

5. Sizing Calculation is attached at Annexure-1

1) CONDUCTOR SIZING CALCULATIONS (AS PER IEEE-80)

$I = A \cdot \text{SQRT}(\text{TCAP} \times 10^{-4} / (t_i \times a_r \times r_r) \times \ln((K_0 + T_m) / (K_0 + T_a)))$		Ref.: Clause 11.3.1 of IEEE-80
where,		
$I =$ Fault Current (rms) in kA		= 63
$T_m =$ maximum allowable temperature in °C		= 1084 Table-1, IEEE-80
$T_a =$ ambient temperature in °C		= 40
$T_r =$ reference temperature for material constants in °C		= 20
$a_0 =$ thermal co-efficient of resistivity at 0 °C		= 0.004132 $a_0 = 1/K_0$
$a_r =$ thermal co-efficient of resistivity at reference temperature T_r		= 0.00381 Table-1, IEEE-80
$r_r =$ the resistivity of the ground conductor at reference temperature T_r , $\mu\Omega \cdot \text{cm}$		= 1.78 Table-1, IEEE-80
$K_0 = 1/a_0$, or $(1/a_r) \cdot T_r$		= 242 Table-1, IEEE-80
$t_i =$ time of current flow in s		= 1
$\text{TCAP} =$ thermal capacity factor in $\text{J}/\text{cm}^3/^\circ\text{C}$		= 3.4 Table-1, IEEE-80
$A =$ Conductor cross section in mm^2		= 226.144476
$\text{Ca} =$ Corrosion allowance per year (in mm)		= 0.5
For 35 Years (in mm)		= 0.5 x 35
		= 18 mm
Effective conductor Cross Section in mm^2		= 250 sq.mm

CONCLUSION

Earthing conductor chosen = 2 runs 1 X 150 sq.mm Cu Flexible cable or 50 X 6 sq.mm Copper Flat

01/10/2024

IEEE-80 2013

Table - 1

Table 1—Material constant

Description	Material ^a conductivity (% IACS)	α , factor ^a at 20 °C (1/°C)	K_0 at 0 °C (0°C)	Fusing ^d temperature T_m (°C)	Resistivity ^a at 20 °C ρ , ($\mu\Omega$ -cm)	Thermal ^e capacity TCAP [J/(cm ³ · °C)]
Copper, annealed soft-drawn	100.0	0.003 93	234	1083	1.72	3.4
Copper, commercial hard-drawn	97.0	0.003 81	242	1084	1.78	3.4
Copper-clad steel wire	40.0	0.003 78	245	1084 ^b	4.40	3.8
Copper-clad steel wire	30.0	0.003 78	245	1084 ^b	5.86	3.8
Copper-clad steel rod	17.0	0.003 78	245	1084 ^b	10.1	3.8
Aluminum-clad steel wire	20.3	0.00360	258	657	8.48	3.561
Steel, 1020	10.8 ^c	0.003 77	245	1510	15.90	3.8
Stainless-clad steel rod ^c	9.8	0.003 77	245	1400 ^d	17.50	4.4
Zinc-coated steel rod	8.6	0.003 20	293	419 ^e	20.10	3.9
Stainless steel, 304	2.4	0.001 30	749	1400	72.00	4.0

^aMaterial constants for copper, steel, stainless steel, and zinc are from *The Metals Handbook* by the American Society for Metals.

^bCopper-clad steel rods based on nominal 5/8 in rod, 0.010 in soft-drawn copper thickness over No. 1020 steel.

^cStainless-clad steel rod based on nominal 5/8 in rod, 0.020 in No. 304 stainless steel thickness over No. 1020 steel core.

^dUnlike most metals, steel has a highly variable heat capacity from 550 °C to 800 °C, however since the heat capacity in this range is much larger than at lower and higher temperatures, calculations using lower values are conservative with respect to conductor heating.

^eBi-metallic materials fusing temperature based on metal with lower fusing temperature.

Shiva Shrivastava

2) CONDUCTOR SIZING CALCULATIONS (AS PER IS:3043)

$$S = (I \times \sqrt{t}) / k \quad (\text{Ref.: Clause 12.2.2.1 of IS 3043})$$

where,

$$I = \text{Fault Current (rms) in kA} = 63$$

$$t = \text{time of current flow in s} = 1$$

k = factor, determined using the formula,

$$\sqrt{(Q_c \times (B+20) / \delta_{20}) \times \ln (1 + (\theta_f - \theta_i) / (B + \theta_i))}$$

$$Q_c = \text{Volumetric heat capacity of conductor material (J / deg.C mm}^3) = 3.80E-03$$

(For steel, As per table-5 of IS 3043)

$$B = \text{Reciprocal of temperature coeff. of resistivity at 0 deg.C for conductor} = 202$$

(For steel, As per table-5 of IS 3043)

$$\delta_{20} = \text{Electrical resistivity of conductor material at 20 deg.C (ohm*mm)} = 1.3800E-04$$

(For steel As per table-5 of IS 3043)

$$\theta_i = \text{Initial temperature of the conductor in deg. C} = 40$$

(As per Table-6A, IS 3043)

$$\theta_f = \text{Final Temperature of the conductor in deg. C} = 500$$

(As per Table-6A, IS 3043)

$$k = \sqrt{(Q_c \times (B+20) / \delta_{20}) \times \ln (1 + (\theta_f - \theta_i) / (B + \theta_i))} = 80.6868322$$

$$S = \text{Conductor cross section in mm}^2 = 780.80$$

$$\text{Effective Cross sectional area of earth conductor in mm}^2 = 785$$

$$Ca = \text{Corrosion allowance per year as per IS (in mm)} = 0.5$$

$$\text{For 25 Years (in mm)} = 0.5 \times 35$$

$$= 18 \text{ mm}$$

$$\text{Effective conductor Cross Section in mm}^2 = 805 \text{ sq.mm}$$

$$\text{Considered selected area (75 x12 GI Flat)} = 900 \text{ sq.mm}$$

CONCLUSION

Earthing conductor chosen = **75x12 GI Flat**

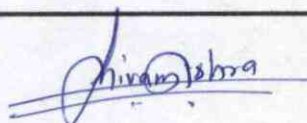


TABLE 5 MATERIAL CONSTANTS

MATERIAL	$B(^{\circ}C)$	$Qc(J/^{\circ}Cmm^3)$	$\delta_{20} (\Omega \text{ mm})$	$\frac{\sqrt{Qc(B+20)}}{\delta_{20}}$
Copper	234.5	3.45×10^{-3}	17.241×10^{-6}	226
Aluminium	228	2.5×10^{-3}	28.264×10^{-6}	148
Lead	230	1.45×10^{-3}	214×10^{-6}	42
Steel	202	3.8×10^{-3}	138×10^{-6}	78

IS.: 3043-1987

TABLE 6 CURRENT RATING OF VARIOUS PROTECTIVE EARTHING MATERIALS

(Clauses 12.2.2 and 19.2)

6A Bare Conductor with No Risk of Fire or Danger to Any Other Touching or Surrounding Material

Boundary Conditions : Initial Temperature. 40°C Final temperature 395°C for copper; 325°C for aluminium; 500°C for steel

MATERIAL	COPPER	ALUMINIUM	STEEL
1 s current rating in A/mm ² (k_1)	205	126	80
3 s current rating in A/mm ² (k_2)	118	73	46

Divyanshu



टीएचडीसी इंडिया लिमिटेड
THDC INDIA LIMITED

(भारत सरकार एवं उ.प्र. सरकार का संयुक्त उपक्रम)
(A joint venture of Govt. of India & Govt. of UP)

Letter No: THDCIL/RKSH/EMD/VPHEP/401-23/2450

Date: 18-02-2019

To,

- Mr. A.M. Gupta Email: amgupta@bhel.in
GM (Hydro Business Group),
Bharat Heavy Electricals Ltd., 4th floor, Tower-A,
AdvantNavis Business Park, Plot No. 7,
Sector-142, Expressway Noida, Gautam Buddh Nagar(U.P.)-201305
- Mr. Gautam Chaklader Email: gautam.chaklader@bhel.in
GM (TBEM Group)
BHEL, Floor-5, Tower-A, Advant Nevis Business Park
Plot No. 7, Sector 142, Express way
Noida 201301, UP

Subject: Contract Agreement (ICB No. THDCIL/RKSH/CC-297/AG-1, AG-2 & AG-3: Approval of "Equipment & Structure Earthing Details of 400kV Pothead yard (Drwg No. TB-4-382-316-013, Rev_0)" of Vishnugad Pipalkoti HEP (444 MW).

Dear Sir,

Please find enclosed herewith one set of approved drawing of "Equipment & Structure Earthing Details of 400kV Pothead yard (Drwg No. TB-4-382-316-013, Rev_0)" of Vishnugad Pipalkoti HEP (444 MW) w.r.t. email dated 05.02.2019.

This approval does not absolve M/s BHEL from its responsibility for correctness of the documents, Manufacturing/supply of the equipment as per Employer's requirement & GTP, for the achievement of the desired performance at site & completeness of the equipment.

This is for your kind information and necessary action please.

Thanking You

Encl.: As above

Yours faithfully,

(L.P. Joshi)
GM (EM Design)

Copy to:

13. Executive Director (Design & Engineering), Rishikesh
14. GM (OMS, QA&Safety), Rishikesh
15. GM (Project), VPHEP, Pipalkoti.
16. GM(MPS), Rishikesh
17. GM(Design-Civil&HM), Rishikesh
18. Shri Saroj Kumar, Sr. Mgr. (TBEM), PEM Floor-5, Tower-A, Advant Nevis Business Park, Plot No. 7, Sector 142, Express way, Noida 201301, UP



टीएचडीसी इंडिया लिमिटेड THDC INDIA LIMITED

(भारत सरकार एवं उ.प्र. सरकार का संयुक्त उपक्रम)
(A joint venture of Govt. of India & Govt. of UP)

पत्रांक: टीएचडीसी/ऋषि/वि०परि०/वीपीएचईपी/401-23/2450

दिनांक: 18.02.2019

प्रेषित,

- श्री ए एम गुप्ता ई-मेल: amgupta@bhel.in
महाप्रबंधक (हाइड्रो बिजनेस ग्रुप),
बीएचईएल., फ्लोर-4, टावर-ए, एडवांट नेवीज बिजनेस पार्क,
प्लॉट नं. 7, सेक्टर-142, एक्सप्रेस वे, नोएडा, गौतमबुद्ध नगर (उ.प्र.) 201305
- श्री गौतम चकलादर, ई-मेल: gautam.chaklader@bhel.in
महाप्रबंधक (टीबीईएम ग्रुप),
भारत हेवी इलैक्ट्रिकल्स लि., फ्लोर-5, टावर-ए, एडवांट नेवीज बिजनेस पार्क,
प्लॉट नं. 7, सेक्टर-142, एक्सप्रेस वे, नोएडा,
गौतमबुद्ध नगर (उ.प्र.) 201305

Subject: Contract Agreement (ICB No. THDCIL/RKSH/CC-297/AG-1, AG-2 & AG-3: Approval of "Equipment & Structure Earthing Details of 400kV Pothead yard (Drwg No. TB-4-382-316-013, Rev_0)" of Vishnugad Pipalkoti HEP (444 MW).

Dear Sir,

Please find enclosed herewith one set of approved drawing of "Equipment & Structure Earthing Details of 400kV Pothead yard (Drwg No. TB-4-382-316-013, Rev_0)" of Vishnugad Pipalkoti HEP (444 MW) w.r.t. email dated 05.02.2019.

This approval does not absolve M/s BHEL from its responsibility for correctness of the documents, Manufacturing/supply of the equipment as per Employer's requirement & GTP, for the achievement of the desired performance at site & completeness of the equipment.

This is for your kind information and necessary action please.

Thanking You

Yours faithfully,

(एल पी जोशी)

महाप्रबंधक(विद्युत परिकल्प)

संलग्नक: उपरोक्तानुसार

प्रतिलिपि:

- 1 अधिशाषी निदेशक (परिकल्प एवं अभियांत्रिकी), ऋषिकेश ।
- 2 महाप्रबंधक (ओएमएस, क्यूए एवं सेफ्टी), ऋषिकेश ।
- 3 महाप्रबंधक(वीपीएचईपी), टीएचडीसीआईएल, पीपलकोटी ।
- 4 महाप्रबंधक(एमपीएस), ऋषिकेश ।
- 5 महाप्रबंधक(सिविल-परिकल्प एवंहाइड्रोमैकेनिकल), ऋषिकेश ।
- 6 श्री सरोज कुमार, वरिष्ठ प्रबंधक (टीबीईएम), बीएचईएल ., फ्लोर-5, टावर-ए, एडवांट नेवीज बिजनेस पार्क, प्लॉट नं. सेक्टर-142, एक्सप्रेस वे, नोएडा, गौतमबुद्ध नगर (उ.प्र.) 201305 ।

AlaknandaBhawan, Bye Pass Road ,Pragatipuram, THDC India Ltd.
Rishikesh,Uttarakhand-249201 Tel. : 0135-2430397, Fax: 01352438682
Email: vphep.emd.thdc@gmail.com

Approval of this drawing/document does not absolve contractor of its responsibility for manufacturing of the equipment as per ER & GTP for the achievement of designed performance at site and completeness of the equipment.

GENERAL NOTES:-

1. EARTH STRIP CLEATED TO LATTICE TYPE EQUIPMENTS STRUCTURE AT AN INTERVAL OF 1000mm.
2. ALL ELECTRICAL EQUIPMENTS SHALL BE EARTHED BY TWO SEPARATE AND DISTINCT EARTH CONNECTIONS.
3. LOCATION AND DETAILS OF ROD ELECTRODE WITH TREATED EARTH PIT SHALL BE DECIDED AT LATER STAGE.
4. SIZE OF RISER SHALL BE DECIDED AT LATER STAGE.
5. RISER SHOULD BE BROUGHT CLOSE TO EQUIPMENTS FOUNDATION.
6. RISERS SHALL BE 300mm ABOVE THE FFL(FINISHED FLOOR LEVEL)
7. SHIELD WIRE CLEATED TO LATTICE TYPE EQUIPMENTS STRUCTURE AT AN INTERVAL OF 2000mm.

Note 1: All non current carrying metal parts of electrical equipments and apparatus shall be earthed through two separate diametrically/diagonally opposite connectors.

2. The detail design shall be finalized at a later stage.

SHEET NO.	DESCRIPTION
2	400kV CVT
3	LIGHTNING ARRESTER(390kV)
4	400kV CURRENT TRANSFORMER
5	400kV HDB ISOLATOR & EARTH SWITCH
6	400kV OUTDOOR CABLE TERMINATION
7	TOWER WITH PEAK
8	CABLE RACK SUPPORT

RECOMMENDED / सिफारिश



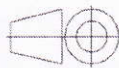
APPROVED AS NOTED /

RB 7/19
GM
J.S.Rana
18/1/19
जे.बी. एस. राणा
(J.B.S. RANA)
अपर महाप्रबंधक (विद्युत परिकल्प)
Addl. General Manager (EM-Design)
टीएचडीसी इंडिया लिमिटेड, ऋषिकेश

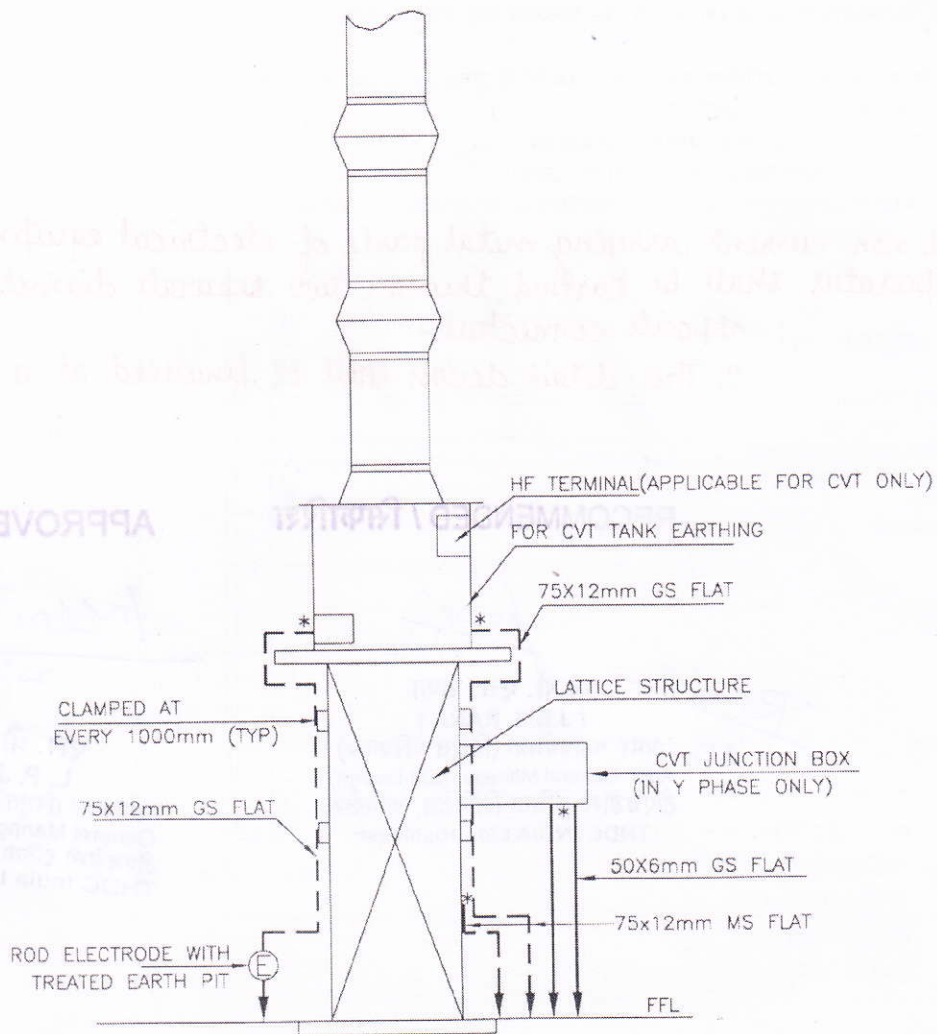
Myriam
2/2/19
एल. पी. जोशी
L. P. JOSHI
महाप्रबंधक (विद्युत यान्त्रिक-परिकल्प)
General Manager (EM-Design)
टीएचडीसी इंडिया लिमिटेड, ऋषिकेश
THDC India Ltd., Rishikesh

LEGEND:-

- CONNECTION TO RISER
- (E) ROD ELECTRODE WITH TREATMENT
- 75X12mm GS FLAT
- 50X6mm GS FLAT
- * BOLTED JOINTS.
- SHIELD WIRE

W.O.NO.	84008	CUSTOMER PROJECT:-	THDC INDIA LTD.				
STATUS	CONTRACT		4X111MW VISHNUGAD PIPALKOTI H.E. PROJECT				
DRG./REF. NO.(INTERNAL)							
	भारत हेवी इलेक्ट्रिकल्स लिमिटेड दांसमिसन परियोजना विभाग		DEPT CODE	NAME	SIGN.	DATE	
	BHARAT HEAVY ELECTRICALS LTD TRANSMISSION BUSINESS GROUP		422	DRN	PK		04.02.19
				DESN	SK	<i>[Signature]</i>	
				CHD	DM	<i>[Signature]</i>	05/02/19
				APPD	AG	<i>[Signature]</i>	5/2/19
TITLE	EQUIPMENT & STRUCTURE EARTHING DETAILS OF 400kV POTHEAD YARD						
REV.	DATE	ALTERED CHECKED APPROVED	SCALE 1:800	BHEL/SUB VENDOR DRG NO. TB-4-382-316-013			
ZONE				REV: 00	SHEET No. 01		

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NOTE:

1. No. OF ROD ELECTRODE WITH TREATED EARTH PIT = 1 No. PER PHASE.
2. NO. OF RISERS = 3 NOS PER PHASE.
3. NO. OF RISERS FOR CVT JUNCTION BOX = 2 NOS PER 3 PHASE.
4. * BOLTED JOINTS.



EQUIPMENT & STRUCTURE EARTHING DETAILS
 400kV CVT

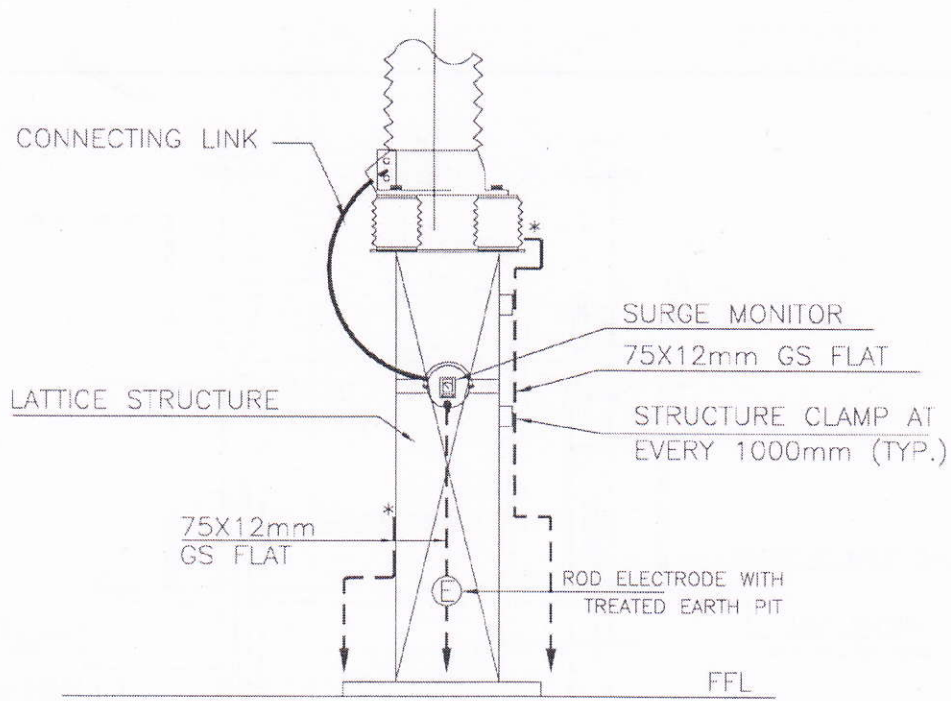
COMPUTERREF.NO.

DRG. No.

TB-4-382-316-013

REV. 00

SHEET No.
02



NOTES;

1. LA SHALL BE EARTHED THROUGH EARTH TERMINAL OF SURGE MONITOR.
2. No. OF ROD ELECTRODE WITH TREATED EARTH PIT = 1 No. PER PHASE.
3. * BOLTED JOINTS.
4. NO. OF RISERS= 3 NOS. PER PHASE.



