



भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)

TCN - 04

Ref: PSER:SCT:NKP-M1741:TCN-04

Date: 30-05-2016

Sub	Tender change notice (TCN) 04	
Job	Design, engineering, supply, erection & commissioning of Hydrogen Plant Package for 2x660 MW North Karanpura STPP, Jharkhand	
Ref	1.0	Tender no PSER:SCT:NKP-M1741:16.
	2.0	BHEL's NIT, vide reference no PSER:SCT:NKP-M1741:4996 Date: 04-05-2016
	3.0	BHEL's TCN-01, vide reference no PSER:SCT:NKP-M1741:TCN-01, dated 06-05-2016.
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:NKP-M1741:TCN-02, dated 23-05-2016.
	5.0	BHEL's TCN-03, vide reference no PSER:SCT:NKP-M1741:TCN-03, dated 26-05-2016.
	6.0	All other pertinent issues till date.

With reference to above, following points/ documents, relevant to tender, may please be noted and complied with while submitting offer.

- 1.0 Clarification to bidder's queries as per attached Annexure-A.
- 2.0 Amendment No-1 to Technical specification as attached.
- 3.0 Revised 'No deviation certificate' as per enclosed Annexure-2. Bidder shall submit no deviation certificate as per enclosed format only.
- 4.0 All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

SR.ENGR (SCT)

Encl

- 1.0 As above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)

POWER SECTOR EASTERN REGION, DJ-9/1, SECTOR-II, SALT LAKE CITY, KOLKATA - 700 091

फैक्स/Fax : (033) 23211960

फोन/Phone : बोर्ड/EPABX : 23211691, 23211798, 23211796

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
Power Sector - Eastern Region,
Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
Kolkata – 700 091

Sub	No Deviation Certificate.	
Job	Design, engineering, supply, erection & commissioning of Hydrogen Plant Package for 2x660 MW North Karanpura STPP, Jharkhand	
Ref	1.0	Tender no PSER:SCT:NKP-M1741:16.
	2.0	BHEL's NIT, vide reference no PSER:SCT:NKP-M1741:4996 Date: 04-05-2016
	3.0	BHEL's TCN-01, vide reference no PSER:SCT:NKP-M1741:TCN-01, dated 06-05-2016.
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:NKP-M1741:TCN-02, dated 23-05-2016.
	5.0	BHEL's TCN-03, vide reference no PSER:SCT:NKP-M1741:TCN-03, dated 26-05-2016.
	6.0	BHEL's TCN-04, vide reference no PSER:SCT:NKP-M1741:TCN-04, dated 30-05-2016
	7.0	All other pertinent issues till date.

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)

POWER SECTOR EASTERN REGION DJ-9/1, SECTOR-II, SALT LAKE CITY, KOLKATA - 700 091

फैक्स/Fax : (033) 23211960

फोन/Phone : बोर्ड/EPABX : 23211691, 23211798, 23211796

ANNUXURE-A TO TCN-01

Design, engineering, supply, erection & commissioning of Hydrogen Plant Package for 2x660 MW North Karanpura STPP, Jharkhand

Tender No. PSER:SCT: NKP-M1741:16

Sl. No.	Reference clause of tender document	Existing provision	Bidder's query	BHEL's clarification
1	Drawing no. PE-DG-405-168-A001 (Page No. 81 of 478 of tender document)	---	Please confirm whether purification unit shall be included in single skid of hydrogen generation plant & electrolyser or it shall be individual skid in separate room	Please follow technical specification.
2	Drawing no. PE-DG-405-168-A001 (Page No. 81 of 478 of tender document)	---	If purification unit is to be installed in separate room, please confirm whether hydrogen purification unit is one or two units	Please follow technical specification.
3	Drawing no. PE-DG-405-168-A001 (Page No. 81 of 478 of tender document)	---	Transformer A/B is shown in P & ID before rectifier. Is it air cooled transformer to be in built in rectifier unit or it is separated from rectifier unit. Please confirm.	Please follow technical specification.
4	Drawing no. PE-DG-405-168-A001 (Page No. 81 of 478 of tender document)	---	In drawing lye storage tank is shown and lye is coming from lye preparation tank line but no image of lye preparation tank is given in drawing. As per our practice we are preparing and storing lye in one tank. Kindly confirm the scope of lye preparation tank.	Please follow technical specification.
5	Drawing no. PE-DG-405-168-A001 (Page No. 81 of 478 of tender document)	---	QT 102A/B is hydrogen % analyzer. Please confirm.	Please follow technical specification.


**AMENDMENT ON TECHNICAL SPECIFICATION
FOR HYDROGEN GENERATION PLANT**
3X660 MW NTPC NORTH KARANPURA STPP

SPECIFICATION NO.: PE-TS-405-168-A001

AMENDMENT NO # 1

REV. NO. 00

DATE:

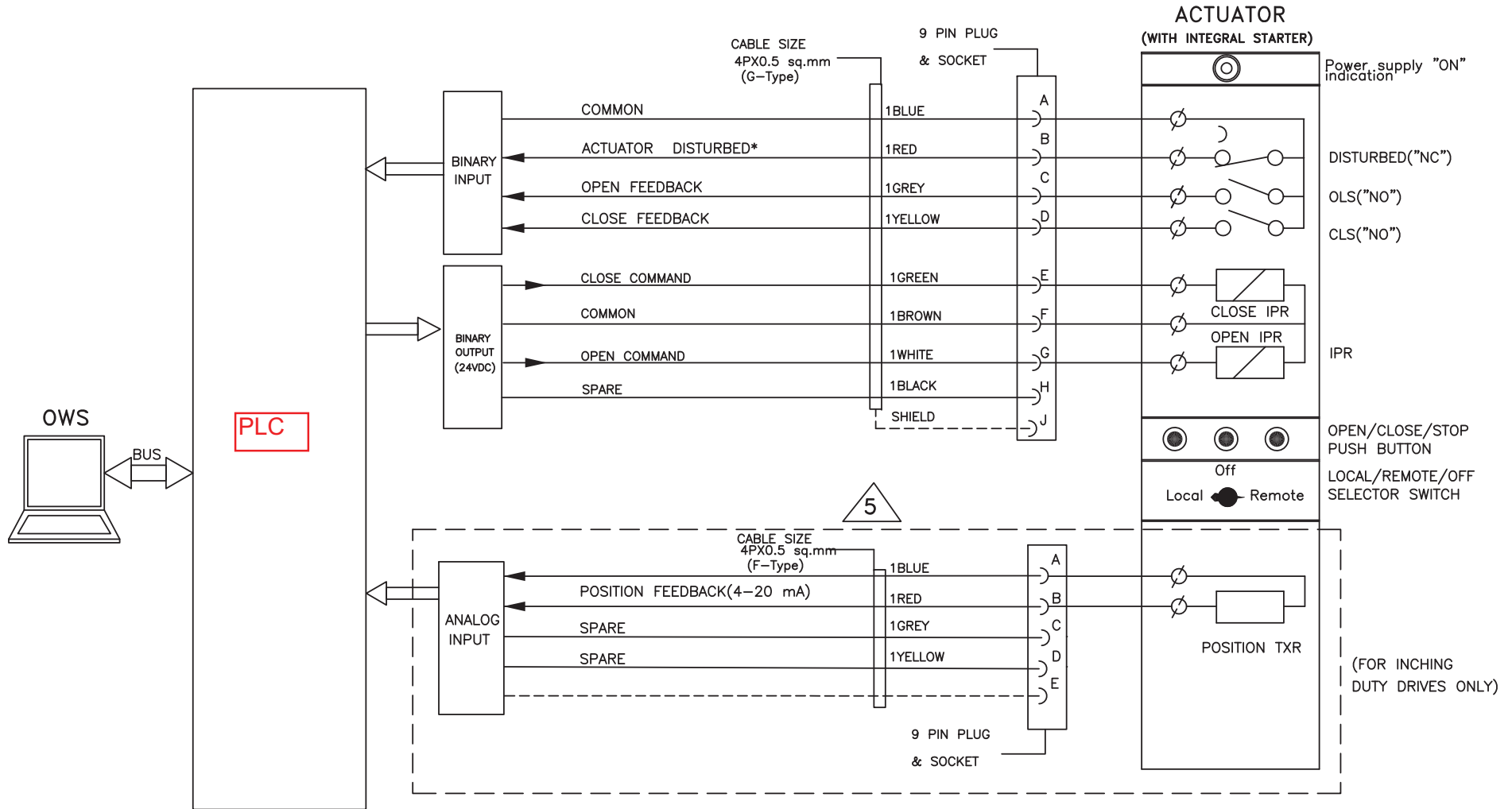
Page 1 of 1

The following modifications with respect to Technical Specification for **HYDROGEN GENERATION PLANT**, BHEL's Technical specification number **PE-TS-405-168-A001** Rev 00 shall apply.

MODIFIED CLAUSES/PAGE NUMBERS.

Sl no	Vol. No.	Section/Description	Clause no	Page no	Existing	Modified to
1.	IIB	SECTION– D3/MEASUREMENT & CONTROL PHILOSOPHY	2.5.0	Page 400 to 405 of 478	SECTION– D3/DRIVE CONTROL PHILOSOPHY REV 01	The pages from 400 to 405 of 478 of technical specification has been replaced with revised Drive Control Philosophy Rev 05 (07 Pages) attached as Annexure-1.
2.	IIB	SECTION– D3/MEASUREMENT & CONTROL PHILOSOPHY	2.5.0	Page 406 of 478	SECTION– D3/WIRING DIAGRAM	The pages from 406 of 478 of technical specification has been replaced with revised Wiring Diagrams (15 Pages) attached as Annexure-2.
3.	IIB	SECTION– D3/MEASUREMENT & CONTROL PHILOSOPHY	2.5.0	Page 407 to 411 of 478	SECTION– D3/ACTUATOR DATASHEETS	The pages from 407 to 411 of 478 of technical specification has been replaced with revised Actuator Datasheet (05 pages) attached as Annexure-3.

DCS INTERFACE FOR (BIDIRECTIONAL DRIVE WITH INTEGRAL STARTER) (BID/BIDI)



NOTE:

* DISTURBED= Loss of Power supply (1 Phase/3 Phase)/
Loss of control supply/ Motor thermostat trip/
Thermal over load/
Local/Off/Remote Sel. switch in local or off mode/



