X660MW MAITREE BANGLADESH STPP

TECHNICAL SPECIFICATION

FOR

GUN METAL VALVES

SPECIFICATION NO. PE-TS-421-100-M003



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

	TECHNICAL SPECIFICATION GUN METAL VALVES 2X660MW MAITREE BANGLADESH STPP	SPECIFICATION NO. PE-TS-421-100-M003	
		SECTION: -	
		REV. NO.: 00	DATE: 07.05.2019
		SHEET 1 OF 1	

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SECTION-I

SPECIFIC TECHNICAL REQUIREMENTS

	SPECIFIC TECHNICAL REQUIREMENTS FOR GUN METAL VALVES	SPECIFICATION NO. PE-TS-421-100-M003	
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1 GENERAL

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

2. SCOPE OF SUPPLY

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

3 CODES AND STANDARDS

- 3.1 All pressure parts shall be designed in accordance with applicable **Relevant International Codes** and Bidder to note that **Indian and Chinese design standards are not acceptable.**
- 3.2 The design, material, construction features, manufacture, inspection and testing of valves shall conform to the latest applicable codes and standards.
- 3.3 The design and testing of valves covered under this specification shall be governed by the following standards.

DESCRIPTION	DESIGN STANDARD	TESTING STANDARD
For Gate, Globe and PLNRV of sizes 50 NB and smaller	BS 5154/ASME B 1.20.1 FEMALE PARALLEL THREAD	BS 5154/ BS EN 12266
For Gate, Globe and SCNRV of sizes above 50 NB and upto 100NB	BS 5154/ BS1560-3.3(R/F)	BS 5154/ BS EN 12266
For Gate, Globe and SCNRV of sizes above 100 NB	BSEN 558/ BS 5154/ BS1560-3.3(R/F)	BS 5154/ BS EN 12266

- 3.4 In case of any conflict between the above codes/ standards and this specification, the latter shall prevail and in case of any further conflict in the matter, the interpretation of the specification by the Engineer shall be final and binding.

4 DESIGN REQUIREMENTS

These valves shall be used for non-corrosive media like cooling water service, drain from compressed air piping etc. as specified in Data Sheet- A. All valves shall be suitable for service conditions i.e. flow, temperature and pressure under which they are required to operate and those performing similar duties shall be interchangeable with each other unless otherwise specified.

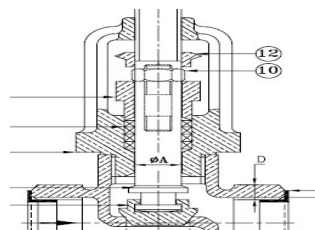
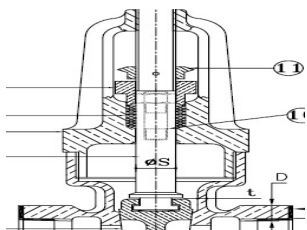
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5 MATERIALS

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

6 CONSTRUCTION FEATURES

- 6.1 The valves covered under this specification for sizes upto 50NB shall have screwed ends and shall be provided with female parallel / taper threads. Bonnet shall be screwed in / union yoke type. Valve ends shall be screwed female/ male parallel threads as per ANSI B1.20.1 as specified in Data Sheet-A. All valves with flanged ends shall have raised face flanges and drilling details as per BS1560-3.3.
- 6.2 All gate and globe valves shall be provided with yoke type screwed- in bonnet and shall be of rising stem, outside screw as indicated in the sketches below. Joint of bonnet with body shall be metal to metal.



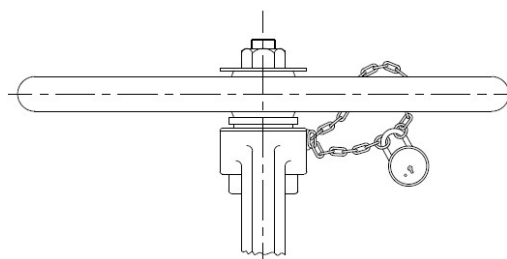
- 6.3 The type of non-return valves for sizes upto 50NB, shall be of piston lift type, designed suitably with disc lift smooth & fully guided. Piston lift non return valves shall also be provided with screwed- in cover. Joint of cover with body shall be metal to metal. The type of non-return valves for sizes above 50NB shall be of Swing check type.
- 6.4 The valves covered under this specification shall have seats as an integral part of the body.
- 6.5 All gate and globe valves shall be of rising stem, outside screw and yoke type with non-rising hand wheel. Protective cover shall be provided to the spindle to protect from foreign materials. The maximum hand wheel force of 500N must not be exceeded.
- 6.6 Gland & gland flange shall be provided in two pieces for uniform tightening of glands. Gland flange shall be of gun metal.
- 6.7 For gate valves yoke for 100 NB & below size valves can be of integral with bonnet. For larger sizes the yoke shall consists of two halves which are bolted together at the top & also to the bonnet.
- 6.8 All Gate valves shall be of the full-way type and when in full open position, the bore of the valve shall not be obstructed by any part of the gate.
- 6.9 Globe valves shall preferably have conical or spherical disc. and the disc shall be free to revolve on the spindle.
- 6.10 Separate seat rings provided in the body and wedge/disc shall be of replaceable type.
- 6.11 All regulating valves shall be designed to prevent erosion of the valve discs and seats when the valves are operated partially opened.

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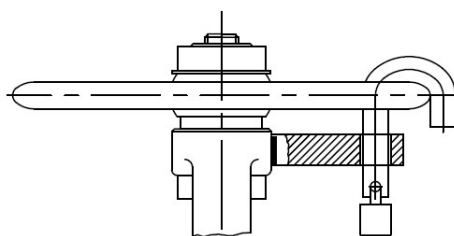
- 6.12 All valves shall have an arrow indicating the direction of flow cast or embossed on the valve body. The direction of flow for globe valves shall be from under to over the disc.
- 6.13 Discs of globe valves which are detachable or two piece construction shall be of such design that they do not become detached from the spindle while in service. Discs of globe & lift check valves shall be guided to ensure correct alignment.
- 6.14 All Globe valves shall preferably be provided with radiused/ spherical/ angular faced disc seatings. The disc shall be secured with stem with disc nut or with such an arrangement that the disc shall be free to revolve. Disc of compressed air system globe valves shall be provided with renewable synthetic rubber seating ring of hardness 60 ° +5 /-0 Shore A.
- 6.15 All gate and globe valves shall be offered with back seating arrangement for replacement of gland packing when the valves are full opened and while working under full working pressure. Back seats shall be provided on both bonnet and stem.
- 6.16 Gate and globe valves shall be supplied with mechanical position indicator for OPEN and SHUT position.
- 6.17 All gate and globe valves shall be closed by rotating the handwheel in the clockwise direction when looking at the face of the handwheel. The face of each handwheel shall be clearly marked "Open" and "Shut" with arrows indicating the direction of rotation to which they refer.
- 6.18 Each valve hand wheel shall be fitted with a circular nameplate of an approved material indicating the valve Tag No., duty or service condition intended and the function of the valve. For valves of smaller size, a permanent steel tag may be fixed on the valve body indicating the purchaser's valve Tag Number and service. The above are in addition to rating plates and labels being provided by the manufacturer.
- 6.19 The body seat of swing check valves shall be inclined to such an angle to minimize chatter.

7 SPECIAL FEATURES OF VALVES.

- 7.1 Extension spindle/ chain operation to the valves shall be provided wherever required as specified in Data Sheet A.
- 7.2 Where required as specified in Data sheet A, valve yoke/spindles shall be lengthened so that the hand wheel is at a height of approximately one meter above the level of the floor or platform from which the valve is to be operated.
- 7.3 For valves that are to be kept locked in full "Open" position, as specified in Data Sheet A, either type of the non-detachable locking arrangement shall be provided by bidder, as shown below.



CHAIN LOCKING ARRANGEMENT



HOOK LOCKING ARRANGEMENT

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- 7.4 Valves with limit switches (as mentioned in Data sheet- A) shall be required only for indication or for interlocking with some equipment. Valves with such provision shall be offered with required number of limit switches for open/close position of the valve. The limit switches for this application shall have one normally open and one normally closed contact. The limit switches shall be of reputed make observing strict quality control and approved by reputed customers and limit switch housing shall be weather proof. The limit switches shall also be wired to a terminal box.

7.5 Motorised Valves:

- 7.5.1 The motorized valves shall be offered with the electric actuators of reputed make observing strict quality control and approved by reputed customers. A particular make and type of actuator shall be designed for the maximum differential working pressure. However, the stall torque of the selected actuators shall be minimum 1.5 times the valve unseating torque requirement at the maximum differential working pressure (design pressure) and required operating time as mentioned in Datasheet-A.
- 7.5.2 Electric actuators shall be directly mounted on the valves except wherever specifically mentioned in specific requirements.
- 7.5.3 Valve actuators shall have local indicators fitted to show whether the valves are in an Open or Shut position.
- 7.5.4 Actuator shall meet requirement as specified in "Part of customer spec for Electrical actuator" (Total 6 sheets) attached in Section-II.
- 7.5.5 The motors, gearing and disengaging hand wheel shall be adequate to open and close the valve under maximum differential pressure and shall be completely assembled on the respective valve and shop tested before shipment.
- 7.5.6 Gear box and Electric Actuator shall also meet the inspection & testing requirements of latest revision of AWWA-C504 /AWWA C542 respectively.

8 MANUFACTURE OF VALVES

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

9 TESTING AND INSPECTION

- 9.1 All valves shall be tested and inspected as per the approved quality plan. The minimum requirements are as indicated in attached quality plan. However, in case of order on the vendor, the QP shall be finalized by vendor with customer without any financial implications to meet customer project technical requirements.

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9.2 Hydrostatic/Air Tests:
Valves shall be hydraulically tested for shell tightness & seat tightness in accordance with BS 5154 & BS EN 12266-1 (Part-1) (as applicable) before painting of valves.

9.3 Gate and Globe valves seats shall also be tested on air at a pressure of 7kg/cm².

9.4 No leakage shall be allowed for any size of the valve covered under this specification. Seats of check valves shall also be tested to one-fourth of the maximum cold working pressure.

9.5 Blue matching of seats shall be carried out and records shall be maintained for verification by the Purchaser.

9.6 Dimensional and functional checks shall be carried out.

9.7 For electrical actuator, manufacturer's quality plan shall be submitted for BHEL & BHEL's customer approval. Quality plan submitted by bidder shall have minimum quality control requirement and shall include at least following tests in their quality plan. i.e. Torque testing & setting of torque switch, travel/stroke, travel time, operation of limit switch, manual operation through hand wheel, operation test with power supply variation energises to open/close, IR, HV, degree of protection, design verification. Bidder has to include all the customer comments in their quality plan without any cost implication.