**EQUIPMENT & STRUCTURE EARTHING DETAILS
LIGHTNING ARRESTER(390kV)**

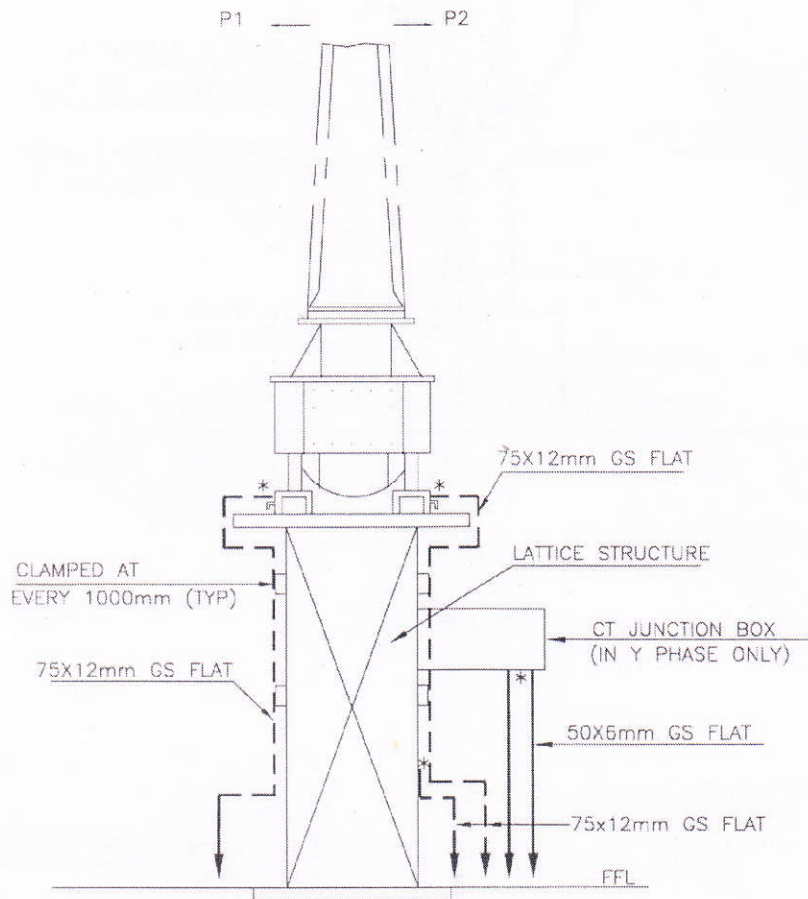
COMPU. DRG. REF.

DRG.NO.

TB-4-382-316-013

REV. 00

SHEET No.
03



NOTE:-

1. NO. OF RISERS = 3 NOS PER PHASE.
2. NO. OF RISERS FOR CT JUNCTION BOX = 2 NOS PER 3 PHASE.
3. * BOLTED JOINTS.



EQUIPMENT & STRUCTURE EARTHING DETAILS
400KV. CURRENT TRANSFORMER

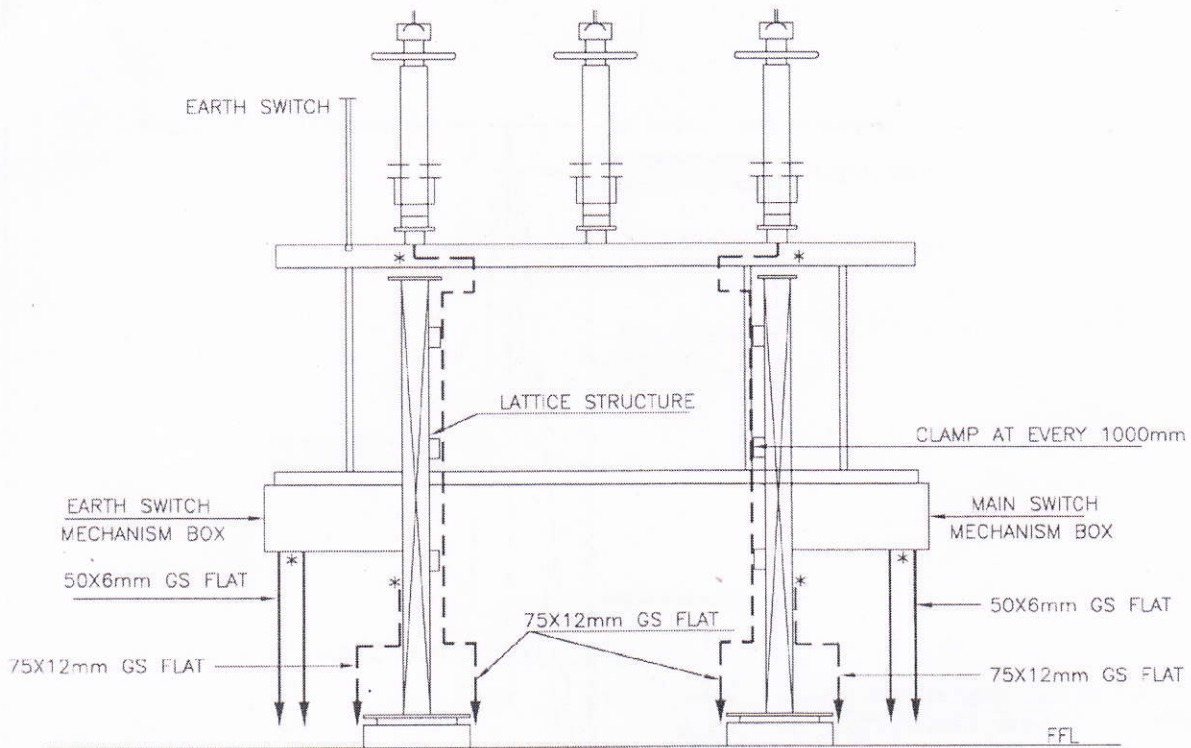
COMPU. DRG. REF.

DRG.NO.

TB-4-382-316-013

REV. 00

SHEET No.
04



NOTES

1. NO. OF RISERS FOR ISOLATOR = 4 NOS. PER PHASE.
2. NO. OF RISERS FOR MAIN SWITCH MECHANISM BOX = 2 NOS. PER BOX.
3. NO. OF RISERS FOR EARTH SWITCH MECHANISM BOX = 2 NOS. PER BOX.
4. * BOLTED JOINTS.



EQUIPMENT & STRUCTURE EARTHING DETAILS

400KV HDB ISOLATOR & EARTH SWITCH

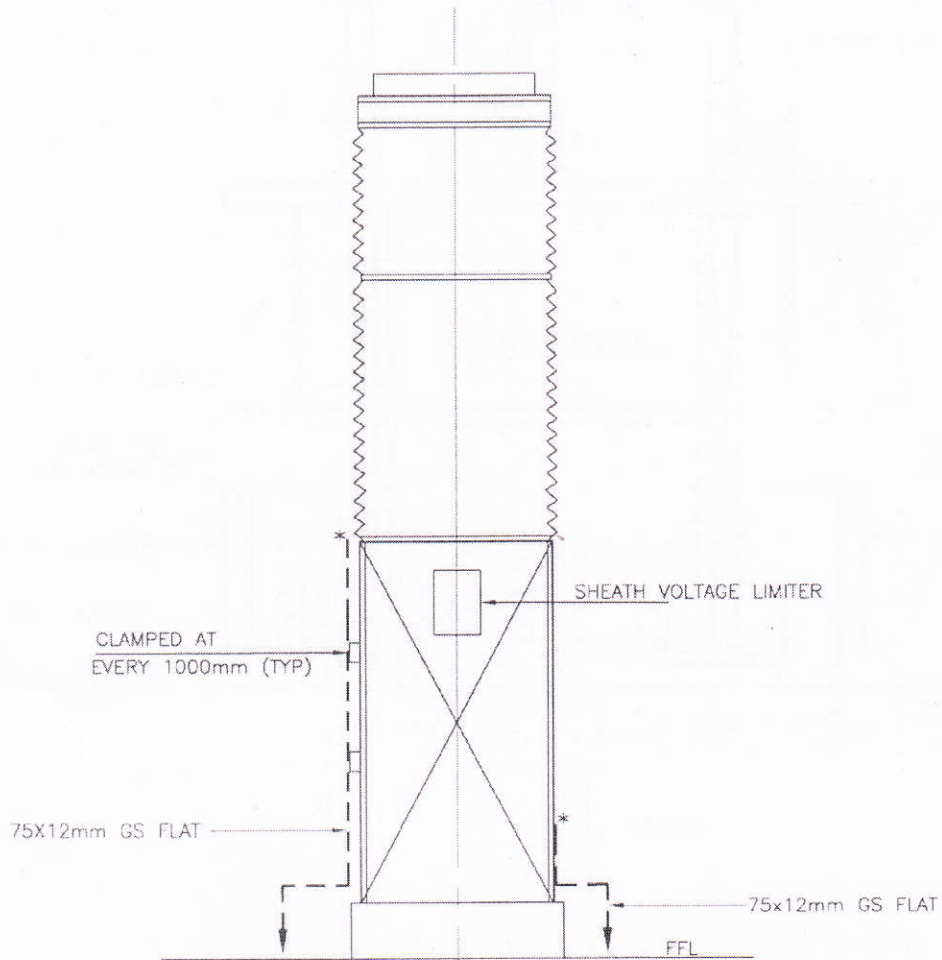
COMPUTERREF.NO.

DRG. No.

TB-4-382-316-013

REV. 00

SHEET No.
05



NOTE:

1. NO. OF RISERS = 3 NOS. PER PHASE.
2. SHEATH VOLTAGE LIMITER EARTHING SHALL BE SHOWN IN SEPARATE DRAWING.
3. * BOLTED JOINTS.



EQUIPMENT & STRUCTURE EARTHING DETAILS
400kV OUTDOOR CABLE TERMINATION

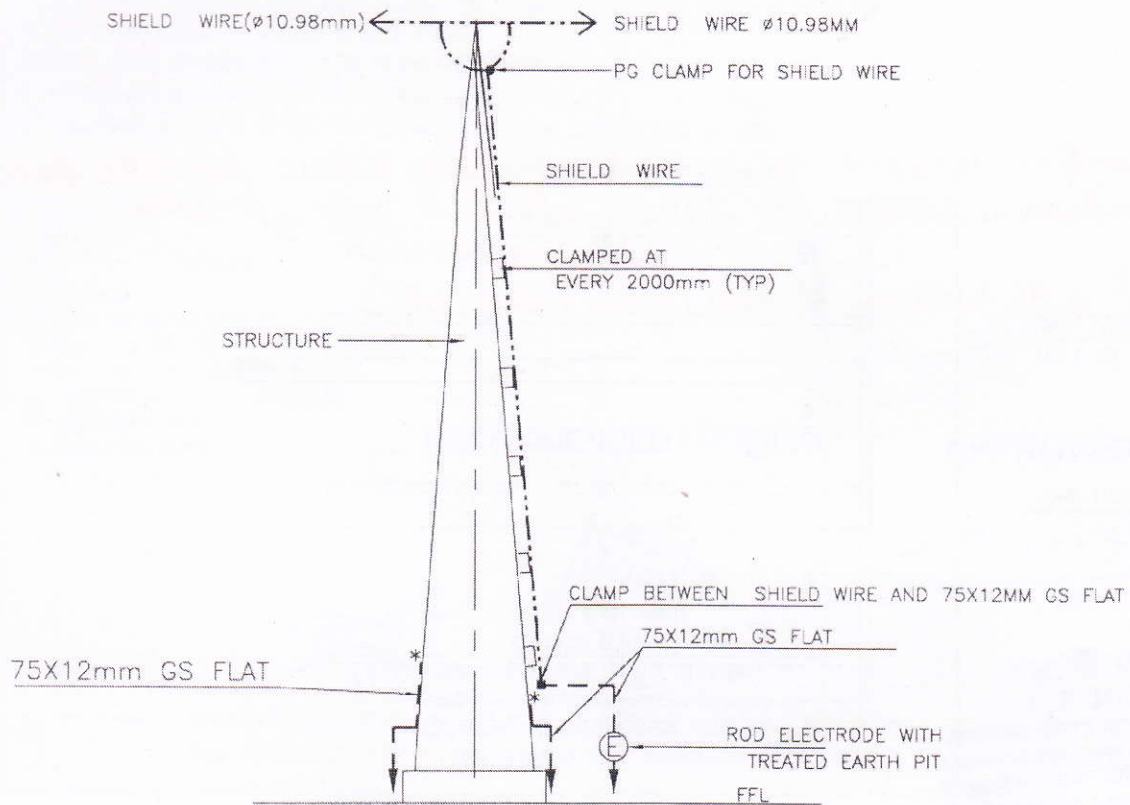
COMPUTERREF.NO.

DRG. No.

TB-4-382-316-013

REV. 00

SHEET No.
06



NOTE:

1. NO. OF ROD ELECTRODE WITH TREATED EARTH PIT : 1 NO. PER PEAK TOWER.
2. NO. OF RISERS = 3 NOS. / TOWER.
3. * BOLTED JOINTS.
4. IF THERE ARE THREE NOS. SHIELD WIRE TERMINATING ON ONE TOWER THEN TWO NOS. PG CLAMP ARE REQUIRED.



EQUIPMENT & STRUCTURE EARTHING DETAILS
TOWER WITH PEAK

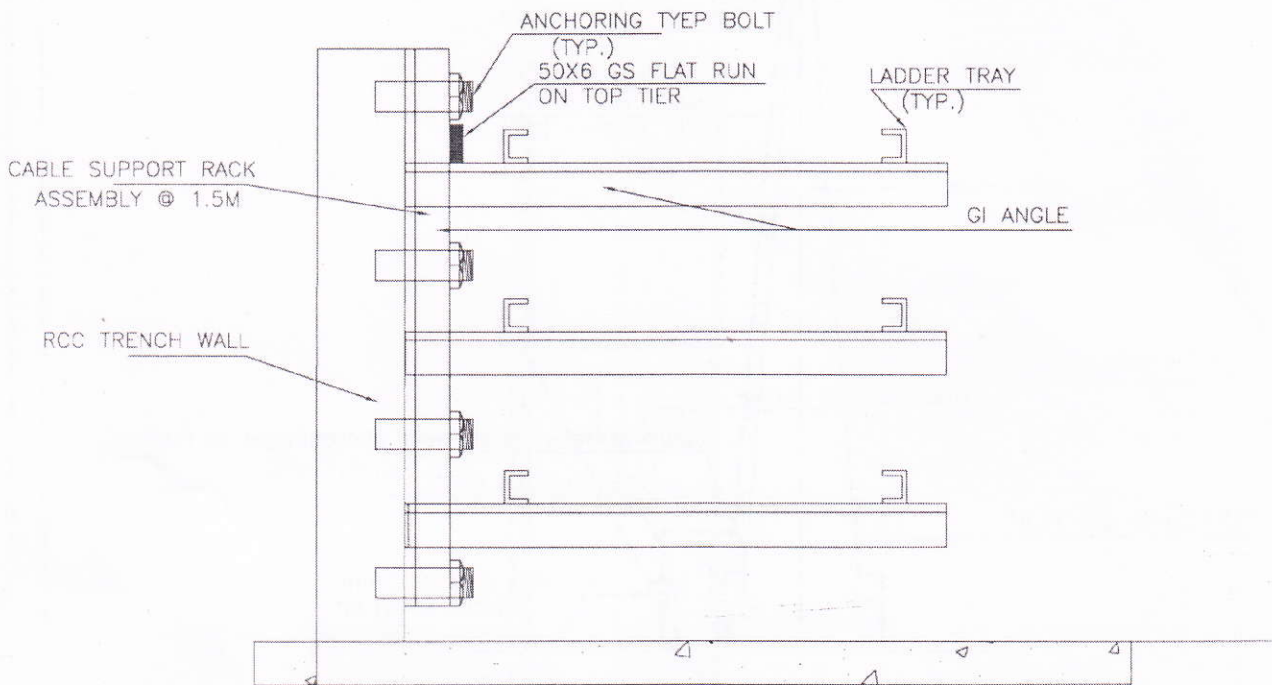
COMPUTERREF.NO.

DRG. No.

TB-4-382-316-013

REV. 00

SHEET No.
07



CABLE RACK SUPPORT

NOTE:-

1. THE EARTH STRIP (50X6mm GS. FLAT) SHALL RUN ON THE TOP TIER ALONG THE CABLE TRENCHES & WELDED TO EACH OF THE RACK AT EVERY 1500mm INTERVAL.



EQUIPMENT & STRUCTURE EARTHING DETAILS
CABLE RACK SUPPORT

COMPU. DRG. REF.

DRG. NO.

TB-4-382-316-013

REV. 00

SHEET No.
08



Siemens Limited
Siemens Energy India
E-76 Waluj MIDC Area
Aurangabad, India - 431133

Approval of this drawing/document does not absolve contractor of its responsibility for manufacturing of the equipment as per ER & GTP for the achievement of designed performance at site and completeness of the equipment.

जाँची गई
CHECKED
[Signature]
01/10/2024

DRAWING NAME : HMI PANEL

PROJECT TITLE 4X111 MW VISHNUGAD PIPALKOTI H.E. PROJECT
DRAWING NUMBER TB-382-316-35-13
PRODUCT TYPE 8DQ1 SWITCHGEAR
OUR CLIENT/EPC BHARAT HEAVY ELECTRICALS LTD.
END CUSTOMER THDC INDIA LTD
PLACE OF INSTALLATION INDOOR

संस्तुत
RECOMMENDED

यथा टिप्पणी अनुमोदित
APPROVED AS NOTED

RESPONSIBLE FOR PROJECT SANKET BUDDHE
SYSTEM VOLTAGE 400 KV
CONTROL VOLTAGE 220 (V)DC
HEATER & ILLUMINATION SUPPLY 240 (V)AC

TOTAL NO. OF PAGES 5

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00		18/09/2024	FOR APPROVAL	SANKET	ANAND	GULAM Q	PROJECT NAME : 4X111 MW VISHNUGAD PIPALKOTI H.E. PROJECT		CLIENT : BHARAT HEAVY ELECTRICALS LTD.	TITLE SHEET	= HMI Panel
REV	DATE	REMARKS	DRAWN BY	CHECKED BY	APPROVED BY	CUSTOMER DRAWING NO :	END CUSTOMER : THDC INDIA LTD		CONSULTANT :	DWG NO. : -	REV No. Page 1

BAY =C01				
GAS COMP	PRESSURE VALUE			UNIT
	L1	L2	L3	
GC.00	5.6	5.6	5.6	Bar
GC.01	5.2	5.2	5.2	Bar
GC.02	5.2	5.2	5.2	Bar
GC.03	5.2	5.2	5.2	Bar
GC.04	5.2	5.2	5.2	Bar
GC.05	5.2	5.2	5.2	Bar
GC.06	5.2	5.2	5.2	Bar
GC.07	5.2	5.2	5.2	Bar
GC.08	5.2	5.2	5.2	Bar
GC.09	5.2	5.2	5.2	Bar
GC.10	5.2	5.2	5.2	Bar
GC.11	5.2	5.2	5.2	Bar

SCREEN -1
TOTAL DM- 36

BAY =C02				
GAS COMP	PRESSURE VALUE			UNIT
	L1	L2	L3	
GC.00	5.6	5.6	5.6	Bar
GC.01	5.2	5.2	5.2	Bar
GC.02	5.2	5.2	5.2	Bar
GC.03	5.2	5.2	5.2	Bar
GC.04	5.2	5.2	5.2	Bar
GC.05	5.2	5.2	5.2	Bar
GC.06	5.2	5.2	5.2	Bar
GC.07	5.2	5.2	5.2	Bar
GC.08	5.2	5.2	5.2	Bar
GC.09	5.2	5.2	5.2	Bar

SCREEN -2
TOTAL DM- 30

BAY =C03				
GAS COMP	PRESSURE VALUE			UNIT
	L1	L2	L3	
GC.00	5.6	5.6	5.6	Bar
GC.01	5.2	5.2	5.2	Bar
GC.02	5.2	5.2	5.2	Bar
GC.03	5.2	5.2	5.2	Bar
GC.04	5.2	5.2	5.2	Bar
GC.05	5.2	5.2	5.2	Bar
GC.06	5.2	5.2	5.2	Bar

SCREEN -3
TOTAL DM- 21

BAY =(C03) BBM				
GAS COMP	PRESSURE VALUE			UNIT
	L1	L2	L3	
GC.07	5.6	5.6	5.6	Bar
GC.08	5.2	5.2	5.2	Bar
GC.09	5.2	5.2	5.2	Bar
GC.10	5.2	5.2	5.2	Bar
GC.11	5.6	5.6	5.6	Bar
GC.12	5.6	5.6	5.6	Bar

SCREEN -4
TOTAL DM- 18

BAY =C04				
GAS COMP	PRESSURE VALUE			UNIT
	L1	L2	L3	
GC.00	5.6	5.6	5.6	Bar
GC.01	5.2	5.2	5.2	Bar
GC.02	5.2	5.2	5.2	Bar
GC.03	5.2	5.2	5.2	Bar
GC.04	5.2	5.2	5.2	Bar
GC.05	5.2	5.2	5.2	Bar
GC.06	5.2	5.2	5.2	Bar
GC.07	5.2	5.2	5.2	Bar
GC.08	5.2	5.2	5.2	Bar
GC.09	5.2	5.2	5.2	Bar

SCREEN -5
TOTAL DM- 30

BAY =C05				
GAS COMP	PRESSURE VALUE			UNIT
	L1	L2	L3	
GC.00	5.6	5.6	5.6	Bar
GC.01	5.2	5.2	5.2	Bar
GC.02	5.2	5.2	5.2	Bar
GC.03	5.2	5.2	5.2	Bar
GC.04	5.2	5.2	5.2	Bar
GC.05	5.2	5.2	5.2	Bar
GC.06	5.2	5.2	5.2	Bar
GC.07	5.2	5.2	5.2	Bar
GC.08	5.2	5.2	5.2	Bar
GC.09	5.2	5.2	5.2	Bar

SCREEN -6
TOTAL DM- 30

BAY =C06				
GAS COMP	PRESSURE VALUE			UNIT
	L1	L2	L3	
GC.00	5.6	5.6	5.6	Bar
GC.01	5.2	5.2	5.2	Bar
GC.02	5.2	5.2	5.2	Bar
GC.03	5.2	5.2	5.2	Bar
GC.04	5.2	5.2	5.2	Bar
GC.05	5.2	5.2	5.2	Bar
GC.06	5.2	5.2	5.2	Bar
GC.07	5.2	5.2	5.2	Bar
GC.08	5.2	5.2	5.2	Bar
GC.09	5.2	5.2	5.2	Bar

SCREEN -7
TOTAL DM- 30

BAY =C07				
GAS COMP	PRESSURE VALUE			UNIT
	L1	L2	L3	
GC.00	5.6	5.6	5.6	Bar
GC.01	5.2	5.2	5.2	Bar
GC.02	5.2	5.2	5.2	Bar
GC.03	5.2	5.2	5.2	Bar
GC.04	5.2	5.2	5.2	Bar
GC.05	5.2	5.2	5.2	Bar
GC.06	5.2	5.2	5.2	Bar
GC.07	5.2	5.2	5.2	Bar
GC.08	5.2	5.2	5.2	Bar
GC.09	5.2	5.2	5.2	Bar
GC.10	5.2	5.2	5.2	Bar
GC.11	5.2	5.2	5.2	Bar

SCREEN -8
TOTAL DM- 36

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00	18/09/2024	FOR APPROVAL	SANKET	ANAND	GULAM Q
REV	DATE	REMARKS	DRAWN BY	CHECKED BY	APPROVED BY

