



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

Purchase / PCPS

TITLE TORQUE LIMITING TYPE ELECTRICAL ACTUATORS – 48 Nos	Phone: +91 431 2574104/2574072 Fax : +91 431 252 0233 / 0525 Email : james@bheltry.co.in
---	--

	Reference Number: Enquiry MM/PCPS/ACTUATOR	Enquiry Date: 29.10.2011	Due date for submission of quotation: 23.11.2011
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/Trichy is looking for Supply of **TORQUE LIMITING TYPE ELECTRICAL ACTUATORS**

ENCLOSURE :

- 1) MECHANICAL SPECIFICATION FOR TORQUE LIMITING TYPE ELECTRIC ROTARY ACTUATOR, SPECIFICATION NUMBER : 44-00003, REVISION 00 - SHEET 01 OF 03 TO 03 OF 03.
- 2) ANNEXURE - A, BUNKER ISOLATION GATE MODEL SKETCH - 1 PAGE,
- 3) ANNEXURE - B, ACTUATOR MODEL SKETCH - 1 PAGE,
- 4) ANNEXURE - C, ACTUATOR MOUNTING DETAILS - 1 PAGE,
- 5) SPECIFICATION FOR ELECTRICAL ACTUATORS, SPECIFICATION NUMBER "PCPS:CI:5316:ELECTACT, REV 00 - PAGE 01 TO 12.
- 6) INTERNAL WIRING DIAGRAM FOR ELECTRICAL VALVE ACTUATORS (AC), 4-V-MISC-90271, REV11 - 1 PAGE.

BHEL commercial terms & conditions with Price Bid formats 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) Bharat Heavy Electricals Limited) under enquiry reference "MM/PCPS/ACTUATOR"	
Tenders should reach us before 14:00 hours on the due date Technical bid will be opened at 14:30 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 Dy.Manager / Purchase/ PCPS

13

BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI - 620 014

Non Pressure Parts / PCPS



TITLE SHEET


SH 01/03

**MECHANICAL SPECIFICATION FOR
TORQUE LIMITING TYPE
ELECTRIC ROTARY ACTUATOR**

Specification No. : **44-00003**

Revision No. : **00**

	Name	Signature	Date
Prepared	M.Periasamy	<i>M. Periasamy</i>	06.09.11
Checked	M.Shahul Hameed	<i>M. Shahul Hameed</i>	06.09.11
Approved	V.Raghavendran	<i>V. Raghavendran</i> 06/09/11	06.09.11

	Specification for Torque Limiting Type Electric Rotary Actuator	SPEC. No. 44-00003 REV. 00	Sheet 02 of 03
---	--	---	---------------------------------

End Application: BIG Gate

BIG Gate Size : 2500X1400

Quantity/Gate: 1 RH+ 1 LH

PGMA : 44-416

1.0 Scope:

- 1.1 This specification covers the **standard mechanical** requirements of design, manufacture, testing inspection (at vendor's works) and supply of Torque limiting type rotary actuator and it's necessary accessories like position indicators, torque limit switches, travel limit switches, space heaters etc.

1.2 The extent of supply stated above is not necessarily exhaustive and shall not relieve the vendor from his responsibility to provide goods and services necessary to satisfy the performance criteria and guarantees specified.

2.0 Final control element :

- 2.1 Dual Plate type coal gate operated by rack and pinion arrangement. Two actuators are required per gate to close/open the gate in opposite direction

3.0 Actuator type :


- 3.1 Refer Annexure-A for Bunker Isolation Gate sketch.
3.2 Thrust load if any should not be transferred from the actuator to driven equipment.

4.0 Actuator Selection Chart:

4.1

S.No	Operating Torque	Qty/Boiler	Shaft Dia(mm)	Run Torque	Starting Torque	Stall Torque
1)	90 Kgm	12 RH 12 LH	60	Supplier to Furnish	Supplier to Furnish	Supplier to Furnish

- 4.2 Actuator output shaft speed 3 rpm.
4.3 No off revolutions of actuator output shaft for full travel from open to close vice versa 18 Revolutions.
4.4 Tripping torque to be set at factory 80 Kgm - for coal gate at the actuator output shaft.
4.5 Tripping torque range required on the torque switch is 50 To 120 Kgm. (Setting Procedure required to reset in the field if required should be furnished by supplier).

	Specification for Torque Limiting Type Electric Rotary Actuator	SPEC. No. 44-00003 REV. 00	Sheet 03 of 03
---	--	---	-----------------------

- 4.6 Output shaft shall be designed with bore and slot for feather key (Ref. Annexure-C)
4.7 Direction of rotation and orientation of shaft shall be as shown Annexure-B

5.0 Type of mounting:

- 5.1 Direct - Horizontal.

6.0 Manual operation:

- 6.1 Chain wheel to be provided instead of hand wheel for manual operation with declutch lever and chain guide.
6.2 Chain wheel shall declutch **automatically** upon energising actuator motor.
6.3 Chain wheel should be suitable for chain pitch 36mm - Ø6 - t=18.
6.4 The direction of rotation for gate open/close shall be clearly indicated (should be visible to a distance of 8m) on the chain wheel.

Note: 1) If any deviation from the Chain spec is required, Vendor should supply the chain.
2) If any extra Component other than chain is required for the operation of Actuator it should be supplied by the Vendor.

6.0 Documents To Be Attached:

- 6.1 Actuator System Catalogue.
6.2 Gear Box, Actuator, Mounting Details Selection Datasheets.
6.3 GA Diagram of the Actuator

Enclosure:

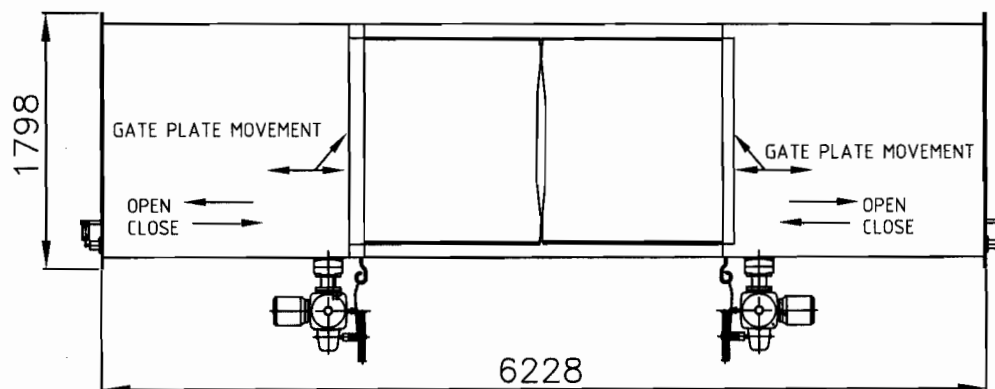
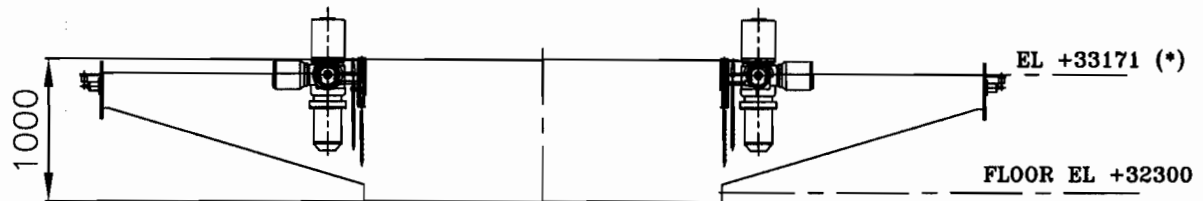
- 1) Annexure A : Bunker Isolation Gate Sketch
2) Annexure B : Actuator model sketch
3) Annexure C : Actuator Mounting Details