10 EXCLUSIONS

Erection & Commissioning of equipment at site is excluded from the bidder's scope.

11 QUALITY ASSURANCE

11.1 The items covered under this contract shall be subjected to inspection, testing and quality surveillance. The Inspection Agency shall, at all reasonable times have access to Vendor's works, Quality Control records and all facilities as reasonably required for carrying out the inspection and testing efficiently, and these shall be provided by the vendor free of cost.

11.2 The Quality Plan enclosed with this specification specify minimum quality control requirement. During contract stage vendor shall furnish this Quality Plan duly signed & stamped for BHEL approval. Quality plans shall be approved by BHEL and customer. All inspection and testing shall be carried out by BHEL/ BHEL representative and customer (as applicable). In case inspection is by both BHEL and their customer, then the inspection can be carried out jointly or separately, which will be informed later. In case of the foreign bidder, inspection shall be carried out by reputed third party.

11.3 The charges for third party inspection (Lloyds, TUV or equivalent) for foreign bidders shall be included in the base price of the item by the bidder. This third party agency shall be approved by BHEL. Bidder to inform the same in the offer and mention the same in Quality Plan.

Note: There may be minor changes in quality plan depending on customer/consultant comments which will have to be accommodated by vendor at no extra cost.

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12 PAINTING

Valve bodies and other items shall be thoroughly cleaned after final testing. For hand wheel of the valves, surface preparation shall be as per SA 2.5, followed by 1 primer coat of Zinc Epoxy with min DFT 80microns and 1-2 intermediate coats of Epoxy high solid with min DFT of 160 microns and subsequently followed by 1 finish coat of 2-comp. polyurethane with DFT of 50microns. Total DFT of the paint will be min 290 microns.

13 PACKING

Sea-worthy packing to be provided as per attached document number PE-TS-888-100-A001 including the details mentioned below:

1. Wooden crate details (Refer Clause 9 of Seaworthy Packing document)
2. Packing (category IV) (Refer Clause 8.4 of Seaworthy Packing document)
3. Packing Identification marks (Refer Clause 7 of Seaworthy Packing document)

Additionally, following requirement also to be fulfilled.

- a. Each valve shall be drained, cleaned, prepared and suitably protected in such a way so as to minimize the possibility of damage and deterioration during transit and storage.
- b. The valve shall be dispatched in total assembled form.
- c. Body ends shall be suitably sealed to protect them against damage during transit and storage.
- d. Valve Tag Nos. shall be incorporated in all the dispatch documents.
- e. Proper care shall be taken to avoid damage to the finished surface during transit.
- f. All the valves shall be packed suitably in wooden cases in order to avoid damage during transit and also during storage at site in tropical climate conditions for a period of 15-18 months.
- g. Vendor to provide the following:
 - Photographs (soft) of valves duly placed inside the wooden box just before final packing.
 - Photographs (soft) of the wooden box in which the valves have been finally packed just before dispatch.

Clearance for dispatch of valves will be given only after receiving the photos of valves in satisfactory condition as mentioned in the condition stated above.

14 SPARES

- a) **Mandatory Spares:** These shall be as per Data Sheet-A.
- b) Order for the spares may be placed simultaneously or otherwise at the option of purchaser.

15 DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER

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

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

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

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16 DOCUMENTS TO BE SUBMITTED AFTER AWARD OF RATE CONTRACT:

Category-A:

- GA Drawing indicating complete cross sectional arrangement of valve, binding dimensions, dismantling clearances, weight and Bill of Material incorporating all material of construction (MOC) of various parts & relevant standard to which MOC confirms to.
- Filled in actuator data sheet.
- Quality plan duly signed and stamped.

Approval of above documents shall be required for manufacturing clearance and the same shall be considered for delay analysis by BHEL.

Category-B:

- Opening closing time calculations (applicable for motorized valves).
- Valve torque and hand wheel force calculation.
- Design calculation of min body thickness & shaft dia. for 150NB size valve.

Above document are required as information for approval of category-A documents. These shall not be considered for delay analysis.

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SECTION-II

- DATA SHEET – A
- QUALITY PLAN
- ACTUATOR DATA SHEET & WIRING DIAGRAM FOR INCHING TYPE
- ACTUATOR DATA SHEET & WIRING DIAGRAM FOR ON/OFF TYPE
- PART OF CUSTOMER SPEC FOR ELECTRIC ACTUATOR
- COMPLIANCE SHEET
- SEA WORTHY PACKING

	DATA SHEET-A GUN METAL VALVES 2X660MW MAITREE BANGLADESH STPP		SPECIFICATION NO. PE-TS-421-100-M003
			SECTION-II
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MATERIAL OF CONSTRUCTION FOR GATE/GLOBE VALVE

PART NO.	PART NAME	MATERIAL	MATERIAL SPECIFICATION/ STD`
1	BODY	GM	Gun metal as per BSEN 1982 :17 Gr. CC491K/ Equivalent international standard
2	BONNET/ COVER	GM	Gun metal as per BSEN 1982 : 17 Gr. CC491K/ Equivalent international standard
3	WEDGE / DISC	GM	Gun metal as per BSEN 1982 : 17 Gr. CC491K/ Equivalent international standard
4	DISC CHECK NUT	GM	Gun metal as per BSEN 1982 : 17 Gr. CC491K/ Equivalent international standard
5	GLAND	GM	Gun metal as per BSEN 1982 : 17 Gr. CC491K/ Equivalent international standard
6	NITRILE RUBBER DISC/ DISC 'O' RING (valves for air service)	NITRILE RUBBER	HARDNESS 60 ° +5 /-0 SHORE 'A'
7	STEM	EXTRUDED BRASS	EXTRUDED BRASS
8	GLAND PACKING	GRAPHITED NON ASBESTOS / TEFLON PACKINGS	
9	GASKET	SWGSS316 (GRAFOIL)	SWG SS316 (GRAFOIL)
10	INDICATOR	GM	Gun metal as per BSEN 1982 : 17 Gr. CC491K/ Equivalent international standard
11	GLAND STUDS & NUTS	CARBON STEEL	BS 916:53 / ASTM A193 Gr.B7/ A194 Gr.2H
12	HAND WHEEL	MALLEABLE CAST IRON	Equivalent or Superior
13	WASHER (for hand wheel screw)	CARBON STEEL	HOT DIP GALVANIZED AS PER ISO 1461/ AISI 316
14	SCREW (for handwheel)	CARBON STEEL	HOT DIP GALVANIZED AS PER ISO 1461/ AISI 316
15	NAME PLATE (FOR VALVE TAG NOS.)	SS (2 mm Thick)	AISI 316 FIXED TO VALVE OR FIRMLY TIED TO HAND WHEEL WITH SS WIRE
16	LOCKING ARRANGEMENT	-----	As per Manufacturer's standard

	DATA SHEET-A GUN METAL VALVES 2X660MW MAITREE BANGLADESH STPP	SPECIFICATION NO. PE-TS-421-100-M003	
		SECTION-II	
		REV. NO.: 00	DATE: 07.05.2019
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**MATERIAL OF CONSTRUCTION FOR
NON RETURN VALVE**

PART NO.	PART NAME	MATERIAL	MATERIAL SPECIFICATION/ STD'
1	BODY	GM	Gun metal as per BSEN 1982 :17 Gr. CC491K/ Equivalent international standard
2	COVER	GM	Gun metal as per BSEN 1982 :17 Gr. CC491K/ Equivalent international standard
3	DISC (FULLY GUIDED)	GM	Gun metal as per BSEN 1982 :17 Gr. CC491K/ Equivalent international standard
4	DISC NUT/ WASHER	GM	Gun metal as per BSEN 1982 :17 Gr. CC491K/ Equivalent international standard
5	BODY SEAT RING	GM	Gun metal as per BSEN 1982 :17 Gr. CC491K/ Equivalent international standard
6	GASKET	SWGSS316 (GRAFOIL)	SWG SS316 (GRAFOIL)
7	BOLTS	ASTM A193 Gr. B7	ASTM A193 Gr. B7
8	NUTS	ASTM A 194 Gr.2H	ASTM A 194 Gr.2H
9	NAME PLATE (FOR VALVE TAG NOS.)	SS (2 mm Thick)	AISI 316 FIXED TO VALVE OR FIRMLY TIED TO HAND WHEEL WITH SS WIRE

NOTE: Indian and Chinese design standards are not acceptable.

Legends:

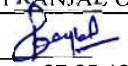
GM: Gun metal

SS: Stainless Steel

		QUALITY PLAN		CUSTOMER: BIFPCL			PROJECT: 2X660MW MAITREE BANGLADESH			SPEC. NO: PE-TS-421-100-M003		
				BIDDER/ VENDOR:			QP NUMBER:MAITREE-00-PGB-QA-120236A-PEM REV 00 DTD. 07.05.19			SPEC.TITLE: GUN METAL GATE , GLOBE, NON RETURN VALVES		
		SHEET 1 OF 4		SYSTEM: - WATER (POTABLE/DRINKING WATER)			ITEM: GUN METAL GATE / GLOBE VALVES SIZE UPTO 50NB ,CLASS PN16 & CL150 FOR SIZE ABOVE 50NB			SECTION VOLUME		
SL NO (1)	COMPONENT /OPERATION (2)	CHARACT- ERISTICS CHECKED (3)	CATE- GORY (4)	TYPE/METHOD OF CHECK (5)	EXTENT OF CHECK (6)	REFERENCE DOCUMENT (7)	ACCEPTANCE NORMS (8)	FORMAT OF RECORD (9)	P	AGENCY W V (10)	REMARKS (11)	