PROJECT: NORTH KARANPURA STPP

**TITLE DDCMIS INTERFACE FOR
BIDIRECTIONAL DRIVE**

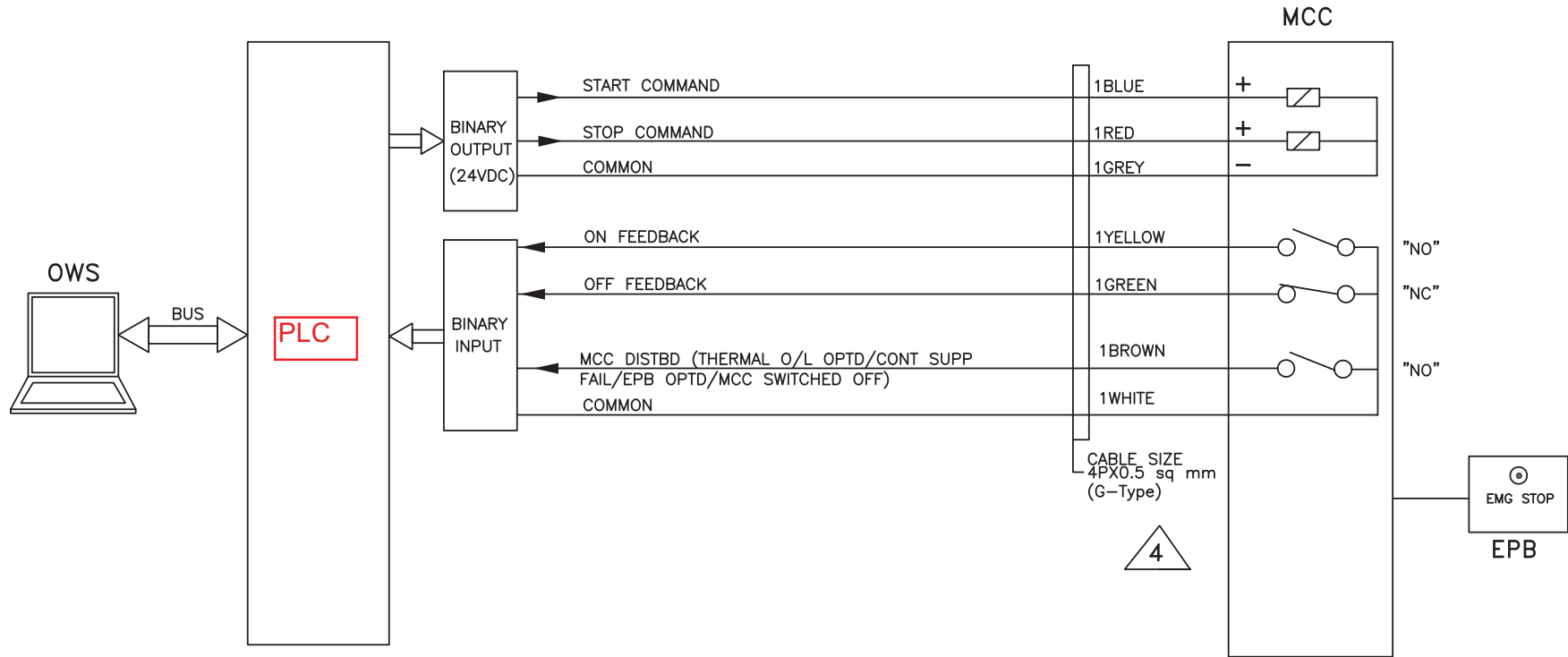
DRG.NO. **PE-DM-405-145-1002**


DATE 03.09.2015

REV.NO. 05

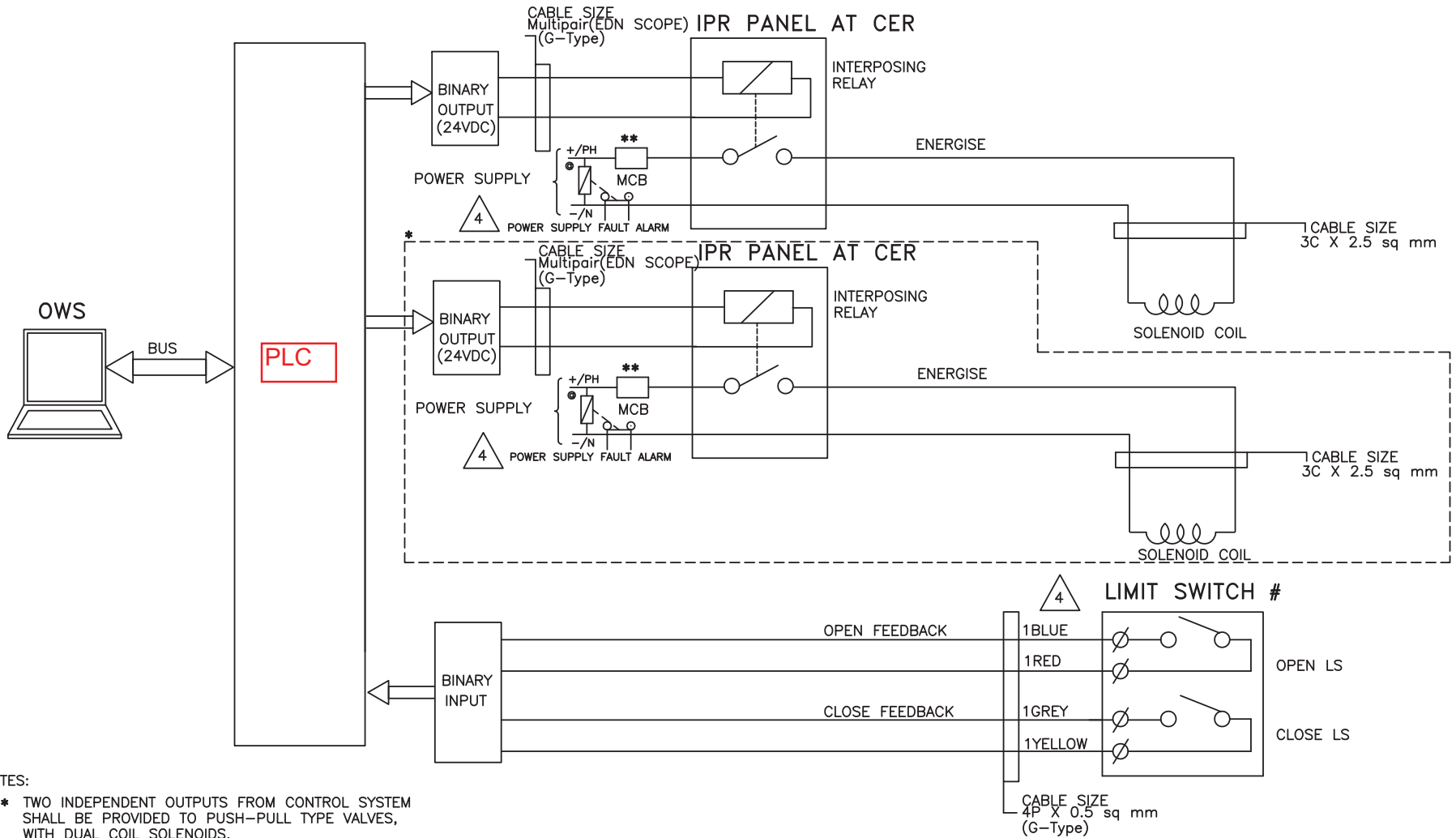
SHT 7 OF 13

DCS INTERFACE FOR UNIDIRECTIONAL LT DRIVE (CONTACTOR CONTROLLED) (LTUD)



	PROJECT: NORTH KARANPURA STPP	DRG.NO. PE-DM-405-145-1002
		DATE 03.09.2015
	TITLE DDCMIS INTERFACE FOR UNIDIRECTIONAL LT DRIVE	REV.NO. 05
		SHT 8 OF 13

DCS INTERFACE FOR SOLENOID DRIVE (SOLV) (24V DC / 240V AC UPS)



NOTES:

- * TWO INDEPENDENT OUTPUTS FROM CONTROL SYSTEM SHALL BE PROVIDED TO PUSH-PULL TYPE VALVES, WITH DUAL COIL SOLENOIDS.
- ** MCB SHALL BE PROVIDED FOR EACH SOLENOID
- # FOR ON/OFF TYPE, SOLENOID ACTUATED CONTROL VALVE.
- © COMMON FOR ALL SOLENOID VALVES



PROJECT: NORTH KARANPURA STPP

TITLE DDCMIS INTERFACE FOR SOLENOID DRIVE

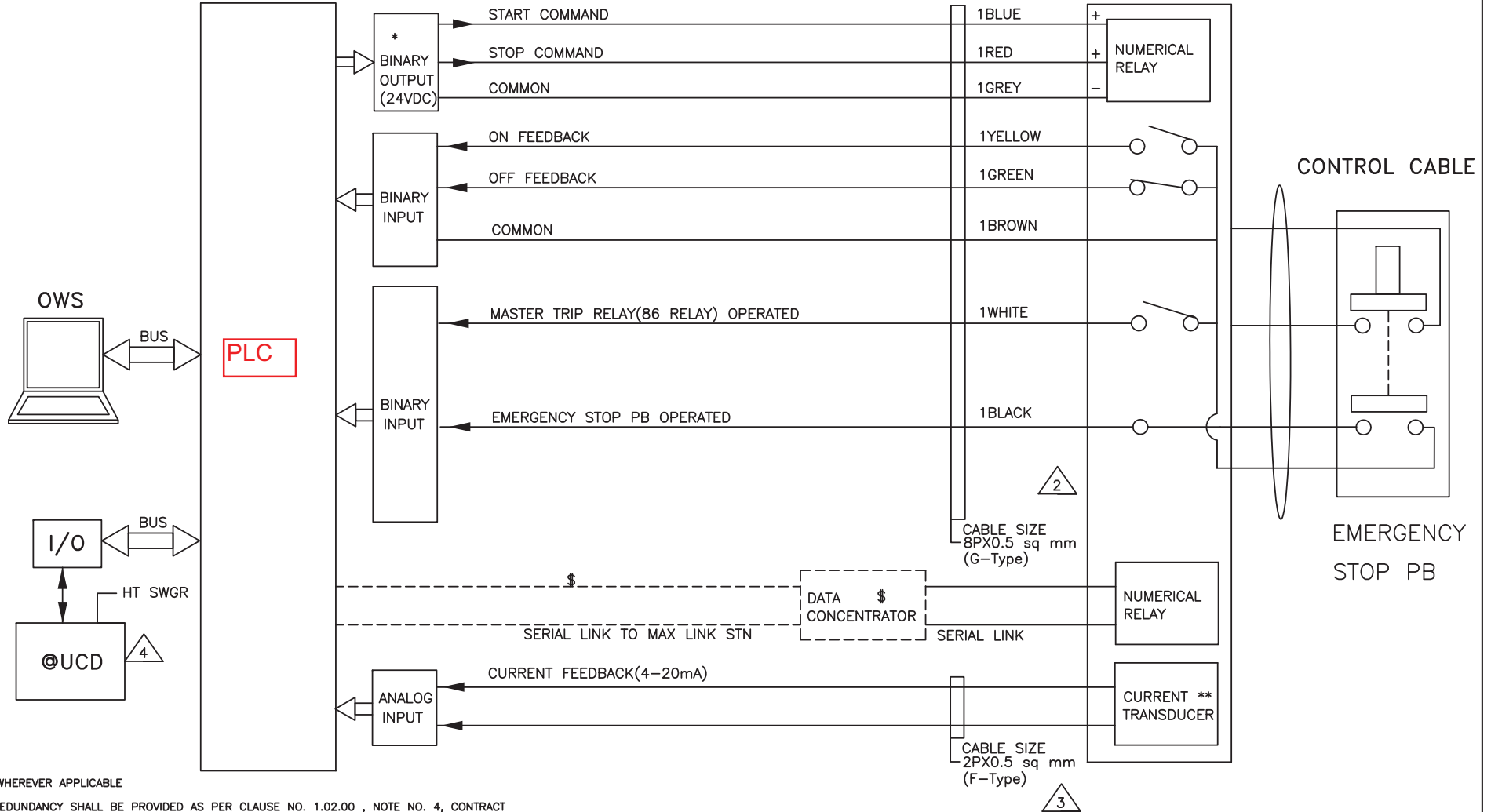
DRG.NO. PE-DM-405-145-1002

DATE 03.09.2015

REV.NO. 05

SHT 9 OF 13

DCS INTERFACE FOR HT/LT UNIDIRECTIONAL DRIVES (BREAKER OPERATED) (HTUD/LTUD) SWGR



NOTE:

⊙ WHEREVER APPLICABLE

* REDUNDANCY SHALL BE PROVIDED AS PER CLAUSE NO. 1.02.00 , NOTE NO. 4, CONTRACT QTY. FOR DDCMIS, APPENDIX-1 TO PART-A OF TECHNICAL SPECIFICATION

§ DATA CONCENTRATOR & SERIAL LINK TO MAX STATION SHALL BE COMMON FOR HT/LT DRIVES (BREAKER CONTROLLED)

** SHALL BE APPLICABLE FOR FD, ID, PA, BFP, CEP, ECW, ACW, MILL MOTORS

1. EXACT NO. OF PORTS/LINKS BETWEEN NUMERICAL RELAYS & MAX LINK STATION SHALL BE AS PER THE APPROVED SWGR & DATA CONCENTRATOR DRAWINGS.

2. OVERLOAD ALARM, RELAY FAULT, SWGR AVAILABLE & SWGR DISTURBED SIGNALS ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.