BUNKER ISOLATION GATE MODEL SKETCH

SPECN.NO
FBC&HRSG 44:000003
REV NO. 00

ANNEXURE-A



*This Elevation may change from +33100 to +33500

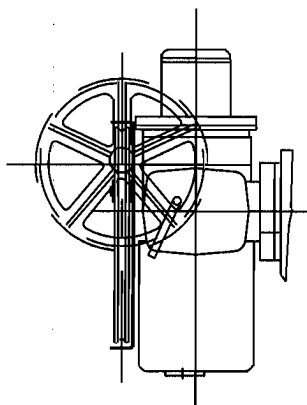
	Name	Signature	Date
Prepared	PERIASAMY.M	<i>M. Periasamy</i>	06-09-11
Checked	M.SHAHUL HAMEED	<i>M. Shahul Hameed</i>	06/9/11
Approved	V.RAGHAVENDRAN	<i>V. Raghavendran</i>	06/09/11



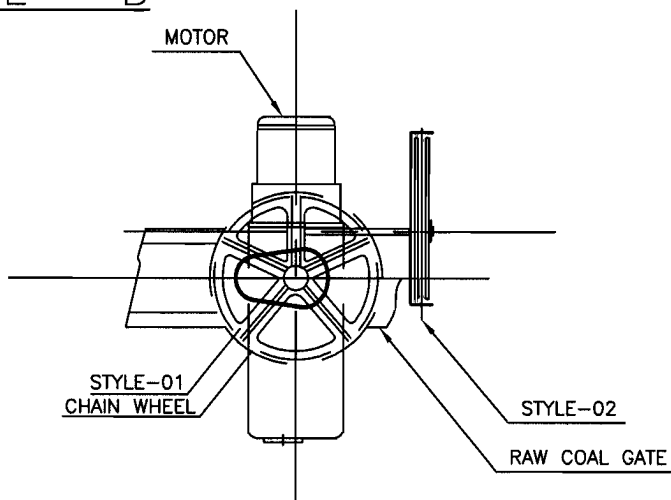
ACTUATOR MODEL SKETCH

SPECN.NO
FBC&HRSG 44:000003
REV NO. 00

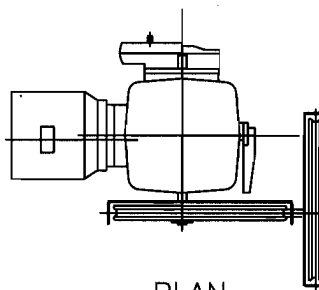
ANNEXURE – B



END VIEW



ELEVATION



PLAN

DIRECTION OF ROTATION

FIRST ACTUATOR

ACTUATOR OUTPUT SHAFT SHOULD ROTATE IN CLOCKWISE DIRECTION FOR CLOSING.
(WHILE FACING THE ACTUATOR OUTPUT SHAFT BY STANDING IN FRONT OF THE OUTPUT SHAFT, THE ACTUATOR OUTPUT SHAFT SHOULD ROTATE IN CLOCKWISE DIRECTION FOR GATE CLOSING)

SECOND ACTUATOR

ACTUATOR OUTPUT SHAFT SHOULD ROTATE IN COUNTER CLOCKWISE DIRECTION FOR CLOSING.
(WHILE FACING THE ACTUATOR OUTPUT SHAFT BY STANDING IN FRONT OF THE OUTPUT SHAFT, THE ACTUATOR OUTPUT SHAFT SHOULD ROTATE IN COUNTER CLOCKWISE DIRECTION FOR GATE CLOSING)

NOTE

1. chain wheel mounting style-01 or style-02
2. A name plate with open/close indication shall be fixed on the out side of the chain wheel.
(The indication fixed be clearly visible to a distance of 8m)

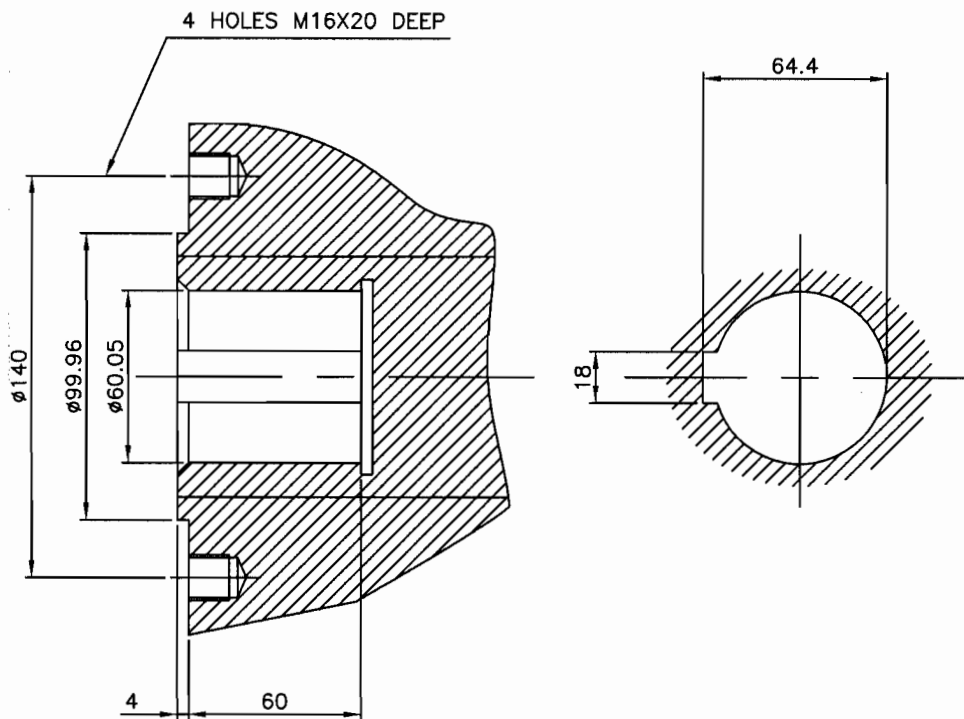
	Name	Signature	Date
Prepared	PERIASAMY.M	<i>m. Periasamy</i>	06/09/11
Checked	M.SHAHUL HAMEED	<i>Shahul Hameed</i>	06/09/11
Approved	V.RAGHAVENDRAN	<i>V. Raghavendran</i>	06/09/11



ACTUATOR MOUNTING
DETAILS

SPECN.NO
FBC&HRSG 44: 00003
REV NO. 00

ANNEXURE - C



NOTE:

- 1) CHANGE OF PITCH AND HOLE SIZE IS NOT ALLOWED

	Name	Signature	Date
Prepared	PERIASAMY.M	<i>m-periasamy</i>	06/09/11
Checked	M.SHAHUL HAMEED	<i>M. Shahul Hameed</i>	06/09/11
Approved	V.RAGHAVENDRAN	<i>V. Raghavendran</i> 08/06/11	06/09/11

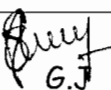
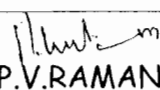
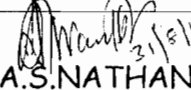
BHARAT HEAVY ELECTRICALS LIMITED
TRICHY - 620 014.

PROCESS & CAPTIVE POWER SYSTEM

ELECTRICALS, CONTROLS & INSTRUMENTATION

PCPS: CI: 5316:ELECACT	REV 00	PAGE 01 OF 12
------------------------	--------	---------------

SPECIFICATION FOR ELECTRICAL ACTUATORS

REV NO	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
00	31.08.11	INITIAL ISSUE	 G.J	 P.V.RAMAN	 A.S.NATHAN

TECHNICAL CONFIRMATIONS

(Fill up YES / NO take plain paper copies furnish along with offer)