GATE/ GLOBE VALVES

1.0	REVISIONS											
1.1	MATERIALS BODY, BONNET, WEDGE/ DISC, DISC CHECK NUT, GLAND, INDICATER,	1. PHYS & CHEM. PROPERTIES	MA	PHYS & CHEM TEST	ONE/ HEAT	APPD DRG/ RELV STD.	APPD DRG/ RELV STD.	TEST CERT	3/2	2	1	BODY WILL CARRY HEAT MARKS FOR CO-RELATION WITH TEST CERTIFICATES
		2.. SURFACE DEFECTS	MA	VISUAL	100%	FREE FROM DEFECTS	FREE FROM DEFECTS	INSPECTION REPORT	2	2	1	
		3. DIMENSIONS	MA	MEASUREMENT	100%	PRODUCTION DRG	PRODUCTION DRG	--DO--	2	2	-	
1.2	'O' RING (SYNTHETIC RUBBER) FOR AIR SERVICE VALVES	1. SURFACE DEFECTS	MA	VISUAL	100%	FREE FROM DEFECTS	FREE FROM DEFECTS	--DO--	2	2	-	
		2. DIMENSIONS	MA	MEASUREMENT	100%	PRODUCTION DRG.	PRODUCTION DRG	--DO--	2	2	1	
		3. HARDNESS	MA	HARDNESS TEST	100%	APPD. DRG/ RELV STD.	APPD. DRG/ RELV STD.	--DO--	3/2	2	1	
1.3	HANDWHEEL	1.MECH PROPERTIES	MA	MECH TEST	ONE/ HEAT	APPD DRG/ RELV STD..	APPD DRG/ RELV STD.	TEST CERT.	3/2	2	1	
		2.HARDNESS	MA	HARDNESS TEST	100%	APPD DRG/RELV STD.	APPD DRG/ RELV STD.	INSPECTION REPORT	3/2	2	1	
		3.DIMENSIONS	MA	MEASUREMENT	100%	APPD DRG	APPD DRG	--DO--	2	2	1	
		4.SURFACE DEFECTS	MA	VISUAL	100%	FREE FROM DEFECTS	FREE FROM DEFECTS	--DO--	2	2	-	
1.5	STUD & NUT	1.PHYS & CHEM. PROPERTIES	MA	PHYS & CHEM TEST	ONE/ HEAT	APPD DRG/ RELV STD.	APPD DRG/ RELV STD.	TEST CERT	3/2	2	1	
		2. SURFACE DEFECTS	MA	VISUAL	100%	FREE FROM DEFECTS	FREE FROM DEFECTS	INSPECTION REPORT	2	2	-	

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

	QUALITY PLAN		CUSTOMER: BIFPCL			PROJECT: 2X660MW MAITREE BANGLADESH			SPEC. NO: PE-TS-421-100-M003			
			BIDDER/ VENDOR:			QP NUMBER:MAITREE-00-PGB-QA-120236A-PEM REV 00 DTD. 07.05.19			SPEC.TITLE: GUN METAL GATE , GLOBE, NON RETURN VALVES			
SHEET 2 OF 4		SYSTEM: - WATER (POTABLE/DRINKING WATER)			ITEM: GUN METAL GATE / GLOBE VALVES SIZE UPTO 50NB ,CLASS PN16 & CL150 FOR SIZE ABOVE 50NB			SECTION VOLUME				
SL NO (1)	COMPONENT /OPERATION (2)	CHARACT- ERISTICS CHECKED (3)	CATE- GORY (4)	TYPE/METHOD OF CHECK (5)	EXTENT OF CHECK (6)	REFERENCE DOCUMENT (7)	ACCEPTANCE NORMS (8)	FORMAT OF RECORD (9)	P	W	V	REMARKS (11)

GATE/ GLOBE VALVES

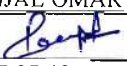
2.0	ELECTRICAL ACTUATOR	REFER CLAUSE No 9.7 OF SPECIFIC TECHNICAL REQUIREMENTS FOR GUN METAL VALVES (pg 5 of 7)										
3.0	MACHINING											
3.1	BODY, BONNET, WEDGE/ DISC, GLAND, CHECK NUT, INDICATOR	1. DIMENSIONS	MA	MEASURE MENT	100%	PROD. DRG	PROD. DRG	LOG BOOK	2	2	-	
		2. THREADED ENDS	MA	THREAD GAUGE	100%	--DO--	--DO--	--DO--	2	2	-	
		3. DISC/ BODY SEAT RING	CR	BLUE MATCHING	100%	THE SURFACE SHALL BE SMOOH AND SHALL HAVE 100% CONTACT WITH SEATING SURFACES		INSPECTION REPORT	2	2	1	
3.2	STEM	1. SURFACE DEFECTS	MA	VISUAL	100%	FREE FROM DEFECTS	LOG BOOK	LOG BOOK	2	2	1	
		2.DIMENSIONS	MA	MEASUREMENT	100%	PRODUCTION DRAWING	LOG BOOK	LOG BOOK	2	2	1	
3.3	BODY, BONNET STEM, DISC/ WEDGE	SURFACE DEFECTS	CR	PT	100%	ASTME165	ASME B 16.34 APPENDIX-III	INSPECTION REPORT	3/2	2	1	
4.0	ASSEMBLY TESTING											
4.1	BODY	LEAK TIGHTNESS	CR	HYDRAULIC	100%	APPD. DRG/ DESIGN STD	NO LEAKAGE	INSPECTION REPORT	2	2, 1	--	

BHEL		PARTICULARS	BIDDER/VENDOR	07.05.19
PRANJAL OMAR		NAME		
		SIGNATURE		
07.05.19		DATE		
BIDDER'S/VENDOR'S COMPANY SEAL				

			QUALITY PLAN			CUSTOMER: BIFPCL			PROJECT: 2X660MW MAITREE BANGLADESH			SPEC. NO: PE-TS-421-100-M003		
						BIDDER/ VENDOR:			QP NUMBER:MAITREE-00-PGB-QA-120236A-PEM REV 00 DTD. 07.05.19			SPEC.TITLE: GUN METAL GATE , GLOBE, NON RETURN VALVES		
			SHEET 3 OF 4			SYSTEM: - WATER (POTABLE/DRINKING WATER)			ITEM: GUN METAL GATE / GLOBE VALVES SIZE UPTO 50NB ,CLASS PN16 & CL150 FOR SIZE ABOVE 50NB			SECTION VOLUME		
SL NO (1)	COMPONENT /OPERATION (2)	CHARACT- ERISTICS CHECKED (3)	CATE- GORY (4)	TYPE/METHOD OF CHECK (5)	EXTENT OF CHECK (6)	REFERENCE DOCUMENT (7)	ACCEPTANCE NORMS (8)	FORMAT OF RECORD (9)	P	AGENCY W (10)	V (11)	REMARKS		

GATE/GLOBE VALVES

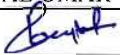
4.2	SEAT & BACK SEAT (IF APPLICABLE)	LEAK TIGHTNESS	CR	--DO --	100%	--DO--	-DO-	-DO-	2	2, 1	-	
4.3	SEAT	LEAK TIGHTNESS	CR	PNEUMATIC	100%	APPD.DRG/ DESIGN STD	NO LEAKAGE	INSPECTION REPORT	2	2, 1	-	
5.0	COMPLETE VALVE	OVERALL DIMENSIONS	MA	VISUAL	100%	APPROVED DRG.	APPROVED DRG.	INSPECTION REPORT	2	2, 1	-	
6.0	ASSEMBLY INSPECTION	1. CLEANING & DEBURRING	MA	VISUAL	100%	APROVED DRG/ RELV STD.	APPROVED DRG / RELV STD.	-DO-	2	2,1	-	
		2.END TO END DIMENSIONS	CR	MEASUREMENT	100%	APPROVED DRG.	APPROVED DRG.	-DO-	2	2,1	-	
		3.OPERATION OF VALVE	CR	MANUAL	100%	RELV STD.	SMOOTH OPENING & CLOSING OF VALVE	-DO-	2	2,1	-	
7.0	PAINTING	SURFACE PREPARATION & UNIFORMITY	MA	VISUAL	100%	APPD DRG./ RELV STD.	APPD DRG / RELV STD.	INSPECTION REPORT	2	2	1*	- ONLY FOR HANDWHEEL * CONFIRMATION CERTIFICATE FROM VENDOR
8.0	PROVISION OF NAME PLATE WITH PURCHASER'S TAG NOS IF ANY & PACKING IN WOODEN CASES	AS PER APPD DRG	MA	VISUAL	100%	APPD DRG /RELV STD.	APPD DRG/ RELV STD.	INSPN REPORT	3/2	2	1	Vendor to provide the following: a) Photographs of valves duly placed inside the wooden box just before final packing. b) Photographs of the wooden box in which the valves have been finally packed just before dispatch. Clearance for dispatch of valves will be given only after receiving the photos of valves
		1. WOODEN CRATE DETAILS	MA	VISUAL	100%	REFER CLAUSE 9 OF SEAWORTHY PACKING DOCUMENT	REFER CLAUSE 9 OF SEAWORTHY PACKING DOCUMENT	-DO-	3/2	2	1	

BHEL		PARTICULARS	BIDDER/VENDOR	
PRANJAL OMAR		NAME		
		SIGNATURE		
07.05.19		DATE		
				BIDDER'S/VENDOR'S COMPANY SEAL.

	QUALITY PLAN		CUSTOMER: BIFPCL			PROJECT: 2X660MW MAITREE BANGLADESH			SPEC. NO: PE-TS-421-100-M003			
			BIDDER/ VENDOR:			QP NUMBER:MAITREE-00-PGB-QA-120236A-PEM REV 00 DTD. 07.05.19			SPEC.TITLE: GUN METAL GATE , GLOBE, NON RETURN VALVES			
	SHEET 4 OF 4		SYSTEM: - WATER (POTABLE/DRINKING WATER)			ITEM: GUN METAL GATE / GLOBE VALVES SIZE UPTO 50NB ,CLASS PN16 & CL150 FOR SIZE ABOVE 50NB			SECTION VOLUME			
SL NO (1)	COMPONENT /OPERATION (2)	CHARACT- ERISTICS CHECKED (3)	CATE- GORY (4)	TYPE/METHOD OF CHECK (5)	EXTENT OF CHECK (6)	REFERENCE DOCUMENT (7)	ACCEPTANCE NORMS (8)	FORMAT OF RECORD (9)	AGENCY P W V (10)			REMARKS (11)
GATE/ GLOBE VALVES												
		2. PACKING (CATEGORY IV)	MA	VISUAL	100%	REFER CLAUSE 8.4 OF SEAWORTHY PACKING DOCUMENT	REFER CLAUSE 8.4 OF SEAWORTHY PACKING DOCUMENT	-DO-	3/2	2	1	in satisfactory condition as mentioned in the condition stated above.
		3. PACKING IDENTIFICATION MARKS	MA	VISUAL	100%	REFER CLAUSE 7 OF SEAWORTHY PACKING DOCUMENT	REFER CLAUSE 7 OF SEAWORTHY PACKING DOCUMENT	-DO-	3/2	2	1	

NOTE: - CR- CRITICAL ACTIVITY MA- MAJOR ACTIVITY PT- PENETRANT TEST
P- PERFORMED BY W - WITNESSED BY V - VERIFIED BY
1- CUSTOMER/ BHEL 2 - VENDOR 3 - VENDOR/ SUB VENDOR

WITNESS "W" SHALL BE 10% OR MINIMUM 2nos BY BHEL/CUSTOMER AT RANDOM & 100% BY VENDOR FOR EACH TYPE, SIZE & RATING.