PROJECT: NORTH KARANPURA STPP

TITLE DDCMIS INTERFACE FOR UNIDIRECTIONAL HT DRIVE

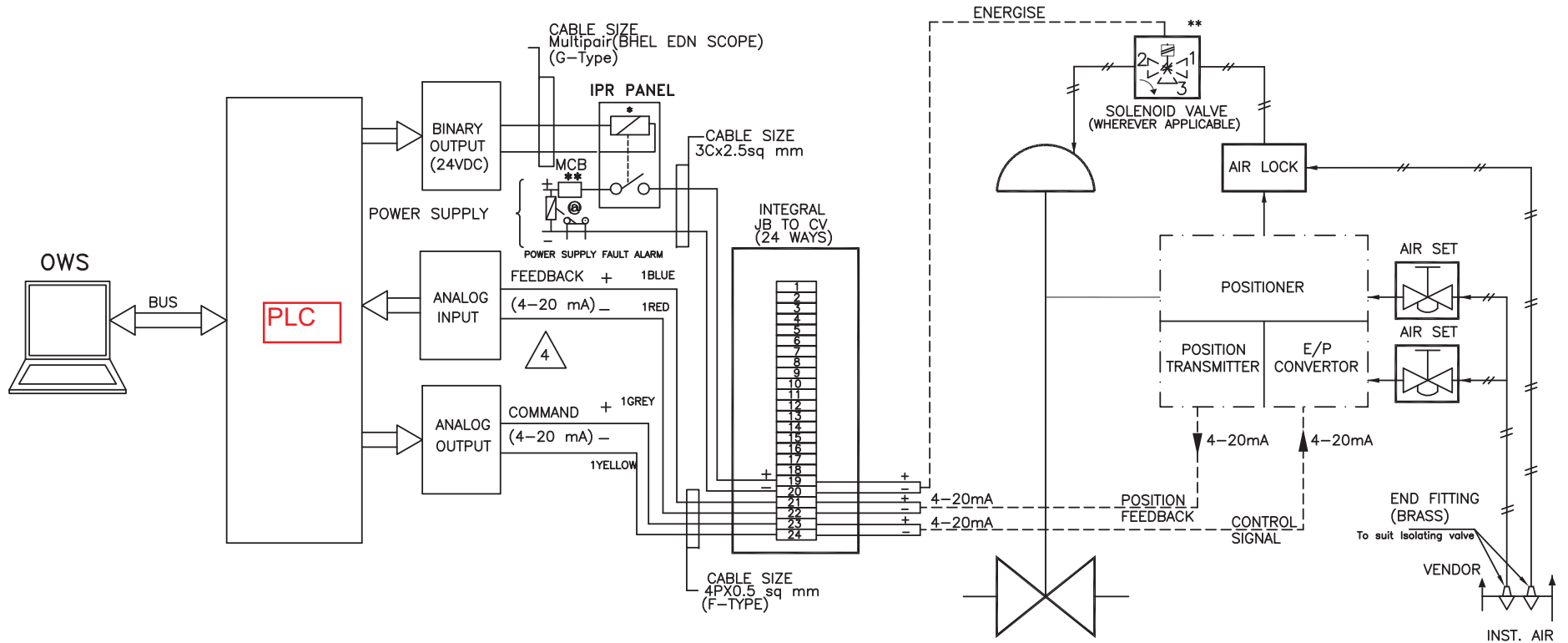
DRG.NO. PE-DM-405-145-1002

DATE 03.09.2015

REV.NO. 05

SHT 10 OF 13

DCS INTERFACE FOR ANALOG DRIVE (MOD-P)

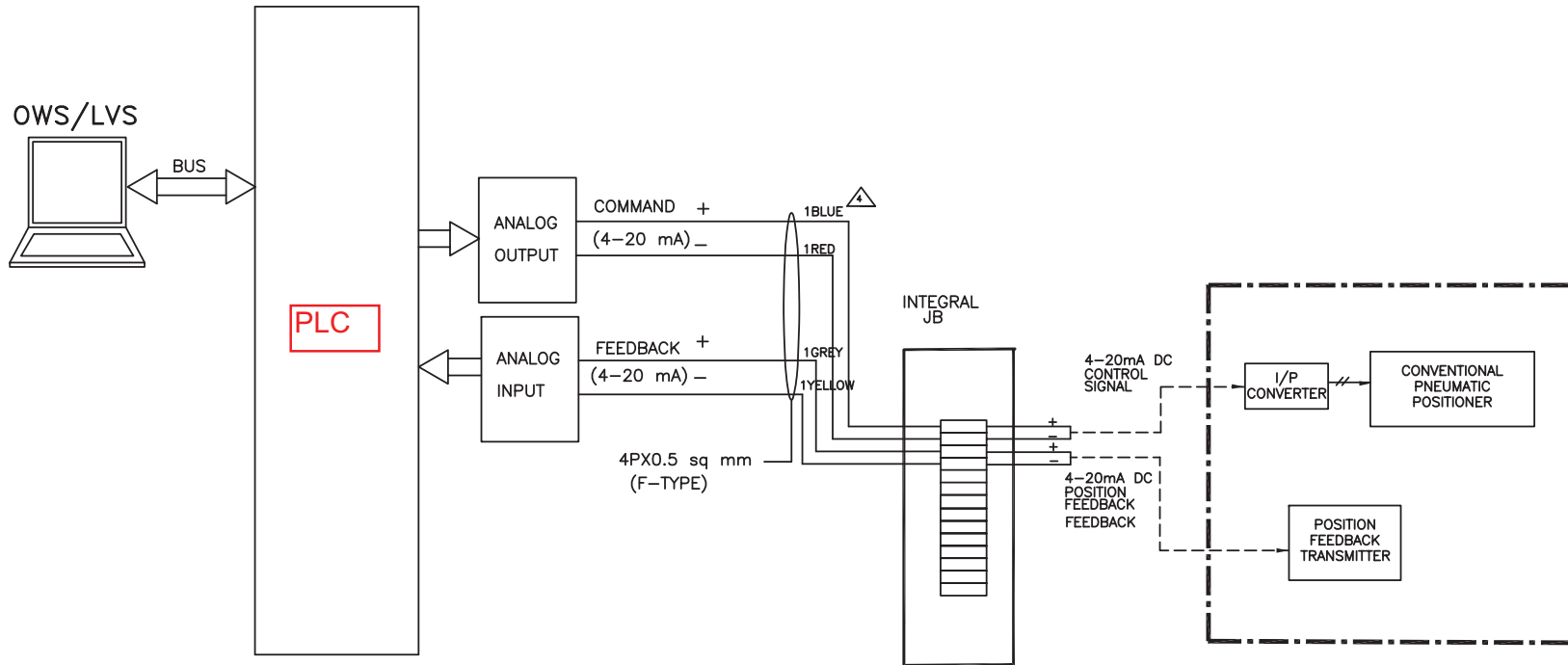



NOTES:

- * APPLICABLE TO VALVES WHERE PROTECTION OPEN/CLOSE ACTION FOR CONTROL DEMAND OVERRIDING IS REQUIRED.
- ** MCB SHALL BE PROVIDED FOR EACH SOLENOID
- © COMMON FOR ALL SOLENOIDS

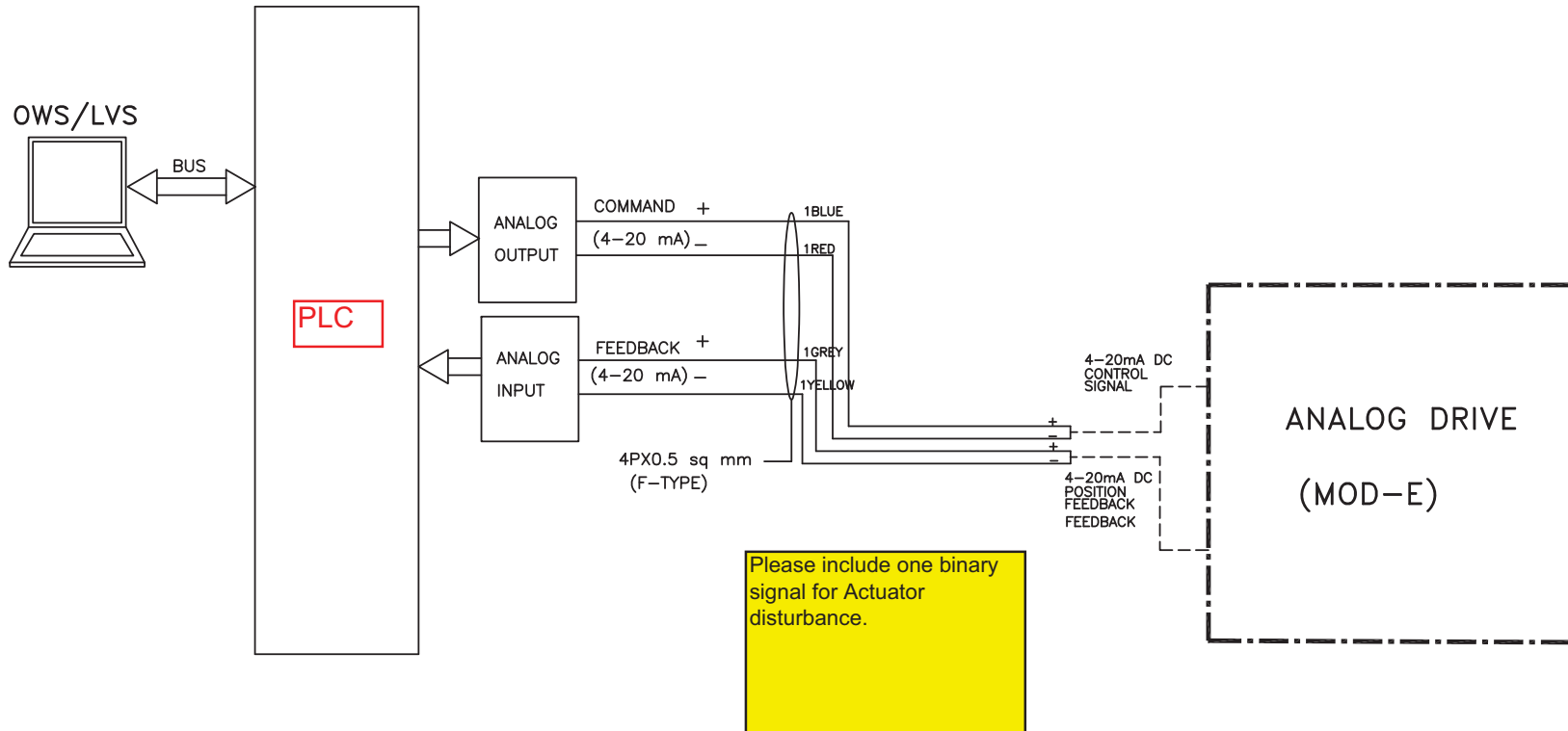
	PROJECT: NORTH KARANPURA STPP		DRG.NO. PE-DM-405-145-1002
	TITLE TYPICAL HOOK-UP DIAGRAM ANALOG DRIVE		DATE 03.09.2015
			REV.NO. 05
			SHT 11 OF 13