THE ACTUATOR SHALL COMPLY/BE SUITABLE FOR

S.NO	SPECIFICATION CONDITION	YES/NO
1.0	MOTOR MOTOR SUITABLE FOR 415V, 3 ϕ , 50Hz, 3WIRE, UNGROUNDED SUPPLY.	
1.1	MOTOR CONFIRMS TO IS 325 OR BS 5000 PART 99	
1.2	MOTOR PAINTED WITH CORROSION RESISTANT EPOXY RESIN PAINT	
1.3	MOTOR INSULATION MINIMUM CLASS B (NON HYGROSCOPIC INSULATION WITH TROPICALISATION SUITABLE FOR CL.3.8)	
1.4	MOTOR SHOULD BE RATED AS FOLLOWS: FOR INCHING APPLICATION MIN. 150 START/HR. FOR OPEN/CLOSE APPLICATION S2-15 DUTY ie., 15 MIN.DUTY.	
1.5	MOTOR SUITABLE FOR DIRECT ON LINE START.	
1.6	STARTING CURRENT LIMITED TO 6 TIMES FULL LOAD CURRENT.	
1.7	TWO EARTH TERMINALS PROVIDED.	
1.8	ATLEAST ONE THERMOSTAT PROVIDED FOR MOTOR WINDING PROTECTION.	
1.9	MOTOR WINDING CONNECTION BROUGHT TO COMMON TERMINALS.	
2.0	ACTUATOR+ SECONDARY GEAR BOX ACTUATOR + SY.GB. CAN START AT 80% RATED VOLT AND RUN AT 75% VOLT AT SPECIFIED RUN TORQUE FOR 5 Min.	
2.1	ACTUATOR + SY.GB CAN OPERATE AT SPECIFIED RUN TORQUE FOR THE FOLLOWING CONDITIONS: AT \pm 10% RATED VOLTAGE (415 V). AT \pm 5% RATED FREQUENCY (50 Hz). AT 10% RATED VOLTAGE + FREQUENCY ABSOLUTE.	
2.2	ACTUATOR + SY.GB CAPABLE OF MEETING TOTAL TURNS INDICATED IN "ACTUATOR DATA SHEET" AND LIMIT SWITCHES SET ACCORDINGLY.	

S.NO	SPECIFICATION CONDITION	YES/NO
3.0	ACTUATOR (BASIC ACTU + SY. GEAR BOX) AS A WHOLE SHOULD MEET IP 55 DEGREE OF PROTECTION.	
3.1	NAME PLATE FOR TORQUE SWITCH CALIBRATION SHALL BE PROVIDED WITH TORQUE VALUE IN KGM.	
3.2	ACTUATOR HAND WHEEL DE-CLUTCH AUTOMATICALLY UPON POWER SUPPLY RESTORATION.	
3.3	COUNTER CLOCKWISE ROTATION LOOKING AT ACTUATOR DRIVING END SHALL RESULT IN CLOSE.	
3.4	ACTUATOR WILL MEET SPECIFIED RUN TORQUE FOR THE DUTY MENTIONED IN 1.4.	
3.5	FOUR LIMIT SWITCHES, TORQUE SWITCHES RATED FOR 5 AMPS AT 250V AC / 0.5 AMPS AT 220V DC AND EACH SWITCH SHALL HAVE 2NO + 2NC INDEPENDENT CONTACTS.	
3.6	ACTUATOR PROVIDED WITH MECHANICAL POSITION INDICATOR FOR 0 TO 100% ADJUSTABLE WITHIN 360° ROTATION.	
3.7	POSITION INDICATOR PROVIDED WITH ADJUSTABLE GEAR SETS & CHARTS.	
3.8A	ACTUATOR PROVIDED WITH SPACE HEATER SUITABLE FOR 240V AC, 1 ϕ , 50Hz IN LIMIT SWITCH COMPARTMENT.	
3.8B	ACTUATOR SUITABLE FOR OPEN IN DAMP DUSTY POLLUTED, ATMOSPHERES OF 100% RELATIVE HUMIDITY AND AMBIENT TEMP.OF -20°C TO +50°C.	
3.9A	ACTUATOR PROVIDED WITH COMMON TERMINALS AND EACH TERMINAL SUITABLE FOR 2X2.5 SQ MM WIRE.	
3.9B	INTERNAL WIRING IS DONE AS PER BHEL DIAGRAM 4-V-MISC-90271. WIRING DIAGRAM SHALL BE PASTED INSIDE TB COMPARTMENT.	
4.0	ACTUATOR SHALL BE PROVIDED WITH TWO POTENTIOMETER TYPE POSITION INDICATORS FOR OPEN & CLOSE.	
4.1	ONE NO. ELECTRONIC POSITION TRANSMITTER SUITABLE FOR 24V DC, 2 WIRE, 4-20mA SHALL BE PROVIDED FOR INCHING DUTY ACTUATORS.	

S.NO	SPECIFICATION CONDITION	YES/NO
5.0	ACTUATOR + SY.GB SHALL MEET ALL THE CONDITIONS MENTIONED IN ACTUATOR DATA SHEET (APPLICABLE FOR BHEL DAMPERS/ VALVES).	
6.0	EVERY ACTUATOR, ESPECIALLY SY.GB SHALL HAVE SELF LOCKING WORM GEARS.	
7.0	STARTING TORQUE FOR LOUVER SHALL BE MINIMUM 4 TIMES THE RUN TORQUE AND FOR GATE SHALL BE MINIMUM 5 TIMES THE RUN TORQUE (APPLICABLE FOR BHEL DAMPERS).	
8.0	GATE ACTUATORS SHALL BE CAPABLE OF RUNNING AT TWICE THE SPECIFIED RUN TORQUE VALUES FOR MINIMUM 6 MINUTES. (APPLICABLE FOR BHEL DAMPERS).	
9.0	NECESSARY NUMBER OF CD COATED FASTENERS (OR) MOUNTING BOLTS, NUTS WITH SPRING WASHERS PROPERLY FIXED OR SCREWED ON SECONDARY GEAR BOX SHALL BE FURNISHED WITH EVERY ACTUATOR(TO CALCULATE LENGTH OF FASTENERS, DAMPER FLANGE THICKNESS CAN BE CONSIDERED AS 20 mm). THE FASTENERS TO BE IDENTIFIED SEPARATELY IN SHIPPING LIST.	
10.0	ACTUATOR + SY. GB PAINTED WITH CORROSION RESISTANT EPOXY RESIN PAINT.	
11.0	APART FROM KEYWAY, KEYS SHALL ALSO BE PROVIDED WITH EVERY ACTUATOR (DEPTH OF KEY SHALL BE AS PER STDS).	
12.0	ALL LOUVERS 90° MOVEMENT ACTUATORS SHALL HAVE SPLINED REMOVABLE BUSH PROPERLY MACHINED AND DRILLED TO THE DIMENSIONS MENTIONED IN ACTUATOR DATA SHEET (APPLICABLE FOR BHEL DAMPERS).	
13.0	ACTUATORS OFFERED SHALL HAVE RPM OF AROUND 0.5 FOR LOUVER AND 1.9 FOR GATE. (APPLICABLE FOR BHEL DAMPERS).	
14.0	EVERY ACTUATOR SHALL BE SUPPLIED WITH ONE NO. $\frac{3}{4}$ ", TWO NOS. 1" & ONE NO. $1\frac{1}{4}$ " ET THREAD CABLE ENTRY WITH DOUBLE COMPRESSION CABLE GLANDS WITH METAL THREADED PLUGS FOR ALL ENTRIES.	

S.NO	SPECIFICATION CONDITION	YES/NO
15.0	ACTUATOR NAME PLATE SHALL HAVE THE MINIMUM OF FOLLOWING: STANDARD MOTOR DETAILS. RATED CURRENT (PROPORTIONAL TO RUN TORQUE). TAG.NO. AS SPECIFIED BY BHEL. DIRECTION OF ROTATION FOR CLOSING OF LOAD (DAMPER). SECONDARY GEAR BOX TYPE. 90° OR 360°. TORQUE CAPACITIES.	
16.0	SECONDARY GEAR BOX SHALL BE PROVIDED WITH SEPARATE NAME PLATE	
17.0	ACTUATOR (BASIC) AND SY. GEAR BOX SHALL PROPERLY COUPLE AND SHALL BE DESPATCHED AS SINGLE UNIT.	
18.0	ACTUATOR + SY. GEAR BOX SHALL HAVE PROPER SEALS TO PREVENT LEAKAGE OF OIL TO OTHER COMPARTMENTS UNDER ANY POSITION OF MOUNTING.	
19.0	SECONDARY GEAR BOX CONTINUOUS TORQUE CAPACITY SHALL BE GREATER THAN OR EQUAL TO STARTING TORQUE OF ACTUATOR.	
20.0	COLOUR OF THE ACTUATOR SHALL BE ADMIRALTY GREY SHADE 632 OF IS-5.	
21.0	REQUIRED DOCUMENTS (ALONG WITH OFFER): DRAWINGS FILLED UP TECHNICAL INFORMATION DATA SHEET & CATALOGUES IN 4 SETS EACH. OFFER IN QUADRUPLICATE. OFFER FOR COMMISSIONING SPARES SPARES FOR 2 YEARS TORQUE FREE OPERATION. SPECIAL TOOLS.	
22.0	REQUIRED DOCUMENTS (ON PLACEMENT OF ORDER): 4 COPIES OF O&M MANUALS CATALOGUES 2 NO. CD CONTAINING THE ABOVE. INSTALLATION DRAWING / MANUAL. 6 SETS OF TEST CERTIFICATES.	
23.0	TEST REQUIREMENTS FOR ACTUATOR ALONG WITH SECONDARY GEAR BOX SHALL BE COMPLIED WITH.	