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

			QUALITY PLAN			CUSTOMER: BIFPCL			PROJECT: 2X660MW MAITREE BANGLADESH			SPEC. NO: PE-TS-421-100-M003		
						BIDDER/ VENDOR:			QP NUMBER:MAITREE-00-PGB-QA-120236B-PEM REV 00 DTD. 07.05.19			SPEC.TITLE: COPPER ALLOY GATE , GLOBE & NON RETURN VALVES		
SHEET 1 OF 2			SYSTEM: WATER (POTABLE WATER)			ITEM: NON RETURN VALVES CLASS 150 , SIZES ABOVE 50NB & UPTO 150NB			SECTION VOLUME					
SL NO (1)	COMPONENT /OPERATION (2)	CHARACT- ERISTICS CHECKED (3)	CATE- GORY (4)	TYPE/METHOD OF CHECK (5)	EXTENT OF CHECK (6)	REFERENCE DOCUMENT (7)	ACCEPTANCE NORMS (8)	FORMAT OF RECORD (9)	AGENCY P W V (10)	REMARKS (11)				

NON RETURN VALVES

1.0	MATERIALS											
1.1	BODY, COVER, DISC,	1. PHYS & CHEM. PROPERTIES 2.. SURFACE DEFECTS 3. DIMENSIONS	MA MA MA	PHYS & CHEM TEST VISUAL MEASUREMENT	ONE/ HEAT 100% 100%	APPD DRG/ RELV STD. FREE FROM DEFECTS PRODUCTION DRG	APPD DRG/ RELV STD. FREE FROM DEFECTS PRODUCTIONDRG	TEST CERT INSPN. REPORT --DO--	3/2 2 2	2 2 2	1 1 -	BODY WILL CARRY HEAT MARKS FOR CO-RELATION WITH TEST CERTIFICATES
2.0	MACHINING											
2.1	BODY, COVER DISC	1. DIMENSIONS 2. THREADED ENDS 3. DISC/ BODY SEATING CONTACT	MA MA CR	MEASUREMENT THREAD GAUGE BLUE MATCHING	100% 100% 100%	PROD. DRG --DO--	PROD. DRG --DO--	LOG BOOK --DO-- INSPN REPORT	2 2 2	2 2 2	- - 1	
2.3	BODY,COVER, DISC	SURFACE DEFECTS	CR	PT	100%	ASTM A165	ASME B 16.34 APPENDIX-III	INSPN REPORT	3/2	2	1	
3.0	ASSEMBLY TESTING											
3.1	BODY	LEAK TIGHTNESS	CR	HYDRAIULIC	100%	APPD DRG/ DESIGNSTD --DO--	NO LEAKAGE	INSPN REPORT -DO- -DO-	2	2,1	--	
3.2	SEAT SEAT	LEAK TIGHTNESS LEAK TIGHTNESS	CR CR	--DO -- --DO--	100% 100%	APPD DRG /AT 25% SEAT TEST PRESSURE	-DO- -DO-	-DO- -DO-	2 2	2,1 2,1	- -	
4.0	COMPLETE VALVE	OVERLALL, DIMENSIONS	MA	VISUAL	100%	APPROVED DRG.	APPROVED DRG.	-DO-	2	2,1	-	
5.0	ASSEMBLY INSPECTION	1. CLEANING & DEBURRING 2. PERFORMANCE	MA CR	VISUAL OPERATION OF DISC	100% 100%	APPROVED DRG/ RELV STD. RELV STD.	APPROVED DRG / RELV STD. SMOOTH OPENING & CLOSING OF DISC	-DO- -DO-	2 2	2,1 2,1	- -	
6.0	PAINTING (IF REQUIRED)	SURFACE PREPAR- ATION & UNIFORMITY	MA	VISUAL	100%	APPD DRG / RELV STD.	APPD DRG / RELV STD.	INSPN REPORT	2	2	1*	

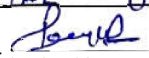
BHEL		PARTICULARS	BIDDER/VENDOR	
PRANJAL OMAR		NAME		
		SIGNATURE		
07.05.19		DATE		
				BIDDER'S/VENDOR'S COMPANY SEAL

	QUALITY PLAN		CUSTOMER: BIFPCL			PROJECT: 2X660MW MAITREE BANGLADESH			SPEC. NO: PE-TS-421-100-M003		
			BIDDER/ VENDOR:			QP NUMBER:MAITREE-00-PGB-QA-120236B-PEM REV 00 DTD. 07.05.19			SPEC.TITLE: COPPER ALLOY GATE , GLOBE & NON RETURN VALVES		
SHEET 2 OF 2			SYSTEM: WATER (POTABLE WATER)			ITEM: NON RETURN VALVES CLASS 150 , SIZES ABOVE 50NB & UPTO 150NB			SECTION VOLUME		
SL NO (1)	COMPONENT /OPERATION (2)	CHARACT- ERISTICS CHECKED (3)	CATE- GORY (4)	TYPE/METHOD OF CHECK (5)	EXTENT OF CHECK (6)	REFERENCE DOCUMENT (7)	ACCEPTANCE NORMS (8)	FORMAT OF RECORD (9)	AGENCY P W V (10)	REMARKS (11)	

NON RETURN VALVES

7.0	PROVISION OF NAME PLATE WITH PURCHASER'S TAG NOS IF ANY & PACKING IN WOODEN CASES	AS PER APPD DRG./ RELV STD.	MA	VISUAL	100%	APPD DRG./ RELV STD.	APPD DRG./ RELV STD.	INSPN REPORT	3/2	2	1	Vendor to provide the following: a) Photographs of valves duly placed inside the wooden box just before final packing. b) Photographs of the wooden box in which the valves have been finally packed just before dispatch. Clearance for dispatch of valves will be given only after receiving the photos of valves in satisfactory condition as mentioned in the condition stated above.
		1. WOODEN CRATE DETAILS	MA	VISUAL	100%	REFER CLAUSE 9 OF SEAWORTHY PACKING DOCUMENT	REFER CLAUSE 9 OF SEAWORTHY PACKING DOCUMENT	-DO-	3/2	2	1	
		2. PACKING (CATEGORY IV)	MA	VISUAL	100%	REFER CLAUSE 8.4 OF SEAWORTHY PACKING DOCUMENT	REFER CLAUSE 8.4 OF SEAWORTHY PACKING DOCUMENT	-DO-	3/2	2	1	
		3. PACKING IDENTIFICATION MARKS	MA	VISUAL	100%	REFER CLAUSE 7 OF SEAWORTHY PACKING DOCUMENT	REFER CLAUSE 7 OF SEAWORTHY PACKING DOCUMENT	-DO-	3/2	2	1	

NOTE: - CR- CRITICAL ACTIVITY MA- MAJOR ACTIVITY PT- PENETRANT TEST
P- PERFORMED BY W - WITNESSED BY V - VERIFIED BY
1- CUSTOMER/ BHEL 2 - VENDOR 3 - VENDOR/ SUB VENDOR
WITNESS "W" SHALL BE 10% OR MINIMUM 2 nos BY BHEL/CUSTOMER AT RANDOM & 100% BY VENDOR FOR EACH TYPE, SIZE & RATING.

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

	SPECIFICATION FOR MOTORISED VALVE ACTUATOR		SPECIFICATION NO.: PE-SS-421-145-1007	
			VOLUME II B	
			SECTION D	
			REV. NO. 00	DATE: 06.10.16
		SHEET 1	OF 3	
Data Sheet A & B				
DATA SHEET-A (TO BE FILLED BY PURCHASER)			DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	
GENERAL*	* PROJECT	2X660MA BIFPCL, MAITREE BANGLADESH		
	OFFER REFERENCE			
	* TAG NO. SERVICE	PW-117, 119		
	* DUTY	☐ ON / OFF ☒ INCHING		
	* LINE SIZE (inlet/outlet): MATERIAL			
	* VALVE TYPE	☒ GLOBE ☐ GATE ☐ REG. GLOBE ☐ BUTTERFLY		
	* OPENING / CLOSING TIME			
	* WORKING PRESSURE			
	AMBIENT CONDITION	SHALL BE SUITABLE FOR CONTINUOUS OPERATION UNDER AN AMBIENT TEMP. OF 0-55 DEG C AND RELATIVE HUMIDITY OF 0-95%		
	VALVE SEAT TEST PRESS	BIDDER TO SPECIFY		
	REQUIRED VALVE TORQUE	BIDDER TO SPECIFY		
	ACTUATOR RATED TORQUE	BIDDER TO SPECIFY		
CONSTRUCTION AND SIZING	CONSTRUCTION	TOTALLY ENCLOSED, DUST TIGHT, WEATHER PROOF, SUITABLE FOR OUTDOOR USE WITHOUT CANOPY, IP:65		
	MECHANICAL POSITION INDICATOR	TO BE PROVIDED FOR 0-100% TRAVEL		
	BEARINGS	DOUBLE SHIELDED, GREASE LUBRICATED ANTI-FRICTION.		
	GEAR TRAIN FOR LIMIT SWITCH/TORQUE SWITCH OPERATION	METAL (NOT FIBRE GEARS). SELF-LOCKING TO PREVENT DRIFT UNDER TORQUE SWITCH SPRING PRESSURE WHEN MOTOR IS DE-ENERGIZED.		
	SIZING	OPEN/CLOSE AT RATED SPEED AGAINST DESIGNED DIFFERENTIAL PRESSURE AT 85% OF RATED VOLTAGE. FOR ISOLATING SERVICE THREE SUCCESSIVE OPEN-CLOSE OPERATIONS OR 15 MINS. WHICHEVER IS HIGHER. FOR INCHING SERVICE - 150 STARTS/HR MINIMUM & FOR REGULATING SERVICE - 600 STARTS/HR MINIMUM.		
HANDWHEEL	* REQUIRED	☒ YES ☐ NO		
	* ORIENTATION	☐ TOP MOUNTED ☐ SIDE MOUNTED		
	*TO DISENGAGE AUTOMATICALLY DURING MOTOR OPERATION.			
ELECTRIC ACTUATOR	ACTUATOR MAKE/MODEL	BIDDER TO SPECIFY		
	MOTOR MAKE / MODEL / TYPE / RATING (KW)	BIDDER TO SPECIFY		
	@ MOTOR TYPE	SQUIRREL CAGE INDUCTION MOTOR, STARTING CURRENT LIMITED TO SEVEN TIMES THE RATED CURRENT as per IEC-60034-30		
	ACTUATOR APPLICABLE WIRING DIAGRAM	☒ ENCLOSED (BIDDER TO CONFIRM) A: ☐ DRG. NO. 3-V-MISC-24227 R00 B: ☐ DRG. NO. 3-V-MISC-24550 R00 C: ☒ DRG. NO. 3-V-MISC-24283 R00 D: ☐ DRG. NO. 4-V-MISC-90271 R11 E: ☐ For Thyristor based Integral starter, Bidder/Vendor to furnish wiring diagram		
	COLOUR SHADE	☒ BLUE (RAL 9003) ☐		
	PAINT TYPE (## Refer Notes)	☐ ENAMEL ☒ EPOXY ☐		
	SHAFT RPM	BIDDER TO SPECIFY		
	OLR SET VALUE	BIDDER TO SPECIFY		
	@ STARTING / FULL LOAD CURRENT	BIDDER TO SPECIFY		
	NO. OF REV FOR FULL TRAVEL	BIDDER TO SPECIFY		

