

# MOTOR OPERATED VALVE ACTUATOR DATA SHEET

NTPC DRAWING NO.

**OWNER :**



**THE SINGARENI COLLIERIES COMPANY LTD.**

(A Government company)  
POWER PROJECT DIVISION

**CONSULTANT :**



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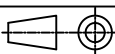
**NTPC Limited**  
(A Government of India Enterprise)  
CONSULTING WING

**PROJECT :**

**SCCL COAL BASED THERMAL POWER PLANT**  
(2 X 600MW)

**PACKAGE**

**BOILER TURBINE GENERATOR PACKAGE**

REV.	DATE	DRN	CHD	APPD	CONTRACTOR	DEPT CODE	NAME	SIGN	DATE
01	31.10.2012	MS	MK	ABS	 <b>BHARAT HEAVY ELECTRICALS LTD.</b> POWER SECTOR PROJECTS ENGINEERING MANAGEMENT NEW DELHI	DRN	MS	-sd-	13.04.12
						CHD	MK	-sd-	13.04.12
						APPD	SHB	-sd-	13.04.12
1.	REVISED TO INDICATE THE WINDING TEMP. PROTECTION OF ELECTRICAL ACTUATOR.				TITLE <b>MOTOR OPERATED VALVE ACTUATOR DATA SHEET</b>				
						DEPT.	SCALE	DRAWING NO.	
						SIGN		PE-ID-381-145-I902	
						DATE		SHEET 1 OF 5	REV. 01



## SPECIFICATION SHEET FOR MOTORISED VALVE ACTUATOR

**2 x 600MW SINGARENI - SCCL TPP**

SPECIFICATION NO.: PE-ID-381-145-I902

VOLUME

SECTION

REV. NO. 00

DATE: 13.04.12

SHEET 2 OF 5

TAG No :-

Qty :-.....Nos.....

### Data Sheet A & B

DATA SHEET-A  
(TO BE FILLED BY PURCHASER)

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

<b>GENERAL*</b>	* PROJECT	<b>2 x 600MW SINGARENI - SCCL TPP</b>	
	OFFER REFERENCE		
	* TAG NO. SERVICE		
	* DUTY	<input type="checkbox"/> ON / OFF <input type="checkbox"/> INCHING	
	* LINE SIZE (inlet/outlet): MATERIAL		
	* VALVE TYPE	<input type="checkbox"/> GLOBE <input type="checkbox"/> GATE <input type="checkbox"/> REG. GLOBE <input type="checkbox"/> BUTTERFLY	
	* OPENING / CLOSING TIME	..... SECONDS	
	* WORKING PRESSURE	..... KG/SQ.CM.	
	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	
	<b>CONSTRUCTION AND SIZING</b>	CONSTRUCTION	TOTALLY ENCLOSED, WEATHER PROOF, IP:55
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 90 % OF RATED VOLTAGE. FOR ISOLATING SERVICE THREE SUCCESSIVE OPEN-CLOSE OPERATIONS OR 15 MINS. WHICHEVER IS HIGHER. . <b>For regulating service 150 starts/Hr min.</b>	
<b>HANDWHEEL</b>	* REQUIRED	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	* ORIENTATION	<input type="checkbox"/> TOP MOUNTED <input type="checkbox"/> SIDE MOUNTED	
	TO DISENGAGE AUTOMATICALLY DURING MOTOR OPERATION.		
<b>ELECTRIC ACTUATOR</b>	ACTUATOR MAKE/MODEL	BIDDER TO SPECIFY	
	MOTOR MAKE / MODEL / TYPE / RATING (KW)	BIDDER TO SPECIFY	
	MOTOR TYPE	SQUIRREL CAGE INDUCTION MOTOR, STARTING CURRENT LIMITED TO SIX TIMES THE RATED CURRENT.	
	ACTUATOR WIRING DIAGRAM & No.	<input checked="" type="checkbox"/> BIDDER TO ENCLOSE <input type="checkbox"/> ENCLOSED	
	COLOUR SHADE	<input checked="" type="checkbox"/> BLUE (RAL 5012) ENAMEL/ <b>GREY ENAMEL PAINT(SHADE 631 AS PER IS.5) OR EQUIVALENT</b> <input type="checkbox"/> .....	
	SHAFT RPM	BIDDER TO SPECIFY	
	OLR SET VALUE	BIDDER TO SPECIFY	
	STARTING / FULL LOAD CURRENT	BIDDER TO SPECIFY	
	NO. OF REV FOR FULL TRAVEL	BIDDER TO SPECIFY	
	@ PWR SUPP TO MTR / STARTER	<b>415V±10%, 3PH, AC, 50Hz±5%, 10%(ABSOLUTE) COMBINED VOLTAGE &amp; FREQUENCY VARIATION</b>	
	@ CONTROL VOLTAGE REQUIREMENT	<b>110V AC- TO BE DERIVED FROM THE POWER SUPPLY TO THE STARTER</b>	
	@ ENCLOSURE CLASS OF MOTOR	<input type="checkbox"/> IP 65 <input checked="" type="checkbox"/> <b>IP 67 FOR OUTDOOR</b> <input type="checkbox"/> FLAME PROOF <input checked="" type="checkbox"/> <b>IP 55 FOR INDOOR</b> , TOTALLY ENCL, SELF VENTILATED.	



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	@ INSULATION CLASS	<input type="checkbox"/> CLASS-B <span style="color: red;">■ CLASS-F WITH TEMPERATURE RISE LIMITED TO CLASS-B</span>	
	@ CONTINUOUS OPERATION TIME	S2-15 MINUTES	
	@ POWER CABLE TYPE / SIZE	LATER (TO BE PROVIDED IN THE CONTRACT STAGE)	
	@ CONTROL CABLE TYPE / SIZE	LATER (TO BE PROVIDED IN THE CONTRACT STAGE)	
	@ WINDING TEMP PROTECTION	<input checked="" type="checkbox"/> THERMOSTAT <input type="checkbox"/> THERMISTOR WITH SWITCHING UNIT <input checked="" type="checkbox"/> 3 Nos., 1 IN EACH PH <input type="checkbox"/> ONE	
	SINGLE PHASE / WRONG PHASE SEQUENCE PROTECTION	REQUIRED	
<b>INTEGRAL STARTER</b>	INTEGRAL STARTER	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	TYPE OF SWITCHING DEVICE	<input checked="" type="checkbox"/> CONTACTORS <input type="checkbox"/> THYRISTORS	
	TYPE	<input checked="" type="checkbox"/> CONVENTIONAL <input type="checkbox"/> SMART (NON-INTRUSIVE)	
	<b>IF SMART</b>		
	a) <del>SERIAL LINK INTERFACE</del>	<input type="checkbox"/> INTEGRAL <input type="checkbox"/> FIELD MOUNTED	
	b) <del>SERIAL LINK PROTOCOL</del>	<input type="checkbox"/> FOUNDATION FIELD-BUS <input type="checkbox"/> PROFI-BUS <input type="checkbox"/> TCP/IP <input type="checkbox"/> .....	
	c) <del>SERIAL LINK MEDIA</del>	<input type="checkbox"/> TWISTED PAIR Cu-CBL <input type="checkbox"/> CO-AXIAL Cu-CBL <input type="checkbox"/> QFC	
	d) <del>HAND HELD PROGRAMMER</del>	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	e) <del>MASTER STATION (See note-10)</del>	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	f) <del>MASTER STN INTRFACE WITH DCS</del>	<input type="checkbox"/> REQUIRED MODBUS <input type="checkbox"/> TCP/IP	
	g) <del>DETAILS OF SPECIAL CABLE</del>	<input type="checkbox"/> ENCLOSED <input type="checkbox"/> NOT REQUIRED	
	WIRING DIAGRAM & No.	<input checked="" type="checkbox"/> BIDDER TO ENCLOSE <input type="checkbox"/> ENCLOSED	
	STEP DOWN CONT. TRANSFORMER	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	OPEN / CLOSE PB	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	STOP PB	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	INDICATING LAMPS	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	LOCAL REMOTE S/S	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	STATUS CONTACTS FOR MONITORING	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
INTEGRAL STARTER DISTURBED SIGNAL	REQUIRED(O/L RELAY OPERATED, CONT./POWER SUPPLY FAILED,S/S IN LOCAL,TORQUE SWITCH OPTD MID WAY)		
<b>INTERPOSING RELAY</b> (Applicable for Integral Starter)	INTERPOSING RELAY	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	INTERPOSING RELAY (QUANTITY)	<input checked="" type="checkbox"/> 2 NOS. <input type="checkbox"/> 3 NOS.	
	DRIVING VOLTAGE	<input checked="" type="checkbox"/> 20.5 – 24V DC <input type="checkbox"/> _____ V DC	
	DRIVING CURRENT	<input checked="" type="checkbox"/> 125 mA MAX <input type="checkbox"/> _____ mA MAX	
	LOAD RESISTANCE	<input checked="" type="checkbox"/> > 192 ohms - < 25 K ohms <input type="checkbox"/> > _____ ohms - < _____ ohms	
<b>TORQUE SWITCH</b> (Not Applicable for Smart Actuator)	MECHANICAL LATCHING DEVICE	<input checked="" type="checkbox"/> REQUIRED(REFER NOTE-6)	
	MFR & MODEL NO.	BIDDER TO SPECIFY	
	OPEN / CLOSE	<input checked="" type="checkbox"/> 1 No. <input type="checkbox"/> 2Nos. / <input checked="" type="checkbox"/> 1 No. <input type="checkbox"/> 2Nos	
	CONTACT TYPE	2 NO + 2 NC	
	RATING	5A, 240 V AC / 0. 5A,220 V DC	
	ENCLOSURE	IP 55	
	CALIBRATED KNOBS(OPEN&CLOSE TS)	REQUIRED FOR SETTING DESIRED TORQUE	
	ACCURACY	±3% OF SET VALUE	
<b>LIMIT SWITCH</b> (Not Applicable for Smart Actuator)	MFR & MODEL NO.	BIDDER TO SPECIFY	
	OPEN : INT : CLOSE	<input type="checkbox"/> 1 No. <input checked="" type="checkbox"/> 2 NOS.	2 Nos. (ADJ.) <input type="checkbox"/> 1 No. <input checked="" type="checkbox"/> 2Nos.



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SHEET 2 OF 5

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### Data Sheet A & B

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(TO BE FILLED BY PURCHASER)

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

	CONTACT TYPE	2 NO + 2 NC		
	RATING (AC / DC)	5A, 240 V AC / 0. 5A,220 V DC		
	ENCLOSURE CLASS	IP 55		
<b>POSITION TRANSMITTER</b> (For Inching Duty Drives)	POSITION TRANSMITTER	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED		
	MFR & MODEL NO.	BIDDER TO SPECIFY		
	TYPE	<input checked="" type="checkbox"/> ELECTRONIC (2-WIRE) CONTACTLESS <input type="checkbox"/> ELECTRONIC (2 WIRE) R/I CONVERTER		
	SUPPLY	<input checked="" type="checkbox"/> 24V DC <input type="checkbox"/> .....		
	OUTPUT	<input checked="" type="checkbox"/> 4-20mA		
	ACCURACY	$\pm 1\%$ FS		
	ENCLOSURE CLASS	IP 55		
	<b>TERMINAL BOX</b>	MOTOR TERMINAL BOX	REQUIRED	
ACTUATOR TERMINAL BOX		REQUIRED		
ENCL CLASS MTR T.B. / ACTUATOR T.B.		<input type="checkbox"/> IP65 <input checked="" type="checkbox"/> IP67.....	<input type="checkbox"/> IP65 <input checked="" type="checkbox"/> IP67.....	
@ EARTHING TERMINAL		PROVIDED		
PLUG & SOCKET(9 PIN) (FOR COMMD, LS/TS FEED BACK, PoT)		<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED <input checked="" type="checkbox"/> 2 NOS. <input type="checkbox"/> .....		
<b>CABLE GLANDS</b>	@ POWER CABLE GLAND	SIZE : .....		
	@ SPACE HEATER CABLE GLAND	SIZE : .....		
	OTHER CONTROL CABLE GLANDS	QUANTITY & SIZE : TWO (SIZE TO BE FURNISHED LATER)		
<b>SPACE HEATER</b>	@ SPACE HEATER	REQUIRED		
	@ POWER SUPPLY			
	@ RATING			
<b>WEIGHT</b>	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 NATIONAL AND INTERNATIONAL STANDARD. AS A MINIMUM, THE FOLLOWING STANDARDS SHALL BE COMPLIED WITH:  
IS-9334, IS-2147, IS-2148, IS-325, IS-2959, IS-4691 AND IS-4722
3. TEMPERATURE RISE SHALL BE RESTRICTED TO 70 DEG. C FOR AMBIENT TEMPERATURE OF 50 DEG C.
4. CABLE GLANDS OF DOUBLE COMPRESSION TYPE BRASS MATERIAL SHALL BE PROVIDED.
5. THE MAKE OF THE MOTOR WILL BE ANY OF THE FOLLOWING : CGL / SIEMENS / ABB / NGEF / BHARAT BIJLI / KIRLOSKAR
6. 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.
7. THE MOTOR SHALL OPERATE SATISFACTORILY UNDER THE +/- 10% SUPPLY VOLTAGE VARIATION AT RATED FREQUENCY, -5% TO +3% VARIATION IN FREQUENCY AT RATED SUPPLY VOLTAGE, SIMULTANEOUS VARIATION IN VOLTAGE & FREQUENCY THE SUM OF ABSOLUTE PERCENTAGE NOT EXCEEDING 10%.
8. THE MOTOR SHALL BE SUITABLE FOR DIRECT ON LINE STARTING.

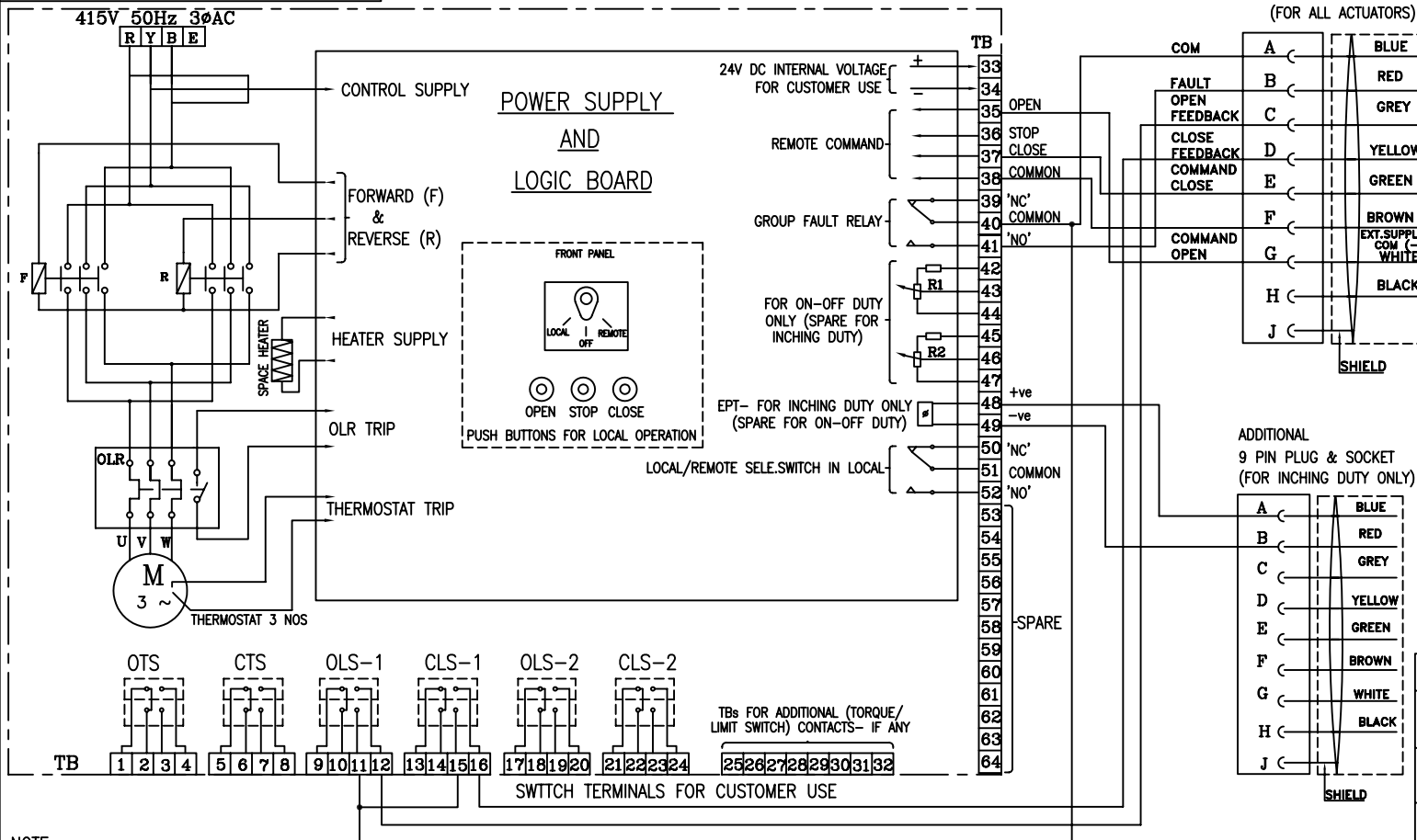
NAME  SIGNATURE  DATE	<b>PREPARED BY</b>	<b>CHECKED BY</b>	<b>APPROVED BY</b>	COMPANY SEAL   NAME  SIGNATURE  DATE
	MS	MK	SHB	
	13.04.2012	13.04.2012	13.04.2012	

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	a	INTERMEDIATE	b	FULL CLOSE
		VALVE POSITION				
<div><div></div><div>INDICATES CONTACT CLOSED</div></div> <div><div></div><div>INDICATES CONTACT OPEN</div></div>						
CONTACT RATING: 5A AT 250V AC & 0.5A AT 220V DC						

INDICATES CONTACT CLOSED

INDICATES CONTACT OPEN

CONTACT RATING: 5A AT 250V AC &amp; 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.

REV	DATE	ALTERED
		CHD & APPD

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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT			ELECTRICAL VALVE ACTUATORS (AC) WITH INTEGRAL STARTERS FOR NTPC PROJECTS (DRAWN FOR INTERMEDIATE POSITION OF VALVES)									
<div><div>BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI-620014.</div></div>			<div>DRN</div> <div>CHD</div> <div>APPD</div>		<div>NAME</div> <div>N.P.ESWAR</div> <div>D.DINAKARAN</div> <div>K.ARUNACHALAM</div>		<div>SIGN</div> <div>N.P.</div> <div>D.D</div> <div>K.A</div>		<div>DATE</div> <div>17.03.05</div> <div>17.03.05</div> <div>17.03.05</div>		<div>NO.OF VAR.</div> <div>-</div>	
<div>DEPT</div>	<div>VL</div>	<div></div>	<div>SCALE</div> <div>NTS</div>		<div>WEIGHT (KG).</div> <div>-</div>		<div>REFERENCE INFORMATION</div>					<div>NO. OF ITEMS</div> <div>-</div>
<div>CODE</div>		<div>-</div>										
<div>TITLE</div> <div>WIRING DIAGRAM (TERMINAL PLAN)</div> <div>FOR ACTUATOR WITH INTEGRAL STARTER WITH PLUG &amp; SOCKET</div> <div>FOR NTPC PROJECTS</div>					<div>CARD CODE</div> <div>U 01</div>		<div>DRAWING NO.</div> <div>3-V-MISC-24283</div>					<div>REV</div> <div>0</div>