PROJECT NAME :
4X111 MW VISHNUGAD PIPALKOTI H.E. PROJECT

CUSTOMER DRAWING NO :

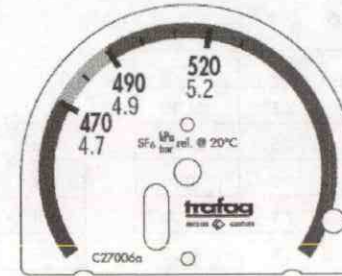
CLIENT : BHARAT HEAVY ELECTRICALS LTD.
END CUSTOMER : THDC INDIA LTD
CONSULTANT :
CUST. DWG. NO. :

HMI DISPLAY	= HMI Panel
DWG NO. : -	REV No. Page 3
	00 Page 5

PRESSURE SETTINGS

FOR CB & VT

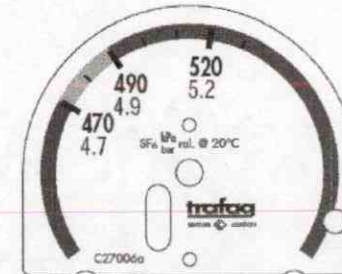
RATED PRESSURE: 560kPa / 5.6bar rel. @20° C	
ALARM LEVEL 1: 520kPa / 5.2bar rel. @20° C	SET FOR DECREASING PRESSURE
ALARM LEVEL 2: 500kPa / 5.0bar rel. @20° C	SET FOR DECREASING PRESSURE
ALARM LEVEL 3: 500kPa / 5.0bar rel. @20° C	SET FOR DECREASING PRESSURE



C1B41205494007

FOR OTHER
COMPARTMENT
EXCEPT CB & VT

RATED PRESSURE: 520kPa / 5.2bar rel. @20° C	
ALARM LEVEL 1: 490kPa / 4.9bar rel. @20° C	SET FOR DECREASING PRESSURE
ALARM LEVEL 2: 470kPa / 4.7bar rel. @20° C	SET FOR DECREASING PRESSURE
ALARM LEVEL 3: 470kPa / 4.7bar rel. @20° C	SET FOR DECREASING PRESSURE



C1B41205494006

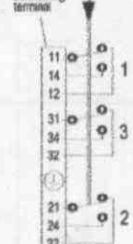
Divyanshu

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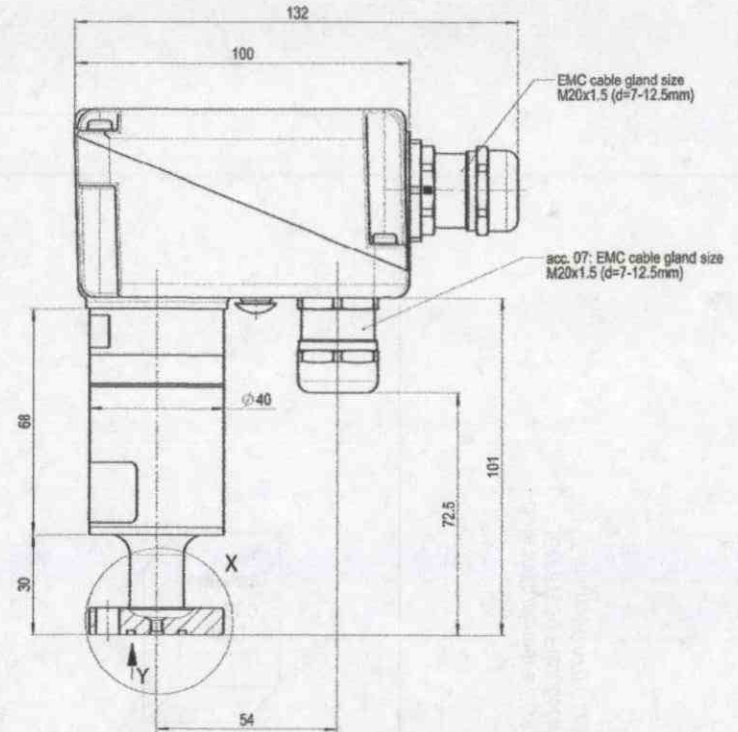
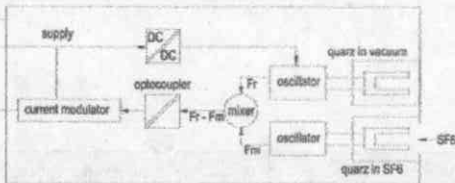
					PROJECT NAME : 4X111 MW VISHNUGAD PIPALKOTI H.E. PROJECT	SIEMENS energy	CLIENT : BHARAT HEAVY ELECTRICALS LTD.	PRESSURE SETTINGS	= HMI Panel
00	18/09/2024	FOR APPROVAL	SANKET	ANAND	GULAM Q.		END CUSTOMER : THDC INDIA LTD		REV No. Page 4
REV	DATE	REMARKS	DRAWN BY	CHECKED BY	APPROVED BY	CUSTOMER DRAWING NO :	CONS :	DWG NO. : -	00 Page 5

ELECTRICAL CONNECTION

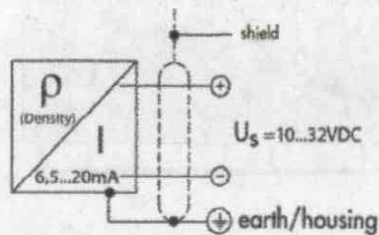
wiring diagram
878X.20.2200.XX
number of microswitches
according to application (max.3)



type label
878X.20.2200.XX
number of microswitches
according to application (max.3)



electrical connection



CABLING DETAILS:

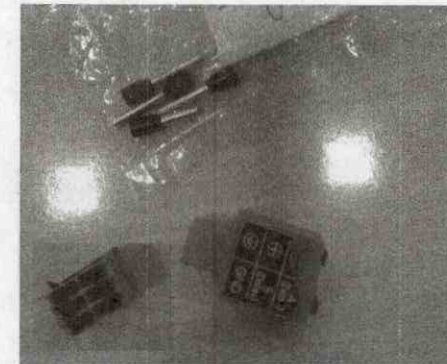
LUGS TO USED FOR DM CABLING :- CORRUGATED PIN TYPE

CABLE TYPE :- SCREENED TWISTED PAIR 3 CORE CABLE FOR COMMUNICATION

TOTAL CABLE LENGTH :- 4000 MTRS

DM GLAND SIZE :- M20

NOTE: HMI SHALL BE PROVIDED WITH WALL MOUNTING PROVISION

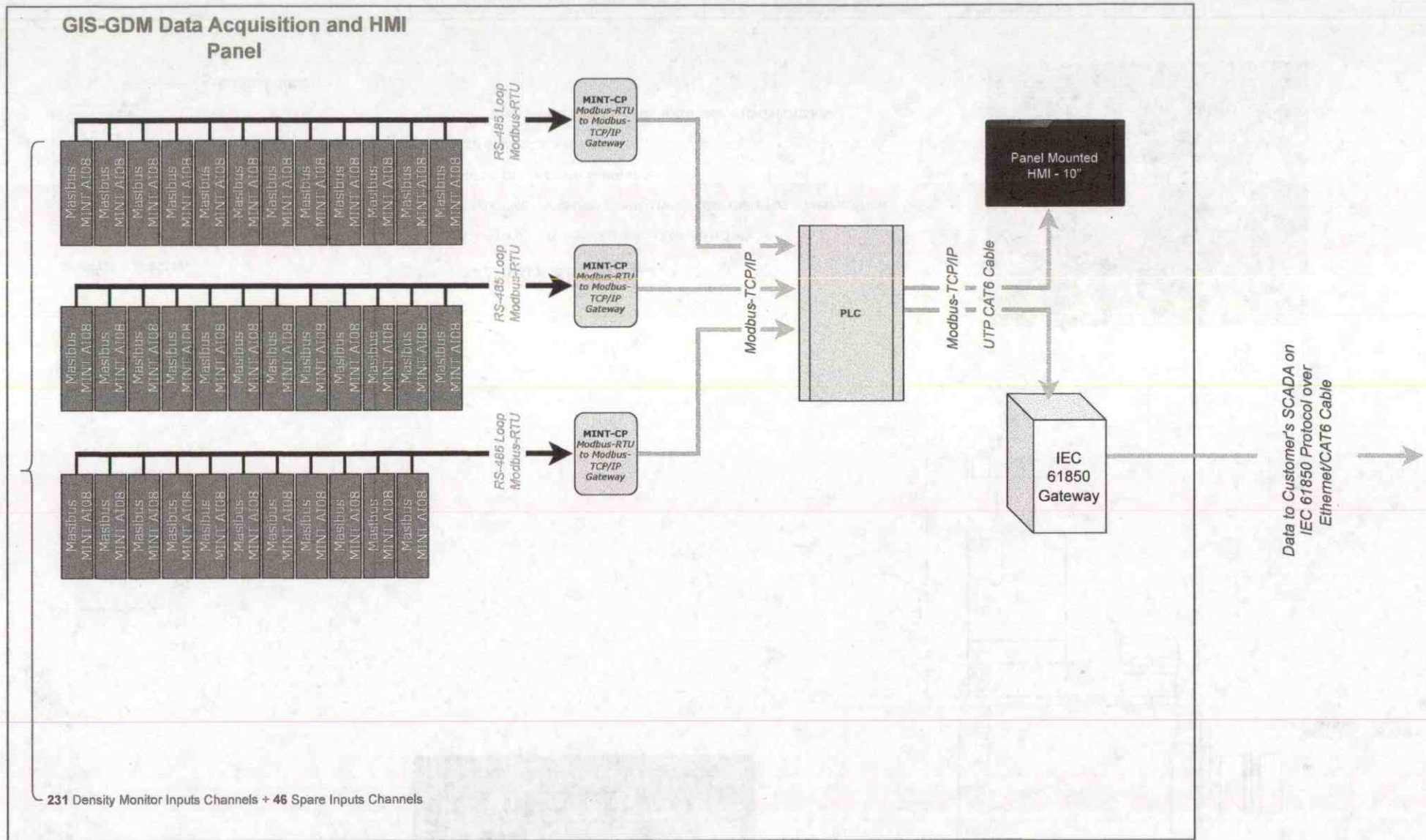


Signature

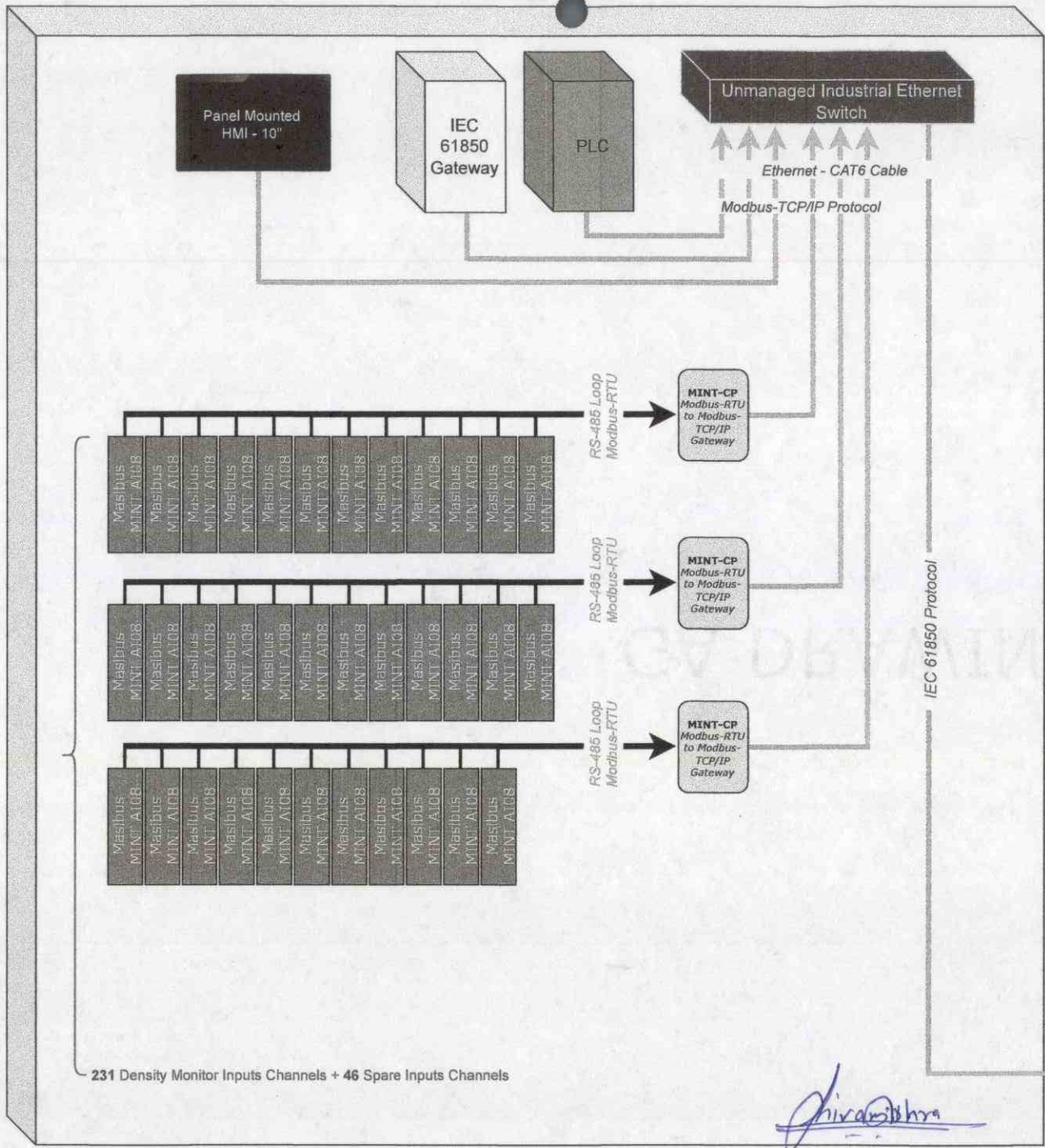
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					PROJECT NAME :	4X111 MW VISHNUGAD PIPALKOTI H.E. PROJECT			CLIENT :	BHARAT HEAVY ELECTRICALS LTD.		ELECTRICAL CONNECTION	= HMI Panel	
					END CUSTOMER :	THDC INDIA LTD			CONSULTANT :				REV No.	Page 5
00	10/09/2024	FOR APPROVAL	SANKET	ANAND	GULAM Q	CUSTOMER DRAWING NO :			CUST. DWG. NO. :			DWG NO. : -	00	Page 5

BLOCK DIAGRAM FOR DATA FLOW DIAGRAM




[Handwritten Signature]



BLOCK DIAGRAM FOR CONNECTION
 DIAGRAM

GA DRAWING



REV	DATE	DESCRIPTION	D9GN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL OHS Panel					
SUPPLIER: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: GENERAL ARRANGEMENT					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A4	229999	229999-01-GA-R0	1	0

TECHNICAL SPECIFICATION OF PANEL

OVERALL DIMENSION FOR ENTIRE PANEL : 2115 (2000+15+100) mm (H) X1300 mm (W) X 600 mm (D)

MOUNTING PLATE DIMENSION : 1900 mm (H) X 1199 mm (W) X 3 mm (T)

CONSTRUCTION FEATURES

1. MATERIAL : CRCA Sheet Steel

2. THICKNESS

- a. Enclosure Frame : 1.5 mm CRCA sheet steel of 9 folded construction
- b. Front door : 2 mm
- c. Side Panel sheet : 1.5 mm
- d. Cable gland plate : 1.5 mm
- e. mounting plate : 3 mm

3. COLOR

- a. Shade for External : RAL 7032 (Siemens Grey)
- b. Shade for Internal : RAL 7032 (Siemens Grey)
- c. Shade for Service & Gland Plate : RAL 7032 (Siemens Grey)
- d. Shade for Base : RAL9005 (BLACK)

4. ACCESSORIES

- a. Locking arrangement : 3-Point Locking.
- b. Lifting arrangement : 04 Nos. Eye Bolts
- c. Gasket : Doors & covers joints will be provided with rubber foam gaskets to be fixing type.
- d. Anti Vibration Pad : 15mm
- e. Louvers : 01 Nos. / Panel
- f. Drawing pocket : 01 Nos. (A3 SIZE)

5. ELECTRICAL ITEM

- a. Door Switch : 01 Nos. / Panel
- b. LED 5W, 230VAC : 01 Nos. / Panel
- c. Fan with Louvers : 01 Nos. / Panel

6. PROTECTION CLASS : IP 54 (Without Cutout)

7. MAKE : REPUTED

8. QTY. : 1 No. 2115 (2000+15+100) mm (H) X1300 mm (W) X 600 mm (D)

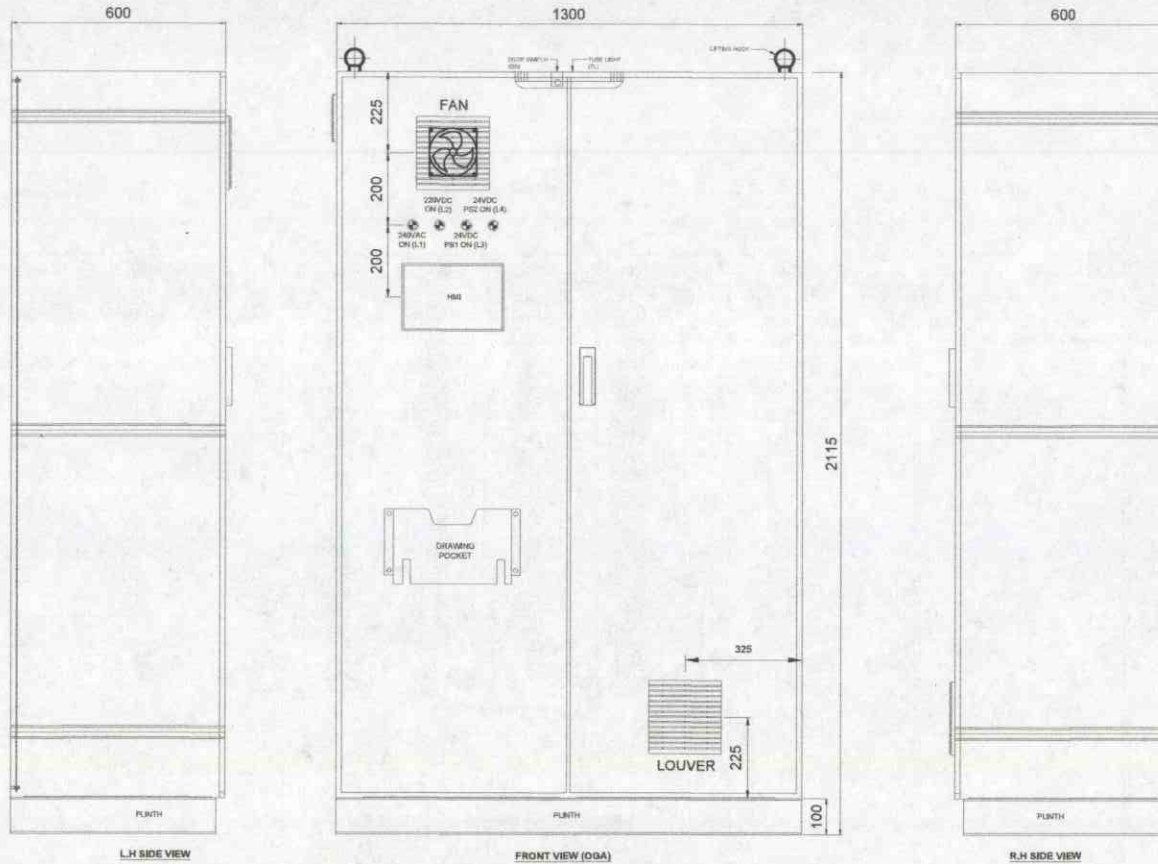
GENERAL NOTES

- a. Field cable entries - From BOTTOM of panel
- b. Free standing type panel
- c. Inter Illumination with door switch
- d. All dimension are in mm. with tolerance ± 5 mm.



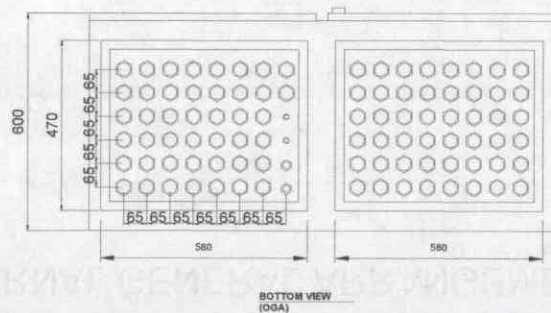
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ
PROJECT: HIM PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
SUPPLIER: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: GENERAL ARRANGEMENT					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A4	229998	229999-01-GA-R0	3	0

OVERALL GENERAL ARRANGEMENT DRAWING



NOTE:

For completeness of site commissioning activity, any additional material if required shall be in BHEL/Siemens scope.



PG28 -62 QTY.
PG16 -2 QTY.
PG7 -2 QTY.