	SPECIFICATION FOR MOTORISED VALVE ACTUATOR		SPECIFICATION NO.: PE-SS-421-145-1007		
			VOLUME II B		
			SECTION D		
			REV. NO. 00	DATE: 06.10.16	
			SHEET 2	OF	3
Data Sheet A & B					
DATA SHEET-A (TO BE FILLED BY PURCHASER)				DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	
	@ PWR SUPP TO MTR / STARTER	415V, 3PH, AC			
	@ CONTROL VOLTAGE REQUIREMENT	TO BE DERIVED FROM THE POWER SUPPLY TO THE STARTER ☐ 230 V ☐ 110 V			
	@ ENCLOSURE CLASS OF MOTOR	☐ IP 67 ☐ FLAME PROOF			
	@ INSULATION CLASS	CLASS-F TEMP. RISE LIMITED TO CLASS-B	As per IEC-60034		
	@ WINDING TEMP PROTECTION	☒ THERMOSTAT (3 Nos., 1 IN EACH PHASE) ☐			
	SINGLE PHASE / WRONG PHASE SEQUENCE PROTECTION	REQUIRED			
INTEGRAL STARTER	INTEGRAL STARTER	☒ REQUIRED ☐ NOT REQUIRED			
	TYPE OF SWITCHING DEVICE	☒ CONTACTORS ☐ THYRISTORS			
	TYPE	☒ CONVENTIONAL ☐ SMART (NON-INTRUSIVE)			
	IF SMART				
	a) SERIAL LINK INTERFACE	☐ INTEGRAL ☐ FIELD MOUNTED			
	b) SERIAL LINK PROTOCOL	☐ FOUNDATION FIELD-BUS ☐ PROFI-BUS ☐ DEVICE NET ☐			
	c) SERIAL LINK MEDIA	☐ TWISTED PAIR Cu-CBL ☐ CO-AXIAL Cu-CBL ☐ OFC			
	d) HAND HELD PROGRAMMER	☐ REQUIRED ☐ NOT REQUIRED			
	e) TYPE OF HAND HELD PROGRAMMER	☐ BLUETOOTH ☐ INFRARED ☐			
	f) MASTER STATION	☐ REQUIRED ☐ NOT REQUIRED			
	g) MASTER STN INTRFACE WITH DCS	☐ MODBUS ☐ TCP/IP			
	h) DETAILS OF SPECIAL CABLE	☐ ENCLOSED ☐ NOT REQUIRED			
	STEP DOWN CONT. TRANSFORMER	☒ REQUIRED			
	OPEN / CLOSE PB	☒ REQUIRED ☐ NOT REQUIRED			
	STOP PB	☒ REQUIRED ☐ NOT REQUIRED			
	INDICATING LAMPS	☒ REQUIRED ☐ NOT REQUIRED			
	LOCAL REMOTE S/S	☒ REQUIRED ☐ NOT REQUIRED			
	STATUS CONTACTS FOR MONITORING	☒ REQUIRED ☐ NOT REQUIRED			
	INTEGRAL STARTER DISTURBED SIGNAL	REQUIRED (O/L RELAY OPERATED, CONT./POWER SUPPLY FAILED, S/S IN LOCAL, TORQUE SWITCH OPTD. MID WAY)			
INTERPOSING RELAY/OPTO COUPLER (Applicable for integral Starter)	TYPE OF ISOLATING DEVICE	☒ INTERPOSING RELAY ☐ OPTO COUPLER ☐ EITHER		The coils of interposing relays shall be connected to freewheeling diode.	
	QUANTITY	☒ 2 Nos. ☐ 3 Nos.			
	DRIVING VOLTAGE	☒ 20.5 – 24V DC ☐ _____ V DC			
	DRIVING CURRENT	☒ 125mA MAX ☐ _____ mA MAX			
	LOAD RESISTANCE	☒ > 192 ohms - <25 k ohms ☐ > _____ ohms - < _____ ohms			
TORQUE SWITCH (Not Applicable for Smart Actuator) (\$\$ Refer Notes)	MFR & MODEL NO.	BIDDER TO SPECIFY			
	OPEN / CLOSE	☒ 1 No. ☐ 2Nos. / ☒ 1 No. ☐ 2Nos			
	CONTACT TYPE	2 NO + 2 NC			
	RATING	5A 240V AC AND 0.5A 220V DC			
	CALIBRATED KNOBS(OPEN&CLOSE TS)	REQUIRED FOR SETTING DESIRED TORQUE			
	ACCURACY	+3% OF SET VALUE			
LIMIT SWITCH (Not Applicable)	MFR & MODEL NO.	BIDDER TO SPECIFY			
	OPEN : INT : CLOSE	☒ 1 No ☐ 2 Nos.	2 Nos. (ADJ.)	☒ 1 No. ☐ 2Nos.	



SPECIFICATION FOR MOTORISED VALVE ACTUATOR

SPECIFICATION NO.: PE-SS-421-145-1007

VOLUME II B

SECTION D

REV. NO.

00

DATE: 06.10.16

SHEET

3

OF

3

Data Sheet A & B

DATA SHEET-A
(TO BE FILLED BY PURCHASER)

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

for Smart Actuator) (\$\$ Refer Notes)	CONTACT TYPE	2 NO + 2 NC	
	RATING (AC / DC)	5A 240V AC AND 0.5A 220V DC	

POSITION TRANSMITTER	POSITION TRANSMITTER (For inching duty & other specific applications)	☒ REQUIRED ☐ NOT REQUIRED	
	MFR & MODEL NO.	BIDDER TO SPECIFY	
	TYPE	☐ ELECTRONIC (2 WIRE) R/I CONVERTER ☒ ELECTRONIC (2 WIRE) CONTACTLESS	
	SUPPLY	☒ 24V DC ☐	
	OUTPUT	☒ 4-20mA	
	ACCURACY	± 1% FS	
SPACE HEATER	@SPACE HEATER	REQUIRED	
	@ POWER SUPPLY (NON INTEGRAL)	230V AC, 1 PH., 50 Hz	
	@ POWER SUPPLY (INTEGRAL)	BIDDER TO SPECIFY	
	@ RATING		
TERMINAL BOX	ACTUATOR/MOTOR TERMINAL BOX	REQUIRED	
	ENCL CLASS ACTUATOR/MOTOR T.B.	@ ☐ IP 68 @ ☐	
	@ EARTHING TERMINAL	REQUIRED	
	PLUG & SOCKET (9 PIN) (FOR COMMD, LS/TS FEED BACK, PoT)	☒ REQUIRED ☐ NOT REQUIRED ☒ 2 NOS. ☐	
CABLE GLANDS	@ POWER CABLE GLAND	SIZE:	
	@ SPACE HEATER CABLE GLAND	SIZE:	
	OTHER CONTROL CABLE GLANDS-1		
	OTHER CONTROL CABLE GLANDS-2	QUANTITY & SIZE :	
WEIGHT	TOTAL WEIGHT (ACTUATOR + ACCESSORIES)	BIDDER TO SPECIFY	_____ Kg.

NOTES:

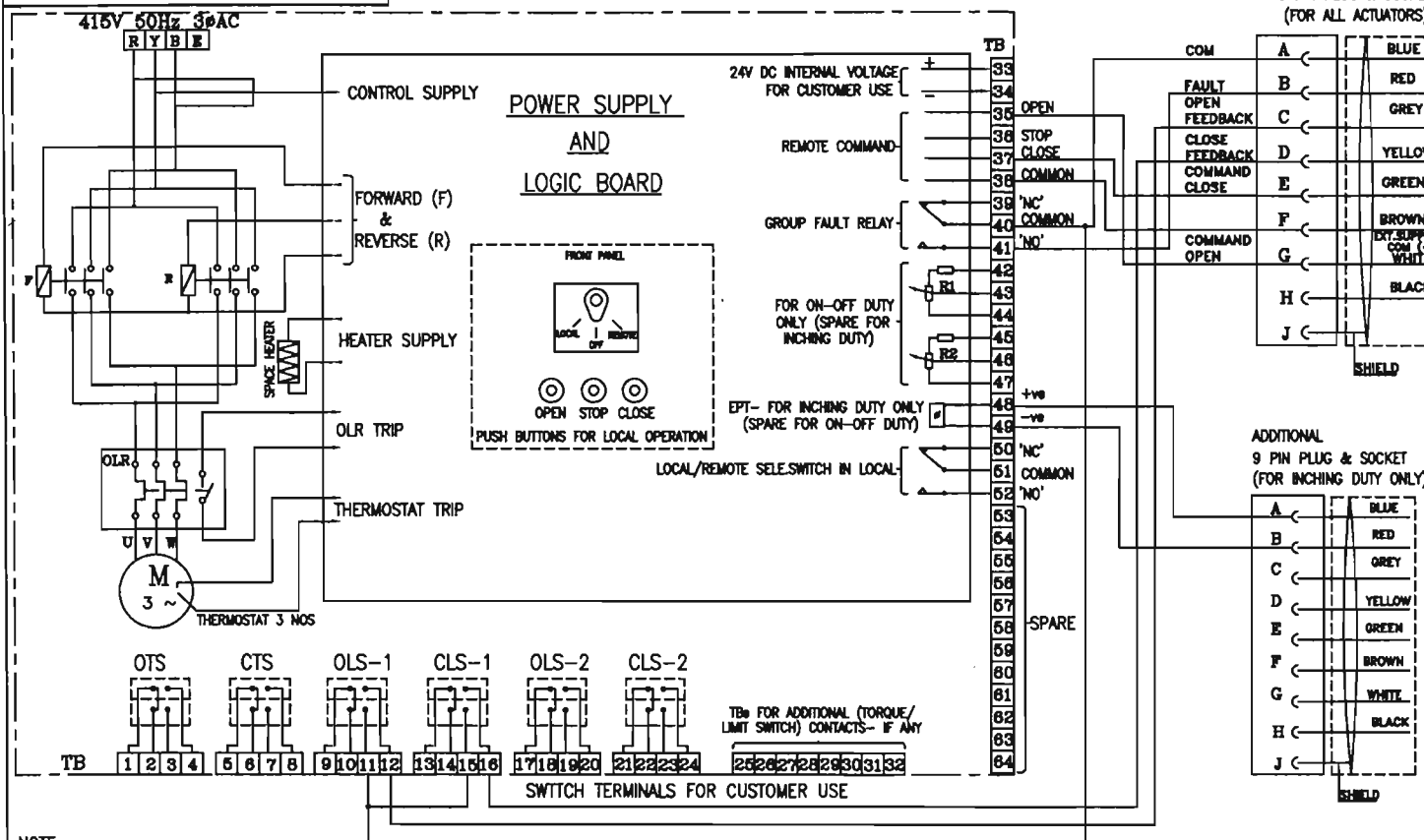
- SCOPE:** DESIGN, MANUFACTURE, INSPECTION, TESTING AND DELIVERY TO SITE OF ELECTRIC ACTUATOR FOR INCHING OR OPEN / CLOSE DUTY.
 - CODES & STANDARDS:** DESIGN AND MATERIALS USED SHALL COMPLY WITH THE RELEVANT LATEST INTERNATIONAL STANDARD (INDIAN CODES ARE NOT ACCEPTABLE).
 - TEMPERATURE RISE SHALL BE RESTRICTED TO 70 DEG. C FOR AMBIENT TEMPERATURE OF 50 DEG C.
 - CABLE GLANDS OF DOUBLE COMPRESSION TYPE, Tinned brass conforming to BS: 6121.**
 - THE TORQUE SWITCHES SHALL BE PROVIDED WITH MECHANICAL LATCHING DEVICE TO PREVENT OPERATION WHEN UNSEATING FROM THE END POSITIONS. THE LATCHING DEVICE SHALL UNLATCH AS SOON AS THE VALVE LEAVES THE END POSITION. IF SUCH PROVISION IS NOT POSSIBLE, THE TORQUE SWITCHES SHALL BE BYPASSED BY END-POSITION LIMIT SWITCHES WHICH OPENS ON VALVE LEAVING END POSITION. THESE LIMIT SWITCHES ARE ADDITIONAL TO THE NUMBER OF LIMIT SWITCHES SPECIFIED ELSEWHERE.
 - THE MOTOR SHALL OPERATE SATISFACTORILY UNDER THE +/- 10% SUPPLY VOLTAGE VARIATION AT RATED FREQUENCY, -6% TO +4% VARIATION IN FREQUENCY AT RATED SUPPLY VOLTAGE, SIMULTANEOUS VARIATION IN VOLTAGE & FREQUENCY THE SUM OF ABSOLUTE PERCENTAGE NOT EXCEEDING 10%.
 - THE MOTOR SHALL BE SUITABLE FOR DIRECT ON LINE STARTING.
 - DAMPERS ETC. ARE TO BE FITTED WITH SOCKET AND PLUG OF WELL-ESTABLISHED MAKE IN ACCORDANCE TO IEC 60309 OR EQUIVALENT FOR THE POWER CABLE CONNECTION. FOR THE CONTROL CABLE CONNECTION SEPARATE SOCKET AND PLUG SHALL BE PROVIDED.
- \$\$** TORQUE SWITCH & LIMIT SWITCH SHALL ACT INDEPENDENT OF EACH OTHER. TANDEM OPERATION IS NOT ACCEPTABLE.
- ##** EPOXY PAINT IS RECOMMENDED FOR COASTAL AREAS.

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

@ = TO BE FILLED BY ES

3-V-MISC-24283

DRAWING NO.



CONTACT DEVELOPMENT DIAGRAM

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

— INDICATES CONTACT CLOSED

- - - - - INDICATES CONTACT OPEN

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

SETTING PROCEDURE OF POSITION LIMIT AND TORQUE SWITCH

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

NOTE:-

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

11. DAMPERS ETC. ARE TO BE FITTED WITH SOCKET AND PLUG OF WELL-ESTABLISHED MAKE IN ACCORDANCE TO IEC 60309 OR EQUIVALENT FOR THE POWER CABLE CONNECTION. FOR THE CONTROL CABLE CONNECTION SEPARATE SOCKET AND PLUG SHALL BE PROVIDED.

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REV	DATE	ALTERED
		CHD & APPD

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

ELECTRICAL VALVE ACTUATORS (AC) WITH INTEGRAL STARTERS

(DRAWN FOR INTERMEDIATE POSITION OF VALVES)

TITLE
WIRING DIAGRAM (TERMINAL PLAN)
FOR ACTUATOR WITH INTEGRAL STARTER WITH PLUG & SOCKET

CARD
CODE
U 01

DRAWING NO.
3-V-MISC-24283

REV
0



SPECIFICATION FOR MOTORISED VALVE ACTUATOR

SPECIFICATION NO.: PE-SS-421-145-I007

VOLUME II B

SECTION D

REV. NO. 00 DATE: 06.10.16

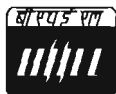
SHEET 1 OF 3

Data Sheet A & B

DATA SHEET-A
(TO BE FILLED BY PURCHASER)

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

GENERAL*	* PROJECT	2X660MA BIFPCL, MAITREE BANGLADESH	
	OFFER REFERENCE		
	* TAG NO. SERVICE	DW-26, 37	
	* DUTY	☒ ON / OFF ☐ INCHING	
	* LINE SIZE (inlet/outlet): MATERIAL		
	* VALVE TYPE	☒ GLOBE ☐ GATE ☐ REG. GLOBE ☐ BUTTERFLY	
	* OPENING / CLOSING TIME		
	* WORKING PRESSURE		
	AMBIENT CONDITION	SHALL BE SUITABLE FOR CONTINUOUS OPERATION UNDER AN AMBIENT TEMP. OF 0-55 DEG C AND RELATIVE HUMIDITY OF 0-95%	
	VALVE SEAT TEST PRESS	BIDDER TO SPECIFY	
	REQUIRED VALVE TORQUE	BIDDER TO SPECIFY	
	ACTUATOR RATED TORQUE	BIDDER TO SPECIFY	
CONSTRUCTION AND SIZING	CONSTRUCTION	TOTALLY ENCLOSED, DUST TIGHT, WEATHER PROOF, SUITABLE FOR OUTDOOR USE WITHOUT CANOPY, IP:65	
	MECHANICAL POSITION INDICATOR	TO BE PROVIDED FOR 0-100% TRAVEL	
	BEARINGS	DOUBLE SHIELDED, GREASE LUBRICATED ANTI-FRICTION.	
	GEAR TRAIN FOR LIMIT SWITCH/TORQUE SWITCH OPERATION	METAL (NOT FIBRE GEARS). SELF-LOCKING TO PREVENT DRIFT UNDER TORQUE SWITCH SPRING PRESSURE WHEN MOTOR IS DE-ENERGIZED.	
	SIZING	OPEN/CLOSE AT RATED SPEED AGAINST DESIGNED DIFFERENTIAL PRESSURE AT 85% OF RATED VOLTAGE. FOR ISOLATING SERVICE THREE SUCCESSIVE OPEN-CLOSE OPERATIONS OR 15 MINS. WHICHEVER IS HIGHER. FOR INCHING SERVICE - 150 STARTS/HR MINIMUM & FOR REGULATING SERVICE - 600 STARTS/HR MINIMUM.	
HANDWHEEL	* REQUIRED	☒ YES ☐ NO	
	* ORIENTATION	☐ TOP MOUNTED ☐ SIDE MOUNTED	
	*TO DISENGAGE AUTOMATICALLY DURING MOTOR OPERATION.		
ELECTRIC ACTUATOR	ACTUATOR MAKE/MODEL	BIDDER TO SPECIFY	
	MOTOR MAKE / MODEL / TYPE / RATING (KW)	BIDDER TO SPECIFY	
	@ MOTOR TYPE	SQUIRREL CAGE INDUCTION MOTOR, STARTING CURRENT LIMITED TO SEVEN TIMES THE RATED CURRENT as per IEC-60034-30	
	ACTUATOR APPLICABLE WIRING DIAGRAM	☒ ENCLOSED (BIDDER TO CONFIRM) A: ☐ DRG. NO. 3-V-MISC-24227 R00 B: ☐ DRG. NO. 3-V-MISC-24550 R00 C: ☒ DRG. NO. 3-V-MISC-24283 R00 D: ☐ DRG. NO. 4-V-MISC-90271 R11 E: ☐ For Thyristor based Integral starter, Bidder/Vendor to furnish wiring diagram	
	COLOUR SHADE	☒ BLUE (RAL 9003) ☐	
	PAINT TYPE (## Refer Notes)	☐ ENAMEL ☒ EPOXY ☐	
	SHAFT RPM	BIDDER TO SPECIFY	
	OLR SET VALUE	BIDDER TO SPECIFY	
	@ STARTING / FULL LOAD CURRENT	BIDDER TO SPECIFY	
	NO. OF REV FOR FULL TRAVEL	BIDDER TO SPECIFY	
			Starting current shall not exceed 7 times rated current as per IEC 60034 for IE-3 motors.



SPECIFICATION FOR MOTORISED VALVE ACTUATOR

SPECIFICATION NO.: PE-SS-421-145-1007

VOLUME II B

SECTION D

REV. NO.