"TECHNICAL INFORMATION"

(FILL UP FOR EACH ACTUATOR- TAKE PLAIN PAPER COPIES - FURNISH ALONG WITH OFFER) SUPPLIER SHALL FURNISH THE FOLLOWING IN THIS SAME FORMAT ONLY. ABSENCE OF ANY DETAIL WILL RESULT AS INCOMPLETE OFFER AND WILL NOT BE CONSIDERED.

SPECIFY TOLERANCE WHEREVER APPLICABLE - (REQUIRED TO BE CHECKED DURING TESTING/INSPECTION).

S.NO	SPECIFICATION CONDITION	ACTU S.NO
1.0	ACTUATOR TYPE CHOSEN.	
2.0	<u>MOTOR:</u> TYPE & FRAME SIZE	
2.1	K.W (415V, 50HZ, 3 ϕ , AC)	
2.2	STARTING CURRENT (A)	
2.3	CURRENT AT RUN TORQUE (A)	
2.4	FULL LOAD CURRENT (AT 100% TORQUE SETTING) (A)	
2.5	CURRENT AT DYNAMIC STALL (LOCKED ROTOR) (A)	
2.6	TIME ALLOWED AT LOCKED ROTOR (IN SECONDS)	
2.7	STARTING TORQUE (KGM) RUN TORQUE (KGM) CLASS OF INSULATION STATOR WINDING - STAR OR DELTA.	
2.8	FULL LOAD TORQUE (100% TORQUE SETTING) (KGM)	

S.NO	SPECIFICATION CONDITION	ACTU S.NO
2.9	NO. OF STARTS PER HR.WITH NO LOAD. NO OF STARTS PER HR WITH LOAD AT SPECIFIED RUN TORQUE. FULL LOAD RPM. AMBIENT TEMPERATURE IN °C (-20°C TO +50°C). DUTY TIME. FULL LOAD POWER FACTOR. FULL LOAD EFFICIENCY. RECOMMENDED BACK UP FUSE & OLR VALUES FOR DESIGNING THE MCC.	
3.0	GEAR BOX: PRIMARY GEAR BOX RATIO. PRIMARY GEAR BOX EFFICIENCY.	
3.1	PRIMARY GEAR BOX MAX OPERATING TORQUE KGM.	
4.0	SECONDARY GEAR BOX TYPE & MAKE. SECONDARY GB RATIO SECONDARY GB EFFICIENCY	
4.1	SY.GB.MAX. OPERATING TORQUE KGM.	
4.2	SY.GB.MOMENTARY TORQUE CAPACITY.	
5.0	ACTUATOR + SY.GEAR BOX OUTPUT RPM.	
5.1	ACTUATOR + SY. GB RUN TORQUE RANGE, KGM	
5.2	SECONDARY GB LEAD ANGLE LESS THAN OR EQUAL TO 6°	
5.3	WORM & WORM WHEEL MATERIAL.	
5.4	ACTUATOR + SY.GB STARTING TORQUE, KGM	
5.5	ACTUATOR + SY. GEAR BOX DYNAMIC STALL TORQUE KGM.	
5.6	BORE DIA X LENGTH OF SY. GB IN MM.	

S.NO	SPECIFICATION CONDITION	ACTU S.NO
5.7	APPROXIMATE WEIGHT OF ACTUATOR + SY. GEAR BOX. (KG)	
5.8	<u>LUBRICANT:</u> RECOMMENDED INTERVAL OF CHECKING/FILLING. TYPE OF LUBRICANT. INDIAN EQUIVALENT MAKE. QTY. IN LITRES/KG. INITIAL FILL BY VENDOR	
5.9	TYPE AND MAKE OF LIMIT SWITCHES AND TORQUE SWITCHES.	
5.10	ACTUATOR + SY. GB PAINT COLOUR PAINT THICKNESS. (MICRONS)	
5.11	OPERATING TIME IN SECONDS FOR EACH ACTUATOR TO BE FURNISHED	
5.12	INDICATE VERY CLEARLY THE RELATIONSHIP BETWEEN NOMINAL TORQUE & RATED TORQUE AND NOMINAL CURRENT & RATED CURRENT	

SPECIFICATION NO PCPS: CI: 5316:ELECACT

REV 00

SH NO 9 OF 12

ROUTINE TEST:

SL.NO	TEST TYPE	RESULT
1	DIMENSIONS	OVERALL & MOUNTING
2	DETAILS OF PAINTING AS PER SPECIFICATION & VENDOR	ANTI CORROSIVE EPOXY PAINT SHADE FINISH PAINT THICKNESS (MIN 80 MICRONS) PEEL OFF TEST
3	MANUAL OPERATION THROUGH HAND WHEEL	
4	CHECKING OF BHEL STD. TB WIRING DIAGRAM	
5	TESTING OF POSITION & TORQUE LIMIT SWITCHES FOR ACCURACY AND REPEATABILITY. BY TURN SETTING (NO OF TURNS) FOR POSITION LIMIT SWITCHES & TORQUE FOR TORQUE SWITCHES.	
6	MANUAL - AUTO SWITCHING FUNCTION	
7	FOR MOTORS, ALL ROUTINE TESTS AS CALLED FOR IN IS 325 / BS 4999/ VDE 0530 / IEC 432.	

8	FINAL OUTPUT SHAFT SPEED & TORQUE OF ACTUATOR + SY. GB AND CORRESPONDING CURRENT AS PER CATALOGUES	
9	POSITION INDICATOR & TRANSMITTER CALIBRATION CHECK FOR ACCURACY, LINEARITY & REPEATABILITY.	
10	LEAKAGE TEST FOR GEAR CASE (VISUAL)	
11	HV TEST AT 1.6 KV (80% OF 2 KV) FOR THE ASSEMBLED ACTUATOR	
12	OPERATION OF ACTUATOR + SY. GB UNDER VARIATION IN SUPPLY VOLTAGE ($\pm 10\%$) AND VARIATION IN FREQUENCY ($\pm 5\%$) FOR VERIFYING SPECIFIED RUN TORQUE & SPEED.	
13	CHECKING OF ACTUATOR BORE DIA X LENGTH AND KEYWAY WIDTH X DEPTH DIMENSIONS	

TYPE TESTS:

SL.NO	TEST TYPE	RESULT
1	TYPE TEST FOR MOTOR AS PER IS 325 / BS 4999 PART 60 / VED 0530 / IEC 432	
2	NOISE AND VIBRATION TEST FOR TOTAL ASSEMBLY IS 4729 / BS 4999	