For completeness of site commissioning activity, additional material shall be considered by HMI supplier. if required

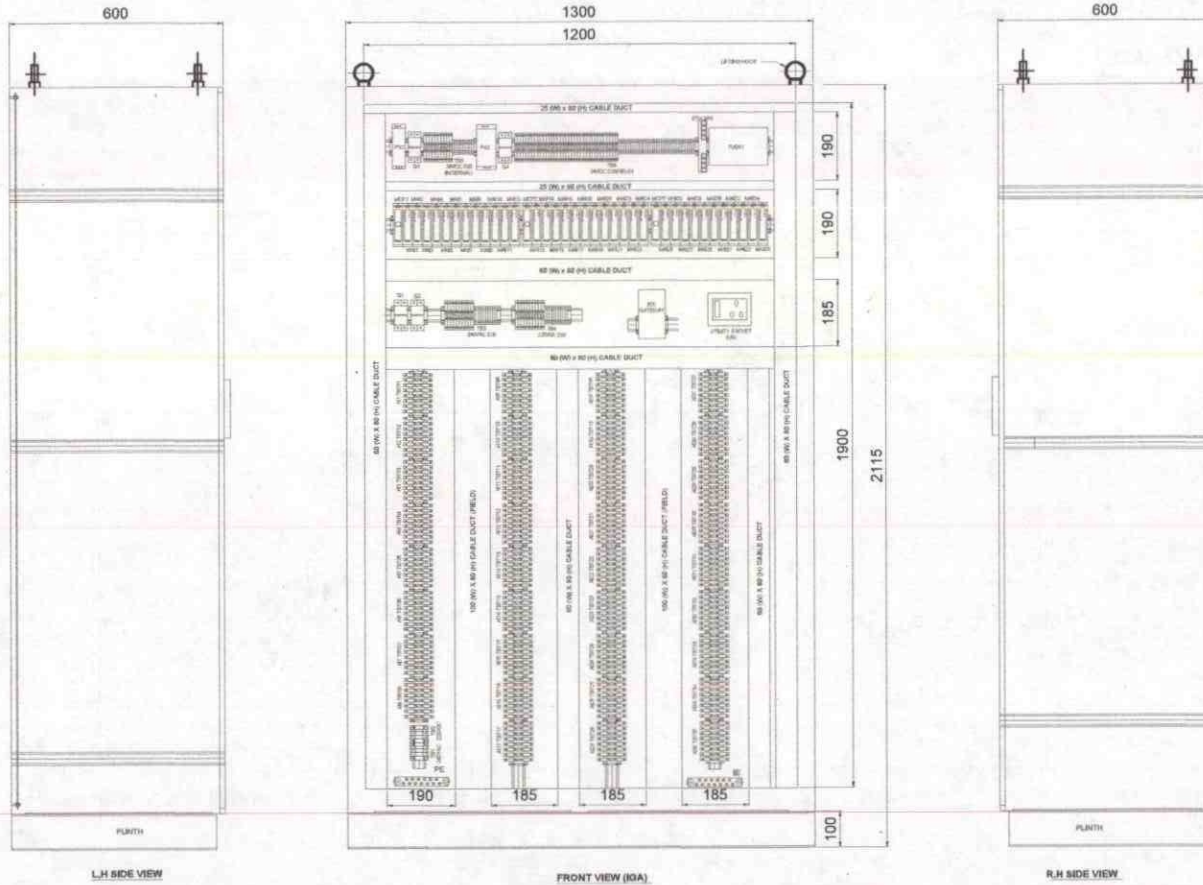
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
CLIENT: SIEMENS - BHEL GIS Panel
SUPPLIER : MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
TITLE: GENERAL ARRANGEMENT

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A4	229999	229999-01-GA-RD	4	0

Divya Sharma

INTERNAL GENERAL ARRANGEMENT DIAGRAM



Shivam Sharma

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GD Panel					
SUPPLIER: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: GENERAL ARRANGEMENT					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A4	229988	229989-01-GA-R0	5	0

Sr. No.	Item Description	Make	Model/Item Code	Qty.	UOM	Legend
1	Fully Wired Safe Area Panel with Internal Accessories - Material: MS - Approx. Size (In mm): 2115 (H) x 1300 (W) x 600 (D) - Color: RAL 7032	Reputed		1	Nos.	PANEL
2	Mint Intelligent Input Card	Masibus	MINT-AI-2-N-N-S0	35	Nos.	AI1 TO AI35
3	MINT Communication Processor	Masibus	MINT CP	3	Nos.	MINTCP1 TO MINTCP3
4	Programmable Logic Controller	Schneider	TM200/241	1	Nos.	PLC
5	Modbus TCP/IP to IEC 61850 Protocol Gateway	Kalkitech	SYNC 2000-M1	1	Nos.	GATEWAY
6	Human Machine Interface ~ HMI	Schneider	HMIET6500	1	Nos.	HMI
7	Power Supply ~ 240VAC/220VDC to 24 VDC, 10A	Mornsun	LIF240-10B24R2S	1	Nos.	PS1
8	Power Supply ~ 240VAC/220VDC to 24 VDC, 5A	Mornsun	L1120-20B24R2S	1	Nos.	PS2
9	Unmanaged Industrial Ethernet Switch, 8 Ports	Phoenix	1085256	1	Nos.	ETH SWITCH
10	2-Pole, 16A MCB	Schneider	A9N2P16C	1	Nos.	Q2
11	2-Pole, 6A MCB	Schneider	A9N2P06C	1	Nos.	Q1
12	2-Pole, 10A MCB	Schneider	A9N2P10C	2	Nos.	Q3, Q4
13	24 VDC Lamp ~ Green	Teknic		2	Nos.	L3, L4
14	220 VDC Lamp ~ Green	Teknic		1	Nos.	L2
15	240 VAC Lamp ~ Red	Teknic		1	Nos.	L1
16	6" Fan With Grill and filter Kit	Reputed	-	2	Nos.	FAN
17	LED Panel Light ~ 12W, 240VAC	Reputed	-	1	Nos.	TL
18	Door Switch	Reputed	-	1	Nos.	DS
19	Utility Socket ~ 5A	Reputed	-	1	Nos.	US
20	Glands - PG-29 for Entry of Signal Cables (3 Cables through 1 Gland)	Reputed	-	93	Nos.	
21	Glands - PG-16 for Entry of Communication Cable	Reputed	-	2	Nos.	
22	Glands - PG-07 for Entry of Power Cables	Reputed	-	2	Nos.	
23	Ethernet Patch Cord	Reputed	-	0	Nos.	
24	2-core x 1 sq. mm Stranded Copper Conductor, PVC Insulated, Shielded Armoured Cable	Rashi	-	13000	Mtrs.	

NTOE: Bom is noted, however, any additional items required for completeness of system shall be in BHEL/Siemens scope.

(Signature)

For completeness of site commissioning activity, additional material shall be considered by HMI Supplier, if required

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
SUPPLIER: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: GENERAL ARRANGEMENT					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A4	229989	229989-01-GA-R0	6	0

Rev. SH.	0	1	2	3	4	5	6	7	8	9	10
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2	X										
3	X										
4	X										
5	X										
6	X										
7	X										
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Shivanth

REV	DATE	DESCRIPTION	DDGN	CHKD	APPD
0	11.08.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
CLIENT: SIEMENS - BHEL GIS Panel
SUPPLIER : MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
TITLE: GENERAL ARRANGEMENT

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A4	23988	23989-01-GA-RD	7	0

WIRING DRAWING - 400KV

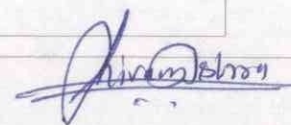


REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
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PROJECT: HMI PANEL					
CLIENT: SIEMENS - SHEL O&S Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SG NO.	DWG. NO.	SH. NO.	REV.
NTB	A3	SO-2425-229999	SO-2425-229999-01-V4-R0	1	0

INDEX PAGE

Sheet No.	Description	Sheet No.	Description	Sheet No.	Description	Sheet No.	Description
1	COVER PAGE	29	ANALOG INPUT WIRING DRAWING	57		85	
2	INDEX SHEET	30	ANALOG INPUT WIRING DRAWING	58		86	
3	WIRING INFORMATION DETAIL	31	ANALOG INPUT WIRING DRAWING	59		87	
4	230V AC POWER DISTRIBUTION WIRING	32	ANALOG INPUT WIRING DRAWING	60		88	
5	220V DC POWER DISTRIBUTION WIRING	33	ANALOG INPUT WIRING DRAWING	61		89	
6	24V DC POWER DISTRIBUTION WIRING (INTERNAL)	34	ANALOG INPUT WIRING DRAWING	62		90	
7	24V DC POWER DISTRIBUTION WIRING (FIELD)	35	ANALOG INPUT WIRING DRAWING	63		91	
8	24V DC POWER DISTRIBUTION WIRING (FIELD)	36	ANALOG INPUT WIRING DRAWING	64		92	
9	24V DC POWER DISTRIBUTION WIRING (FIELD)	37	ANALOG INPUT WIRING DRAWING	65		93	
10	SPARE SHEET	38	ANALOG INPUT WIRING DRAWING	66		94	
11	RS-485 COMMUNICATION WIRING DRAWING	39	ANALOG INPUT WIRING DRAWING	67		95	
12	ANALOG INPUT WIRING DRAWING	40	ANALOG INPUT WIRING DRAWING	68		96	
13	ANALOG INPUT WIRING DRAWING	41	ANALOG INPUT WIRING DRAWING	69		97	
14	ANALOG INPUT WIRING DRAWING	42	ANALOG INPUT WIRING DRAWING	70		98	
15	ANALOG INPUT WIRING DRAWING	43	ANALOG INPUT WIRING DRAWING	71		99	
16	ANALOG INPUT WIRING DRAWING	44	ANALOG INPUT WIRING DRAWING	72		100	
17	ANALOG INPUT WIRING DRAWING	45	ANALOG INPUT WIRING DRAWING	73			
18	ANALOG INPUT WIRING DRAWING	46	ANALOG INPUT WIRING DRAWING	74			
19	ANALOG INPUT WIRING DRAWING	47	REVISION HISTORY DETAIL	75			
20	ANALOG INPUT WIRING DRAWING	48		76			
21	ANALOG INPUT WIRING DRAWING	49		77			
22	ANALOG INPUT WIRING DRAWING	50		78			
23	ANALOG INPUT WIRING DRAWING	51		79			
24	ANALOG INPUT WIRING DRAWING	52		80			
25	ANALOG INPUT WIRING DRAWING	53		81			
26	ANALOG INPUT WIRING DRAWING	54		82			
27	ANALOG INPUT WIRING DRAWING	55		83			
28	ANALOG INPUT WIRING DRAWING	56		84			

0	11.09.24	FIRST ISSUE	DN	DP	KJ				
REV	DATE	DESCRIPTION	D8GN	CHKD	APPD				
PROJECT: HMI PANEL									
CLIENT: SIEMENS - BHEL QIS Panel									
CONTRACTOR:									
SYSTEM SOLUTION BY: MAGIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD.									
TITLE: WIRING DRAWING									
SCALE	SIZE	SO NO.	DWG. NO.	BH. NO.	REV.				
NTS	A3	SO-2425-229999	SO-2425-229999-01-WA-R0	2	0				



INFORMATION PAGE

CROSS FERRULING DETAIL

T101	T101-01/T102-01	T101-01/T102-01	T102
01	T101-02/T102-02	T101-02/T102-02	01
02			02

WIRE SIZE

SR NO.	SIGNAL TYPE	WIRE SIZE	CURRENT CAPACITY	WIRE COLOR	LEGEND
01	240 VAC INCOMER	2.5 SQ MM	24 A	RED (240 VAC-P) BLACK (240 VAC-N)	RD2.5 , BK2.5
02	240 VAC DISTRIBUTION	1.5 SQ MM	17 A	RED (240 VAC-P) BLACK (240 VAC-N)	RD1.5 , BK1.5
03	220 VDC INCOMER	2.5 SQ MM	24 A	WHITE (220 VDC) BLUE (0 VDC)	WH2.5 , BL2.5
04	220 VDC DISTRIBUTION	2.5 SQ MM	24 A	WHITE (220 VDC) BLUE (0 VDC)	WH2.5 , BL2.5
05	24 VDC INCOMER	2.5 SQ MM	24 A	WHITE (24 VDC) BLUE (0 VDC)	WH2.5 , BL2.5
06	24 VDC DISTRIBUTION	0.5 SQ MM	5 A	WHITE (24 VDC) BLUE (0 VDC)	WH0.5 , BL0.5
07	ANALOG I/P	0.5 SQ MM	5 A	WHITE	WH0.5
08	POWER EARTH	2.5 SQ MM	24 A	GREEN	G2.5
09	INSTRUMENT EARTH	2.5 SQ MM	24 A	YELLOW - GREEN	YG2.5
10					
11					

SYMBOL LIBRARY

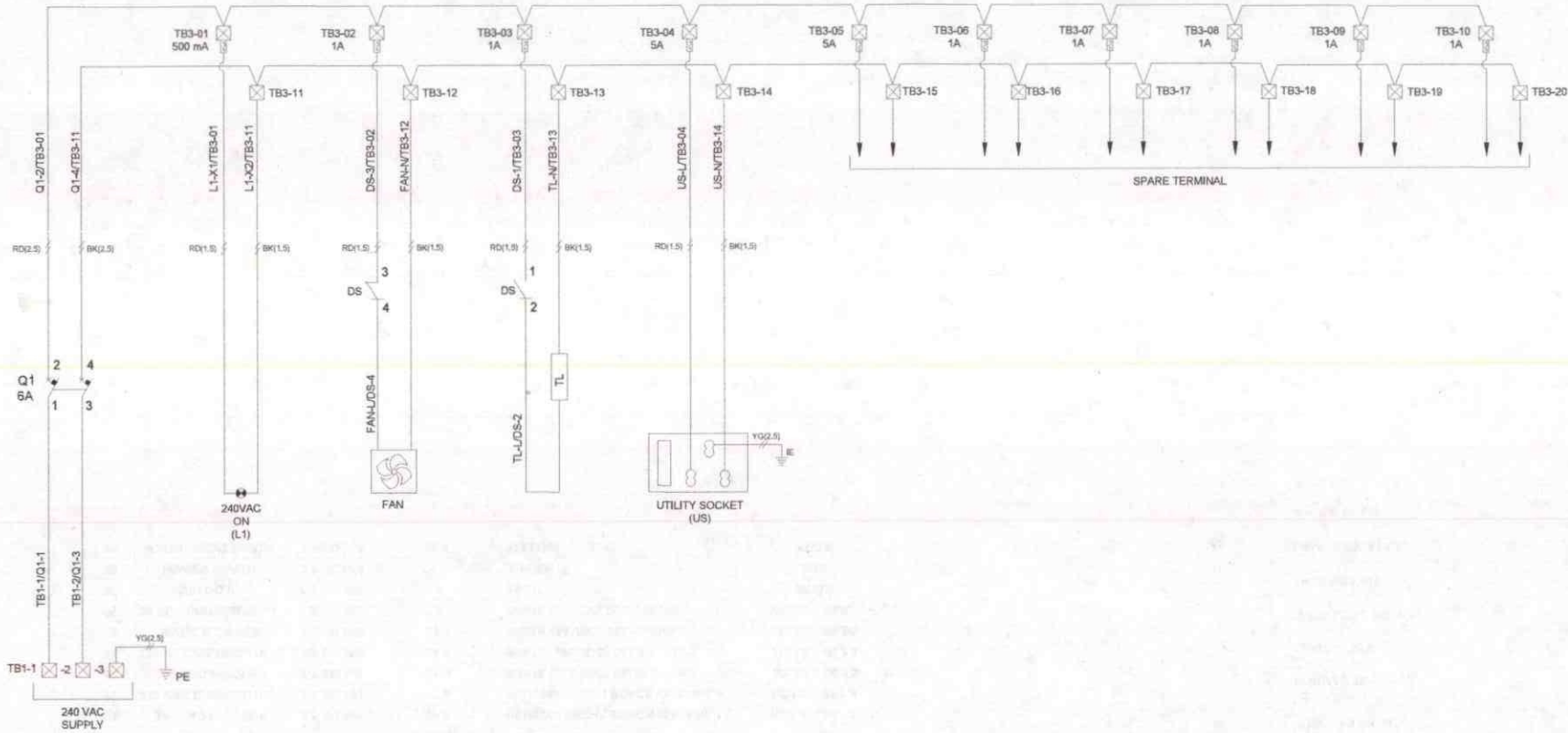
SYMBOL	DESCRIPTION
	2 POLE MCB
	FAN
	DOOR SWITCH
	TUBE LIGHT
	FUSE TERMINAL
	NORMAL TERMINAL
	CONTACTOR
	OVER LOAD RELAY
	THERMOSTATE
	LAMP INDICATION
	4 POLE MCCB

Chiranjit Debora

0	11.09.24	FIRST ISSUE	DN	DP	IJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD.					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WM-R0	3	0

240V AC DISTRIBUTION WIRING DRAWING

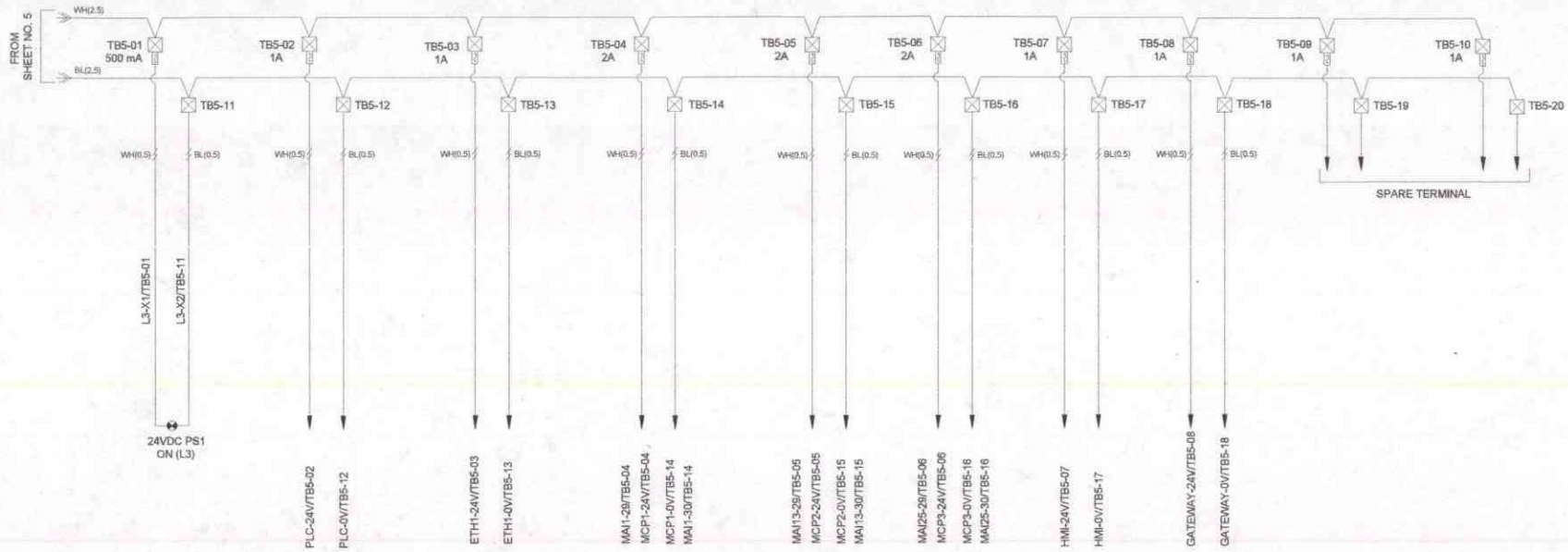
NOTE:-



Signature

0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MARIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD.					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	80-2425-229899	80-2425-229899-01-AM-R0	4	0

24V DC POWER DISTRIBUTION WIRING (INTERNAL)



NOTE:-

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD

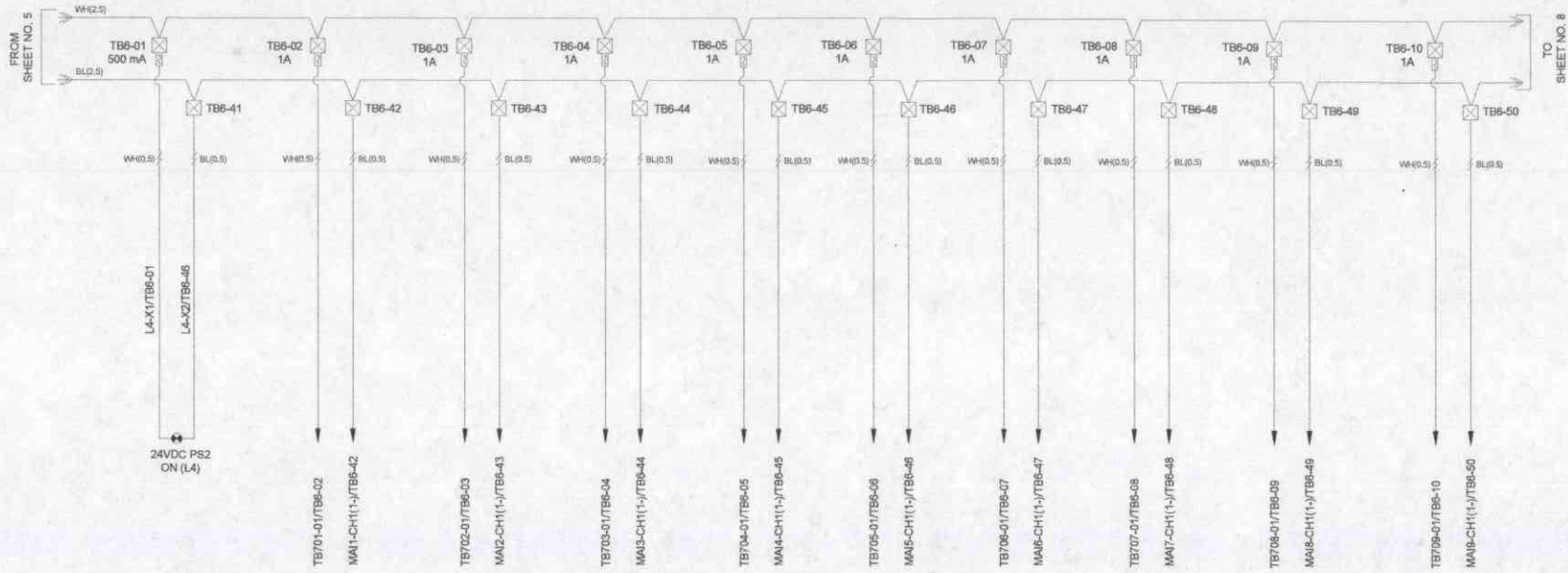
TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229898	SO-2425-229898-01-VM-R0	8	0

Shivabhar

24V DC POWER DISTRIBUTION WIRING (FIELD)