DCS INTERFACE FOR MODULATING TYPE PNEUMATIC DAMPER



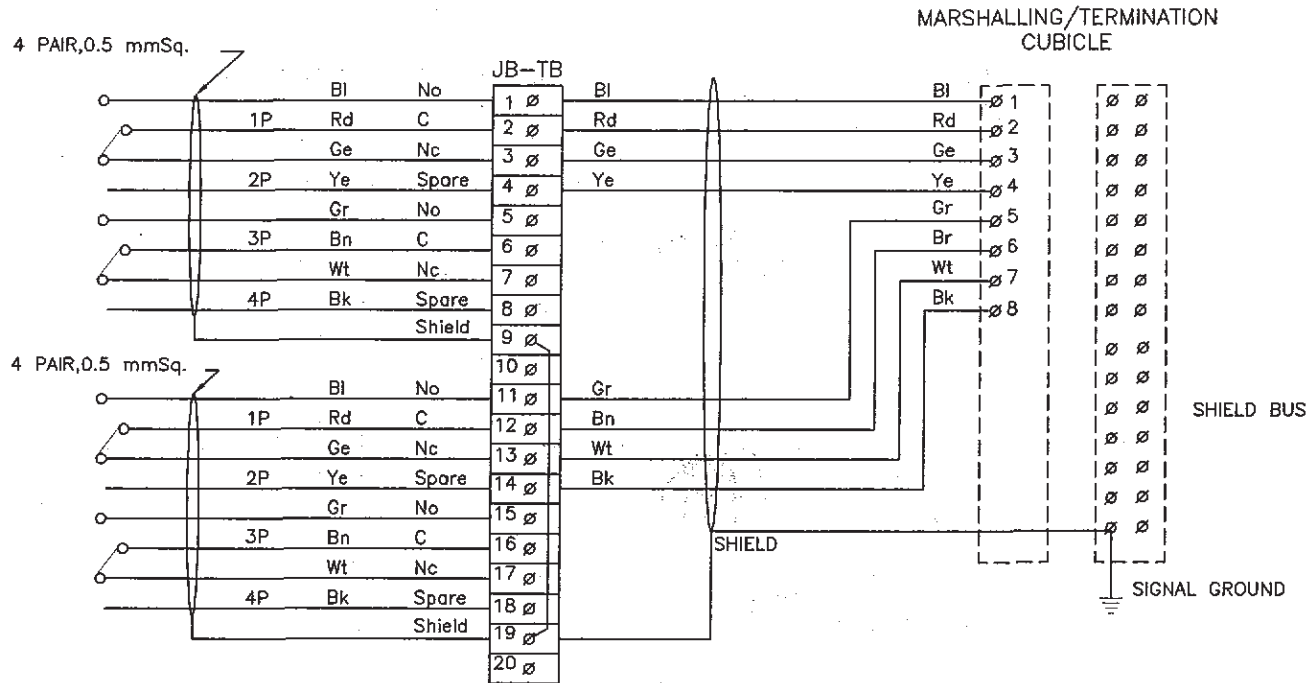
	PROJECT: NORTH KARANPURA STPP		DRG.NO.	PE-DM-405-145-1002
			DATE	03.09.2015
	TITLE DCS INTERFACE FOR MODULATING TYPE PNEUMATIC DAMPER		REV.NO.	05
			SHT	12 OF 13

DCS INTERFACE FOR ANALOG DRIVE (MOD-E)



	PROJECT: NORTH KARANPURA STPP		DRG.NO.	PE-DM-405-145-1002
	TITLE DCS INTERFACE FOR ANALOG DRIVE MODULATING ELECTRIC TYPE		DATE	03.09.2015
REV.NO.			05	
			SHT	13 OF 13

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NTPC LIMITED
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ENGINEERING DIVISION

PROJECT	TYPICAL THERMAL POWER PROJECT		
TITLE	INTERFACING OF FIELD INSTRUMENTS/ SWGR SWITCH (COC) TERMINATION DETAILS		
SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065	A
SH 01 OF 14			

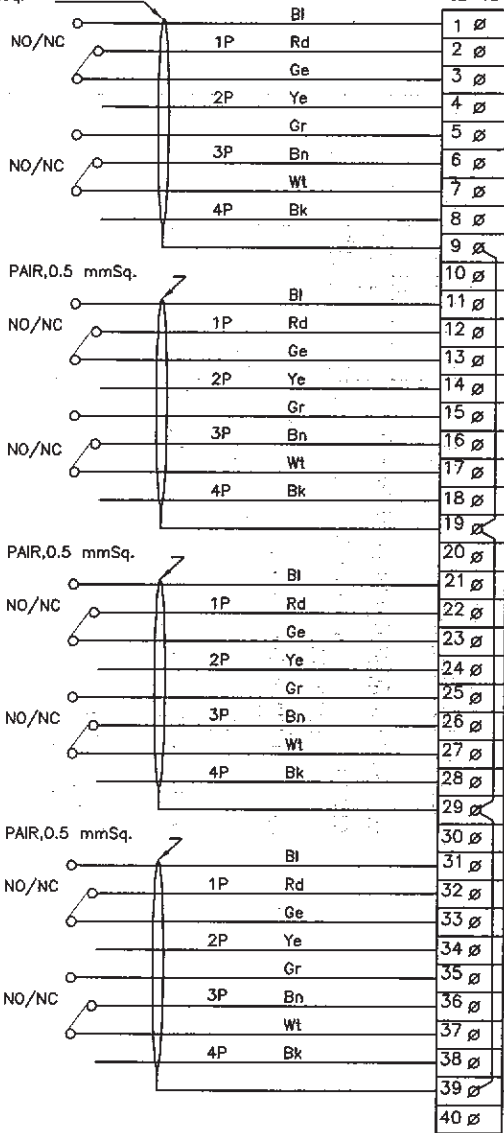
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										29.04.08
CLEARED BY											

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ANNEXURE -2

TENDER NO- PSER:SCT:NKP-M1741:16

4 PAIR,0.5 mmSq.



MARSHALLING/TERMINATION CUBICLE

SHIELD BUS

SIGNAL GROUND

* Bl/Ge/Gr/Wh CORE SHALL BE TERMINATED IN TERMINAL 1 OR 3, 11 OR 13, 21 OR 23 AND 31 OR 33 RESPECTIVELY DEPENDING ON THE PARTICULAR TYPE OF CONTACT (NO OR NC) IS TO BE WIRED TO DDCMIS.

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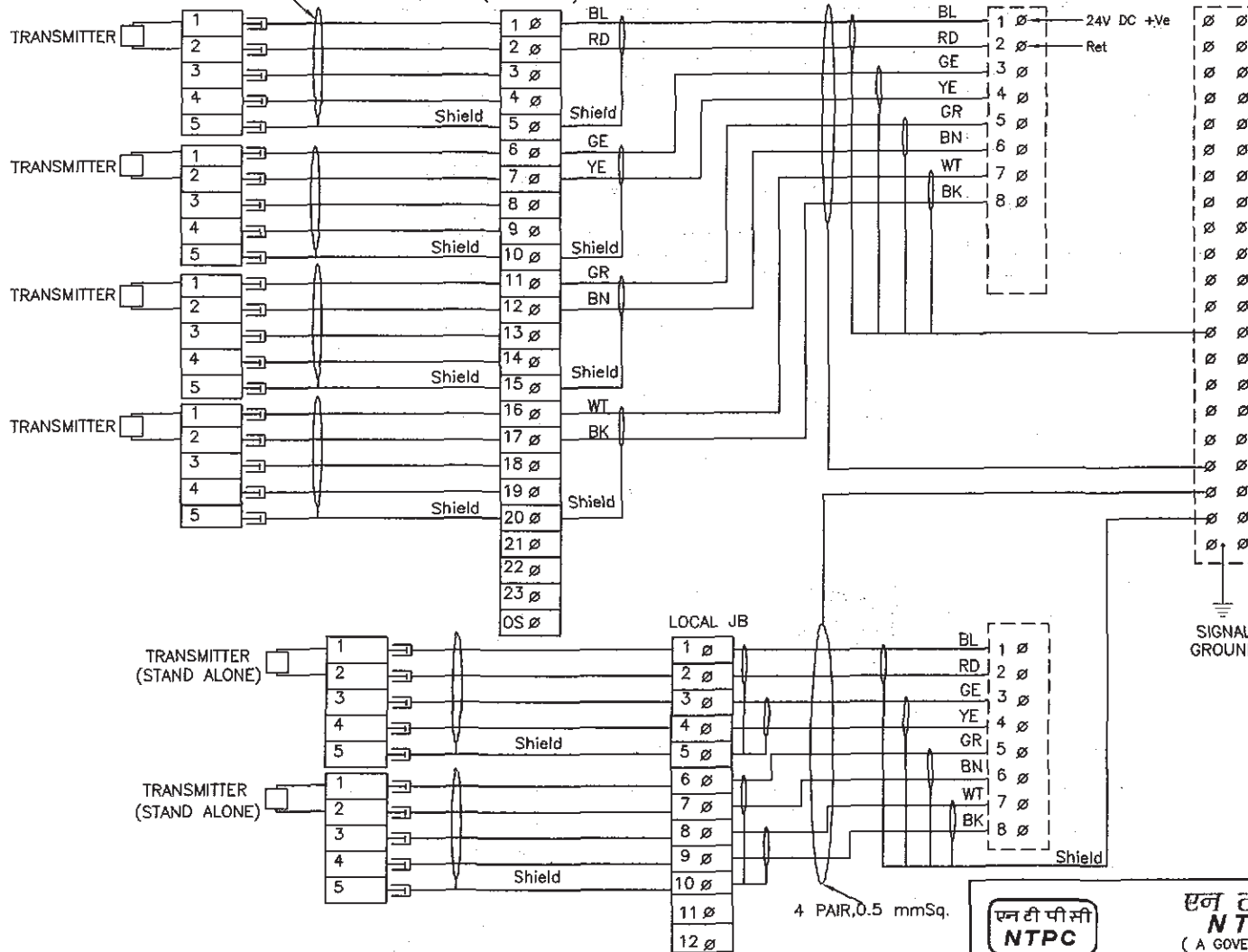
PROJECT		TYPICAL THERMAL POWER PROJECT			
TITLE		INTERFACING OF FIELD INSTRUMENTS SWITCH TERMINATION DETAILS NO/NC			
REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	DATE
A	FIRST ISSUE				29.04.08
SIZE	SCALE	DRG. NO.	REV. NO.		
A3	NTS	0000-999-POI-A-065	A		

CLEARED BY.

INTERNAL WIRING/2 PAIR,0.5 mmSq.(TYP)

INTEGRAL JB OF LIE/LIR
(4-20mA)

MARSHALLING/TERMINATION
CUBICLE



SHIELD BUS

SIGNAL GROUND

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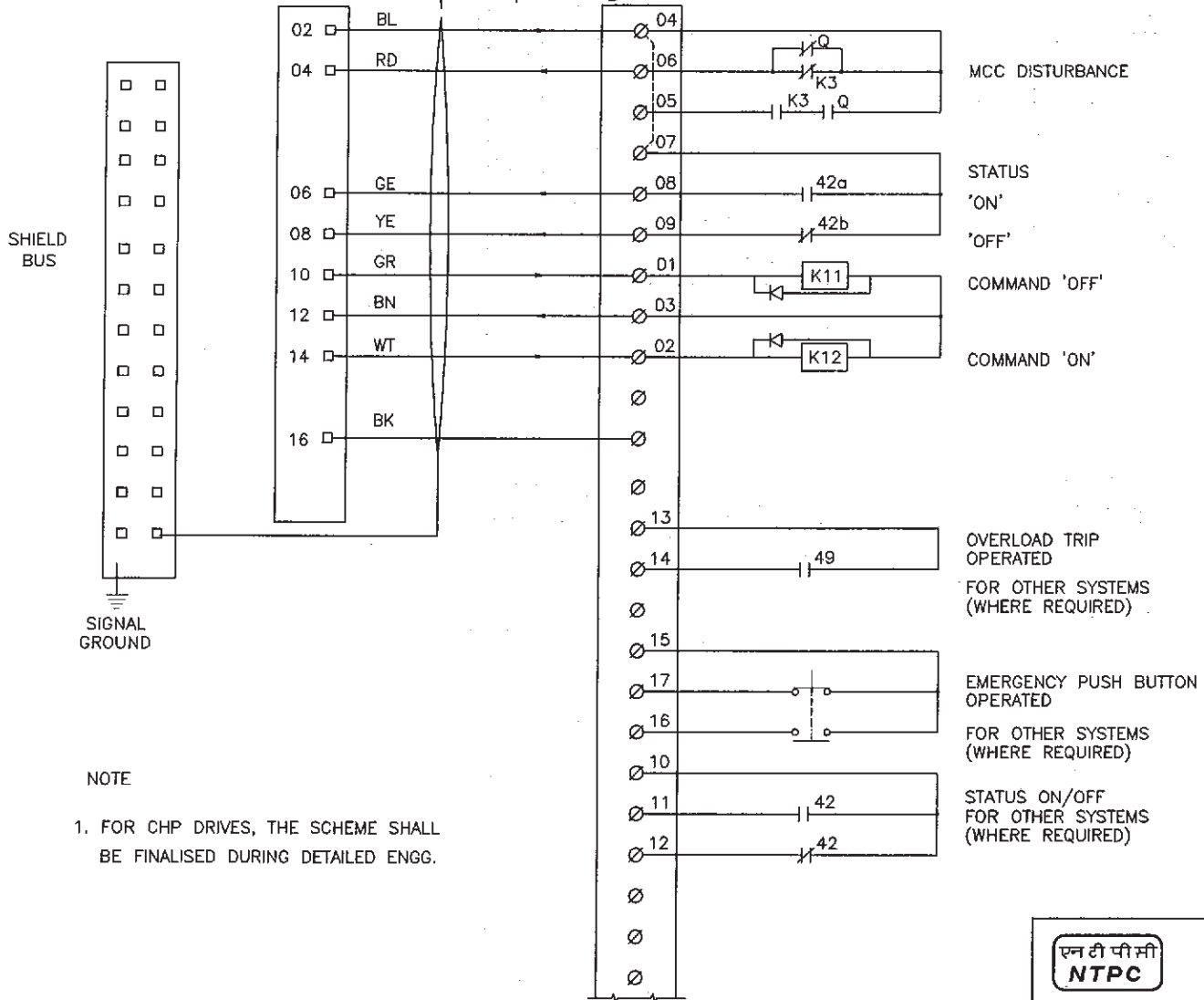
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ENGINEERING DIVISION

PROJECT										TYPICAL THERMAL POWER PROJECT					
TITLE										INTERFACING OF FIELD INSTRUMENTS 4-20mA					
REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE	SIZE	SCALE	DRG. NO.	REV. NO.
A	FIRST ISSUE										12.1.05	A3	NTS	0000-999-POI-A-065	B
B	INTERNAL WIRING FOR LIE/LIR MOUNTED SHOWN WIRING OF STAND ALONE TXTR SHOWN										04.12.06				
CLEARED BY												SH 04 OF 14			

MARSHALLING/ TERMINATION CUBICLES

4 PAIR,
0.5 Sq. mm
MCC/SWGR
D







SIGNAL GROUND

NOTE

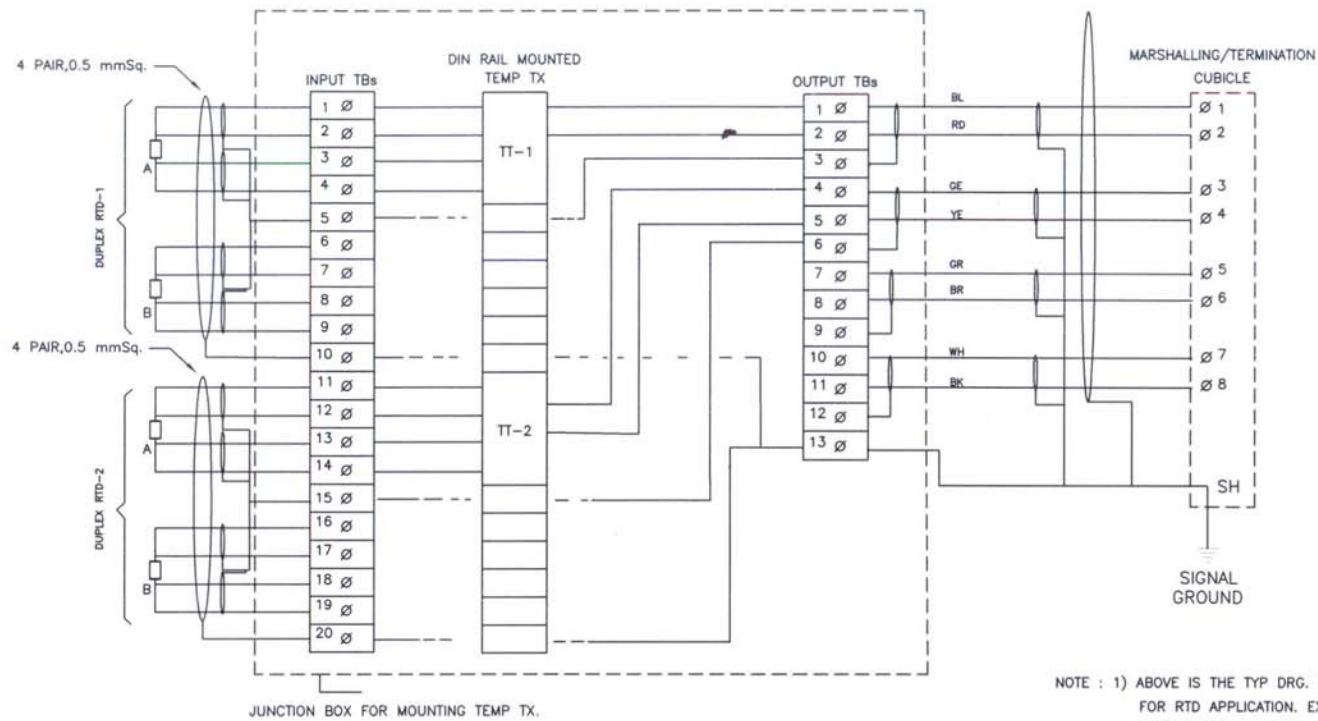
1. FOR CHP DRIVES, THE SCHEME SHALL BE FINALISED DURING DETAILED ENGG.

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		<p>एन टी पी सी लिमिटेड NTPC LIMITED (A GOVERNMENT OF INDIA ENTERPRISE) ENGINEERING DIVISION</p>	
PROJECT		TYPICAL THERMAL POWER PROJECT	
TITLE		INTERFACING OF FIELD INSTRUMENTS INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR (LT MOTORS)	
REV. NO.	DESCRIPTION	SIZE	SCALE
A	FIRST ISSUE	A3	NTS
DATE	APPD	DRG. NO.	REV. NO.
29.04.06		0000-999-POI-A-065	A
DRAWN		CLEARED BY	
DESIGN			
CHKD.			
M	E	C	C&I
ARCH.	APPD	DATE	DATE


ANNEXURE -2
TENDER NO- PSER:SCT:NKP-M1741:16



NOTE : 1) ABOVE IS THE TYP DRG. FOR DIN RAIL MOUNTED TEMP TRANSMITTERS FOR RTD APPLICATION. EXACT TYPE OF TEMP TRANSMITTER SHALL BE AS PER PART-A OF SPECIFICATION.
2) THE EXACT GROUPING OF TEMP TXs SHALL BE FINALISED DURING DETAILED ENGG. STAGE.

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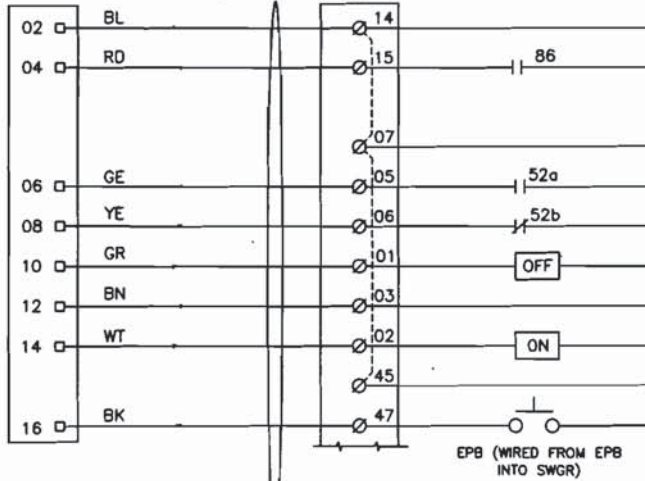
		NTPC LIMITED (A GOVERNMENT OF INDIA ENTERPRISE) ENGINEERING DIVISION	
PROJECT		TYPICAL THERMAL POWER PROJECT	
TITLE		INTERFACING OF FIELD INSTRUMENTS TYPICAL RTD CONNECTION WITH TEMP TRANSMITTERS INJBS	
REV. NO.	DESCRIPTION	SIZE	SCALE
A	FIRST ISSUE	A3	NTS
REV. NO.	DESCRIPTION	DRG. NO.	REV. NO.
		0000-999-POI-A-065	C

REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
											29.04.06
CLEARED BY											

ANNEXURE -2

TENDER NO- PSER:SCT:NKP-M1741:16

MARSH./TERM CUBICLE 4 PAIR 0.5 Sq. mm MCC/SWGR



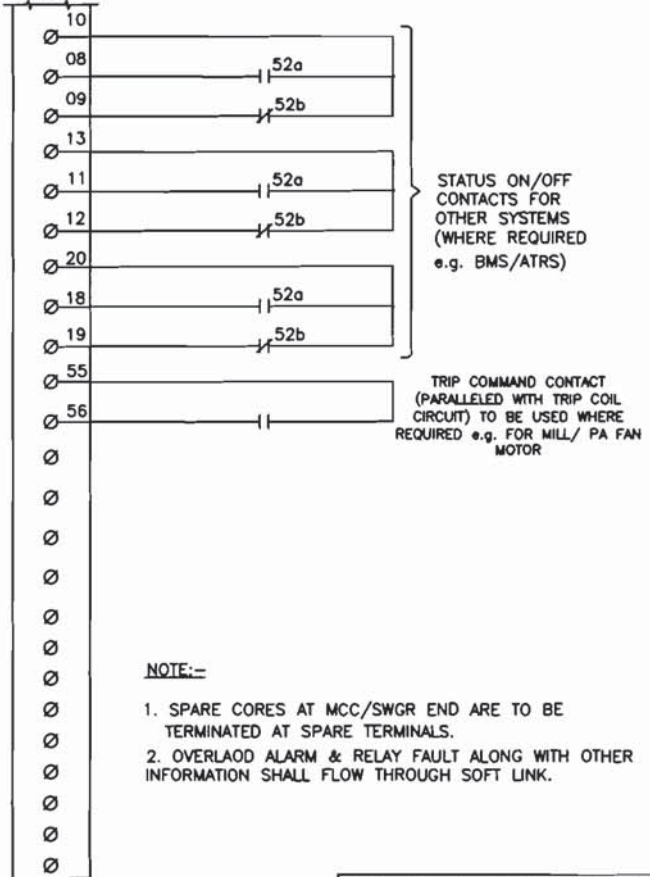
ELECT. PROTECTION OPERATED (RELAY/ MET CABINET)

STATUS ON OFF FROM BREAKER

COMMAND 'OFF' COMMAND 'ON' 24 V SIGNAL FROM DDCMIS FOR SWGR RELAY/ MET CABINET

EPB (WIRED FROM EPB INTO SWGR)

MCC/SWGR D-



STATUS ON/OFF CONTACTS FOR OTHER SYSTEMS (WHERE REQUIRED e.g. BMS/ATRS)

TRIP COMMAND CONTACT (PARALLELED WITH TRIP COIL CIRCUIT) TO BE USED WHERE REQUIRED e.g. FOR MILL/ PA FAN MOTOR

NOTE:-

1. SPARE CORES AT MCC/SWGR END ARE TO BE TERMINATED AT SPARE TERMINALS.
2. OVERLOAD ALARM & RELAY FAULT ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.

SHIELD BUS



SIGNAL GROUND

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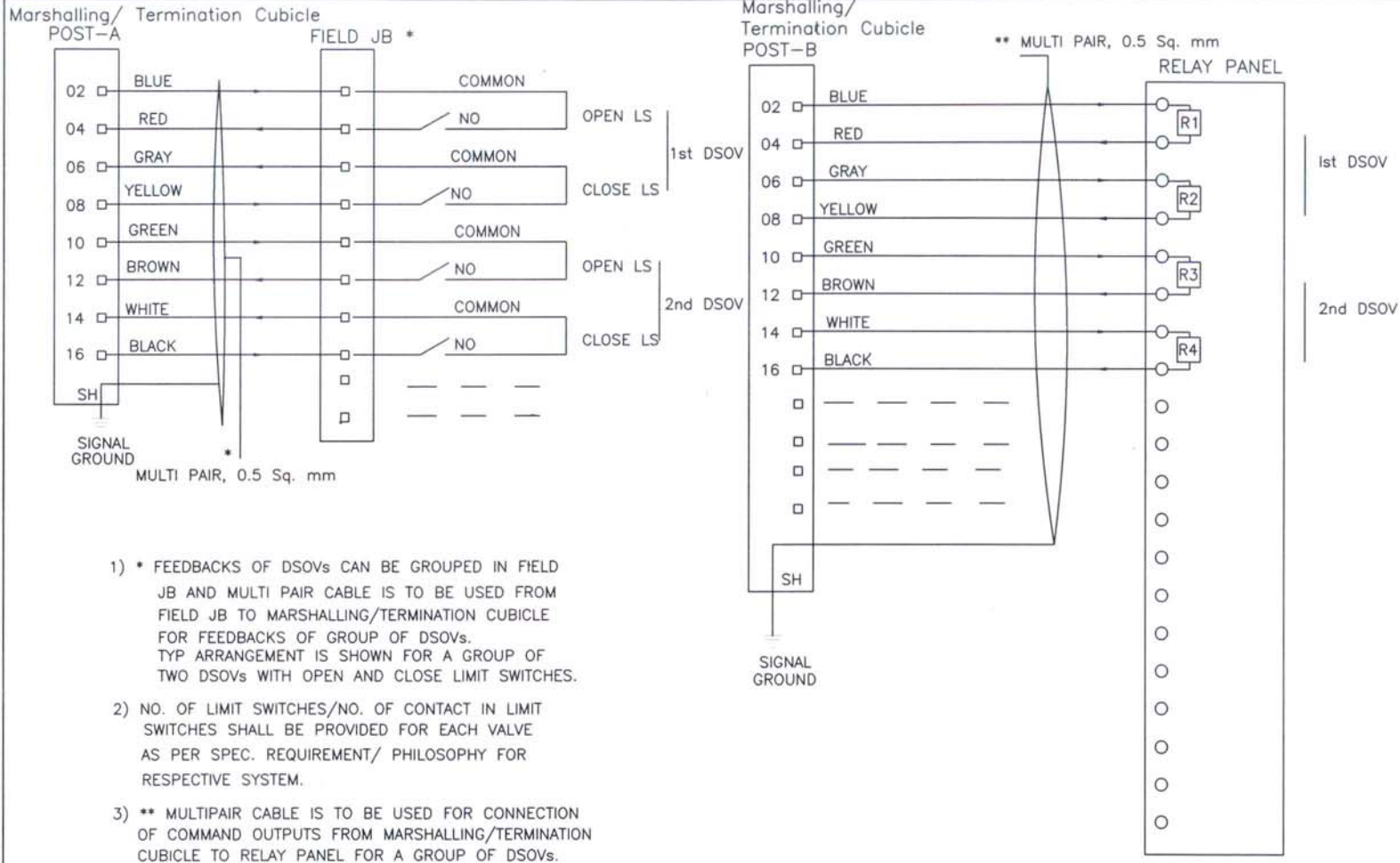


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(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT	TYPICAL THERMAL POWER PROJECT		
TITLE	INTERFACING OF FIELD INSTRUMENTS INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR (HT MOTORS)		
SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065	B
DATE			SH 07 OF 14

REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	C	C&I	ARCH.	AMPD	DATE
B	Revised for Numerical relay based SWGR									14.02.08
CLEARED BY										

ANNEXURE -2
TENDER NO- PSER:SCT:NKP-M1741:16



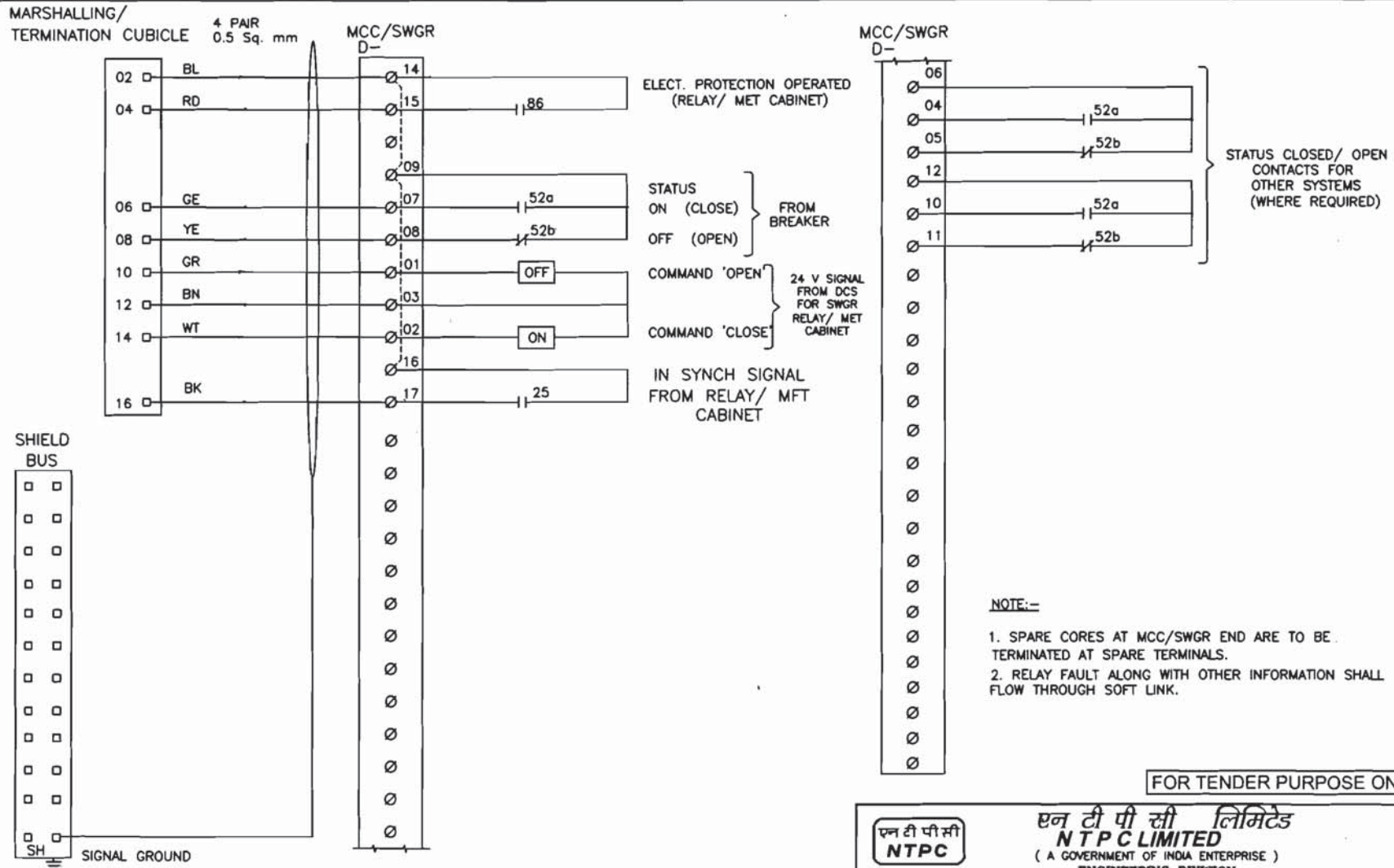
- 1) * FEEDBACKS OF DSOVs CAN BE GROUPED IN FIELD JB AND MULTI PAIR CABLE IS TO BE USED FROM FIELD JB TO MARSHALLING/TERMINATION CUBICLE FOR FEEDBACKS OF GROUP OF DSOVs. TYP ARRANGEMENT IS SHOWN FOR A GROUP OF TWO DSOVs WITH OPEN AND CLOSE LIMIT SWITCHES.
- 2) NO. OF LIMIT SWITCHES/NO. OF CONTACT IN LIMIT SWITCHES SHALL BE PROVIDED FOR EACH VALVE AS PER SPEC. REQUIREMENT/ PHILOSOPHY FOR RESPECTIVE SYSTEM.
- 3) ** MULTIPAIR CABLE IS TO BE USED FOR CONNECTION OF COMMAND OUTPUTS FROM MARSHALLING/TERMINATION CUBICLE TO RELAY PANEL FOR A GROUP OF DSOVs.

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 नैशनल थर्मल पावर कारपोरेशन लिमिटेड
National Thermal Power Corporation Ltd.
 (A GOVERNMENT OF INDIA ENTERPRISE)
 ENGINEERING DIVISION

		PROJECT TYPICAL THERMAL POWER PROJECT													
		TITLE INTERFACING OF FIELD INSTRUMENTS INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR (DOUBLE COIL SOLENOID)													
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE	SIZE	SCALE	DRG. NO.	REV. NO.
B	FIRST ISSUE										30.10.02	A3	NTS	0000-999-POI-A-065	C
CLEARED BY												SH 09 OF 14			

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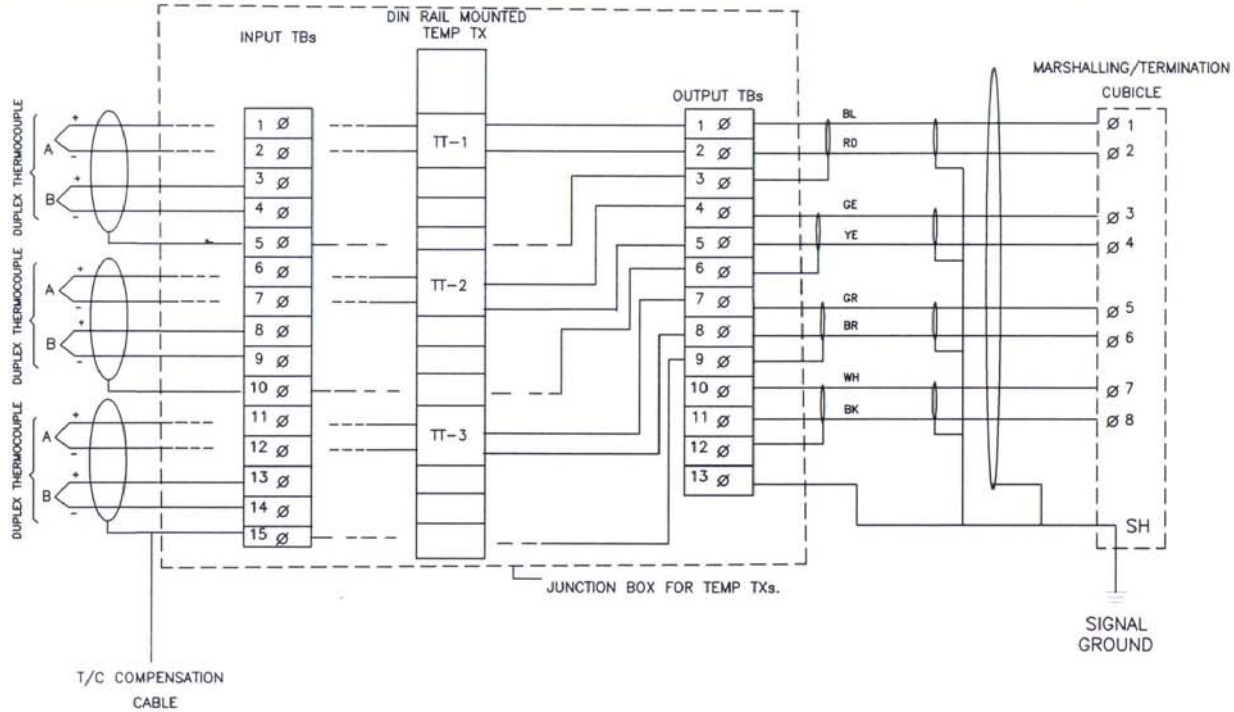


NOTE:-
1. SPARE CORES AT MCC/SWGR END ARE TO BE TERMINATED AT SPARE TERMINALS.
2. RELAY FAULT ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.

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ENGINEERING DIVISION

PROJECT										TYPICAL THERMAL POWER PROJECT					
TITLE										INTERFACING OF FIELD INSTRUMENTS INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR (Elect. Bkr. - Sync.-LT)					
REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE	SIZE	SCALE	DRG. NO.	REV. NO.
B	Revised for Numerical Relay based SWGR.										14.02.08	A3	NTS	0000-405-POI-A-065	B
CLEARED BY															
SH 10 OF 14															



- NOTE: 1) ABOVE IS THE TYP DRG. FOR DIN RAIL MOUNTED TEMP TRANSMITTER FOR T/C APPLICATION. EXACT TYPE OF TEMP TRANSMITTERS SHALL BE AS PER PART-A OF SPECIFICATION.
- 2) THE EXACT GROUPING OF TEMP TXs SHALL BE FINALISED DURING DETAILED ENGG. STAGE.
- 3) AFTER GLANDING OF T/C CABLES ON JB, THE CABLE PAIR OF FIRST ELEMENT WILL BE DIRECTLY CONNECTED TO TT AND FOR CABLE PAIR OF SECOND ELEMENT LOOP SHALL BE KEPT, BEFORE TERMINATION AT INPUT TBs FOR FUTURE USE.

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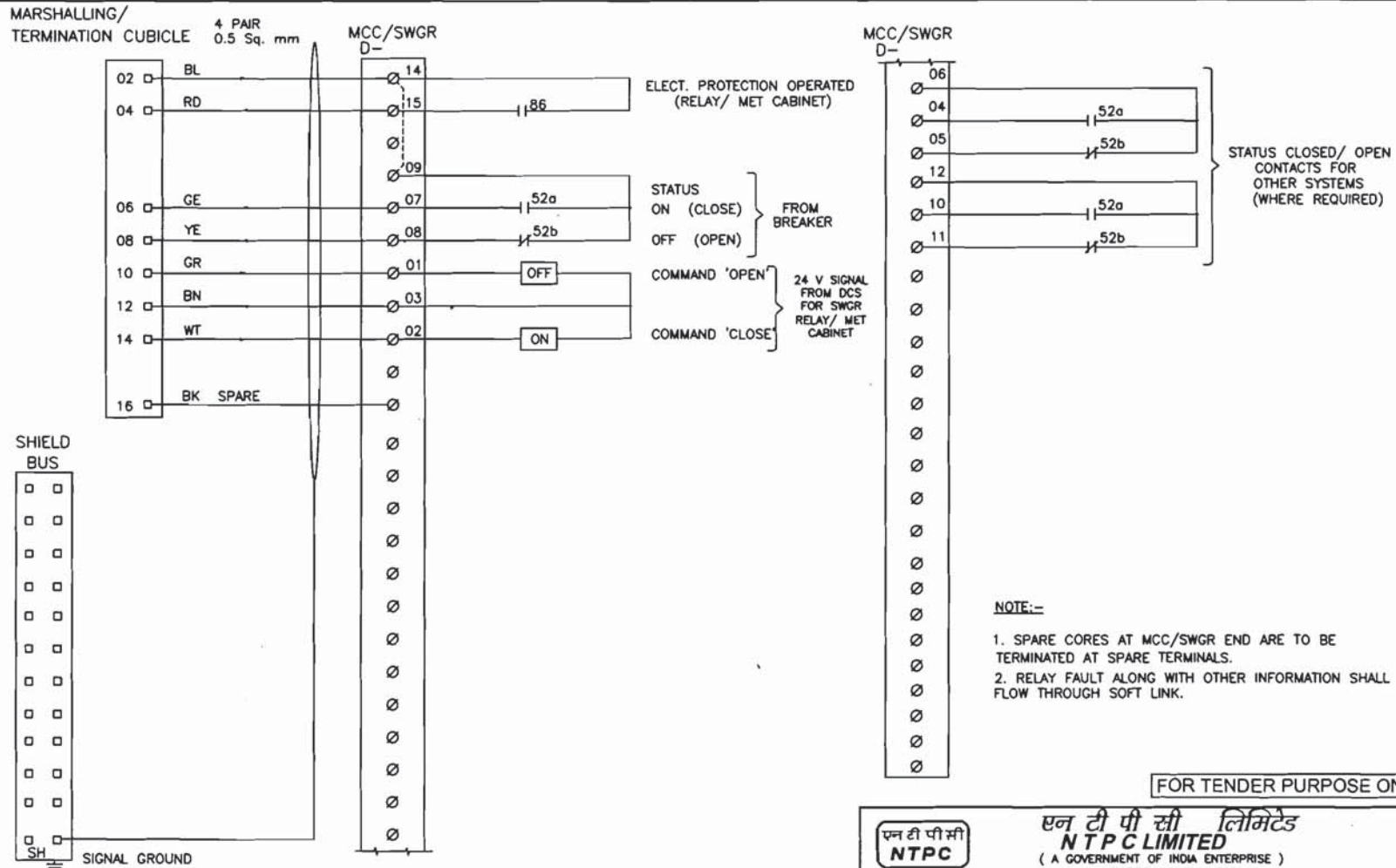
FOR TENDER PURPOSE ONLY



NTPC LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

										PROJECT		TYPICAL THERMAL POWER PROJECT		
										TITLE		INTERFACING OF FIELD INSTRUMENTS TYPICAL T/C CONNECTION WITH TEMP TXs IN JBs		
A	FIRST ISSUE									29.04.06	SIZE	SCALE	DRG. NO.	REV. NO.
REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE	A3	NTS	0000-999-POI-A-065
										Cleared By		SH 11 OF 14		

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NOTE:-

1. SPARE CORES AT MCC/SWGR END ARE TO BE TERMINATED AT SPARE TERMINALS.
2. RELAY FAULT ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.

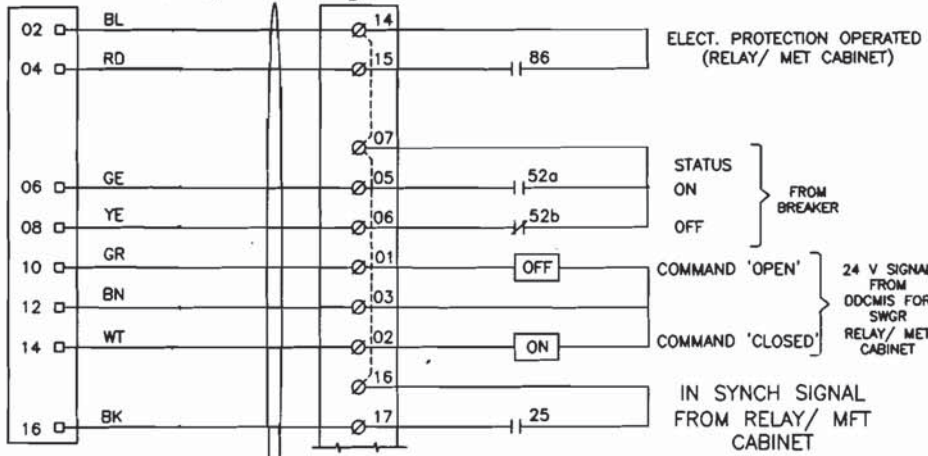
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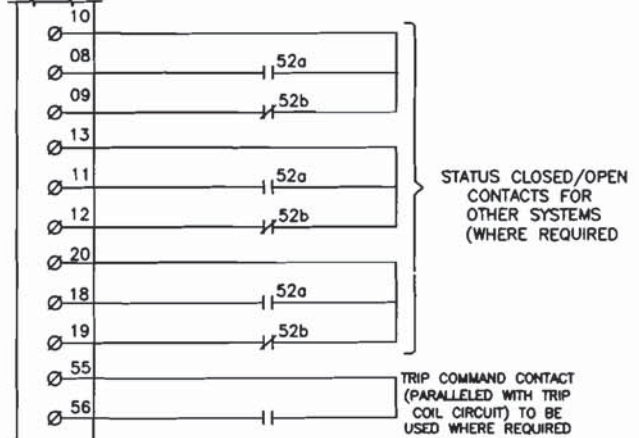
PROJECT	TYPICAL THERMAL POWER PROJECT		
TITLE	INTERFACING OF FIELD INSTRUMENTS INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR (Elect. Bkr. - Non. Sync.-LT)		
SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065	B
SH 12 OF 14			

REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
B	Revised for Numerical Relay based SWGR.										14.02.08
CLEARED BY											

MARSH./TERM CUBICLE 4 PAIR 0.5 Sq. mm MCC/SWGR D-



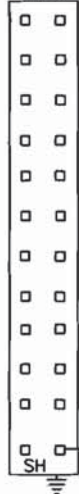
MCC/SWGR D-



NOTE:-

1. SPARE CORES AT MCC/SWGR END ARE TO BE TERMINATED AT SPARE TERMINALS.
2. RELAY FAULT ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.

SHIELD BUS



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PROJECT	TYPICAL THERMAL POWER PROJECT		
TITLE	INTERFACING OF FIELD INSTRUMENTS INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR (Elect. Brkr. - Sync.-HT)		
REV. NO.	DESCRIPTION	DATE	REV. NO.
B	Revised for Numerical relay based SWGR	14.02.08	B
REV. NO.	DESCRIPTION	DATE	REV. NO.

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DRAWN	DESIGN	CHKD.	M	C	C&d	ARCH.	APPD	DATE

CLEARED BY

FORM NO. PEM-5666-0

	SPECIFICATION FOR MOTORISED VALVE ACTUATOR		
	REV. NO.	00	DATE: 01.08.2014
	SHEET	1	OF 4
Data Sheet A & B			
DATA SHEET-A (TO BE FILLED BY PURCHASER)		DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	
GENERAL*	* PROJECT	3 X 660 MW NORTH KARANPURA STPP	
	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		
	* 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, 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. FOR INCHING /REGULATING SERVICE - 150 STARTS/HR MINIMUM.	
HANDWHEEL	* 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.		
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 SIX TIMES THE RATED CURRENT-INCLUSIVE OF I.S. TOLERANCE	
	ACTUATOR APPLICABLE WIRING DIAGRAM	<input checked="" type="checkbox"/> ENCLOSED (BIDDER TO CONFIRM) A: <input type="checkbox"/> DRG. NO. 3-V-MISC-24227 R00 B: <input type="checkbox"/> DRG. NO. 3-V-MISC-24550 R00 C: <input type="checkbox"/> DRG. NO. 3-V-MISC-24283 R00 D: <input type="checkbox"/> DRG. NO. 4-V-MISC-90271 R11 E: <input type="checkbox"/> For Thyristor based Integral starter, Bidder/Vendor to furnish wiring diagram	
	COLOUR SHADE	<input checked="" type="checkbox"/> BLUE (RAL 5012) ENAMEL <input type="checkbox"/>	
	PAINT TYPE (## Refer Notes)	<input type="checkbox"/> ENAMEL <input type="checkbox"/> EPOXY <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	415V +/- 10% , 3PH,3 W, AC 50 HZ +/- 5%	
	@ CONTROL VOLTAGE REQUIREMENT	TO BE DERIVED FROM THE POWER SUPPLY TO THE STARTER <input type="checkbox"/> 230 V <input checked="" type="checkbox"/> 110 V AC/24V DC	

FORM NO. PEM-666-0

	SPECIFICATION FOR MOTORISED VALVE ACTUATOR		
	REV. NO.	00	DATE: 01.08.2014
	SHEET	2	OF 4
Data Sheet A & B			
DATA SHEET-A (TO BE FILLED BY PURCHASER)		DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	
	MOTOR BEARING WITH 2 EARTH TERMINALS	DOUBLE SHIELDED, GREASE LUBRICATED ANTI FRICTION	
	@ ENCLOSURE CLASS OF MOTOR	IP 67 FOR OUTDOOR & IP 55 FOR INDOOR(TOTALLY ENCLOSED SELF VENTILATED)	
	@ INSULATION CLASS	CLASS-F TEMP. RISE LIMITED TO CLASS-B	
	@ WINDING TEMP PROTECTION	<input checked="" type="checkbox"/> THERMOSTAT (3 Nos.,1 IN EACH PHASE) <input type="checkbox"/>	
	SINGLE PHASE / WRONG PHASE SEQUENCE PROTECTION	REQUIRED	
INTEGRAL STARTER	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)	
	IF SMART	(NOT APPLICABLE)	
	a) SERIAL LINK INTERFACE	<input type="checkbox"/> INTEGRAL <input type="checkbox"/> FIELD MOUNTED	
	b) SERIAL LINK PROTOCOL	<input type="checkbox"/> FOUNDATION FIELD-BUS <input type="checkbox"/> PROFI-BUS <input type="checkbox"/> DEVICE NET <input type="checkbox"/>	
	c) SERIAL LINK MEDIA	<input type="checkbox"/> TWISTED PAIR Cu-CBL <input type="checkbox"/> CO-AXIAL Cu-CBL <input type="checkbox"/> OFC	
	d) HAND HELD PROGRAMMER	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	e) TYPE OF HAND HELD PROGRAMMER	<input type="checkbox"/> BLUETOOTH <input type="checkbox"/> INFRARED <input type="checkbox"/>	
	f) MASTER STATION	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	g) MASTER STN INTRFACE WITH DCS	<input type="checkbox"/> MODBUS <input type="checkbox"/> TCP/IP	
	h) DETAILS OF SPECIAL CABLE	<input type="checkbox"/> ENCLOSED <input type="checkbox"/> NOT REQUIRED	
	STEP DOWN CONT. TRANSFORMER	<input checked="" type="checkbox"/> 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)		
INTERPOSING RELAY/OPTO COUPLER (Applicable for integral Starter)	TYPE OF ISOLATING DEVICE	<input checked="" type="checkbox"/> INTERPOSING RELAY <input type="checkbox"/> OPTO COUPLER <input type="checkbox"/> EITHER	
	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"/> 125mA MAX <input type="checkbox"/> _____ mA MAX	
	LOAD RESISTANCE	<input checked="" type="checkbox"/> > 192 ohms - <25 k ohms <input type="checkbox"/> > _____ ohms - < _____ ohms	
TORQUE SWITCH (Not Applicable for Smart Actuator) (\$\$ Refer Notes)	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 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 for Smart Actuator) (\$\$)	MFR & MODEL NO.	BIDDER TO SPECIFY	
	OPEN : INT : CLOSE	<input type="checkbox"/> 1 No. <input checked="" type="checkbox"/> 2 Nos. <input type="checkbox"/> 1 No. <input checked="" type="checkbox"/> 2Nos.	
	CONTACT TYPE	2 NO + 2 NC	

FORM NO. PEM-6666-0



**SPECIFICATION
FOR
MOTORISED VALVE ACTUATOR**

REV. NO.	00	DATE: 01.08.2014
SHEET	3	OF 4

Data Sheet A & B


DATA SHEET-A
(TO BE FILLED BY PURCHASER)

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

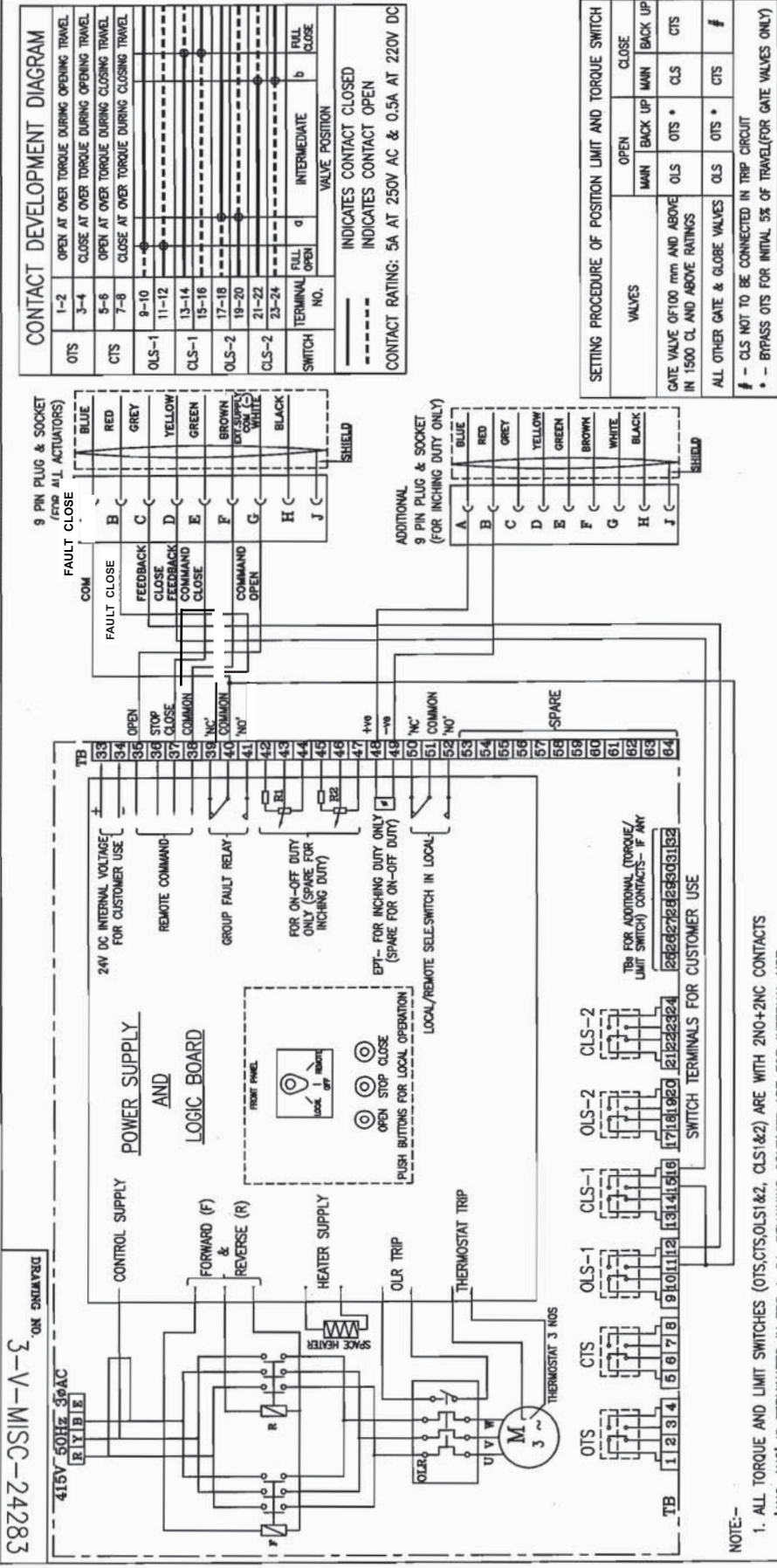
Refer Notes)	RATING (AC / DC)	5A 240V AC AND 0.5A 220V DC
Limit switches shall be silver plated with high conductivity and non-corrosive type. Contact rating shall be sufficient to meet the requirement of control system subject to a minimum of 60 V, 6 VA rating. Protection class shall be IP 55.		

POSITION TRANSMITTER	POSITION TRANSMITTER (For inching duty applications)	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED
	MFR & MODEL NO.	BIDDER TO SPECIFY
	TYPE	<input type="checkbox"/> ELECTRONIC (2 WIRE) R/I CONVERTER <input checked="" type="checkbox"/> ELECTRONIC (2 WIRE) CONTACTLESS INDUCTIVE TYPE ,EXTERNAL 24 V DC OPERATED ,SUITABLE FOR STABILISED 4-20 mA SIGNAL
	SUPPLY	<input checked="" type="checkbox"/> 24V DC <input type="checkbox"/>
	OUTPUT	<input checked="" type="checkbox"/> 4-20mA
	ACCURACY	± 1% FS
SPACE HEATER	@SPACE HEATER	REQUIRED
	@ POWER SUPPLY (NON INTEGRAL)	230V AC,1 PH.,50 Hz
	@ POWER SUPPLY (INTEGRAL)	POWER SUPPLY DERIVED FROM MAIN POWER SUPPLY AVAILABLE AT ACTUATOR END.
	@ RATING	
TERMINAL BOX	ACTUATOR/MOTOR TERMINAL BOX	REQUIRED
	ENCL CLASS ACTUATOR/MOTOR T.B.	<input checked="" type="checkbox"/> IP 68 @ <input type="checkbox"/>
	@ EARTHING TERMINAL	REQUIRED
	PLUG & SOCKET(9 PIN) (FOR COMM, LS/TS FEED BACK, PoT)	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED <input checked="" type="checkbox"/> 2 NOS. PRE WIRE <input type="checkbox"/>
CABLE GLANDS	@ POWER CABLE GLAND	SIZE:-----
	@ SPACE HEATER CABLE GLAND	SIZE:-----
	OTHER CONTROL CABLE GLANDS-1	<input type="checkbox"/> 1No. for BFV of CW PUMP(Cable size 2Px1.5mm ²)
	OTHER CONTROL CABLE GLANDS-2	QUANTITY & SIZE :-----

FORM NO. PEM-6666-0

	SPECIFICATION FOR MOTORISED VALVE ACTUATOR			
	REV. NO.	00	DATE:	01.08.2014
	SHEET	4	OF	4
Data Sheet A & B				
DATA SHEET-A (TO BE FILLED BY PURCHASER)			DATA SHEET-B (TO BE FILLED-UP BY BIDDER)	
WEIGHT	TOTAL WEIGHT (ACTUATOR + ACCESSORIES)	BIDDER TO SPECIFY		_____ Kg.
<p>NOTES:</p> <ol style="list-style-type: none"> 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 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, -5% TO +3% 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. <p>\$\$ TORQUE SWITCH & LIMIT SWITCH SHALL ACT INDEPENDENT OF EACH OTHER. TANDEM OPERATION IS NOT ACCEPTABLE.</p> <p>## EPOXY PAINT IS RECOMMENDED FOR COASTAL AREAS.</p> <ol style="list-style-type: none"> 8. IT SHALL BE POSSIBLE TO OPERATE THE ACTUATOR LOCALLY. LOCKABLE LOCAL/REMOTE SELECTION SHALL BE PROVIDED ON THE ACTUATOR. 9. POSITION INDICATOR SHALL BE PROVIDED FOR 0 TO 100 % TRAVEL 10. WIRING SHALL BE SUITABLE VOLTAGE GRADE COPPER WIRE. 				
	PREPARED BY	CHECKED BY	APPROVED BY	VENDOR COMPANY SEAL
	Madhav gupta	Mayank kesharwani	Bharat Singh	NAME
	SIGNATURE			SIGNATURE
	DATE	01.08.2014	01.08.2014	01.08.2014
NOTES* = TO BE FILLED BY MPL (LEAD AGENCY). @= TO BE FILLED BY ES				

ALL DIMENSIONS ARE IN MILLIMETRES. FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP / QP.



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	d	INTERMEDIATE	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	OLS	OTS *	CLS	CTS
IN 1500 CL AND ABOVE RATINGS				
ALL OTHER GATE & GLOBE VALVES	OLS	OTS *	CLS	CTS

- CLS NOT TO BE CONNECTED IN TRIP CIRCUIT
 * - BYPASS OTS FOR INITIAL 5% OF TRAVEL (FOR GATE VALVES ONLY)

TYPE OF PRODUCT: ELECTRICAL VALVE ACTUATORS (AC) WITH INTEGRAL STARTERS
 OR NAME OF CUSTOMER/PROJECT: FOR NTPC PROJECTS (DRAWN FOR INTERMEDIATE POSITION OF VALVES)

BHARAT HEAVY ELECTRICALS LTD.,
 UNIT: HIGH PRESSURE BOILER PLANT,
 THERCOPURAM-680004.

DEPT: 358-121
 SCALE: NTS
 CODE: -
 TITLE: WIRING DIAGRAM (TERMINAL PLAN)
 FOR ACTUATOR WITH INTEGRAL STARTER WITH PLUG & SOCKET FOR NTPC PROJECTS

REV: DATE: ALTERED: CTD & APPD

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DRY N.P.ESWAR	SIGN N.P	DATE 17.03.05	NO. OF VAR. 17.03.05
CHED D.DINAKARAN	D.D	17.03.05	-
APPD K.ARUNACHALAM	K.A	17.03.05	-

WEIGHT (KG): -
 DRAWING NO. 3-V-MISC-24283
 CARD CODE U 01
 REV 0
 Page 6 of 6

- NOTE:-
- ALL TORQUE AND LIMIT SWITCHES (OTS, CTS, OLS1 & 2, CLS1 & 2) ARE WITH 2NO+2NC CONTACTS. 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.