3	TEMPERATURE RISE TEST DURING: • OPERATION OF ACTUATOR AT 75% VOLTAGE FOR 5 MINUTES • OPERATION OF ACTUATOR AT 50° C AMBIENT	
4	ENCLOSURE PROTECTION FOR THE TOTAL ASSEMBLY FOR IP 55 AS PER IS 2147 OR NEMA - IV OUTDOOR	
5	ENDURANCE TEST FOR ACTUATOR	
6	MECHANICAL & ELECTRICAL ENDURANCE TEST FOR LIMIT SWITCHES	
7	ALL TEST LISTED UNDER ROUTINE TEST	
8	DAMP HEAT CYCLE TEST AS PER IS 9000 / IEC 68-30	
9	<p>PERFORMANCE TEST OF ACTUATORS</p> <p>A) <u>SIZING TORQUE TEST</u> Place the beam connected to the actuator in the horizontal position and add weights to it until the actuator stalls (With torque switch active) Ref.Fig.1</p> <p>B) <u>DYNAMIC STALL TORQUE TEST</u> 1. Remove all the weights from the Damper simulator I beam. 2. Run the actuator without load until it hits a U-bolt arrangement which has weights attached to the bottom of it (Ref.Fig.2) 3. Add weights until the actuator cannot lift the U-bolt arrangement from the horizontal position.</p> <p>C) <u>GEAR BOX STURDINESS TEST</u> Repeat the sizing torque test and ensure that there is no damage of gear box of actuator.</p>	<p>FIG.1 shows a schematic of the Sizing Torque Test. An 'Actuator + Secy Gear Box' is mounted on a 'SUPPORT'. A 'ROD/BEAM' is connected to the actuator and is in a horizontal position. A weight 'WT' is applied to the end of the rod/beam.</p> <p>FIG-2 shows a schematic of the Dynamic Stall Torque Test. An 'Actuator + Secy Gear Box' is mounted on a 'SUPPORT'. A 'ROD/BEAM' is connected to the actuator and is in a horizontal position. A 'U-BOLT' is attached to the end of the rod/beam, and a 'WEIGHT' is attached to the bottom of the U-bolt. The diagram also shows the 'INITIAL POSITION OF ROD/BEAM' and the 'FINAL POSITION OF ROD/BEAM'.</p>

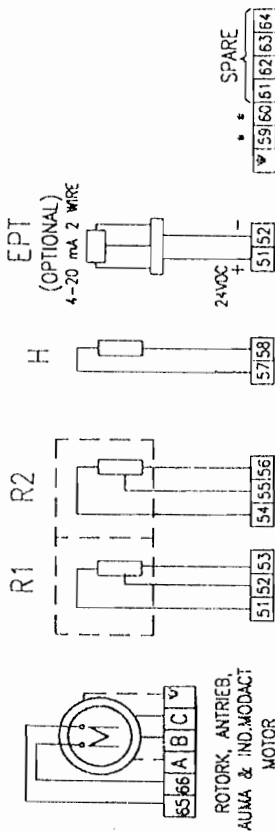
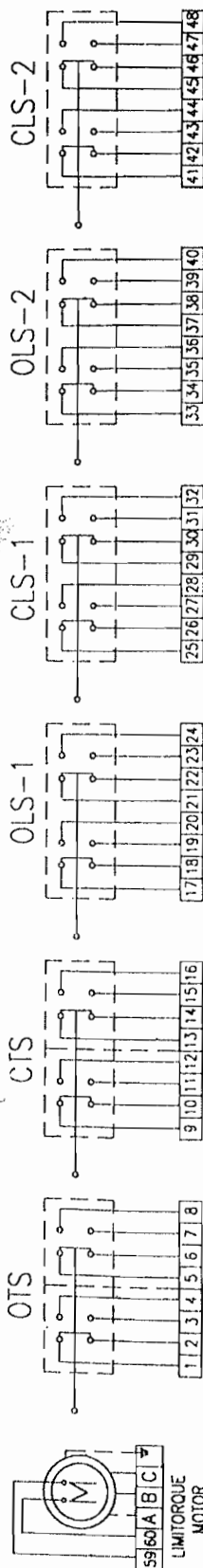
1.	<u>DOCUMENTS TO BE PROVIDED</u> Certificate for routine test detailing out the results	
2.	Routine and type test for motors	
3.	Type test report for tests listed under 'B'	
4.	Material Test Certificate for casting, gear, shaft etc.	
5.	Endurance Test for limit switches	

NOTES:

1. The tests should also be in conformity to the QP submitted by the supplier and approved by BHEL/Customer.
2. All test facilities shall be arranged by the vendor at his works before calling BHEL Representative for inspection.
3. Approved drawings, P.O., specifications and relevant standards shall be made available during testing/inspection.
4. All measuring and testing instruments shall be periodically calibrated from national test house and certificates made available during inspection.

Vendor to furnish the following along with the Offer:

- 1.0 Actuator Starting Torque (KGM)
- 2.0 Final output shaft angular movement/RPM.
- 3.0 Actuator bore dia and length of the gate shaft inside the actuator.
- 4.0 End connection details of actuator considering end connection of gate.
- 5.0 GA drg. of actuator.
- 6.0 Lubrication details and
- 7.0 List of commissioning spares/O & M spares/Mandatory spares.



* - SPARE FOR ROTORK, AUMA, ANTRIEB & IND.MODACT

SWITCHES - ALL ARE POTENTIAL FREE AND TWO PAIR OF CONTACTS CAN BE USED FOR DIFFERENT SUPPLY

Thermostat - 65-66 (ROTORK, AUMA, ANTRIEB & IND.MODACT), 59-60 (LIMITORQUE).

EPT - ELECTRONIC POSITION TRANSMITTER (POTENTIOMETRIC TYPE, FOR INCHING DUTY)

THERMOSTAT TERMINALS - TERMINATED IN MOTOR TB IN ANTRIEB & IND.MODACT AND IN MAIN TB IN OTHER MAKES

CTS - TORQUE SWITCHES FOR CW ROTATION (CLOSE) - 2 NO+2 NC

OTS - TORQUE SWITCHES FOR CCW ROTATION (OPEN) - 2 NO+2 NC

OLS-1, OLS-2 - LIMITSWITCHES FOR POSITION OPEN - 2 NO+2 NC

CLS-1, CLS-2 - LIMITSWITCHES FOR POSITION CLOSE - 2 NO+2 NC

OTS, CTS - TWO INDEPENDENT SWITCHES IN ANTRIEB & LIMITORQUE

OLS-2 & CLS-2 - CAM DISC IN ROTORK & ANTRIEB

R1-R2 - POTENTIOMETER 2 x 100 OHMS

H - SPACE HEATER 1ø 240V AC SUPPLY

M - MOTOR 3ø 415V 50 Hz AC SUPPLY

CONTACT DEVELOPMENT DIAGRAM	
OTS	1-2 OFF AT OVER TORQUE DURING OPENING TRAVEL 3-4 ON AT OVER TORQUE DURING OPENING TRAVEL 5-6 ON AT OVER TORQUE DURING CLOSING TRAVEL 7-8 ON AT OVER TORQUE DURING CLOSING TRAVEL
CTS	9-10 OFF AT OVER TORQUE DURING OPENING TRAVEL 11-12 ON AT OVER TORQUE DURING OPENING TRAVEL 13-14 OFF AT OVER TORQUE DURING CLOSING TRAVEL 15-16 ON AT OVER TORQUE DURING CLOSING TRAVEL
OLS-1	17-18 19-20 21-22 23-24 25-26 27-28 29-30 31-32 33-34 35-36 37-38 39-40 41-42 43-44 45-46 47-48
CLS-1	
OLS-2	
CLS-2	
SWITCH	TERMINAL NO. FULL OPEN 0 INTERMEDIATE b FULL CLOSE
INDICATES CONTACT CLOSED	
INDICATES CONTACT OPEN	

SETTING PROCEDURE OF POSITION LIMIT AND TORQUE SWITCH			
VALVES	OPEN		CLOSE
	MAIN	BACK UP	BACK UP
GATE VALVE OF 100 mm AND ABOVE IN 1500 CL AND ABOVE RATINGS	OLS	OTS	CLS
ALL OTHER GATE & GLOBE VALVES	OLS	OTS	CLS

• - CLS NOT TO BE CONNECTED IN TRIP CIRCUIT

NOTE:

1. BYPASS OTS FOR INITIAL 5% OF TRAVEL (FOR GATE VALVES ONLY)

IN AUMA, ANTRIEB & LIMITORQUE ACTUATORS.

2. CONNECT THERMOSTAT WITHOUT FAIL IN THE STARTER CIRCUIT

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



BHARAT HEAVY ELECTRICALS LTD.
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPPALLI 600014.