00

DATE: 06.10.16

SHEET

2

OF

3

Data Sheet A & B

DATA SHEET-A
(TO BE FILLED BY PURCHASER)

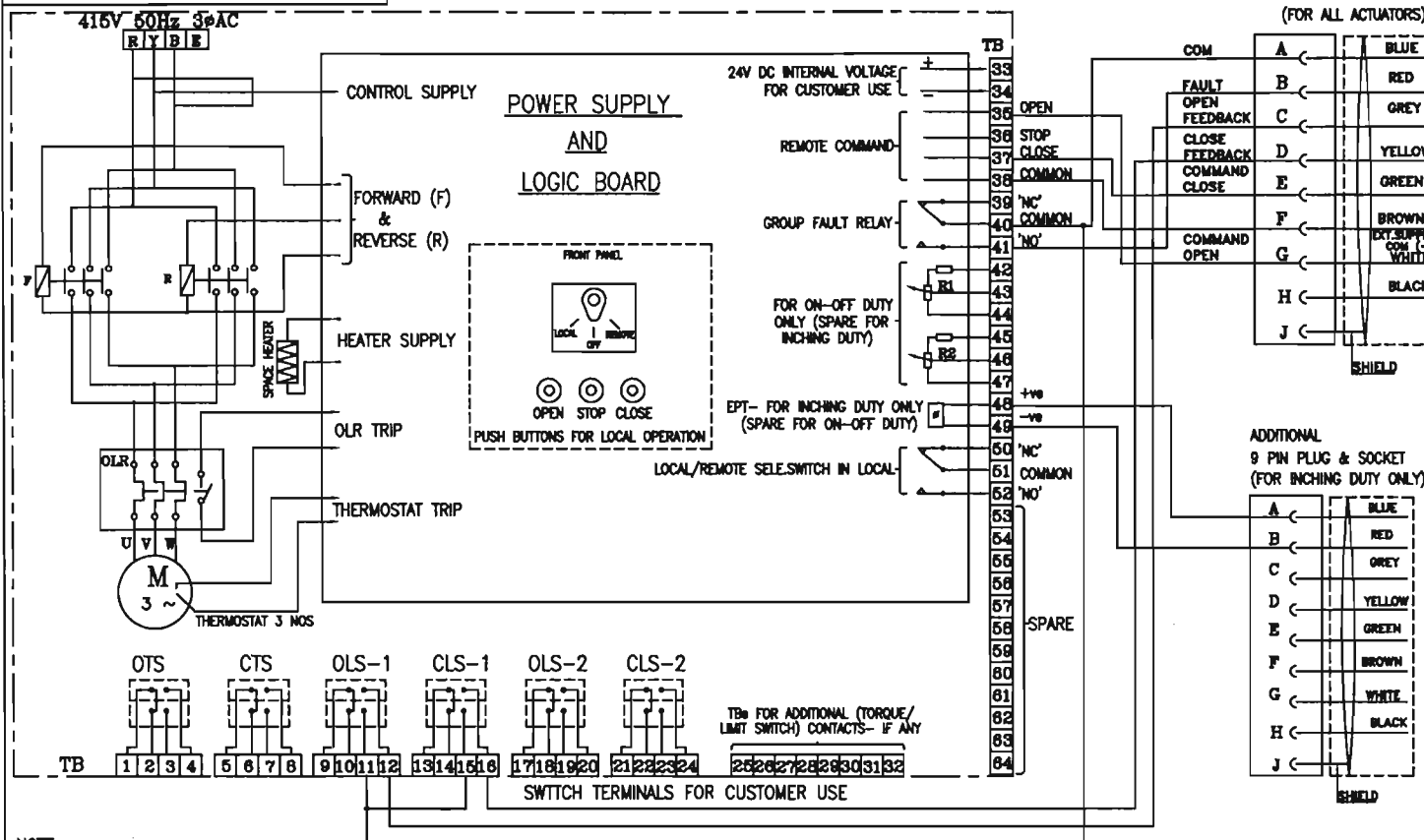
DATA SHEET-B
(TO BE FILLED-UP BY BIDDER)

	@ PWR SUPP TO MTR / STARTER	415V, 3PH, AC		
	@ CONTROL VOLTAGE REQUIREMENT	TO BE DERIVED FROM THE POWER SUPPLY TO THE STARTER ☐ 230 V ☐ 110 V		
	@ ENCLOSURE CLASS OF MOTOR	☐ IP 67 ☐ FLAME PROOF		
	@ INSULATION CLASS	CLASS-F TEMP. RISE LIMITED TO CLASS-B	As per IEC-60034	
	@ WINDING TEMP PROTECTION	☒ THERMOSTAT (3 Nos., 1 IN EACH PHASE) ☐		
	SINGLE PHASE / WRONG PHASE SEQUENCE PROTECTION	REQUIRED		
INTEGRAL STARTER	INTEGRAL STARTER	☒ REQUIRED ☐ NOT REQUIRED		
	TYPE OF SWITCHING DEVICE	☒ CONTACTORS ☐ THYRISTORS		
	TYPE	☒ CONVENTIONAL ☐ SMART (NON-INTRUSIVE)		
	IF SMART			
	a) SERIAL LINK INTERFACE	☐ INTEGRAL ☐ FIELD MOUNTED		
	b) SERIAL LINK PROTOCOL	☐ FOUNDATION FIELD-BUS ☐ PROFI-BUS ☐ DEVICE NET ☐		
	c) SERIAL LINK MEDIA	☐ TWISTED PAIR Cu-CBL ☐ CO-AXIAL Cu-CBL ☐ OFC		
	d) HAND HELD PROGRAMMER	☐ REQUIRED ☐ NOT REQUIRED		
	e) TYPE OF HAND HELD PROGRAMMER	☐ BLUETOOTH ☐ INFRARED ☐		
	f) MASTER STATION	☐ REQUIRED ☐ NOT REQUIRED		
	g) MASTER STN INTRFACE WITH DCS	☐ MODBUS ☐ TCP/IP		
	h) DETAILS OF SPECIAL CABLE	☐ ENCLOSED ☐ NOT REQUIRED		
	STEP DOWN CONT. TRANSFORMER	☒ REQUIRED		
	OPEN / CLOSE PB	☒ REQUIRED ☐ NOT REQUIRED		
	STOP PB	☒ REQUIRED ☐ NOT REQUIRED		
	INDICATING LAMPS	☒ REQUIRED ☐ NOT REQUIRED		
	LOCAL REMOTE S/S	☒ REQUIRED ☐ NOT REQUIRED		
STATUS CONTACTS FOR MONITORING	☒ REQUIRED ☐ NOT REQUIRED			
INTEGRAL STARTER DISTURBED SIGNAL	REQUIRED (O/L RELAY OPERATED, CONT./POWER SUPPLY FAILED, S/S IN LOCAL, TORQUE SWITCH OPTD. MID WAY)			
INTERPOSING RELAY/OPTO COUPLER (Applicable for integral Starter)	TYPE OF ISOLATING DEVICE	☒ INTERPOSING RELAY ☐ OPTO COUPLER ☐ EITHER		The coils of interposing relays shall be connected to freewheeling diode.
	QUANTITY	☒ 2 NOs. ☐ 3 NOs.		
	DRIVING VOLTAGE	☒ 20.5 – 24V DC ☐ _____ V DC		
	DRIVING CURRENT	☒ 125mA MAX ☐ _____ mA MAX		
	LOAD RESISTANCE	☒ > 192 ohms - <25 k ohms ☐ > _____ ohms - < _____ ohms		
TORQUE SWITCH (Not Applicable for Smart Actuator) (SS Refer Notes)	MFR & MODEL NO.	BIDDER TO SPECIFY		
	OPEN / CLOSE	☒ 1 No. ☐ 2Nos. / ☒ 1 No. ☐ 2Nos		
	CONTACT TYPE	2 NO + 2 NC		
	RATING	5A 240V AC AND 0.5A 220V DC		
	CALIBRATED KNOBS(OPEN&CLOSE TS)	REQUIRED FOR SETTING DESIRED TORQUE		
	ACCURACY	+3% OF SET VALUE		
LIMIT SWITCH (Not Applicable)	MFR & MODEL NO.	BIDDER TO SPECIFY		
	OPEN : INT : CLOSE	☒ 1 No ☐ 2 Nos.	2 Nos. (ADJ.)	☒ 1 No. ☐ 2Nos.