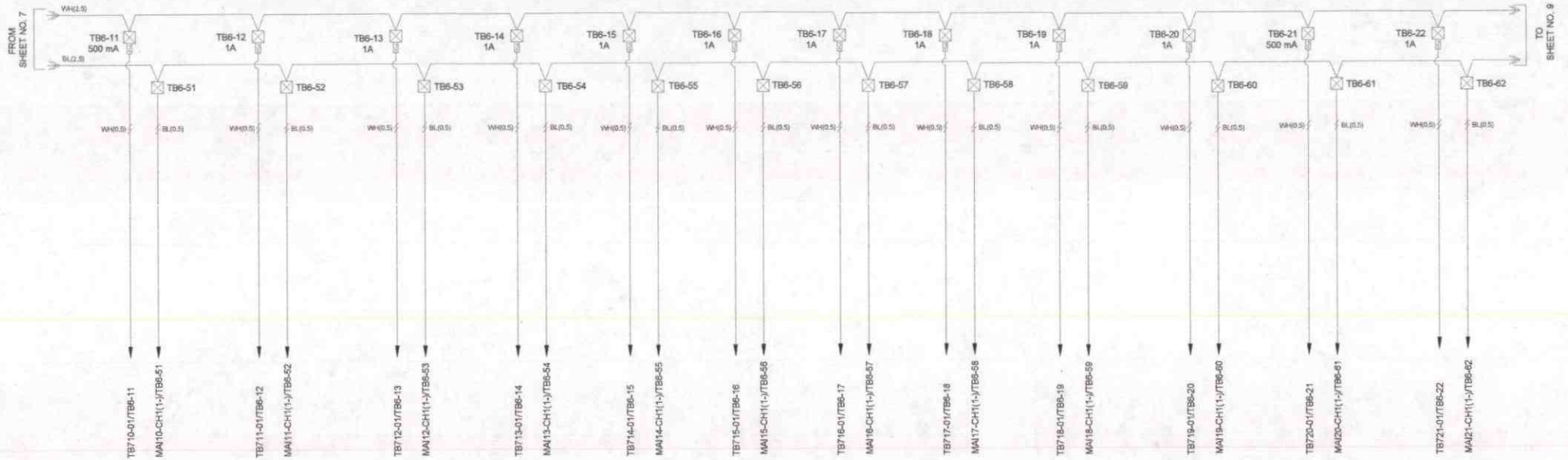
NOTE:-



Chiranjit Das

0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WH-R0	7	0

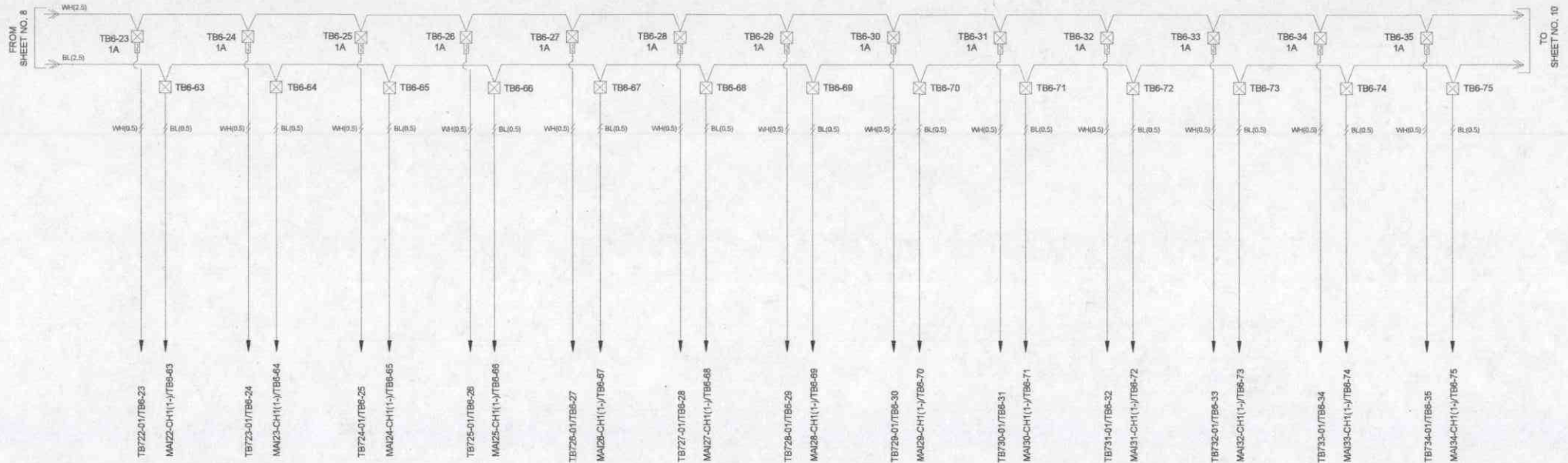
24V DC POWER DISTRIBUTION WIRING (FIELD)



Shiraj Shrivastava

0	11.05.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DBGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL OIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-228889	SO-2425-229999-01-VM-R3	8	0

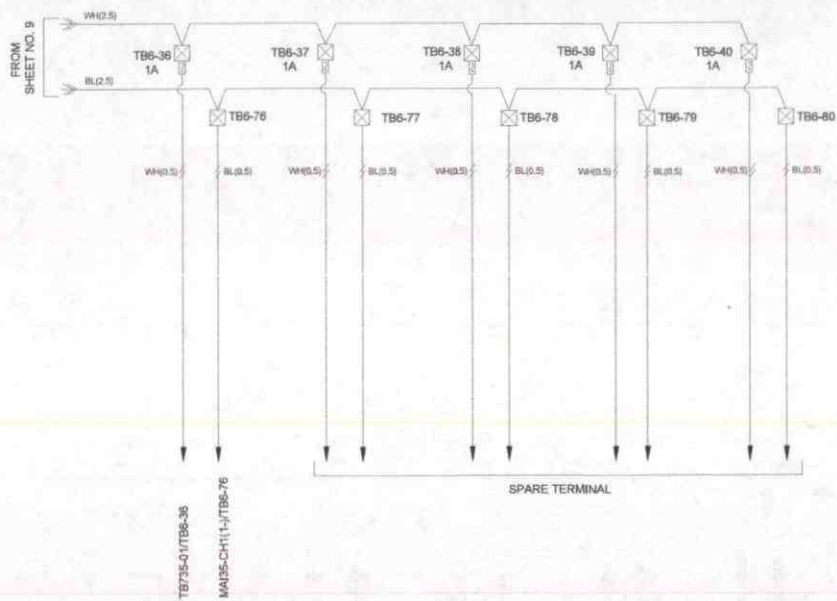
24V DC POWER DISTRIBUTION WIRING (FIELD)



0	11.09.24	FIRST ISSUE	DN	DP	KJ				
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD				
PROJECT: HMI PANEL									
CLIENT: SIEMENS - BHEL GIS Panel									
CONTRACTOR:									
SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD									
TITLE: WIRING DRAWING									
SCALE	SIZE	SO NO.	OWG. NO.	BH. NO.	REV.				
NTS	A3	SO-2425-229999	SO-2425-229999-01-WR-0	9	0				

Handwritten signature

24V DC POWER DISTRIBUTION WIRING (FIELD)



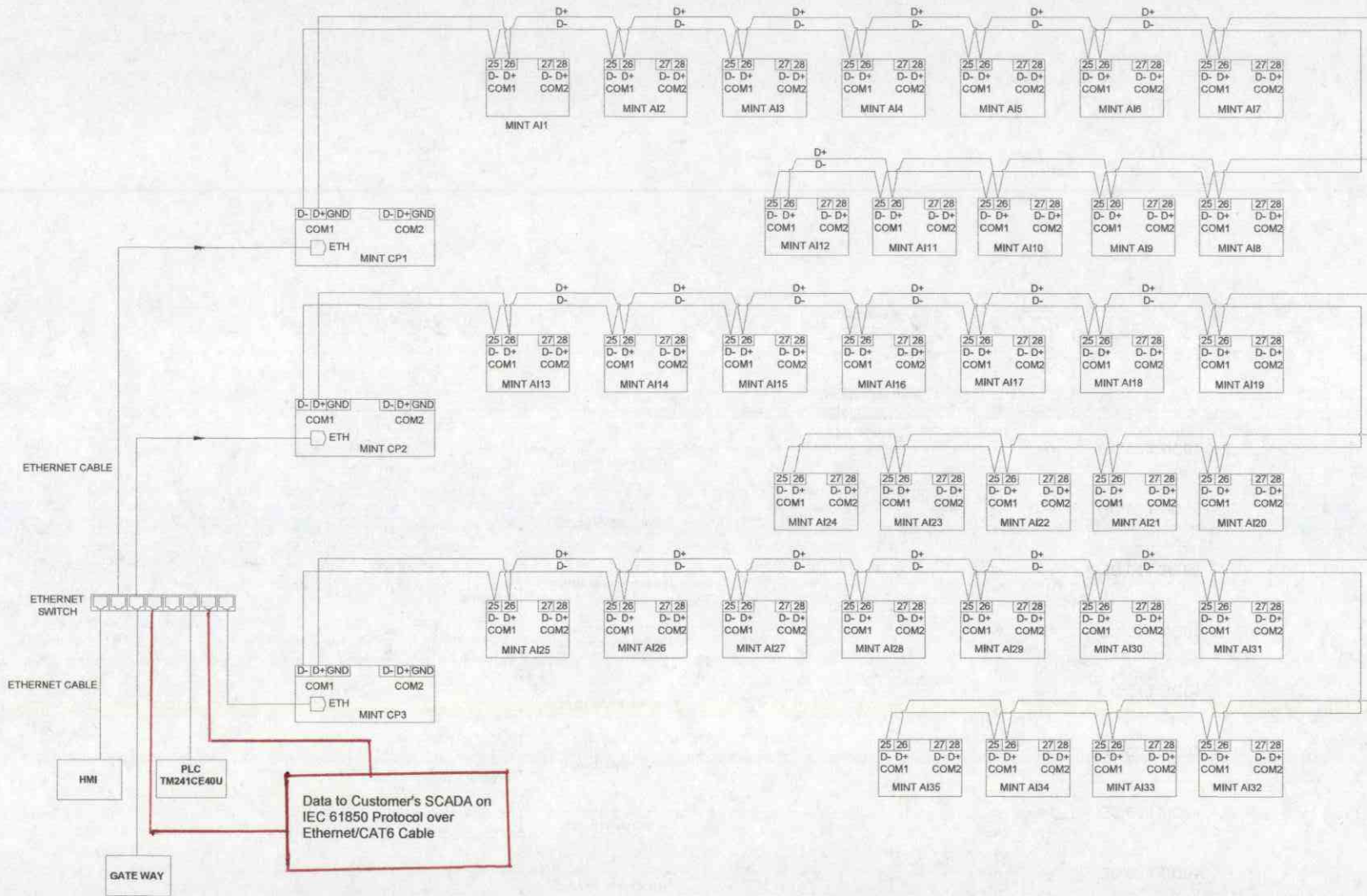
NOTE:-

Signature

0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	S/O NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229699	SO-2425-229999-01-WR-R0	10	0

RS-485 COMMUNICATION WIRING DRAWING

NOTE:-



Divansh

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229909	SO-2425-229909-01-WM-R0	11	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MAI2

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 02



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	GC.02.L3/C01
1-		
2C		
2+	CH2	GC.03.L1/C01
2-		
3C		
3+	CH3	GC.03.L2/C01
3-		
4C		
4+	CH4	GC.03.L3/C01
4-		
5C		
5+	CH5	GC.04.L1/C01
5-		
6C		
6+	CH6	GC.04.L2/C01
6-		
7C		
7+	CH7	GC.04.L3/C01
7-		
8C		
8+	CH8	GC.05.L1/C01
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL OIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MAGBUS AUTOMATION AND INSTRUMENTATION PVT. LTD.
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-VM-RS	13	0

Shivam Singh

**MINT ANALOG INPUT
(8 point Analog Input)**

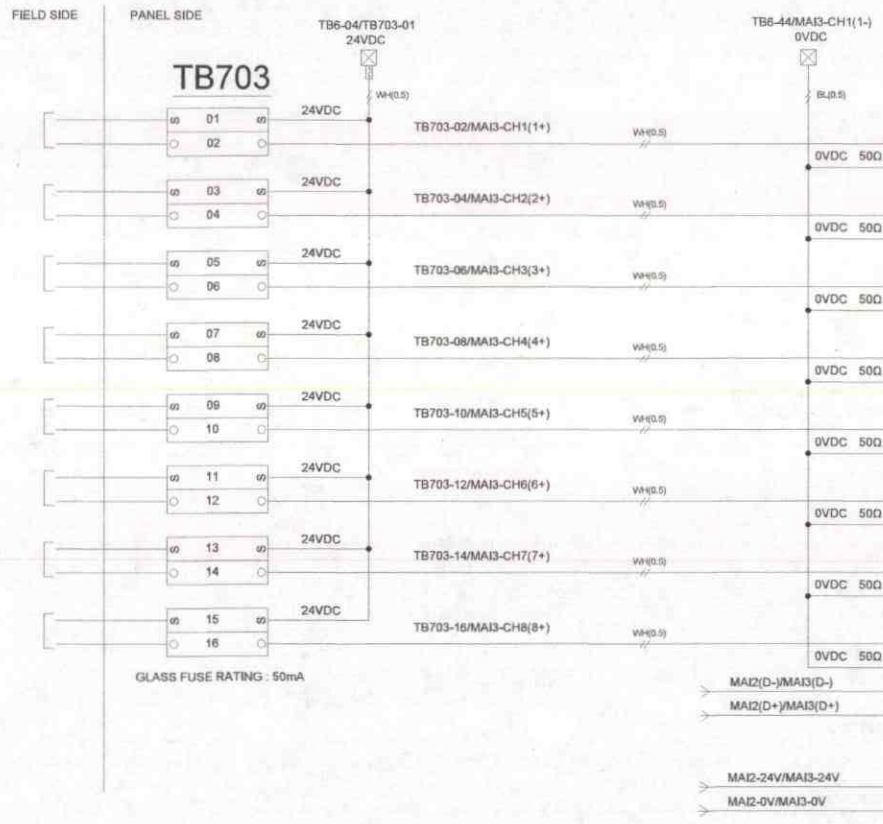
BASE UNIT : NA

LEGEND : MAI3

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 03



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.05.L2/C01
1+		
1-	CH2	GC.05.L3/C01
2C		
2+	CH3	GC.06.L1/C01
2-		
3C	CH4	GC.06.L2/C01
3+		
3-	CH5	GC.06.L3/C01
4C		
4+	CH6	GC.07.L1/C01
4-		
5C	CH7	GC.07.L2/C01
5+		
5-	CH8	GC.07.L3/C01
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

Divya

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229989	SO-2425-229999-01-VM-R0	14	0

**MINT ANALOG INPUT
(8 point Analog Input)**

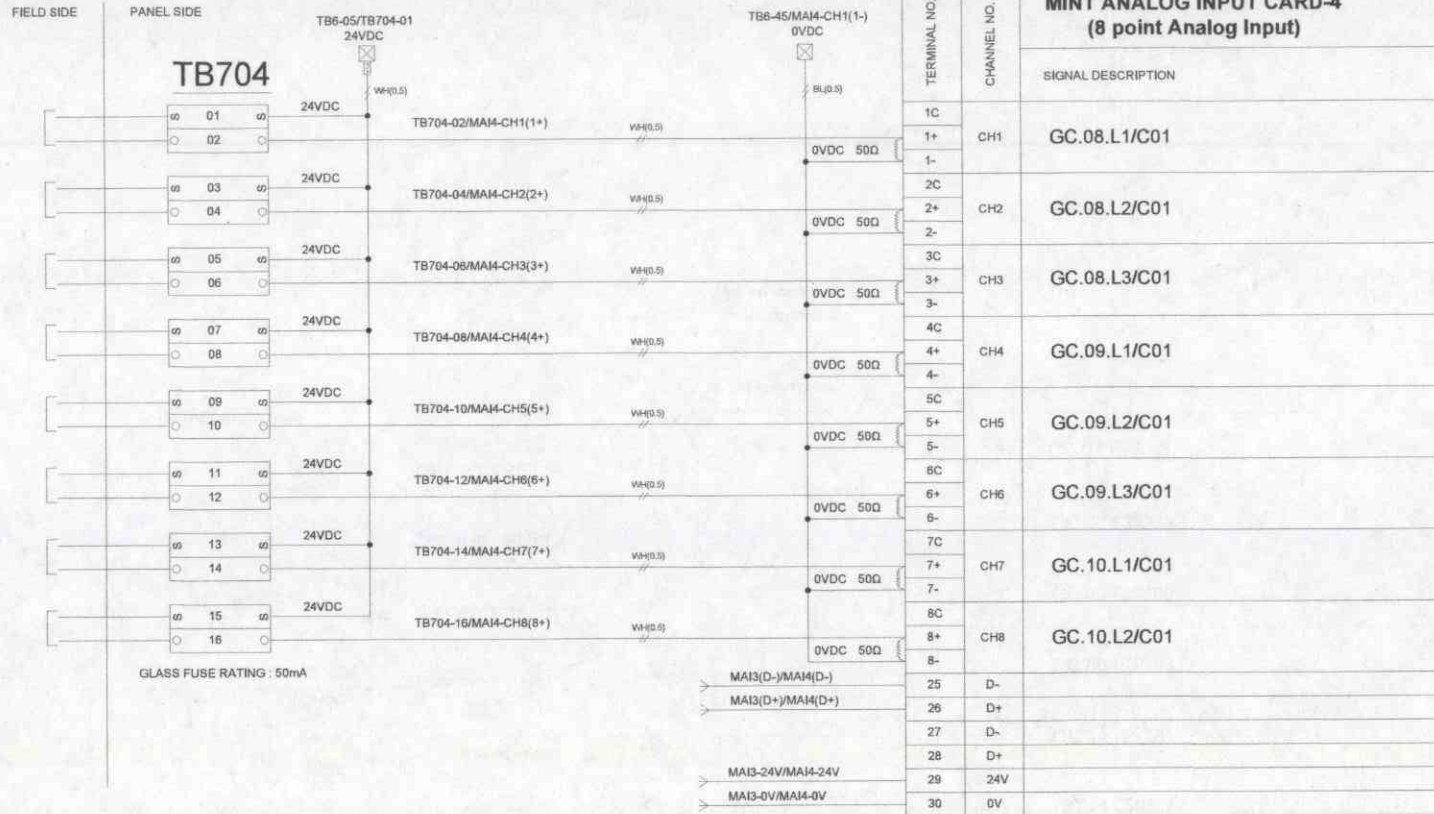
BASE UNIT : NA

LEGEND : MAI4

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 04



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	GC.08.L1/C01
1-		
2C		
2+	CH2	GC.08.L2/C01
2-		
3C		
3+	CH3	GC.08.L3/C01
3-		
4C		
4+	CH4	GC.09.L1/C01
4-		
5C		
5+	CH5	GC.09.L2/C01
5-		
6C		
6+	CH6	GC.09.L3/C01
6-		
7C		
7+	CH7	GC.10.L1/C01
7-		
8C		
8+	CH8	GC.10.L2/C01
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

REV	DATE	DESCRIPTION	DSGN	CHKD	APPR
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL

CLIENT: SIEMENS - BHEL GIS Panel

CONTRACTOR:

SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD

TITLE: WIRING DRAWING

SCALE	SIZE	SD NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WM-R0	15	0

Signature

**MINT ANALOG INPUT
(8 point Analog Input)**

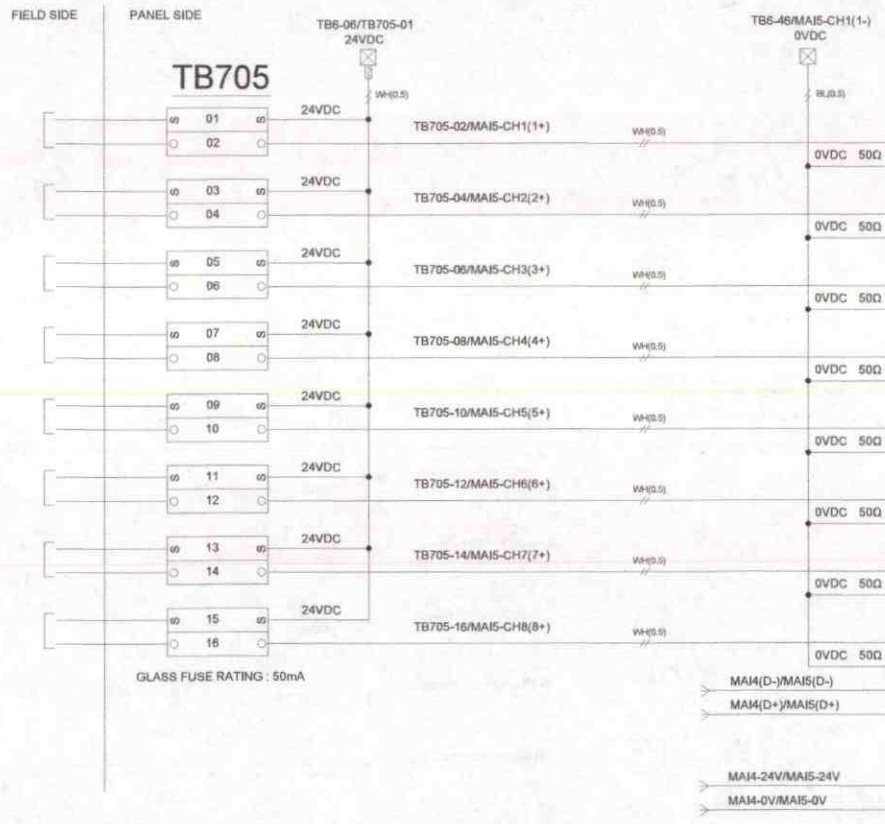
BASE UNIT : NA

LEGEND : MAIS

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 05



GLASS FUSE RATING : 50mA

TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	GC.10.L3/C01
1-		
2C		
2+	CH2	GC.11.L1/C01
2-		
3C		
3+	CH3	GC.11.L2/C01
3-		
4C		
4+	CH4	GC.11.L3/C01
4-		
5C		
5+	CH5	GC.00.L1/C02
5-		
6C		
6+	CH6	GC.00.L2/C02
6-		
7C		
7+	CH7	GC.00.L3/C02
7-		
8C		
8+	CH8	GC.01.L1/C02
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

Hiradhegy

0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-228988	SO-2425-228989-01-VA-R0	16	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA
MODULE : MINT-AI-08

LEGEND : MAI6
SLAVE ID : 06

NOTE:-



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.01.L2/C02
1+		
1-	CH2	GC.01.L3/C02
2C		
2+	CH3	GC.02.L1/C02
2-		
3C	CH4	GC.02.L2/C02
3+		
3-	CH5	GC.02.L3/C02
4C		
4+	CH6	GC.03.L1/C02
4-		
5C	CH7	GC.03.L2/C02
5+		
5-	CH8	GC.03.L3/C02
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
CLIENT: SIEMENS - BHEL GIS Panel
CONTRACTOR:
SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WR-0	17	0

Signature

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MAI7

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 07



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.04.L1/C02
1+		
1-	CH2	GC.04.L2/C02
2C		
2+	CH3	GC.04.L3/C02
2-		
3C	CH4	GC.05.L1/C02
3+		
3-	CH5	GC.05.L2/C02
4C		
4+	CH6	GC.05.L3/C02
4-		
5C	CH7	GC.06.L1/C02
5+		
5-	CH8	GC.06.L2/C02
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

Mirza Shera

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-228990	SO-2425-228999-01-WA-R0	18	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MA18

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 08



GLASS FUSE RATING : 50mA

MAI7(D-)/MAI8(D-)
 MAI7(D+)/MAI8(D+)
 MAI7-24V/MAI8-24V
 MAI7-24V/MAI8-0V

Divansh Singh

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-VM-R0	10	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MAI9

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 09



GLASS FUSE RATING : 50mA

TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.09.L2/C02
1+		
1-	CH2	GC.09.L3/C02
2C		
2+	CH3	GC.00.L1/C03
2-		
3C	CH4	GC.00.L2/C03
3+		
3-	CH5	GC.00.L3/C03
4C		
4+	CH6	GC.01.L1/C03
4-		
5C	CH7	GC.01.L2/C03
5+		
5-	CH8	GC.01.L3/C03
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

Shivam Bham

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASSBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WR-09	20	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MA110

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 10



TERMINAL NO.	CHANNEL NO.	MINT ANALOG INPUT CARD-10 (8 point Analog Input)
SIGNAL DESCRIPTION		
1C		
1+	CH1	GC.02.L1/C03
1-		
2C		
2+	CH2	GC.02.L2/C03
2-		
3C		
3+	CH3	GC.02.L3/C03
3-		
4C		
4+	CH4	GC.03.L1/C03
4-		
5C		
5+	CH5	GC.03.L2/C03
5-		
6C		
6+	CH6	GC.03.L3/C03
6-		
7C		
7+	CH7	GC.04.L1/C03
7-		
8C		
8+	CH8	GC.04.L2/C03
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.08.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL

CLIENT: SIEMENS - BHEL QIS Panel

CONTRACTOR:

SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD

TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WI-RD	21	0

Divya Mishra

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MAI11

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 11



Signature

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.08.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL OIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MARRIUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-VM-R0	22	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MAH2

NOTE:-

MODULE : MINT-AI-08

SLAVE ID :12



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.07.L2/C03
1+		
1-		
2C	CH2	GC.07.L3/C03
2+		
2-		
3C	CH3	GC.08.L1/C03
3+		
3-		
4C	CH4	GC.08.L2/C03
4+		
4-		
5C	CH5	GC.08.L3/C03
5+		
5-		
6C	CH6	GC.09.L1/C03
6+		
6-		
7C	CH7	GC.09.L2/C03
7+		
7-		
8C	CH8	GC.09.L3/C03
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - SHEL OIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MARISSUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-228889	SO-2425-228889-01-WM-R0	23	0

[Handwritten Signature]

**MINT ANALOG INPUT
(8 point Analog Input)**

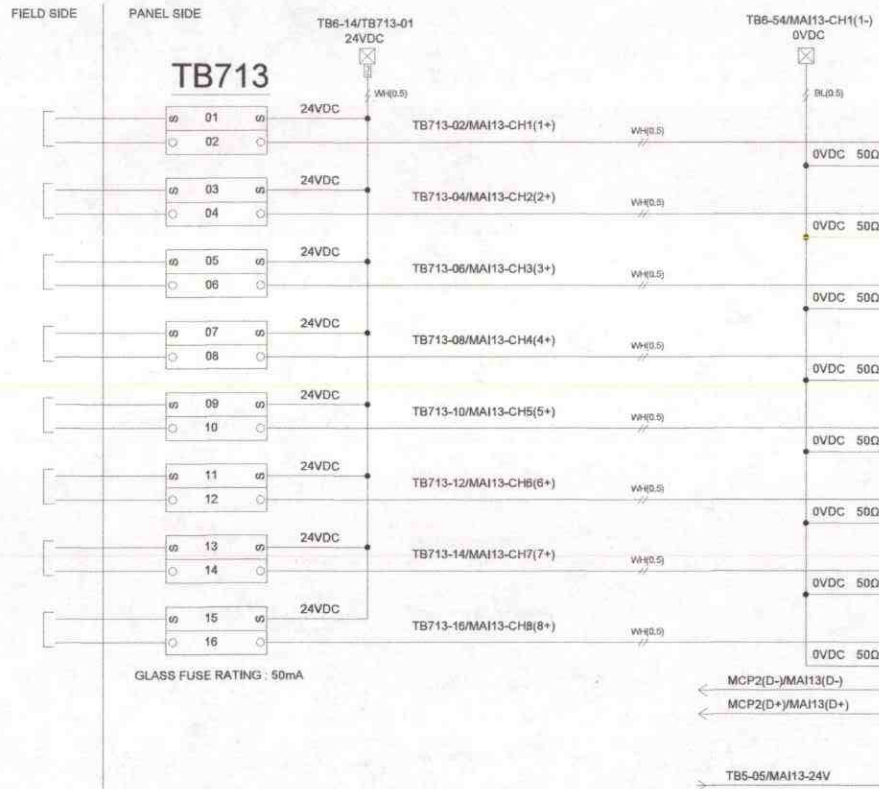
BASE UNIT : NA

LEGEND : MA113

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 13



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.10.L1/C03
1+		
1-	CH2	GC.10.L2/C03
2C		
2+	CH3	GC.10.L3/C03
2-		
3C	CH4	GC.11.L1/C03
3+		
3-	CH5	GC.11.L2/C03
4C		
4+	CH6	GC.11.L3/C03
4-		
5C	CH7	GC.12.L1/C03
5+		
5-	CH8	GC.12.L2/C03
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

MCP2(D-)MAI13(D-)
MCP2(D+)MAI13(D+)

TB5-05/MAI13-24V
TB5-15/MAI13-0V

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL OIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD.
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229898	SO-2425-229898-01-WM-R0	24	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MAH4

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 14



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	GC.12.L3/C03
1-		
2C		
2+	CH2	GC.00.L1/C04
2-		
3C		
3+	CH3	GC.00.L2/C04
3-		
4C		
4+	CH4	GC.00.L3/C04
4-		
5C		
5+	CH5	GC.01.L1/C04
5-		
6C		
6+	CH6	GC.01.L2/C04
6-		
7C		
7+	CH7	GC.01.L3/C04
7-		
8C		
8+	CH8	GC.02.L1/C04
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MABBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DMG. NO.	SRL NO.	REV.
NTS	A3	SO-2425-220999	SO-2425-220999-01-WR-00	25	0

Signature

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MAI15

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 15



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.02.L2/C04
1+		
1-	CH2	GC.02.L3/C04
2C		
2+	CH3	GC.03.L1/C04
2-		
3C	CH4	GC.03.L2/C04
3+		
3-	CH5	GC.03.L3/C04
4C		
4+	CH6	GC.04.L1/C04
4-		
5C	CH7	GC.04.L2/C04
5+		
5-	CH8	GC.04.L3/C04
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

(Handwritten Signature)

0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	D8GN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASHBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229899	SO-2425-229899-01-WA-R0	26	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MA16

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 16



TERMINAL NO.	CHANNEL NO.	MINT ANALOG INPUT CARD-16 (8 point Analog Input)	SIGNAL DESCRIPTION
1C			
1+	CH1		GC.05.L1/C04
1-			
2C			
2+	CH2		GC.05.L2/C04
2-			
3C			
3+	CH3		GC.05.L3/C04
3-			
4C			
4+	CH4		GC.06.L1/C04
4-			
5C			
5+	CH5		GC.06.L2/C04
5-			
6C			
6+	CH6		GC.06.L3/C04
6-			
7C			
7+	CH7		GC.07.L1/C04
7-			
8C			
8+	CH8		GC.07.L2/C04
8-			
25	D-		
26	D+		
27	D-		
28	D+		
29	24V		
30	0V		

Signature

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.08.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	S/O NO.	DIAG. NO.	SH. NO.	REV.
NTS	A3	GC-2425-229898	GC-2425-229899-01-WA-R0	27	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MAI17

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 17



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.07.L3/C04
1+		
1-	CH2	GC.08.L1/C04
2C		
2+	CH3	GC.08.L2/C04
2-		
3C	CH4	GC.08.L3/C04
3+		
3-	CH5	GC.09.L1/C04
4C		
4+	CH6	GC.09.L2/C04
4-		
5C	CH7	GC.09.L3/C04
5+		
5-	CH8	GC.00.L1/C05
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

Shivakrishna

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL DRS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SD-2425-229999-01-WR-RD	25	0

**MINT ANALOG INPUT
(8 point Analog Input)**

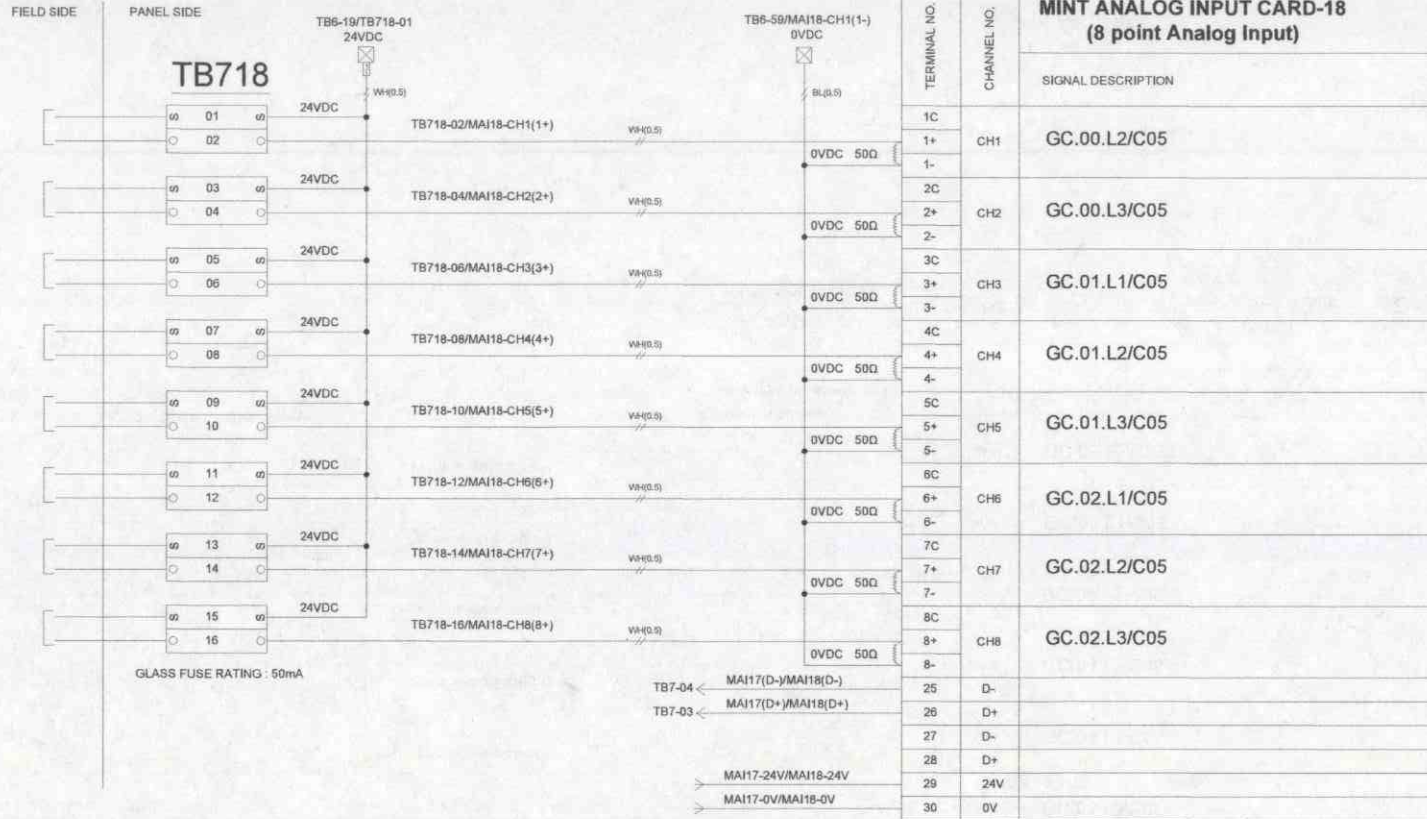
BASE UNIT : NA

LEGEND : MAI18

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 18



REV	DATE	DESCRIPTION	DSGN	CHKD	APPO
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
CLIENT: SIEMENS - BHEL GRS Panel
CONTRACTOR:
SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WR-00	29	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MA119

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 19



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	GC.03.L1/C05
1-		
2C		
2+	CH2	GC.03.L2/C05
2-		
3C		
3+	CH3	GC.03.L3/C05
3-		
4C		
4+	CH4	GC.04.L1/C05
4-		
5C		
5+	CH5	GC.04.L2/C05
5-		
6C		
6+	CH6	GC.04.L3/C05
6-		
7C		
7+	CH7	GC.05.L1/C05
7-		
8C		
8+	CH8	GC.05.L2/C05
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

Signature

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
CLIENT: SIEMENS - BHEL GIS Panel
CONTRACTOR:
SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229969	SO-2425-229969-01-WA-R0	30	0

**MINT ANALOG INPUT
(8 point Analog Input)**

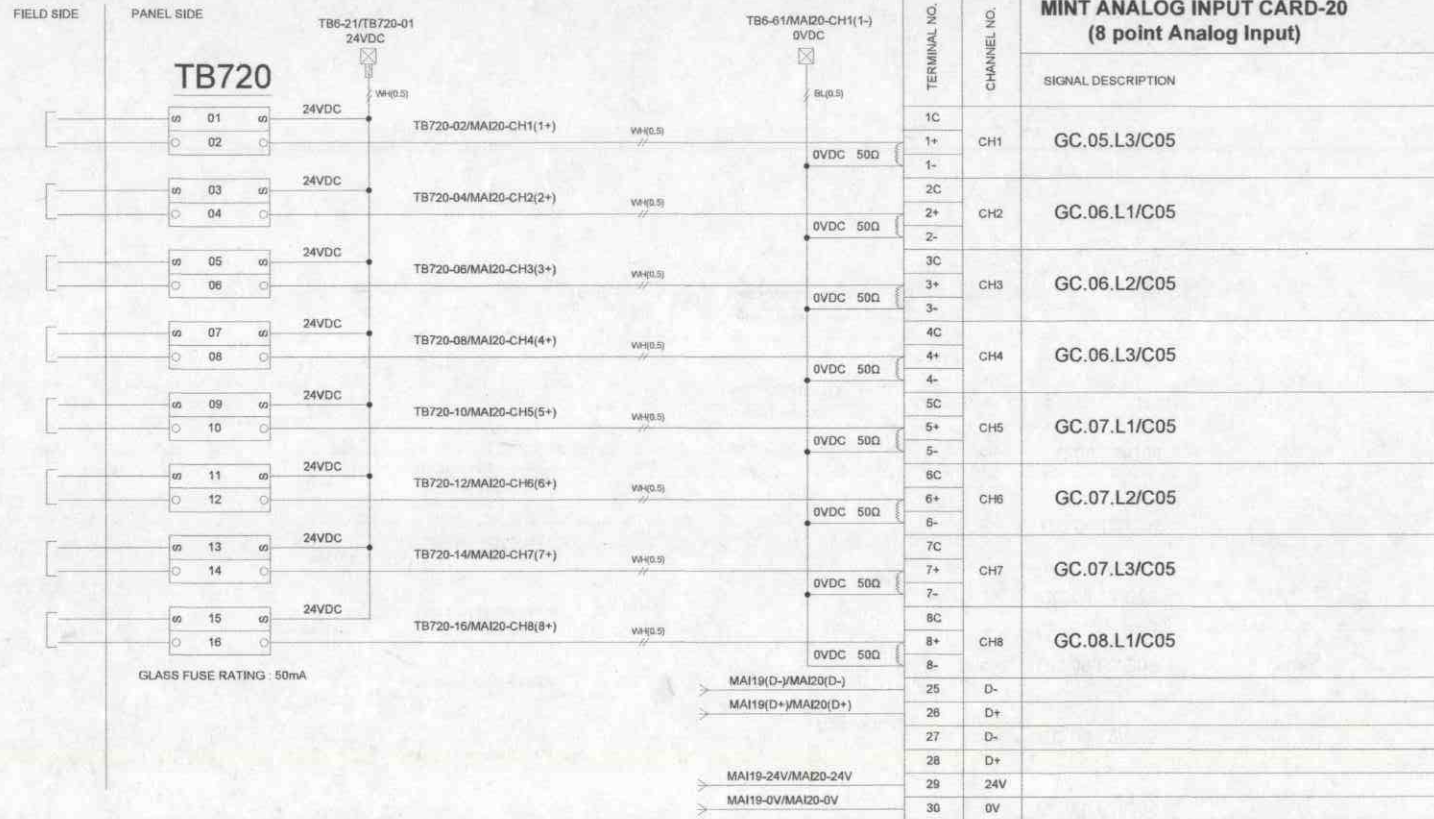
BASE UNIT : NA

LEGEND : MAI20

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 20



0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	80-2425-229988	80-2425-229989-01-VM-R0	31	0

Shivam Sharma

**MINT ANALOG INPUT
(8 point Analog Input)**

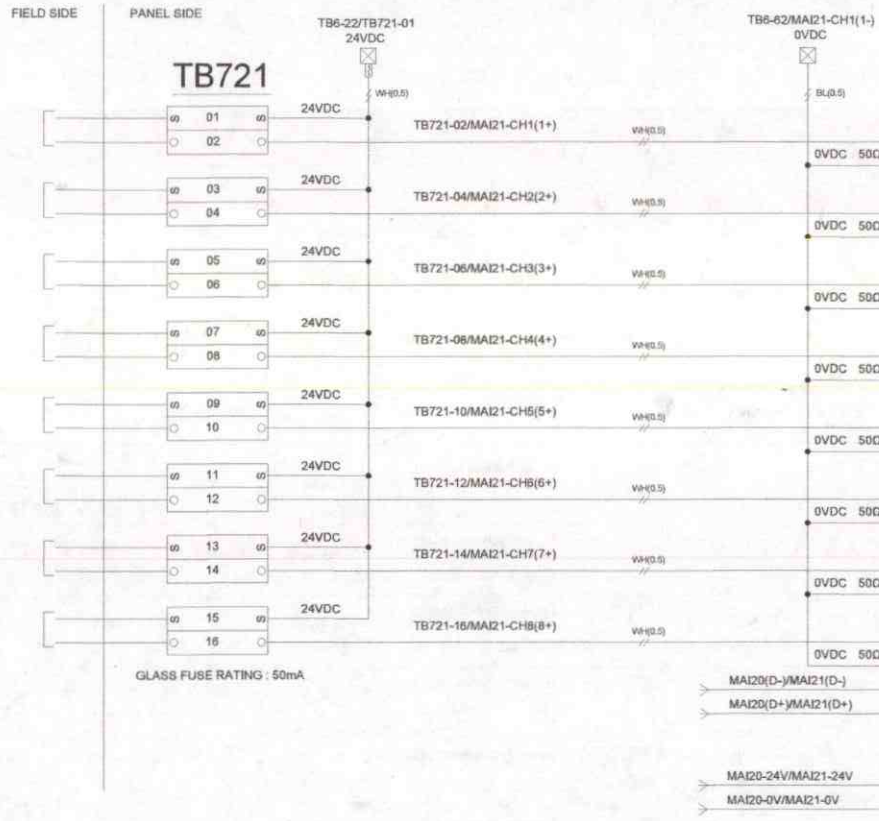
BASE UNIT : NA

LEGEND : MAI21

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 21



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	GC.08.L2/C05
1-		
2C		
2+	CH2	GC.08.L3/C05
2-		
3C		
3+	CH3	GC.09.L1/C05
3-		
4C		
4+	CH4	GC.09.L2/C05
4-		
5C		
5+	CH5	GC.09.L3/C05
5-		
6C		
6+	CH6	GC.00.L1/C06
6-		
7C		
7+	CH7	GC.00.L2/C06
7-		
8C		
8+	CH8	GC.00.L3/C06
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

Shivabharadwaj

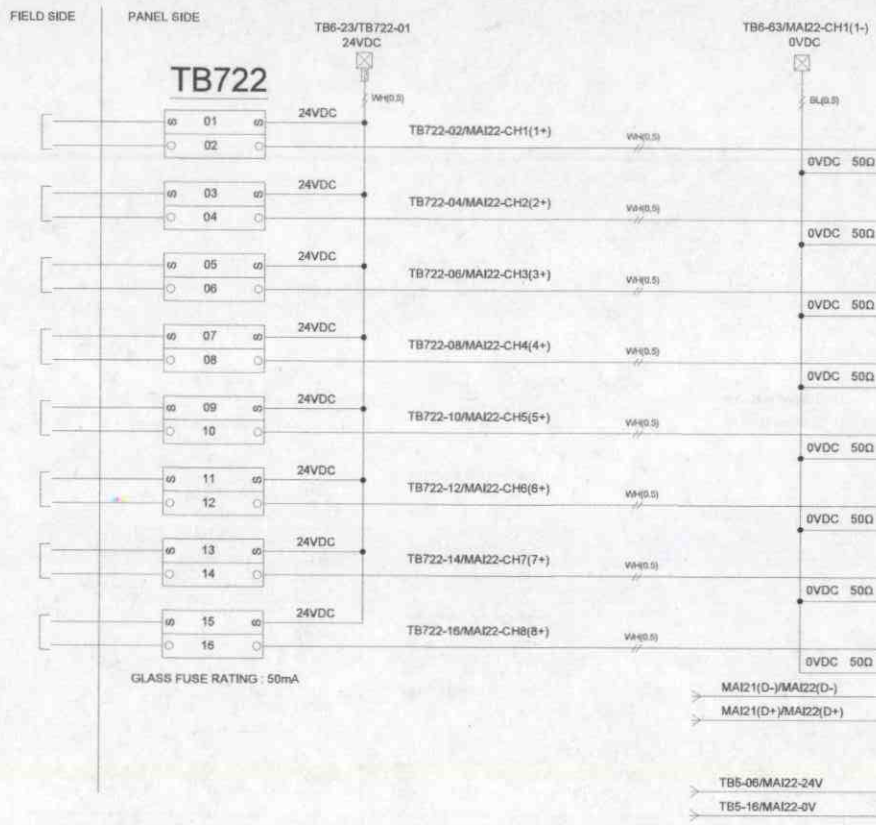
0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - EHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-VK-R0	32	0

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA
MODULE : MINT-AI-08

LEGEND : MAI22
SLAVE ID : 22

NOTE:-



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	GC.01.L1/C06
1-		
2C		
2+	CH2	GC.01.L2/C06
2-		
3C		
3+	CH3	GC.01.L3/C06
3-		
4C		
4+	CH4	GC.02.L1/C06
4-		
5C		
5+	CH5	GC.02.L2/C06
5-		
6C		
6+	CH6	GC.02.L3/C06
6-		
7C		
7+	CH7	GC.03.L1/C06
7-		
8C		
8+	CH8	GC.03.L2/C06
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

0	11.08.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - SHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WA-R0	33	0

Signature

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA

LEGEND : MAI23

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 23



GLASS FUSE RATING : 50mA

Shivam Dohari

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL OIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD.
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-228998	SO-2425-228998-01-W8-R0	34	0

**MINT ANALOG INPUT
(8 point Analog Input)**

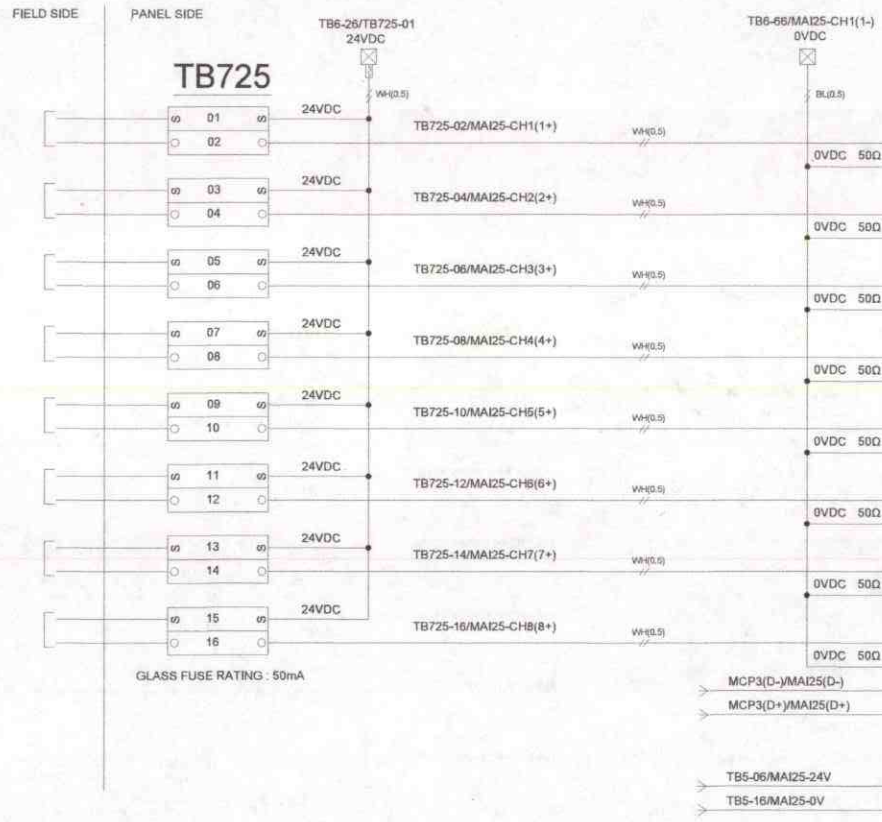
BASE UNIT : NA

LEGEND : MAI25

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 25



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.09.L1/C06
1+		
1-	CH2	GC.09.L2/C06
2C		
2+	CH3	GC.09.L3/C06
2-		
3C	CH4	GC.00.L1/C07
3+		
3-	CH5	GC.00.L2/C07
4C		
4+	CH6	GC.00.L3/C07
4-		
5C	CH7	GC.01.L1/C07
5+		
5-	CH8	GC.01.L2/C07
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DGNN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GHS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MARIUS AUTOMATION AND INSTRUMENTATION PVT. LTD.					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229998	SO-2425-229889-01-VM-R0	36	0

**MINT ANALOG INPUT
(8 point Analog Input)**

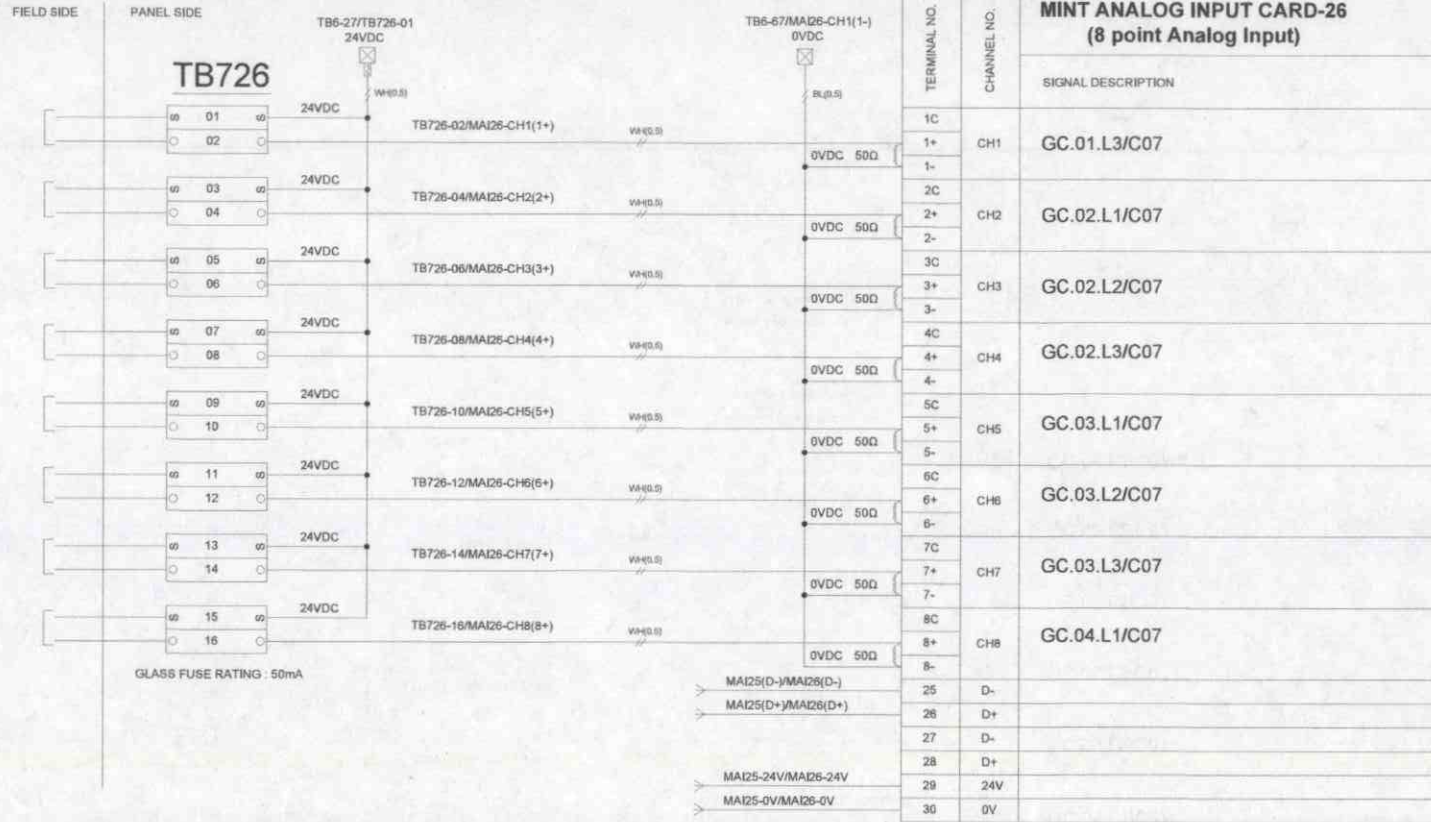
BASE UNIT : NA

LEGEND : MAI26

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 26



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	GC.01.L3/C07
1-		
2C		
2+	CH2	GC.02.L1/C07
2-		
3C		
3+	CH3	GC.02.L2/C07
3-		
4C		
4+	CH4	GC.02.L3/C07
4-		
5C		
5+	CH5	GC.03.L1/C07
5-		
6C		
6+	CH6	GC.03.L2/C07
6-		
7C		
7+	CH7	GC.03.L3/C07
7-		
8C		
8+	CH8	GC.04.L1/C07
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MARIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-228889	SO-2425-228889-01-WIRING	37	0

Shirish Das

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA
MODULE : MINT-AI-08

LEGEND : MAI27
SLAVE ID : 27

NOTE:-



GLASS FUSE RATING : 50mA

TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.04.L2/C07
1+		
1-	CH2	GC.04.L3/C07
2C		
2+	CH3	GC.05.L1/C07
2-		
3C	CH4	GC.05.L2/C07
3+		
3-	CH5	GC.05.L3/C07
4C		
4+	CH6	GC.06.L1/C07
4-		
5C	CH7	GC.06.L2/C07
5+		
5-	CH8	GC.06.L3/C07
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

TB7-06 ← MAI26(D-)MAI27(D-)
 TB7-05 ← MAI26(D+)MAI27(D+)
 MAI26-24V/MAI27-24V
 MAI26-0V/MAI27-0V

Shivakrishna

0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
PROJECT: HMR PANEL					
CLIENT: SIEMENS - BHEL GMS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WR-R0	38	0

**MINT ANALOG INPUT
(8 point Analog Input)**

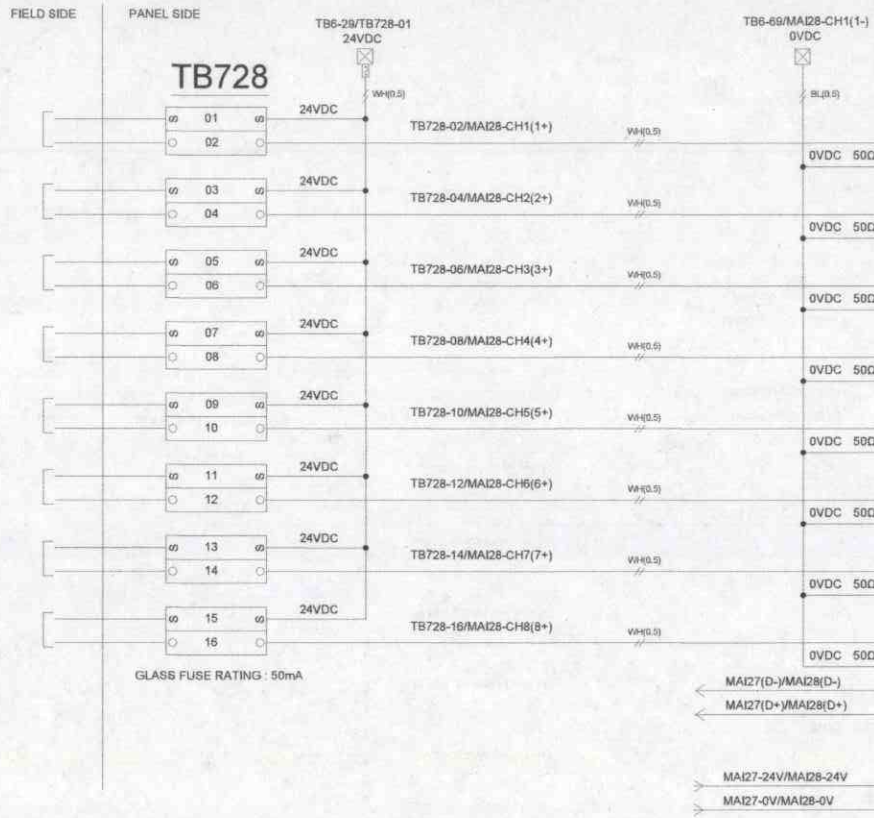
BASE UNIT : NA

LEGEND : MAI28

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 28



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	GC.07.L1/C07
1-		
2C		
2+	CH2	GC.07.L2/C07
2-		
3C		
3+	CH3	GC.07.L3/C07
3-		
4C		
4+	CH4	GC.08.L1/C07
4-		
5C		
5+	CH5	GC.08.L2/C07
5-		
6C		
6+	CH6	GC.08.L3/C07
6-		
7C		
7+	CH7	GC.09.L1/C07
7-		
8C		
8+	CH8	GC.09.L2/C07
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

0	11.09.24	FIRST ISSUE	DN	DP	KJ
REV	DATE	DESCRIPTION	DGN	CHKD	APPD
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-226999	SO-2425-226999-01-W4-R0	39	0

Shivraj Singh

**MINT ANALOG INPUT
(8 point Analog Input)**

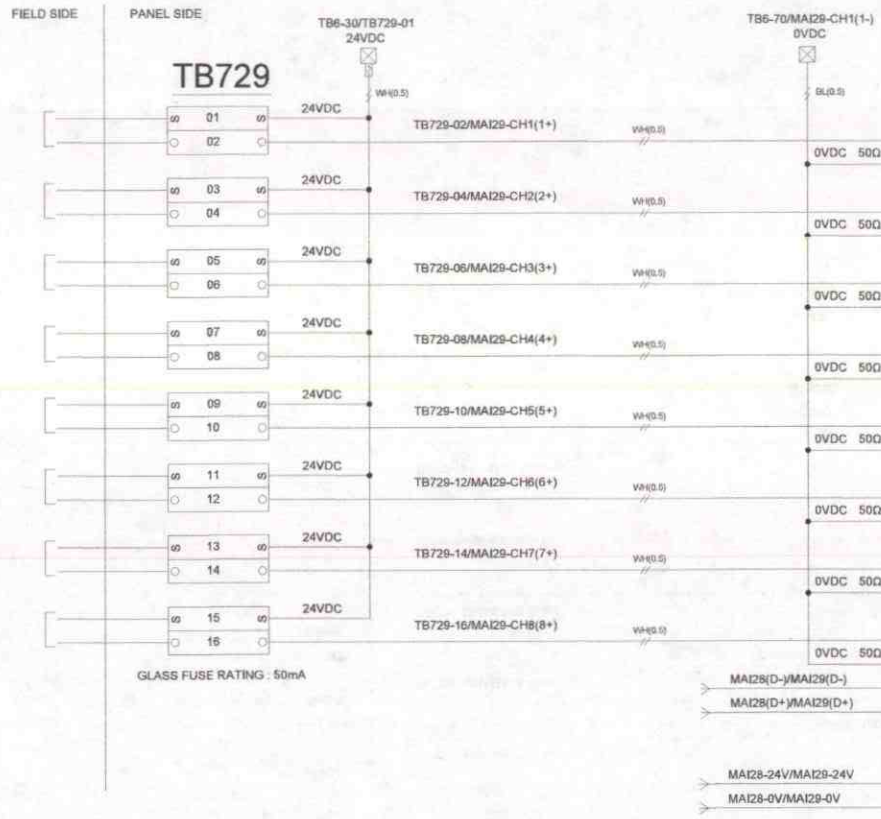
BASE UNIT : NA

LEGEND : MAI29

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 29



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	GC.09.L3/C07
1+		
1-	CH2	GC.10.L1/C07
2C		
2+	CH3	GC.10.L2/C07
2-		
3C	CH4	GC.10.L3/C07
3+		
3-	CH5	GC.11.L1/C07
4C		
4+	CH6	GC.11.L2/C07
4-		
5C	CH7	GC.11.L3/C07
5+		
5-	CH8	SPARE AI
6C		
6+		
6-		
7C		
7+		
7-		
8C		
8+		
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.06.24	FIRST ISSUE	DN	DP	KJ

PROJECT: IIMI PANEL
 CLIENT: SIEMENS - BHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MARIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-VM-R0	40	0

Signature

**MINT ANALOG INPUT
(8 point Analog Input)**

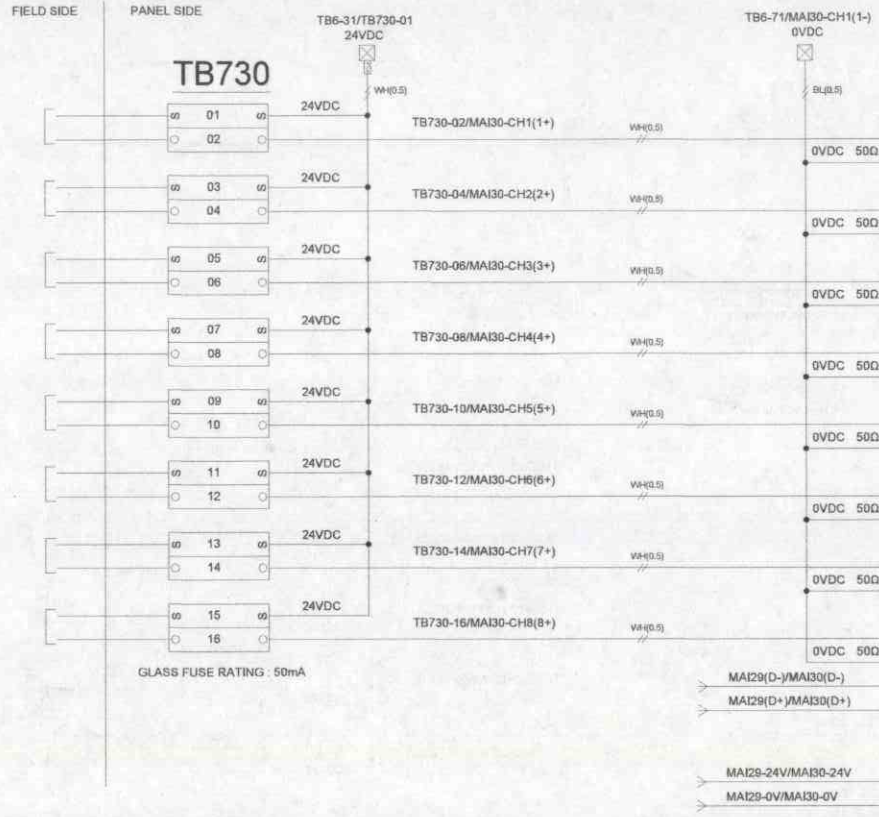
BASE UNIT : NA

LEGEND : MAI30

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 30



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C		
1+	CH1	SPARE AI
1-		
2C		
2+	CH2	SPARE AI
2-		
3C		
3+	CH3	SPARE AI
3-		
4C		
4+	CH4	SPARE AI
4-		
5C		
5+	CH5	SPARE AI
5-		
6C		
6+	CH6	SPARE AI
6-		
7C		
7+	CH7	SPARE AI
7-		
8C		
8+	CH8	SPARE AI
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - BHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD.
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-239998	SO-2425-239998-01-WR-R0	41	0

Signature

**MINT ANALOG INPUT
(8 point Analog Input)**

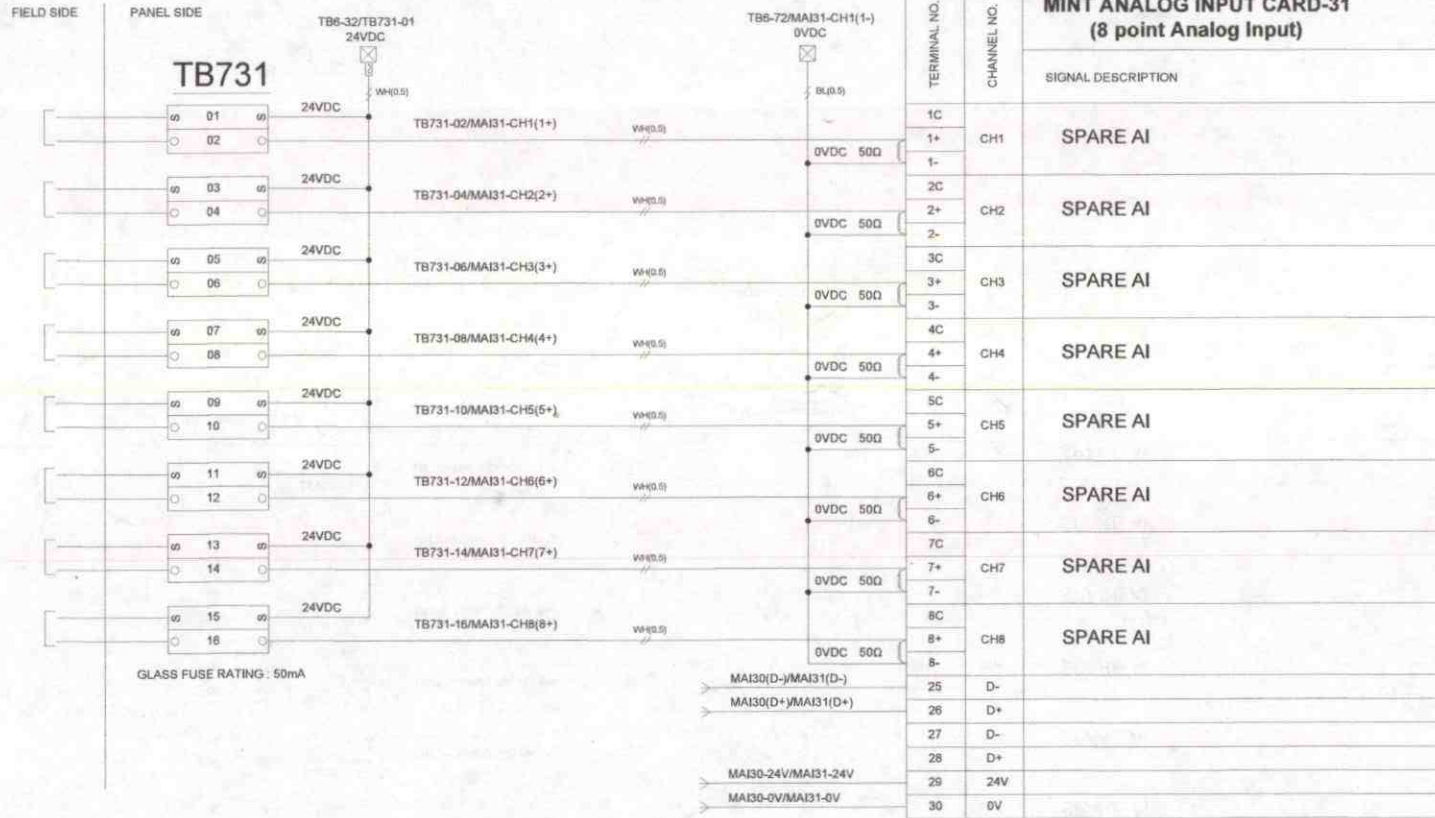
BASE UNIT : NA

LEGEND : MAI31

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 31



Signature

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.06.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL

CLIENT: SIEMENS - BHEL GIS Panel

CONTRACTOR:

SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD

TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DMG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-239909	SO-2425-239909-01-VA-R0	42	0

**MINT ANALOG INPUT
(8 point Analog Input)**

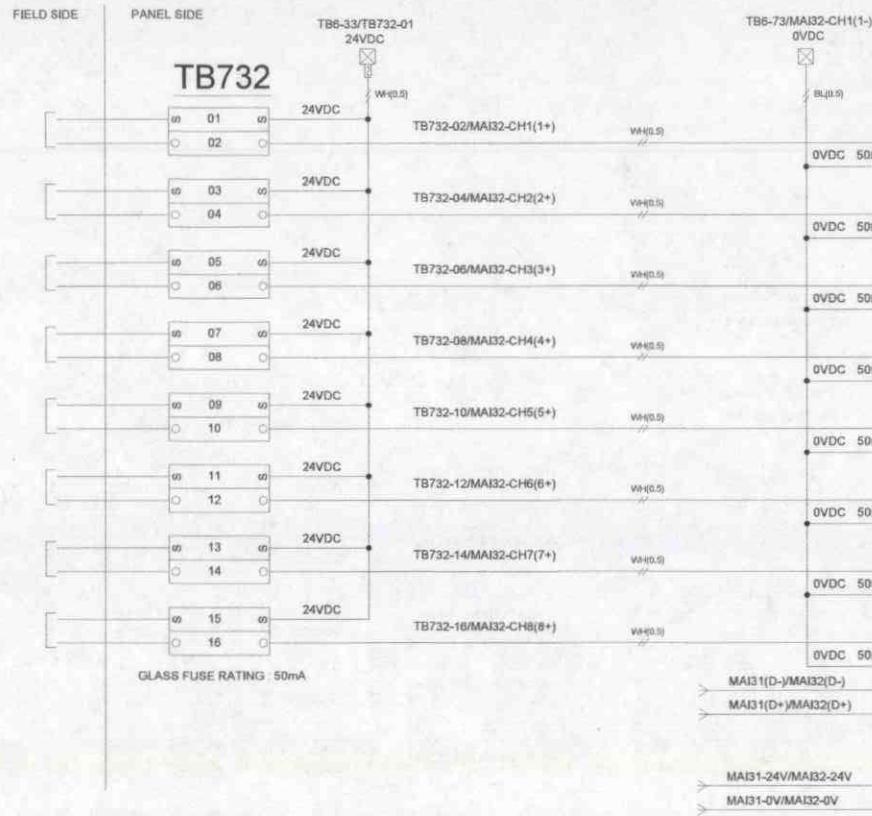
BASE UNIT : NA

LEGEND : MAI32

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 32



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	SPARE AI
1+		
1-	CH2	SPARE AI
2C		
2+	CH3	SPARE AI
2-		
3C	CH4	SPARE AI
3+		
3-	CH5	SPARE AI
4C		
4+	CH6	SPARE AI
4-		
5C	CH7	SPARE AI
5+		
5-	CH8	SPARE AI
6C		
6+	D-	
6-		
7C	D+	
7+		
7-	D-	
8C		
8+	D+	
8-		
25	D-	
26	D+	
27	D-	
28	D+	
29	24V	
30	0V	

Signature

REV	DATE	DESCRIPTION	D8GN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
 CLIENT: SIEMENS - SHEL GIS Panel
 CONTRACTOR:
 SYSTEM SOLUTION BY: MASBUS AUTOMATION AND INSTRUMENTATION PVT. LTD
 TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-228998	SO-2425-229999-01-AM-R0	43	0

**MINT ANALOG INPUT
(8 point Analog Input)**

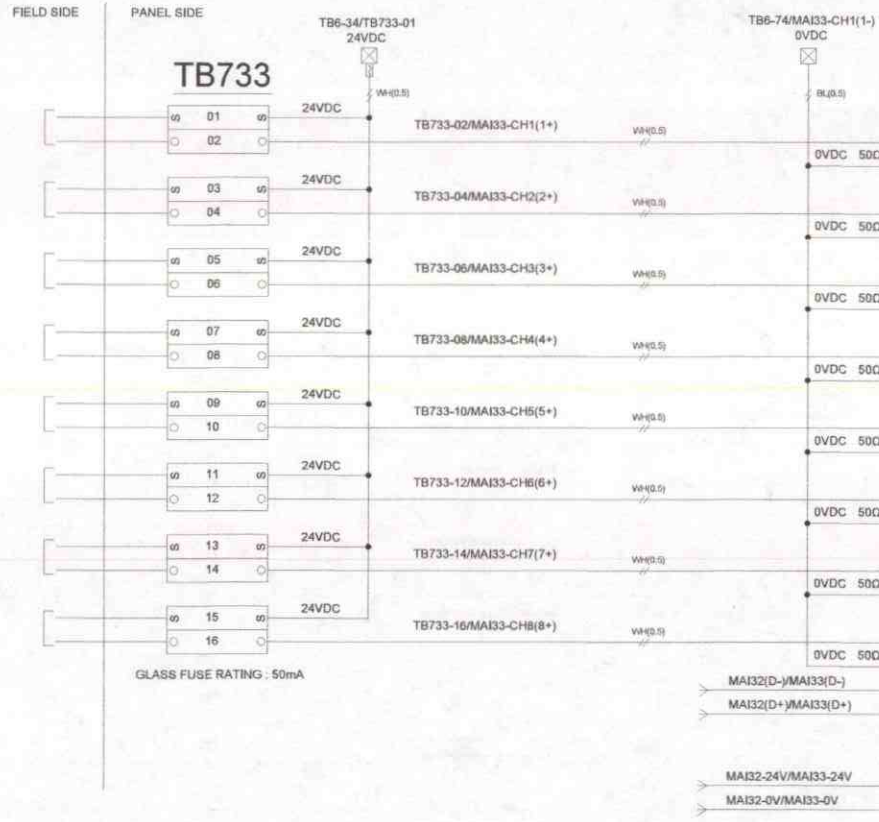
BASE UNIT : NA

LEGEND : MAI33

NOTE:-

MODULE : MINT-AI-08

SLAVE ID : 33



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	SPARE AI
1+		
1-	CH2	SPARE AI
2C		
2+	CH3	SPARE AI
2-		
3C	CH4	SPARE AI
3+		
3-	CH5	SPARE AI
4C		
4+	CH6	SPARE AI
4-		
5C	CH7	SPARE AI
5+		
5-	CH8	SPARE AI
6C		
6+	D-	
6-		
7C	D+	
7+		
7-	24V	
8C		
8+	0V	
8-		
25		
26		
27		
28		
29		
30		

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL

CLIENT: SIEMENS - BHEL GIS Panel

CONTRACTOR:

SYSTEM SOLUTION BY: MASIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD

TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WR-03	44	0

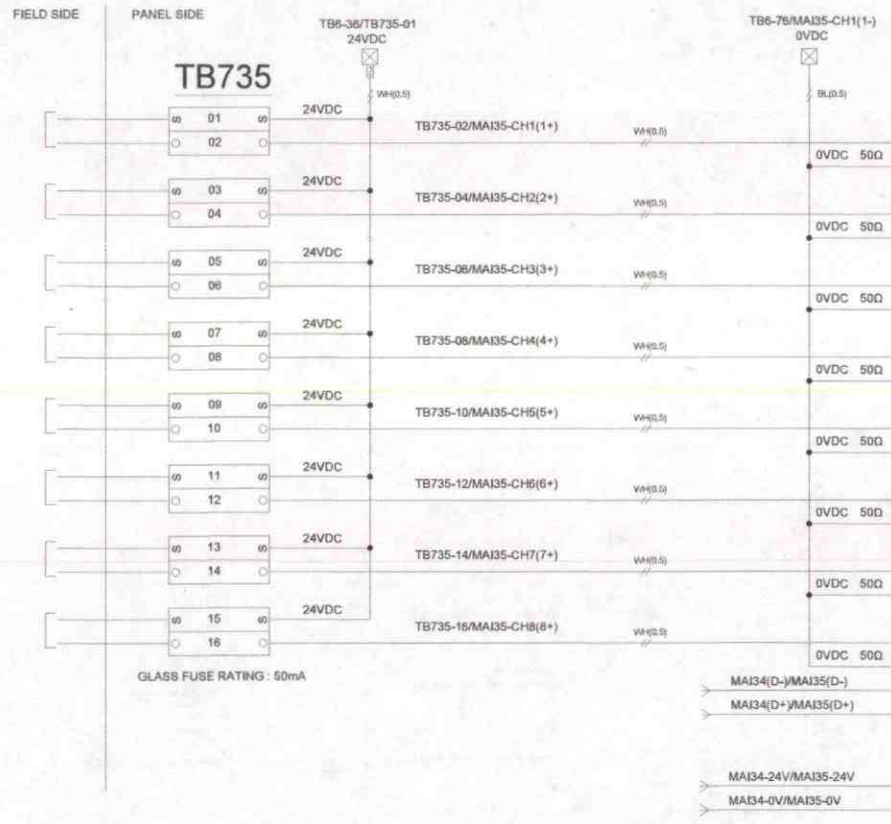
Divya Mishra

**MINT ANALOG INPUT
(8 point Analog Input)**

BASE UNIT : NA
MODULE : MINT-AI-08

LEGEND : MAI35
SLAVE ID : 35

NOTE:-



TERMINAL NO.	CHANNEL NO.	SIGNAL DESCRIPTION
1C	CH1	SPARE AI
1+		
1-	CH2	SPARE AI
2C		
2+	CH3	SPARE AI
2-		
3C	CH4	SPARE AI
3+		
3-	CH5	SPARE AI
4C		
4+	CH6	SPARE AI
4-		
5C	CH7	SPARE AI
5+		
5-	CH8	SPARE AI
6C		
6+	D-	
6-		
7C	D+	
7+		
7-	24V	
8C		
8+	0V	
8-		
25	MAI34(D-)/MAI35(D-)	
26	MAI34(D+)/MAI35(D+)	
27		
28		
29		
30		

Divakar

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.09.24	FIRST ISSUE	DN	DP	KJ

PROJECT: HMI PANEL
CLIENT: SIEMENS - BHEL GIS Panel
CONTRACTOR:
SYSTEM SOLUTION BY: MASSBUS AUTOMATION AND INSTRUMENTATION PVT. LTD.
TITLE: WIRING DRAWING

SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229989	SO-2425-229989-01-VM-R0	46	0

Rev. SH.	0	1	2	3	4	5	6	7	8	9	10
1	X										
2	X										
3	X										
4	X										
5	X										
6	X										
7	X										
8	X										
9	X										
10	X										
11	X										
12	X										
13	X										
14	X										
15	X										
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34	X										
35	X										
36	X										
37	X										
38	X										
39	X										
40	X										
41	X										
42	X										
43	X										

Rev. SH.	0	1	2	3	4	5	6	7	8	9	10
44	X										
45	X										
46	X										
47	X										
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NOTE:-

REV	DATE	DESCRIPTION	DSGN	CHKD	APPD
0	11.29.24	FIRST ISSUE	DN	DP	KJ
PROJECT: HMI PANEL					
CLIENT: SIEMENS - BHEL GIS Panel					
CONTRACTOR:					
SYSTEM SOLUTION BY: MAGIBUS AUTOMATION AND INSTRUMENTATION PVT. LTD					
TITLE: WIRING DRAWING					
SCALE	SIZE	SO NO.	DWG. NO.	SH. NO.	REV.
NTS	A3	SO-2425-229999	SO-2425-229999-01-WIR-01	47	0

Divyanshu

Document Name:-GA DRAWING/GUARANTEED TECHNICAL PARTICULARS and BILL OF MATERIALS (BOM) OF MISCELLANEOUS ITEMS (EARTHING MATERIALS, ALUMINIUM BLOCKS FOR CABLE SNAKING, CABLE SPACERS, CABLE SUSPENSION DEVICES, CABLE IDENTIFICATION TAGS, EMBEDMENTS, HARDWARES etc.).

(Drawing NO.:-TB-382-316-36-30)

NOTE (1):- This document contains only details of Earthing Rod and Cleat for ECC cable, As per reference Letter No. TBEM/VISHNUGAD/PIPALKOTI/THDC/DWG/XLPE/114(1) aluminum block for cable snaking and any other items mentioned therein, required as per actual site condition, shall be in scope of BHEL.

(2) As cleats are to be installed at regular interval the Number of cleats required as per actual site condition shall be in Scope of BHEL.

Contractor of this drawing/document does not assume responsibility for manufacturing of the equipment as per ER & GTP for the achievement of designed performance at site and completeness of the equipment.

ACCEPTED AS INFORMATION AS NOTED
यथा टिप्पणी सूचनार्थ हेतु स्वीकृत

जांची गई
CHECKED

संस्तुत
RECOMMENDED

Signature
Aulita
मालवी
24/09/25

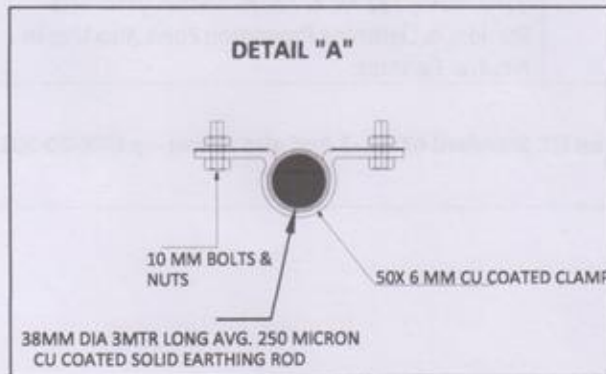
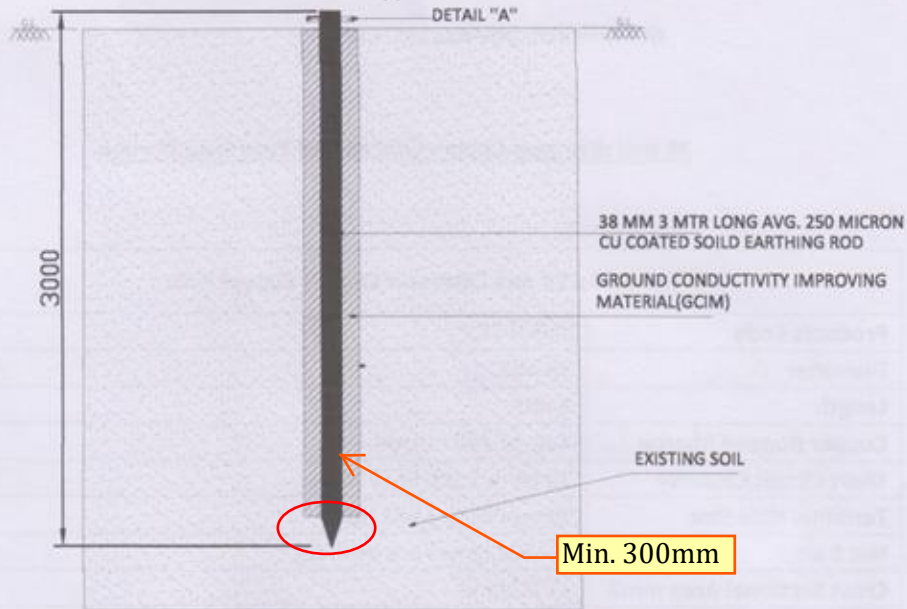
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MKHILK

Signature
आर. आर. सेमवाल
R. R. Semwal
मुख्य महाप्रबंधक (विद्युत-परिकल्प)
CGM (EM-Design)
टीएचडीसी इंडिया लिमिटेड, राषिकेश
THDC INDIA Ltd., Rishikesh

REVISION NO. DATE BY

ADDITIONAL INFORMATION				PROJECT	4X111MW VISHNUGAD PIPALKOTI H.E. PROJECT.				
STATUS OF DRAWING				CUSTOMER	 THDC INDIA LTD. RISHIKESH, UTTARAKHAND.				
DISTRIBUTION OF PRINTS				CONTRACTOR	 BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP				
REV	DATE	ALTERED	T.K.	DATE	ALTERED	T.K.	DATE	ALTERED	T.K.
01	27.08.2025	CHECKED APPROVED	V.K. P.H.	28.04.2025	CHECKED APPROVED	V.K. P.H.	27.08.2025	CHECKED APPROVED	V.K. P.H.
ZONE		REVISED AS PER CUSTOMER COMMENTS		ZONE					
SUB-SUPPLIER/VENDOR				UNIVERSAL CABLES LTD. NEW DELHI				TITLE:-GA DRAWING/GUARANTEED TECHNICAL PARTICULARS and BILL OF MATERIALS (BOM) OF MISCELLANEOUS ITEMS (EARTHING MATERIALS, ALUMINIUM BLOCKS FOR CABLE SNAKING, CABLE SPACERS, CABLE SUSPENSION DEVICES, CABLE IDENTIFICATION TAGS, EMBEDMENTS, HARDWARES etc.).	
DRAWING NO.				DRAWING NO.		DRAWING NO.		REV.	
TB-382-316-36-30				TB-382-316-36-30		TB-382-316-36-30		01	

ETP MAKE EARTHING ELECTRODE



TECHNICAL SPECIFICATION

SR. NO	DETAILS	DESCRIPTION
1	MODEL NUM	ETP CCR383WELDP
2	TYPE	SOLID ROD TYPE
3	PRODUCT DETAILS	38 MM DIAMETER 3MTR LONG AVG. 250 MICRON COPPER COATED SOLID EARTHING ELECTRODE
4	DIAMETER	38 MM
5	LENGTH	3000 MM
6	COATING OF SOLID ROD	AVG. 250 MICRON COPPER COATED
7	TERMINAL SIZE	50x6 MM CU COATED WELDED CLAMP
8	CROSS SECTION AREA	1133 MM ²
9	TOLERANCE	-3%
10	FAULT CURRENT CAPACITY	50KA FOR1 SEC RMS VALUE
11	STANDARDS FOLLOW	IEC-62561-2,IEEE-80-2013, IS-3043-2018

MANUFACTURER NAME	ETP EARTHING & LPS SOLUTION PVT LTD, SURAT
ADDRESS	PLOT NO. 6302, ROAD NO. 63, GIDC, SACHIN, SURAT 394230, GUJARAT
REFERENCE NO.	ETP/PRODUCT DESIGN/24-25/38/3/P
PREPARED BY	NAITIK PATEL
DATE	19-03-2024
CHECKED BY	APPROVED BY

ETP Earthing & LPS Solution Pvt.



Plot No-6302, Road No-63, Near Water Tank, Sachin G.I.D.C, Surat-394520.

CIN: U31904GJ2020PTC118315

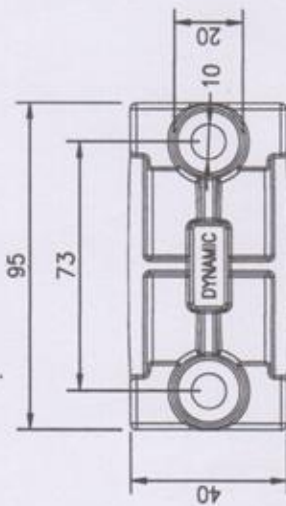
GST NUMBER: 24AAGCE1992C1ZV

38 mm diameter Copper Coated Rod Type Specification

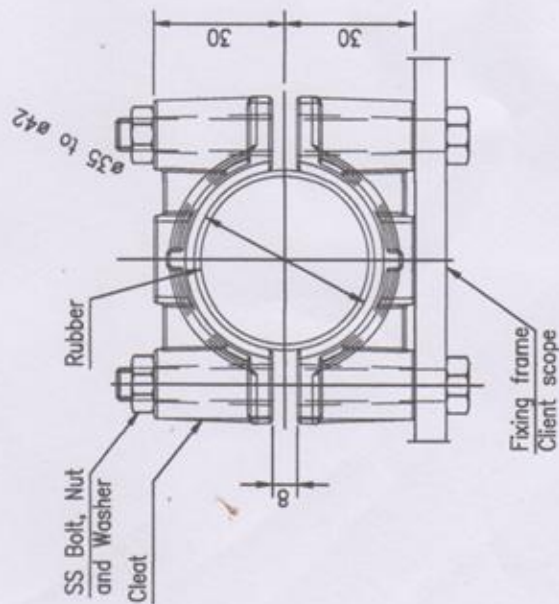
ETP Make 38 mm Diameter Copper Coated Rod	
Products Code	CCR383P.
Diameter	38 mm
Length	3 mtr
Copper Bonded Micron	Avg. of 250 micron
Short Circuit Capacity	50 kA in 1 SEC RMS Value.
Terminal Hole Size	12 mm Dia (2 nos Hole)
Nut Bolt	S.S 304 (2 nos are Include)
Cross Sectional Area mm ²	1134 mm ²
Generally Use.	Any Equipment OR M/C Body Earthing. Also Use 33kv, 66kv, 132 KV & 220 kv Switch yard, Sub Station, & Lightning Protection Zone Also Use In Neutral Earthing.
All Test preparation on IEC Standard 62561-2 And also follow-up IEEE-80-2013	

BOM(Bill of Material for Earthing)

SR NO	Name	Unit	Qty
1	EARTHING SYSTEM		
1.1	38 mm dia 3 meter long 250 micron cu coated earthing electrode with meet IS-3043-2018/IEEE-80-2013..	Nos	7
1.2	Earthing compound(25 kg) GCIM standard to lower resisitivity of soil sulphur content :- less than 2% Self resistivity: less than 0.12 ohm-m	Nos	14



PLAN



ELEVATION

NOTE:

1. All dimensions are in mm
2. Indicated dimensions are subjected to manufacturing tolerance
 - i. 10 to 50 mm : +/- 5%
 - ii. from 51 to 100 mm: +/- 4%
 - iii. From 101 to 300 mm: +/- 3%

S.NO	DESCRIPTION	QTY	MTL
1	TWO BOLT CLAMP	1 SET	LM6
2	M8 x 90 lg bolt/nut/p.washer/s.washer	2 SET	GI
3	50 x 150 lg Rubber	1 No.	Neoprene



DYNAMIC

UNIVERSAL CABLE LTD.

BHEL TBG

SL.NO	SOURCE	SCALE	DATE	NAME	DATE	M.G	N.G
		NTS	17.07.2017	A.S			
				DRN.		CHKD.	APPRD.

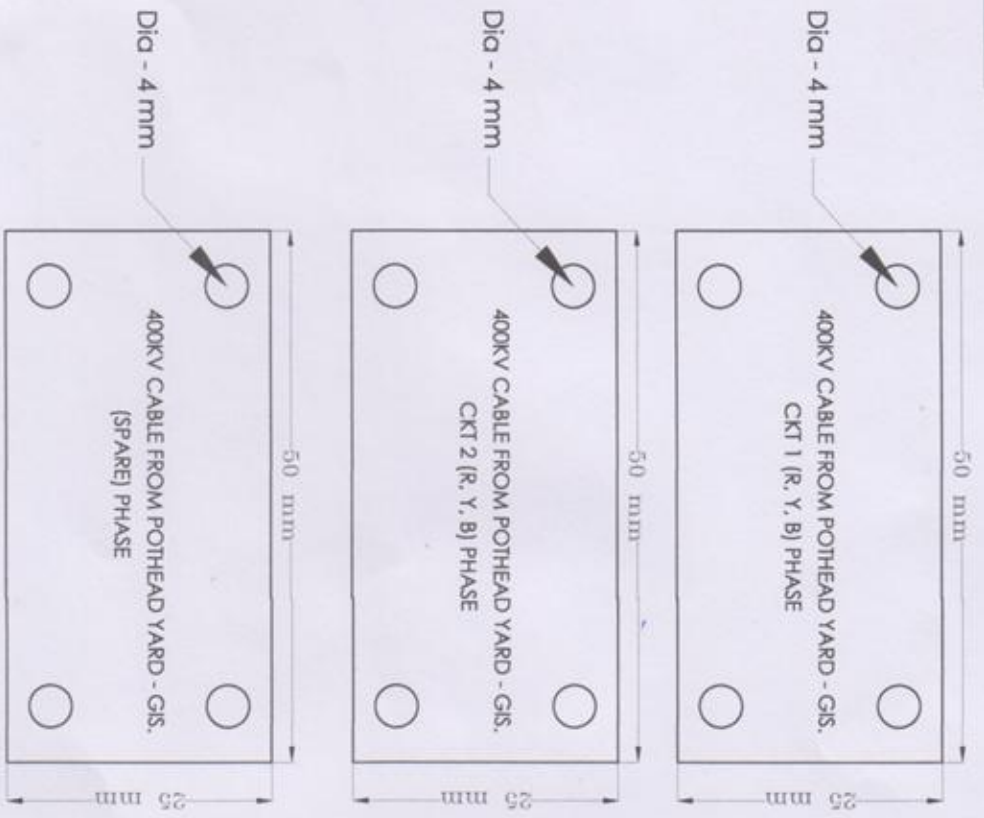
TITLE:

TWO BOLT CLEAT SUITABLE FOR SINGLE CORE CABLE(35-42MM)

DRAWING NO.

DE-TBC 08

REV. 0



Tag Material - Aluminium
 Tag Thickness - 3 mm
 Text - Engraved on Tag with minimum font size 4 mm
 Holes to tie the Tag - 4 Nos. of Dia 4 mm each
 Tag Fixing Cable - With Nylon string at every 30 Mtrs

REV.	DATE	ALTERED	CHKD.	DATE	ALTERED	CHKD.	DATE	ALTERED	CHKD.	DATE	ALTERED	CHKD.	DATE	ALTERED	CHKD.	DATE	ALTERED	CHKD.
		DESIGNED			DESIGNED			DESIGNED			DESIGNED			DESIGNED			DESIGNED	
		APPROVED			APPROVED			APPROVED			APPROVED			APPROVED			APPROVED	
ZONE				ZONE				ZONE					ZONE					

UNIVERSAL CABLES LTD. NEW DELHI	ADDITIONAL INFORMATION	PROJECT	4X111MW VISHNUGAD PIPALKOTI H.E. PROJECT.
SUB-SUPPLIER/VENDOR	STATUS OF DRAWING	CUSTOMER	THDC INDIA LTD. RISHIKESH, UTTARAKHAND.
	DISTRIBUTION OF PRINTS	CONTRACTOR	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP
		TITLE	CABLE IDENTIFICATION TAG.
		DRAWING NO.	TD-282-316-24-30
		DATE	01/05