365-139

R.P.ESWAR

TITLE

INTERNAL WIRING DIAGRAM

FOR

ELECTRICAL VALVE ACTUATORS (AC)

(DRAWN FOR INTERMEDIATE POSITION OF VALVES)

DATE 09.09.2000

CONTRACT DEV. FC-0000

REV 11

RETRACTED WITH REVISION 11

DRAWING No. 4-V-MISC-90271

DESCRIPTION

APPD

CHEK

DATE

09.09.2000

11

09.09.2000

09.09.2000

09.09.2000

09.09.2000

09.09.2000

09.09.2000

BHEL/FBC&HRSG/Purchase

TERMS AND CONDITIONS (for ENQUIRY)

1 (a) **QUOTATION:** Each tender should be sent in double cover, inner cover should be sealed with tender's distinctive seal and superscribed with correct tender No. item of supply and due date of opening. The outer cover should only bear the address of this office and should not have any indication that a tender is within. Two or more quotation should not be sent in one cover but the quotation against each tender should be sent separately to avoid confusion. Tender should not be addressed to any individual's name but only by designation.

(b) Tenders should be free from **CORRECTION AND ERASURES**. Corrections if any, must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail.

© Price should be net F.O.R dispatching station inclusive of risk in transit and remain valid for 60 days from due date.

(d) If any Sales Tax is payable as extra to the quoted price it should be specifically stated in quotations along with CST & TNGST No. failing which the purchaser will not be liable for payment of Sales Tax. Our T N G S T No.3560005 Dt.01-04-1995, CST No.239383 Dt.11.06.1991.

(e) No revision of prices will be entertained after tenders are opened.

(f) Manufacturer's Name, Trade Mark or Patent No. if any should be specified. Illustrative leaflets giving technical particulars are required along with quotation wherever necessary.

(g) Product with ISI Certification marks will be preferred.

h) The Purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any tender in part or full without assigning any reason whatsoever.

2. **SAMPLES:** Wherever possible, sample should be submitted separately whether specifically requested or not so as to reach the Purchaser on or before the due date of the enquiry. They should be clearly marked with the enquiry No and the date on the outside cover to facilitate identification.

3. **PACKING AND MARKING:** The supplier shall arrange for securely protecting and packing the stores to avoid loss or damages during transit.

4 **TERMS OF PAYMENT:** Payment will be made within 30 days of satisfactory receipt of materials at site. Wherever required by the purchaser, the successful tenderer must send the operation & maintenance manuals, test certificate, drawings etc., for the materials ordered. These should be sent immediately after dispatch of the materials and a statement to that effect should be made in the invoice. Failure to comply with this provision will result in delay in payment of the bills. Goods dispatched either by V P P or by the document presented through bank will not be accepted unless agreed to by the Purchaser.

The duplicate copy of the invoice meant for the transporters should accompany the material as stipulated under C.E Rules 52A and 173C (or) 57GG. A Photostat copy of the above invoice for each delivery challen should be submitted along with the original bills routed through bank or submitted directly to BHEL Finance Department.

5 SECURITY DEPOSIT: For purchases over Rs.5,000/- the successful tenderer/s may be requested to furnish a Bank Guarantee. Security Deposit for an appropriate value as may be determined by BHEL.

6 LIQUIDATED DAMAGES/PENALTY AND INTEREST ON ADVANCES FOR DELAY IN DELIVERY:

If the supplier fails to deliver the raw material / equipment / components within the period in the contract the purchaser shall deduct Liquidated Damages a sum equivalent to 0.5% of the price for each week of delay up to a maximum of 15% of the price of the delayed/undelivered goods. In addition to the recovery of interest at normal cash credit rate plus 2% for the unadjusted portion of the advances. If the delay in delivery of a part contributes to delay in execution of total system. LD and interest on advances will be recovered on the total contract price/total advance paid.

7 RISK PURCHASE: Alternatively the purchaser at his option will be entitled to terminate the contract 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 dispatch within the time stipulated as aforesaid of if the same were not available, the best and the nearest available substitute therefore. The supplier shall be liable for any loss which the Purchaser may sustain by reason of such risk purchases in addition to penalty at the rate mentioned in clause 6 above.

8 PREFERENTIAL DELIVERY: It should be noted if a contract is placed on a higher tender as a result of this invitation to tender in preference to the lowest acceptable offer in consideration of the earlier delivery, the seller will be liable to pay to the purchaser the difference between the contract rate and that of the lowest acceptable tender on the basis of final price F O R destination, including all elements of freights, sales tax, duties and other incidental in case of complete supplies in terms of such contract within the date of delivery specified in the tender and incorporated in the contract.

9 MODVAT/CREDIT: If any Excise Duty is payable, the chapter head/sub-head reference and the rate of the duty should be quoted. If the tender is availing MODVAT credit for his input materials, the effect of proforma credit should be passed on to the purchaser. Tender under " MODVAT" shall be preferred.

10 GENERAL : The Purchaser reserves the right to split up the tender and place order for individual items with different tenders and also increase or decrease the quantity.

Any other conditions which might have been quoted by the Seller and are in contravention to the terms prescribed in the order and which have not been specifically accepted in by Purchaser will not be applicable to the contract.

BHARAT HEAVY ELECTRICALS LIMITED
PCPS / PURCHASE

Ref: MM/PCPS/ACTUATOR

Dated 29.10.2010

SPECIAL CONDITIONS

1. This tender is for the supply as per the enclosed Enquiry and specification. The offered price shall be valid for 6 months from the date of quotation. The vendor shall have adequate experience in manufacturing of this item.
2. The tender is in TWO parts. One part consisting of Technical Bid with Commercial terms & conditions along with Quality plan for the supply in-line with our requirements and another part containing Price Bid. Techno-Commercial bid and Price Bids are to be submitted in separate sealed covers. In addition to technical and commercial conditions, vendors who are not registered vendors of BHEL, Trichy have to submit the filled in "Supplier Registration Forms" (available in www.bhel.com website) along with the technical bid. Based on this and other conditions, as well as capacity and capability and approval by customer vendor will be shortlisted. Both these covers are to be put in a single cover duly super scribing the Enquiry Number. The technical bid with commercial terms & conditions will be opened on the due date and based on the acceptance of techno-commercial bid and vendor evaluation, the price bid of the qualified vendors will be opened on a suitable date with due intimation.

Following will be the criteria for short-listing the vendors

- Evaluation of dully filled Supplier Registration Forms.
- Availability of minimum manufacturing, handling, testing and measuring facilities as detailed in the Supplier Registration Form.
- BHEL will have the right for spot assessment of the facilities.
- Meeting our techno-commercial requirements of the enquiry.
- Customer approval for the vendors before ordering.

Accepting & entering in to Integrity Pact (IP).

3. BHEL reserves the right to Negotiate with the L1 vendor.
4. BHEL reserves the right to re-float the tender opened, if L1 price is not the lowest acceptable price to them inter-alia other reasons.
5. The materials are to be dispatched to M/s. Bhavnagar Energy Company Ltd, C/o. BHEL Site office, Padva Village, Ghogha, Bhavnagar, Gujarat, **in case of indigenous** vendors on FOR/Destination basis. **in case of foreign vendors on FOB/Nearest seaport basis.** Mode of packing & delivery shall be clearly specified in your quote.
6. Desired delivery within 12 weeks from the date of order. For the delayed delivery, LD is applicable at 0.5% per week, subject to a max. of 15% on undelivered portion.
7. Offers will be evaluated on FOR / BECL Site cost basis only. Necessary loading factor for internal freight & insurance will be added from sea port to BECL site in case of foreign vendors.
8. 100% payment will be effected on receipt and acceptance of materials at site in case of indigenous vendors. 100% payment on collection basis thro' bank will be effected for foreign vendors. PBG should be submitted as per proforma attached for 10% value of the order along with dispatch / negotiation documents.
9. Applicable commercial terms & conditions shall be clearly spelt out in the offer.
10. Quotes should be submitted only by the principals. Orders will be placed only on the principals. Ordering on Indian agent will not be done. Qualified L1 vendor will be considered for ordering.

11. Full details can be downloaded from BHEL's website <http://www.bhel.com> (Tender Notifications page > NIT_XXXX) or from the Govt. Tenders website <http://tenders.gov.in> (Public Sector Units > Bharat Heavy Electricals Limited page against Ref. No. NIT_XXXX). Interested parties may submit their offers to the following address, **along with vendor registration requirement in BHEL format hosted in BHEL web site.**

SR. MANAGER / PURCHASE / PCPS, 4TH FLOOR, BLDG.79, Bharat Heavy Electricals Ltd.,
HIGH PRESSURE BOILER PLANT, TIRUCHIRAPPALLI - 620 014, TAMILNADU, INDIA.
Ph: (0431) 2574104 / 2574163, FAX: 2520233
E-mail : james@bheltry.co.in, nsmani@bheltry.co.in

Dy. Manager/Purchase/PCPS

BHEL / FBC & HRSG / Purchase

TERMS & CONDITIONS (FOR IMPORT ENQUIRY)

I OFFER:

Offer in English Language and in Triplicate in a sealed cover super scribing the Enquiry Number and the due date shall be submitted (addressed) to:

The Manager/Purchase/FBC&HRSG
Building No.79
Bharat Heavy Electricals Limited
High Pressure Boiler Plant
TIRUCHIRAPALLI - 620 014
Tamil Nadu, India

Offer should be firm for net FOB Nearest Sea Port and C&F Chennai Port price indicating the shipping specifications and the earliest delivery in respect of offers from overseas suppliers. Offer from indigenous sources shall be firm for F.O.R TIRUCHIRAPALI.

II DOCUMENTS:

- (i) offer should be accompanied by detailed technical literature, Catalogue and detailed dimensional drawing in English and In Triplicate or otherwise, the offer will not be considered.
- (ii) In case Overseas suppliers route their offer through their accredited selling agents, a letter of authority should be furnished mentioning the name and address of their selling agents who are authorized to bid, negotiate and concluded a contract on their behalf.

III AGENCY COMMISSION:

- (i) In respect of the offer from Overseas suppliers, agency commission, if any, payable to their agents in India, shall invariably be shown separately in the pro forma invoice and this will be paid by us IN INDIA in Indian Rupees, on satisfactory completion of the contract.
- (ii) If overseas principal has any tie up with any third party in respect of Agency Commission it should be declared while submitting the offers.
- (iii) Copies of current Agency Agreement / Authorization Letter in respect of Agency Commission shall be furnished along with offer, if not made available earlier.
- (iv) For calculation of Rupees equivalent of Agency Commission, exchange rate as prevailing on the date of order will be taken.

IV SPARES:

The tender should quote separately for spares that are required for two years trouble free operations. The spares offer should accompany the offer of main equipment otherwise the quotation will be overlooked.

V VALIDITY:

The offers for main equipment and spares shall be kept open for acceptance for 120 days (one hundred and twenty days) from the date of opening of the tender.

VI TEST CERTIFICATES, OPERATING AND MAINTENANCE MANUALS:

The tender shall clearly mention in their offer that the Test certificate and Operating and Maintenance Manuals etc., as called for in the Technical specification in the required number of copies will be provided at no extra cost. If any amount is payable as extra, the same shall be indicated separately in the offer.

VII TERMS OF PAYMENT :

In the event of an order the Purchase will arrange for an Irrevocable Letter of Credit against presentation of documents. Under no circumstances confirmed and irrevocable letter of credit will be established by the Purchase.

VIII GENERAL:

- (i) Preference will be given to suitable indigenous or ex-stock imported offers failing which imported offers from incoming consignment against the indigenous supplies " stock and sale licence" will be accepted. If stock and sale licence is not available with the indigenous suppliers, the same shall be indicated in their offer.
- (ii) Bank Guarantee: The supplier in the event of an order should furnish a Bank Guarantee from an approved Bank at no extra cost in a pro forma which will be supplied to the Supplier, along with the order, for an amount equipment to 10% of the value of the contract. The Bank Guarantee should remain in full force and effect during the period that would be taken for successful completion of the contract and shall continue to be enforceable till 12 months from the date of receipt of consignment at Purchaser's site or 18 months from the date of last shipment at the Port of delivery whichever is earlier.

XI LD/PENALTY AND INTEREST ON ADVANCES FOR DELAY IN DELIERY:

" If the supplier fails to deliver the equipment / components within the period specified in the contract the Purchaser shall deduct Liquidated Damages a sum equivalent to 0.5% of the price for each week of delay up to maximum 15% of the price of the delayed / undelivered goods, in addition to the recovery of interest at normal cash credit rate plus 2% for the unadjusted portion of the advances. If the delay in delivery of a part contributes to delay in execution of total system, LD and interest on advances will be recovered on the total contract price / total advance paid"

kundan/En_Anc_Fin



BHARAT HEAVY ELECTRICALS LIMITED
FBC & HRSG / PURCHASE
TIRUCIRAPPALLI - 620 014 , TAMILNADU

445 - 407 (Rev.01)

INSTRUCTIONS TO TENDERERS (INDIGENOUS)

- 01.a Tenderers shall quote their price on **Ex-Works / FOR Despatching point** basis. Materials will be transported by road through **BHEL / TRICHY approved transport carriers** to respective destinations indicated in the tender.
- b Split-up prices must be furnished by the tenderer for the basic Instrument / Equipment and for all accessories quoted.
02. Offer must include Spares required for:
 - a) Commissioning of the equipment.
 - b) 2 years trouble free operation.
03. If the tender specification calls for various alternatives, all such alternatives are to be quoted by the tenderers.
04. Data sheet as called for in the enquiry shall be filled by the tenderer in full and submitted along with the quotations.. **Offers with incomplete information in data sheet are liable for rejection.**
05. Offers shall be accompanied by copies of drawings, catalogues, illustrated leaflets as called for in the tender specification.
06. In case of tenders invited in two parts, vendors shall furnish **Un-priced Complete Bill Of Materials in the technical bids** for our evaluation. Technical bids alone will be opened on the tender due date.
07. Manufacturer's quality plan must be sent along with the offer. The Vendor shall submit along with the offer the list of components made in house and the list of bought out components, the source, the quality requirements for the same. A copy of the product catalogue with all the relevant information shall also accompany the offer. **In case BHEL Standard Quality plan is applicable, vendor to confirm for their compliance.**
08. Each and every point of BHEL specification / data sheet must be either confirmed or commented upon without fail either in typed form or in neatly hand written form bringing out clearly the deviations (if any) taken by the tenderers. However, the tenderers must make all efforts to adhere to BHEL specifications in toto. Offers received without such point to point confirmations / comments shall be considered incomplete and liable for rejection.
09. **Status of tender submission shall invariably be informed to BHEL either over E-Mail / Fax atleast two days in advance of due date, failing which no extension of due date is entertained.**

10. **No advance will be made along with order.** Our payment terms will be **100% within 45 days after receipt and acceptance of materials at our works / site.** Please note that finalisation of tender is not only on the price factor but also on your accepting our terms of payment.
11. The equipment shall be guaranteed for a period of **12 / 18 months** from the date of putting the equipment in use or **18 / 24 months** from the date of despatch whichever is earlier.
12. Vendor to confirm for providing **Bank Guarantee for 10% order value (as per BHEL format)** valid for a period mentioned in the point No.11 .
13. Please quote **DGS&D** rates if the equipment is covered under the current rate contract. A copy of current rate contract shall also be enclosed with the offer.
14. The purchase also reserves the right to allow to the Public Enterprises price preference facilities as admissible under Government policy.
15. The rate of excise duty prevalent on the date of quotation shall be clearly indicated in the offer itself for incorporation in the Purchase Order. It will be payable at the quoted rates subject to completion of delivery within the stipulated dates. However revision due to statutory variations will be applicable.
16. In case of an order, **3 sets of hard copies of detailed dimensional drawings, O&M instructions & manuals and 2 sets of soft copies in CD** will have to be furnished by the supplier **at no extra cost.**
17. If the component requires approval of the prospective supplier's drawing before manufacture, such drawings must be furnished within two weeks from the date of Letter of Intent unless contracted otherwise. Drawings to be submitted for approval must be complete in all respects without necessitating submission of revised drawings for approval.
18. **"Original Invoice for Buyer"** should be submitted along with the advance copy of documents to, The Manager / Purchase / IPP, Bldg.No.79, BHEL, Trichy-14 for each of the despatch made, for processing payment.
19. Detailed offer should reach us before the due date indicated in the tender. Telegraphic offers will normally be not accepted and will be treated as incomplete.
20. Offers must reach us latest **before 2.30 P.M.** on the date of opening of tender viz:
21. The materials are to be despatched to :

QUOTATION DATA SHEET

THE TENDERS SHALL FURNISH THE PARTICULARS CALLED FOR IN THE QUOTATION DATA SHEET ENCLOSED AND SUBMIT THE FILLED IN DATA SHEET ALONG WITH THE QUOTATION WITHOUT FAIL OFFERS WITH INCOMPLETE INFORMATION IN DATA SHEET ARE LIABLE FOR REJECTION. IN CASE OF DISCREPANCY, INFORMATION CONTAINED IN THIS DATA SHEET SHALL BE CONSIDERED FOR EVALUATION.

PLEASE STRIKE OUT WHICHEVER IS NOT APPLICABLE:

PROJECT:

ENQ.NO & DATE :

DUE DATE :

01	VALIDITY	UPTO
02	DELIVERY PERIOD	..... MONTHS / WEEKS
03	DELIVERY PLACE	
	(a) EX-WORKS PLACE	
	(b) FOR / DESPATCHING POINT	
04	EXCISE DUTY	..... % / NOT APPLICABLE
05	TAX	..... % / NOT APPLICABLE
	(a) C S T	..... % / NOT APPLICABLE
	(b) LOCAL TAXES (SUPPLY WITHIN THE STATE)	..... % / NOT APPLICABLE
06	OCTROI CHARGES	..... % / NOT APPLICABLE
07	PACKING CHARGES	..... % / NOT APPLICABLE
08	FORWARDING CHARGES	..... % / NOT APPLICABLE
09	FREIGHT CHARGES	..... % / NOT APPLICABLE
10	INSURANCE CHARGES	..... % / NOT APPLICABLE
11	TESTING / IBR CHARGES (LUMPSUM)	..... % / NOT APPLICABLE
12	COMMISSIONING CHARGES (LUMPSUM)	..... % / NOT APPLICABLE
13	PAYMENT TERMS	
14	ACCEPTANCE FOR PROVIDING BANK GUARANTEE AS PER BHEL PROFORMA	YES / NO / APPLICABLE
15	DIMENSIONAL DRGS / DATA SHHETS	ENCLOSED / NOT APPLICABLE
16	ANY OTHER ADDITIONAL FACTORS	
17	LD CLAUSE @ 0.5% PER WEEK MAXIMUM 15% FOR THE DELAYED DESPATCHING	
18	GUARANTEE PERIOD SHALL BE 18 / 24 MONTHS	

WE CONFIRM THAT THE STATUTORY LEVIES, DUTIES, TAXES ETC FURNISHED ABOVE ARE BASED ON THE LATEST GOVT NOTIFICATION. WE ALSO CONFIRM THAT WE HAVE GONE THROUGH ALL THE CONDITIONS OF THE ENQUIRY AND OUR OFFER IS ACCORDINGLY SUBMITTED

SIGNATURE WITH SEAL

(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT AND THE EXPIRY DATE OF BG MUST BE AFTER 60 DAYS FROM THE DATE OF COMPLETION OF WARRANTY PERIOD)

PERFORMANCE BANK GUARANTEE

In accordance of M/s. Bharat Heavy Electricals Limited (A Government of India undertaking, a company incorporated under the Companies Act 1956 having its Registered Office at "BHEL House", SIRI Fort, New Delhi 110 049) through its High Pressure Boiler Plant Division located at Tiruverumbur, Tiruchirapalli- 620 014 (hereinafter called 'the Company') having entered into a contract withhereinafter called 'the said contractor' which term includes 'suppliers' for the purpose of this Bond and under the terms and conditions of the contract No..... Dt Between BHEL, Trichy and as per the contract, the contractor / supplier is to furnish a performance Bank guarantee for Rs. for the due performance of the equipment to be supplied under the above referred contract and for the fulfillment of all the terms and conditions of the contract, We(indicate the name of the bank) (herein after referred to as the bank) at the request of (Contractor(s)) do here by undertake to pay the company an amount not exceeding Rs.....against any loss or damage caused to or suffered or would be caused to or suffered by the company by reason of any breach by the said contractor (s) of any of the terms and conditions contained in the said agreement.

2. We(indicate the name of the bank with full address), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company by reason of breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement or by the reason of the contractor(s) 'failure to perform' the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____.

3. We undertake to pay unconditionally to the Company any money so demanded notwithstanding any dispute(s) raised by the Contractor in any suit, or proceedings pending before any Court or Tribunal or Arbitration or before any other authority relating thereto our liability under this present being absolute and unequivocal. The payment under this guarantee would not wait till the disputes have been decided by any Court or Tribunal or in the arbitration proceedings or by any other authority. The payment so made by us under this Bond shall be a valid discharge of liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.

4. We.....(indicate the name of Bank), further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till _____ Office / Department/ Division of the Company certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. (I) Unless a demand or claim under this guarantee is made on us in writing on or before the _____ we shall be discharged from all the liability under this guarantee thereafter. But where such claim or demand has been preferred by the Company with the Bank before the expiry of the said date, the claim shall be enforceable notwithstanding the fact that the said enforcement is effected after the said date.

(ii) For the purpose of this clause, any letter making demand on the Bank by M/s. BHEL dispatched by Registered Post with Ack.Due or by Telegram or by any Electronic media addressed to the above mentioned address of the Bank shall be deemed to be the claim / demand in writing referred to above irrespective of the fact as to whether and when the said letter reaches the Bank, as also any letter containing the said demand or claim is lodged with the bank personally.

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

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

8. It shall not be necessary for the company to proceed against the contractor before proceeding against the guarantor-bank and the guarantee herein contained shall be enforceable against them notwithstanding any security, which the company may have obtained or obtain from the Contractor shall, at the time when proceedings are taken against the guarantor hereunder be outstanding or unrealised.

9. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Tiruchirapalli.

10. The guarantor hereby declare that it has power to execute this guarantee and the executant has full powers to do so on its behalf under the proper authority granted to him/them by the guarantor

11. We(indicate the name of Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the company in writing.

In witness whereof we....., (indicate the name of Bank) have hereunto setout Bank Seal the _____ day _____ month 200

LIST OF NATIONALISED BANKS

- 01. ALLAHABAD BANK**
- 02. ANDHRA BANK**
- 03. BANK OF INDIA**
- 04. BANK OF BARODA**
- 05. BANK OF MAHARASTRA**
- 06. BHARATH OVERSEAS BANK**
- 07. CANARA BANK**
- 08. CENTRAL BANK OF INDIA**
- 09. CORPORATION BANK**
- 10. DENA BANK**
- 11. INDIAN BANK**
- 12. INDIAN OVERSEAS BANK**
- 13. OREINTAL BANK OF COMERCE**
- 14. PUNJAB NATIONAL BANK**
- 15. PUNJAB AND SIND BANK**
- 16. STATE BANK OF INDIA**
- 17. STATE BANK OF TRAVANCORE**
- 18. STATE BANK OF MYSORE**
- 19. STATE BANK OF BIKANER & JAIPUR**
- 20. STATE BANK OF HYDERABAD**
- 21. STATE BANK OF PATIALA**
- 22. STATE BANK OF MAHARASTRA**
- 23. SYNDICATE BANK**
- 24. UCO BANK**
- 25. UNION BANK OF INDIA**
- 26. UNITED BANK OF INDIA**
- 27. VIJAYA BANK**

OTHER BANKS	
28	ABN AMRO BANK N.V.
29	CITI BANK N.A.
30	DEUTSCHE BANK AG
31	HDFC BANK LTD.
32	ICICI BANK LTD.
33	IDBI LTD.
34	STANDARD CHARTERED BANK
35	THE HONGKONG AND SHANGHAI BANKING CORPORATION LTD.