	SPECIFICATION FOR MOTORISED VALVE ACTUATOR		SPECIFICATION NO.: PE-SS-421-145-I007		
			VOLUME	II B	
			SECTION	D	
			REV. NO.	00	DATE: 06.10.16
			SHEET	3	OF 3
Data Sheet A & B					
DATA SHEET-A (TO BE FILLED BY PURCHASER)			DATA SHEET-B (TO BE FILLED-UP BY BIDDER)		
for Smart Actuator) (\$\$ Refer Notes)	CONTACT TYPE	2 NO + 2 NC			
	RATING (AC / DC)	5A 240V AC AND 0.5A 220V DC			
POSITION TRANSMITTER	POSITION TRANSMITTER (For inching duty & other specific applications)	☐ REQUIRED ☒ NOT REQUIRED			
	MFR & MODEL NO.	BIDDER TO SPECIFY			
	TYPE	☐ ELECTRONIC (2 WIRE) R/I CONVERTER ☒ ELECTRONIC (2 WIRE) CONTACTLESS			
	SUPPLY	☒ 24V DC ☐			
	OUTPUT	☒ 4-20mA			
	ACCURACY	± 1% FS			
SPACE HEATER	@SPACE HEATER	REQUIRED			
	@ POWER SUPPLY (NON INTEGRAL)	230V AC, 1 PH., 50 Hz			
	@ POWER SUPPLY (INTEGRAL)	BIDDER TO SPECIFY			
	@ RATING				
TERMINAL BOX	ACTUATOR/MOTOR TERMINAL BOX	REQUIRED			
	ENCL CLASS ACTUATOR/MOTOR T.B.	@ ☐ IP 68 @ ☐			
	@ EARTHING TERMINAL	REQUIRED			
	PLUG & SOCKET (9 PIN) (FOR COMM, LS/TS FEED BACK, Pot)	☒ REQUIRED ☐ NOT REQUIRED ☒ 2 NOS. ☐			
CABLE GLANDS	@ POWER CABLE GLAND	SIZE: _____			
	@ SPACE HEATER CABLE GLAND	SIZE: _____			
	OTHER CONTROL CABLE GLANDS-1				
	OTHER CONTROL CABLE GLANDS-2	QUANTITY & SIZE : _____			
WEIGHT	TOTAL WEIGHT (ACTUATOR + ACCESSORIES)	BIDDER TO SPECIFY		_____ Kg.	
NOTES: 1. SCOPE: DESIGN, MANUFACTURE, INSPECTION, TESTING AND DELIVERY TO SITE OF ELECTRIC ACTUATOR FOR INCHING OR OPEN / CLOSE DUTY. 2. CODES & STANDARDS: DESIGN AND MATERIALS USED SHALL COMPLY WITH THE RELEVANT LATEST INTERNATIONAL STANDARD (INDIAN CODES ARE NOT ACCEPTABLE). 3. TEMPERATURE RISE SHALL BE RESTRICTED TO 70 DEG. C FOR AMBIENT TEMPERATURE OF 50 DEG C. 4. CABLE GLANDS OF DOUBLE COMPRESSION TYPE, Tinned brass conforming to BS: 6121. 5. THE TORQUE SWITCHES SHALL BE PROVIDED WITH MECHANICAL LATCHING DEVICE TO PREVENT OPERATION WHEN UNSEATING FROM THE END POSITIONS. THE LATCHING DEVICE SHALL UNLATCH AS SOON AS THE VALVE LEAVES THE END POSITION. IF SUCH PROVISION IS NOT POSSIBLE, THE TORQUE SWITCHES SHALL BE BYPASSED BY END-POSITION LIMIT SWITCHES WHICH OPENS ON VALVE LEAVING END POSITION. THESE LIMIT SWITCHES ARE ADDITIONAL TO THE NUMBER OF LIMIT SWITCHES SPECIFIED ELSEWHERE. 6. THE MOTOR SHALL OPERATE SATISFACTORILY UNDER THE +/- 10% SUPPLY VOLTAGE VARIATION AT RATED FREQUENCY, -6% TO +4% VARIATION IN FREQUENCY AT RATED SUPPLY VOLTAGE, SIMULTANEOUS VARIATION IN VOLTAGE & FREQUENCY THE SUM OF ABSOLUTE PERCENTAGE NOT EXCEEDING 10%. 7. THE MOTOR SHALL BE SUITABLE FOR DIRECT ON LINE STARTING. 8. DAMPERS ETC. ARE TO BE FITTED WITH SOCKET AND PLUG OF WELL-ESTABLISHED MAKE IN ACCORDANCE TO IEC 60309 OR EQUIVALENT FOR THE POWER CABLE CONNECTION. FOR THE CONTROL CABLE CONNECTION SEPARATE SOCKET AND PLUG SHALL BE PROVIDED. \$\$ TORQUE SWITCH & LIMIT SWITCH SHALL ACT INDEPENDENT OF EACH OTHER. TANDEM OPERATION IS NOT ACCEPTABLE. ## EPOXY PAINT IS RECOMMENDED FOR COASTAL AREAS.					
NOTES* = TO BE FILLED BY MPL (LEAD AGENCY). @ = TO BE FILLED BY ES					

3-V-MISC-24283

DRAWING NO.



CONTACT DEVELOPMENT DIAGRAM

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

— INDICATES CONTACT CLOSED
 - - - - - INDICATES CONTACT OPEN
 CONTACT RATING: 5A AT 250V AC & 0.5A AT 220V DC

SETTING PROCEDURE OF POSITION LIMIT AND TORQUE SWITCH

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

NOTE:-

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

11. DAMPERS ETC. ARE TO BE FITTED WITH SOCKET AND PLUG OF WELL-ESTABLISHED MAKE IN ACCORDANCE TO IEC 60309 OR EQUIVALENT FOR THE POWER CABLE CONNECTION. FOR THE CONTROL CABLE CONNECTION SEPARATE SOCKET AND PLUG SHALL BE PROVIDED.

REV	DATE	ALTERED
		CHD & APFD

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TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

ELECTRICAL VALVE ACTUATORS (AC) WITH INTEGRAL STARTERS
(DRAWN FOR INTERMEDIATE POSITION OF VALVES)

TITLE
WIRING DIAGRAM (TERMINAL PLAN)
FOR ACTUATOR WITH INTEGRAL STARTER WITH PLUG & SOCKET

CARD CODE
U 01

DRAWING NO.
3-V-MISC-24283

REV
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B0.6.18.8 Technical conditions for low voltage motors

If not specified otherwise all motors must be designed to meet IP 55 enclosure according IEC60034-5.

All motors with rated power (referred to 40 °C ambient temp.) less than 160 kW must be designed as LV motors with premium efficiency class IE3.

The equipments which are only operating for short period shall not be covered under IE3 such as:

- a) Sootblower Motors- operates only during sootblowing sequence
- b) Seal air fan motor for damper sealing operation-operated only during maintenance.

B0.6.18.8.1 Constructive features

The same features as for high voltage motors shall apply.

Anti-condensing heating shall be provided for motors of 55 kW and above.

B0.6.18.8.2 Electric features

All motors shall be designed as 3-phase squirrel-cage motors suitable for direct on line starting.

The motors must be capable of being switched on to a large and stable network and with phases in opposition.

The electric features a), b) and c) of high voltage motors also apply here.

Motors starting current must not exceed 7.0 times rated current (referred to the motor rating and 45 °C ambient temp).

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The Starting current of LV Motor (IE3) shall be inline with IEC 60034-30. Applicable de-rating factor for design temperature of 45 Deg C shall also be applied.

B0.6.18.8.3 Protective features

An earthing clamp inside the terminal box has to be provided.

B0.6.18.8.4 Other features

Cable leads

All cable connecting boxes are to be designed to meet the requirements of IP 55 or IP 58 protection class respectively.

The cable connecting boxes are to be installed easily accessible on the motor. The connecting boxes must be capable of being turned by 90° or 180° and of being opened up longitudinally. The connection boxes are to be fitted with a terminal block.

Shafts

Where not otherwise specified, motors must be fitted with a free shaft end.

Protection against explosion hazards

Low-voltage motors, which are to be installed in areas exposed to the risk of explosion, must comply with the rules laid down in VDE 0165/0170/0171 for explosion-proof design in relation to the flash-point group classification for the particular explosive mixture.

B0.6.18.10 | Actuator drives

As far as applicable the above "Technical conditions for low voltage motors" shall apply.

In addition, all actuators for valves, dampers etc are to be fitted with socket and plug of well-established make to IEC 60309 or equivalent for the power cable connection. For the control cable connection separate socket and plug shall be provided.

Self-cooling at respective ambient temperature conditions is mandatory. Fan cooling is not accepted.

Actuators shall have integrated starters. Regulation type shall be continuous modulation type (min. 3000 starts per minutes).

B0.6.19.16 Actuators

Intelligent drives with integrated power switch unit and further electronics shall be installed. Actuators equipped with integral controls shall be supplied which can be operated via the operation elements on the local controls as soon as power is connected. Only operation commands and feedback signals shall be exchanged between the control system and the actuator. Motor switching shall be performed within the device and virtually without delay.

Unless otherwise specified actuators for modulating valves and dampers shall either be pneumatic or electrically operated. Self contained sealed hydraulic units may be considered where high thrusts or high speeds of operation are required.

Actuators for ON/OFF duty or manually positioned units shall generally be electrical motor and/or pneumatic driven, however the use of solenoid types on small valves shall be allowed dependent on duty.

The various types and sizes of actuators shall be rationalized and as far as possible each type shall be from a common manufacturer to facilitate interchangeability and spares.

In order to prevent the risk of fire or explosion pneumatic actuators shall be used in hazardous areas and associated equipment (e.g. positioners) must be intrinsically safe in accordance with IEC 60079-11.

Pneumatic actuators must be designed in such a way that in the event of air failure the actuator will remain in the position immediately prior to loss of power, or assume a position which is safe for the process.

With either action the failure mode shall be suitably monitored and the Plant operator informed by some form of alarm. The failure response of all actuators in the event of the loss of the prime mover (air pressure, oil pressure, electrical power) shall be indicated on the Piping and Instrumentation (P&I) diagrams, valve schedules, etc.

All pneumatic tubing to control drives or actuators shall, unless otherwise agreed to by the Employer/Engineer, be in copper which shall be sheathed in PVC or alternatively in stainless steel.

For all actuators of control valves and dampers of main systems local indicating pointer and position transmitters for remote indication and closed loop feedback shall be provided in accordance with the most severe operating conditions to be expected. The transmitters shall be designed to withstand conditions such as high temperature, vibrations and leakage of steam and of hot water wherever required. The protection class shall be IP 65 according to IEC 60529.

All actuators shall have a handwheel for direct manual operation. The diameter of the handwheel and geared effort shall be such that they can be reasonably operated by one man. A lockable mechanical clutch mechanism shall be provided to inhibit power control of the actuators when the handwheel is operated.

The speed of response of actuators used for modulating control shall be chosen to suit each particular application. Facilities shall be provided for limiting the actuator movement in each direction.

Special attention must be paid to adequately dimensioned drives and care must be taken to avoid any unintended displacement of the actuator on sudden rises of pressure in the piping.

Actuators shall have fail safe operation and actuator locking device in the event of abnormal conditions. Any abnormality on the valve shall be transmitted to the DCS.

All electrical actuator drives necessary for the safe operation and shut-down of the Plant in the event of 0.4 kV switchgear failure shall be connected to the UPS.

	COMPLIANCE SHEET GUN METAL VALVES 2X660MW MAITREE BANGLADESH STPP		SPECIFICATION NO. PE-TS-421-100-M003
			SECTION : II
	REV. NO.: 00		DATE: 07.05.2019
	Sheet 1 of 1		

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

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

Bidder to specify Gun metal grade in the following table:

Sl.No. (As per Data Sheet-A)	Valve Type	Valve Size (NB)	Valve Material	Material Grade (To be filled by Bidder)
1	Globe valve (GLV)	25	GUN METAL WITH NITRILE DISC	
2	Globe valve (GLV)	25	GUN METAL	
3	Gate valve (GV)	40	GUN METAL	
4	Globe valve (GLV)	40	GUN METAL	
5	Globe valve (GLV)	40	GUN METAL	
6	Globe valve (GLV)	50	GUN METAL	
7	Globe valve (GLV)	50	GUN METAL	
8	Gate valve (GV)	80	GUN METAL	
9	Gate valve (GV)	80	GUN METAL	
10	Gate valve (GV)	80	GUN METAL	
11	Globe valve (GLV)	80	GUN METAL	
12	SCNRV	80	GUN METAL	
13	Gate valve (GV)	150	GUN METAL	
14	Gate valve (GV)	150	GUN METAL	
15	Globe valve (GLV)	150	GUN METAL	
16	SCNRV	150	GUN METAL	

Name of Bidder / Authorized Representative :-

Designation :-

Signature :-

Company Seal :-

Date :-

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL