

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN mm

DRAWING NO. 3 699 21 00990

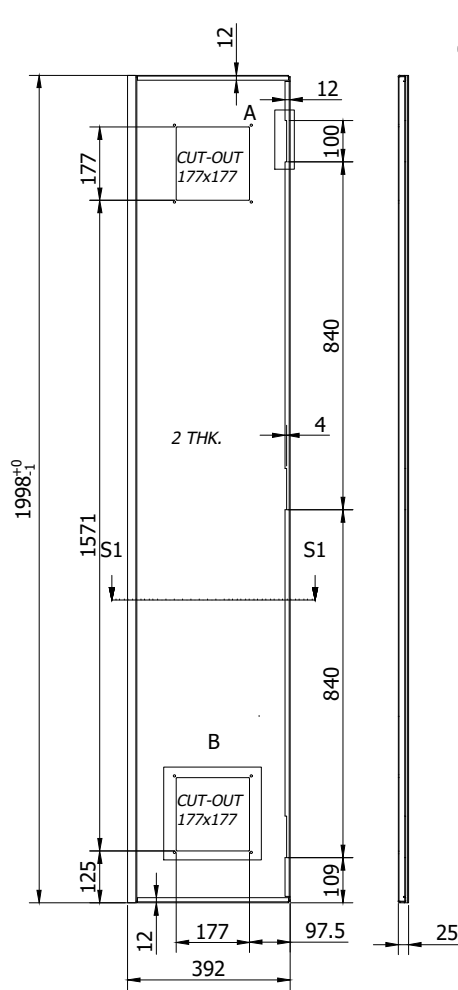
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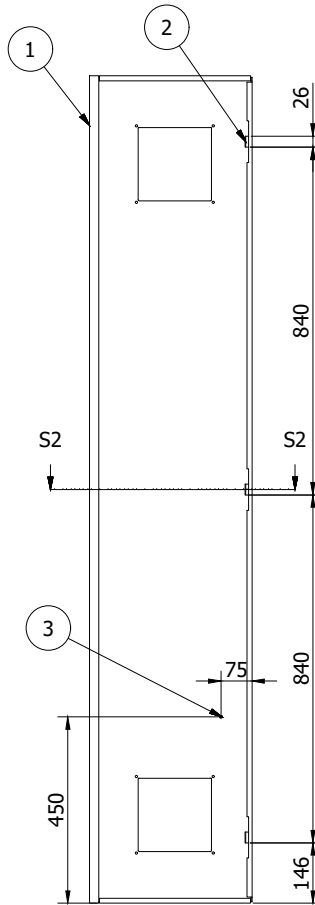
REF. DRG. NO.

SIGN & DATE

INVENTORY NO.

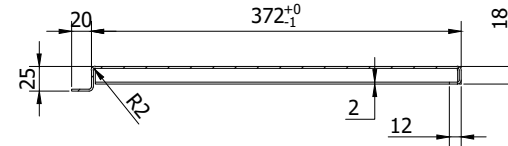


BENDING & FORMING DETAILS

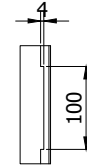
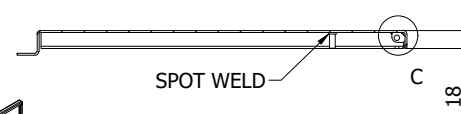


WELDING DETAILS

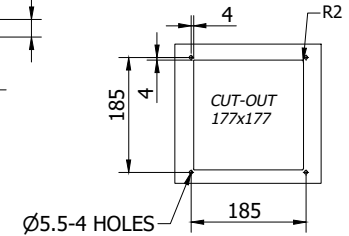
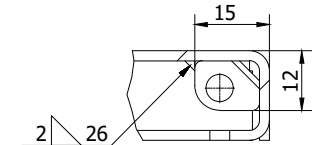
3D VIEW



SECTION:S1-S1

DETAIL:A
AT 3 PLACES

SECTION:S2-S2

DETAIL:B
AT 2 PLACESDETAIL:C
AT 3 PLACES

NOTE:

1. NOTCHED SHT. MUST BE WITH IN DIMENSIONS, AND FREE FROM TWISTING AND BOWING.
2. DOOR BENDING SHOULD BE 90° THRO OUT FROM BOTTOM TO TOP
3. ALL OPEN CORNERS & EDGES TO BE FILLED WITH SUITABLE FILLER MATERIAL
4. FINISH : POWDER COATING AS PER M.O No.

NOTE TO VENDOR

1. FOR GENERAL REQUIREMENTS REF. DRG. No.36992600528

PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	-	435x2044x2 THK CRC SHEET
2	3	46992102258	SPECIAL HINGE TUBE
3	1	46992600258IT02	WELD STUD

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALOREDEPT.
ENGG
CODE
426FOR UNSPECIFIED-
TOLERANCES
REFER ED 0230499SCALE
1:12

WEIGHT(Kg)

REF. TO ASSY. DRG.

ITEM NO.

No. OF

NAME	SIGN.	DATE	No. OF
VIN		05.12.2024	
JOTHISH		05.12.2024	
JOTHISH		05.12.2024	

REV.	DATE	ALTERED	VIN	REV.	DATE	ALTERED	VIN	REV.	DATE	ALTERED	VIN
03	17.02.25	CHECKED	JS	02	23.12.24	CHECKED	JS	02	09.12.24	CHECKED	JS
		APPROVED	JS			APPROVED	JS			APPROVED	JS

TOLERANCE ADDED FOR DIMM 1998 & 372

DIA 5.5 WAS DIA 5 AND R2 ADDED
IN DETAIL:B

CUT-OUT 177x177 WAS 224x224

TITLE

DOUBLE DOOR-LH
2000 HEIGHT

DRAWING NO.

3 699 21 00990

REV.

03

SHEET NO. 01

NO. OF SHEETS 02

DRAWING NO.
3 699 21 00990

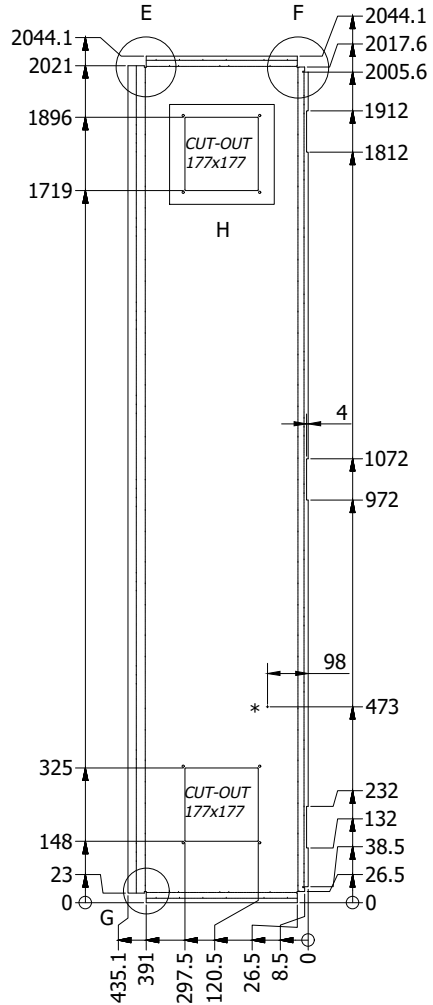
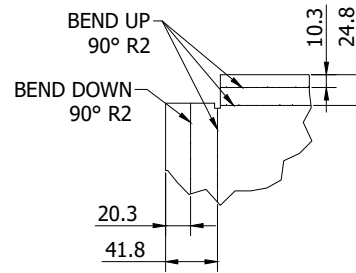
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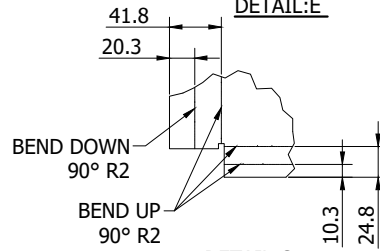
REF. DRG. NO.

SIGN & DATE

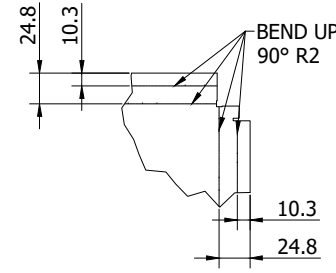
INVENTORY NO.

DEVELOPMENT VIEW
ONLY FOR REFERENCE

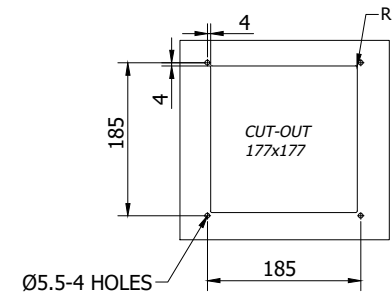
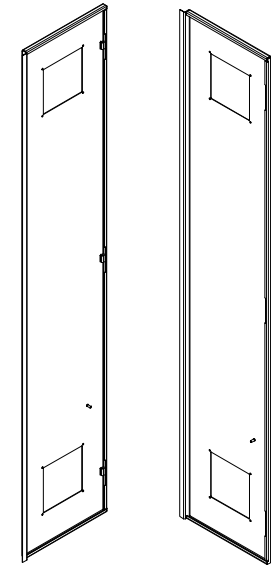
DETAIL:E



DETAIL:G



DETAIL:F

DETAIL:H
AT 2 PLACES

NOTE:

- * PUNCH MARK FOR STUD WELDING AT 1 PLACE.
- DEVELOPMENT SIZE SHOWN AS PER SOFTWARE CALCULATION
REQUIRED MACHINE ALLOWANCE TO BE CONSIDERED BY MANUFACTURER.

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

DRN	NAME	SIGN.	DATE	No. OF
CKD	VIN		05.12.2024	
APPD	JOTHISH		05.12.2024	

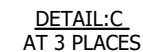
DEPT.	FOR UNSPECIFIED-TOLERANCES	SCALE	WEIGHT(Kg)	REF. TO ASSY. DRG.	ITEM NO.	No. OF
ENGG	REFER ED 0230499	1:12				

CODE
426TITLE
DOUBLE DOOR-LH
DEVELOPMENT VIEWDRAWING NO.
3 699 21 00990
SHEET NO. 02 NO. OF SHEETS 02REV.
03

3

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INVENTORY NO.



1. NOTCHED SHOT MUST BE WITH IN DIMENSIONS, AND FREE FROM TWISTING AND BOWING.
2. DOOR BENDING SHOULD BE 90° THRO OUT FROM BOTTOM TO TOP
3. ALL OPEN CORNERS & EDGES TO BE FILLED WITH SUITABLE FILLER MATERIAL
4. FINISH : POWDER COATING AS PER M.O No.

1. FOR GENERAL REQUIREMENTS REF. DRG. No.36992600528

PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	-	421X2044X2 THK CRC SHEET
2	3	46992102258	SPECIAL HINGE TUBE
3	7	46992600258IT02	WELD STUD

3D VIEW



NAME	SIGN.	DATE
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DRN	VIN		05.12.2024
CKD	JOTHISH		05.12.2024
APPD	JOTHISH		05.12.2024

REF. TO ASSY. DRG.	ITEM NO

DRAWING NO.

FOR UNSPECIFIED-
TOLERANCES
REFER ED 0230499



SCALE
1:12

WEIGHT(Kg)

100

TITLE

DOUBLE DOOR-RH
2000 HEIGHT

DRAWING NO.

3 699 21 0099:

SHEET NO. 01	NO. OF SHEETS
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REV.
04

DRAWING NO.
3 699 21 00991

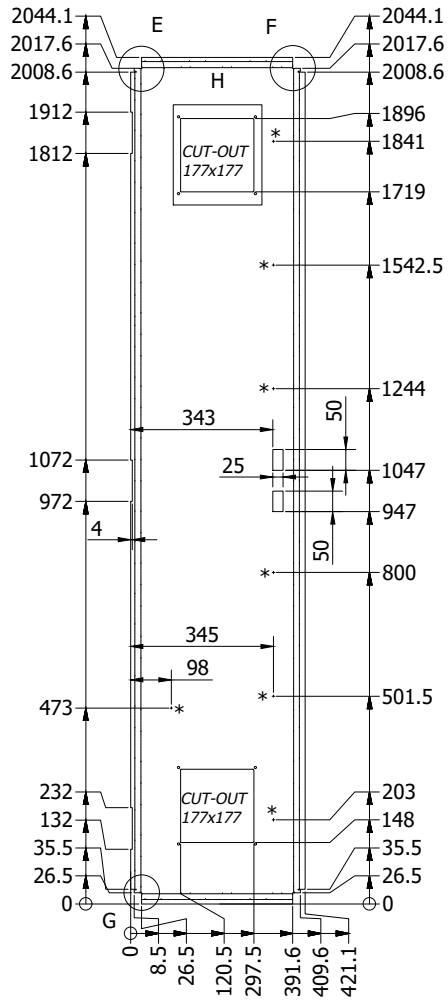
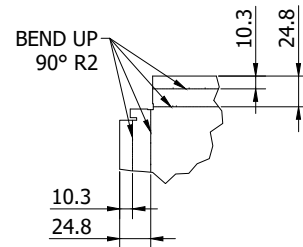
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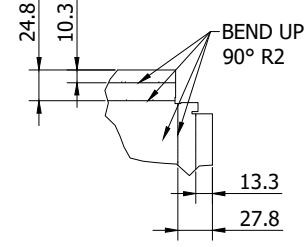
REF. DRG. NO.

SIGN & DATE

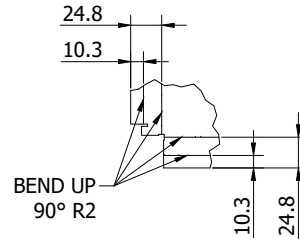
INVENTORY NO.

DEVELOPMENT VIEW
ONLY FOR REFERENCE

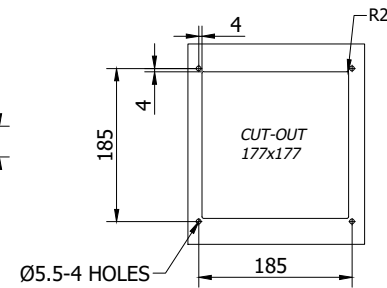
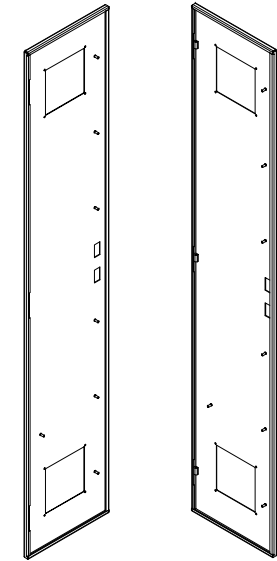
DETAIL:E



DETAIL:F



DETAIL:G

DETAIL:H
AT 2 PLACES3D VIEW
ONLY FOR REFERENCE

NOTE:

- * PUNCH MARK FOR STUD WELDING AT 7 PLACES.
- DEVELOPMENT SIZE SHOWN AS PER SOFTWARE CALCULATION
REQUIRED MACHINE ALLOWANCE TO BE CONSIDERED BY MANUFACTURER.

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

DRN	NAME	SIGN.	DATE	No. OF
CKD	VIN		05.12.2024	
APPD	JOTHISH		05.12.2024	

REV.	DATE	ALTERED	VIN	REV.	DATE	ALTERED	VIN
03	07.02.25	CHECKED	JS	02	23.12.24	CHECKED	JS
		APPROVED	JS			APPROVED	JS

CUT-OUT 25X50 X-DIMN 343 WAS 355.5	DIA 5.5 WAS DIA 5 AND R2 ADDED IN DETAIL:H	DIMN 947 & 1047 WAS 922 & 1072 AND
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DEPT.	FOR UNSPECIFIED-TOLERANCES	SCALE	WEIGHT(Kg)	REF. TO ASSY. DRG.	ITEM NO.	No. OF
ENGG	REFER ED 0230499	1:12				
CODE	426					
TITLE	DOUBLE DOOR-RH DEVELOPMENT VIEW	DRAWING NO.	3 699 21 00991	REV.	04	
		SHEET NO.	02	NO. OF SHEETS	02	

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A

B

C

D

E

F

G

GENERAL REQUIREMENT FOR SUPPLIERS TO MANUFACTURE & POWDER COAT DOORS & END COVERS

MATERIAL:

Material of the doors & end covers shall be of 2mm thick CRC sheet as per IS-513 Grade D.

QUALITY REQUIREMENTS:

- 1.Raw material TC for mechanical bend test, chemical composition for CRC sheet shall be provided as per IS-513 Grade-D.
- 2.Visual & dimensional inspection at vendor works by EDN QS after fabrication before powder coating is envisaged.
- 3.Final inspection after powder coating such as visual, powder coating thickness (one time type test such as scratch hardness, bed test, pull of adhesion test as per IS-101 Part5 is envisaged).
- 4.Powder coating thickness shall be a minimum of 60 microns to a maximum of 100 microns.

FINISH:

1. Doors shall undergo pre-treatment with seven tank process before powder coating.
2. Interior colour of the doors shall be as per RAL 9003 (Signal White) - Smooth Semi Glossy
3. Exterior colour shall be provided as RAL 7035 (Light Grey) - Structure Semi Glossy. (however only exterior colour shade shall change project wise & this shall be intimated to supplier during placement of PO, Exterior Finish shall be structure semi glossy for any envisaged shades).
4. For Plain end covers Interior & Exterior shade & finish shall be same.

RECOMMENDED POWDER MAKE:

Varna Make, Ultratech Make, Paintel Make.

NOTE :

In-house Powder Coating facilities of vendors shall be audited one time by BHEL QS before placement of po.

PROJECT :

CUSTOMER:

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

TITLE:

GENERAL DETAILS TO SUPPLIER FOR DOORS & END COVERS

No. OF SHEETS	
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01

SHEET No.	
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01

WBS. No.

DRG. No.	
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3 699 26 00528

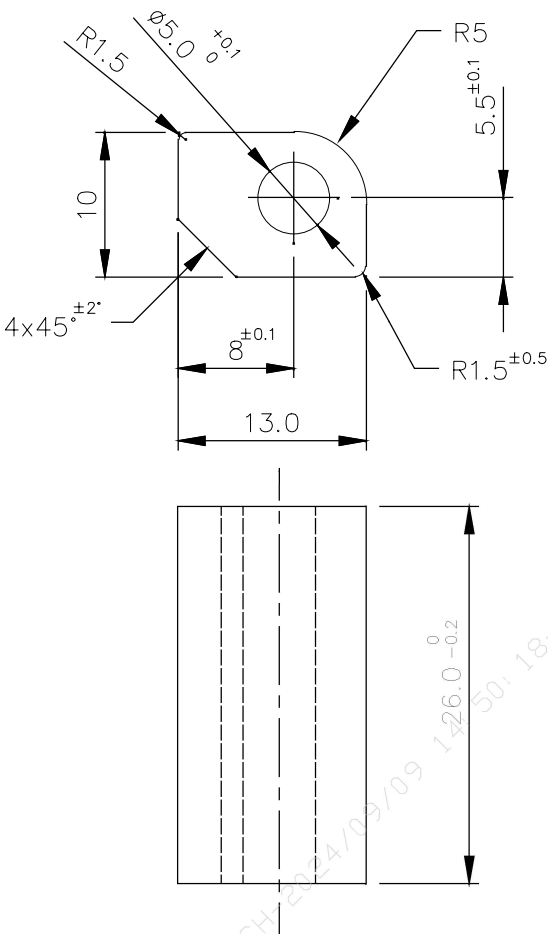
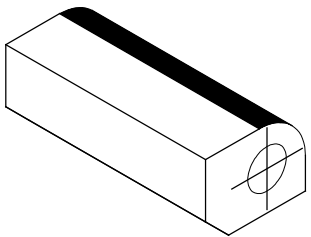
REV

00

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN MM)

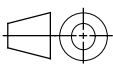
REV.	DATE	ALTERED	PRADEEP	REV.	DATE	ALTERED	S.N.Murthy	REV.	DATE	ALTERED	S.N.Murthy
03	14.02.17	CHECKED	SURESH	02	01.10.16	CHECKED	Susheel	01	03-05-13	CHECKED	K.B.R
		APPROVED	SURESH			APPROVED	Suresh			APPROVED	A.Louis
MATERIAL DESCRIPTION WAS DIFFERENT.				GENERALLY REVISED				FINISH WAS ZINC PLATED			

FINISH : — NATURAL

REF.	DRG.NO.	01	ø16 x 26 Lg. EN1A(NL) BS-970-1955				
QTY.	ITEM NO.		DESCRIPTION	DRAWING No.	ITEM	MATERIAL CODE	UNIT Wt. (Kgs.)
					VAR.	MATERIAL SPECN.	QTY.

SIGN & DATE		BHARAT HEAVY ELECTRICALS LIMITED. ELECTRONICS DIVISION, BANGALORE	DRN	NAME	SIGN.	DATE	No. OF VAR
			CKD	S.N.Murthy		31.12.11	
			APPD	K.B.R		31.12.11	
				A.Louis		31.12.11	

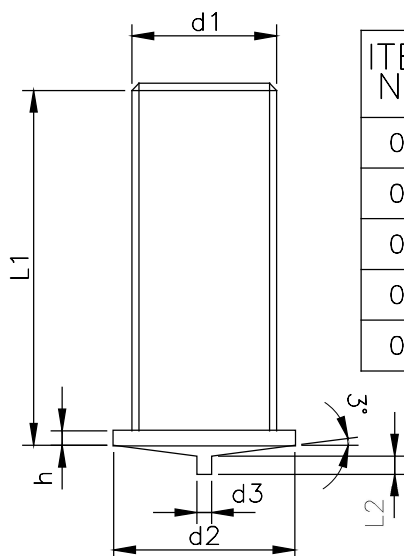
INVENTORY NO.	DEPT. GHCE	FOR UNSPECIFIED TOLERANCES REFER ED 0230499 IS 12160-1987		SCALE N.T.S	WEIGHT (Kg)	REF. TO ASSY. DRG.	ITEM NO.	No. OF ITEM
	CODE 408							

TITLE SPECIAL HINGE TUBE					DRAWING NO. 4 699 21 02258			REV. 03
SHEET NO. 01					NO. OF SHEETS 01			

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN MM)

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
03	11.01.99	S.N.Murthy	05	18.02.05	Satish	04	20.09.04	S.N.Murthy
		CHECKED S.H.G.Rao			CHECKED S.N.Murthy			CHECKED Narendra
		APPROVED K.SAiram			APPROVED Narendra			APPROVED Narendra
REVISED & REDRAWN (AUTOCAD)			DIM 'h' IN TABULAR COLOUMN TOLERANCE DIM WAS NOT ON			UNDER CUT OF RADIUS 0.5mm DELETED AS PER F.B FROM CE-FABN 119/001/04-05		



ITEM No.	d1	d2	d3	L1	L2	n	h	MATERIAL CODE
01	M4	4.5	0.65	25	0.55	1.5	0.7-1.4	CN 9087867026
02	M6	7.5	0.75	16	0.80	2.0	0.8-1.4	CN 9087867018
03	M6	7.5	0.75	20	0.80	2.0	0.8-1.4	
04	M8	8.5	0.90	25	0.90	2.2	0.8-1.4	
05	M5	6.5	0.75	20	0.80	2.0	0.8-1.4	CN 9087867034

NOTE :-

1. MATERIAL : C10 AS PER 1S:4432
2. FINISH : COPPER COATED TO 0.005mm THK.
3. APPLICATION : FOR CAPACITOR DISCHARGE STUD WELDING
4. TOLERANCE : ± 0.05
5. TO BE PACKED TO AVOID DAMAGE

QTY.	ITEM NO.	DESCRIPTION	DRAWING No.	ITEM	MATERIAL CODE	A	UNIT Wt. (Kgs.)
				VAR.	MATERIAL SPECN.	C	QTY.

DEPT. ENGG.	FOR UNSPECIFIED TOLERANCES REFER ED 0230499	SCALE N.T.S	WEIGHT (Kg)	REF. TO ASSY. DRG.	ITEM NO.	No. OF ITEM
402						

TITLE	DRAWING NO.	REV.
WELD STUD	4 699 26 00258	05
SHEET NO. 01	NO. OF SHEETS 01	

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BHEL	PLANT STANDARD	ED 023 04 99
A4 - 15	ELECTRONICS DIVISION	REV NO 04
		PAGE 0 OF 3

REVISION HISTORY SHEET

REV NO	DATE	NATURE OF CHANGE	REASONS	PREPARED BY	APPROVED BY
00	09/11/93	1st ISSUE		MRV, SHG	N.J
01	11/09/95	Clause 5.0 added, Clause 6.0 was earlier 5.0	BVQI Audit Feedback	MRV, SHG	N.J
02	11/10/96	Clause 2, 3.1, 3.3 revised, 3.1.1, 3.1.2 added	BVQI Audit Feedback	MRV, SHG	N.J
03	10/01/97	Clause 3.2.3 added	F.B From QS	SHG	N.S
04	13/02/02	Reaffirmation	-	CCR	NS
04	29/12/21	Reaffirmation	-	M S KABIR	Sanjay R Godbole

APPROVED:
SRG

PREPARED:	ISSUED:	DATE:
MSK	ENGG SERV.	15-02-22.

PROCEDURE FOR ALLOWABLE TOLERANCE FOR UNSPECIFIED TOLERANCE
ON DRAWINGS

1.0 SCOPE:

This standard specifies the tolerance not specified in ASSEMBLY and FABRICATED COMPONENT drawings.

2.0 GENERAL:

This standard shall be referred in all Mechanical Drawings (for all assembly and fabricated components) prepared subsequent to issue of this standard.

All the dimensions are in mm unless otherwise specified.

3.0 UNSPECIFIED TOLERANCE: Tolerance shall be as under unless other wise specified in DRAWINGS.

3.1 Tolerance on machining :(for machining with chips of all metals and non-metallic such as ceramics, plastic materials etc.,)

Reference is taken from Corporate Standard AA 023 02 08
Table 1 - Medium Class of Deviation for Linear Dimensions is to be followed unless otherwise specified.

Class of Deviation	Range of Nominal Dimensions									
	Above Upto and Including	0.5	3	6	30	120	315	1000	2000	
		3	6	30	120	315	1000	2000	4000	
Medium		± 0.1	± 0.1	± 0.2	± 0.3	± 0.5	± 0.8	± 1.2	± 2	
Coarse		-	± 0.2	± 0.5	± 0.8	± 1.2	± 2	± 3	± 4	

APPROVED:
SRG

PREPARED:
MSK

ISSUED: DATE:
ENGG SERV. 15-02-22.

3.2.1. Tolerance on non-machining: (for sheet metal fabrication, bus bar bending) - Reference is taken from Corporate standard AA 062 11 04.

Degree of accuracy B is to be followed for sheet metal forming and Degree of accuracy C is to be followed for bus bar forming unless otherwise specified.

Degree of Accuracy	Range of Nominal Dimensions						
	Over Upto & Including	30	120	300	1000	2000	4000
B		± 1	± 2	± 3	± 4	± 6	± 8
C		± 2	± 3	± 4	± 6	± 8	± 10

A permissible variation of ± 1 mm applies to dimensions upto 30 mm.

TOLERANCE ON BENDING OPERATION: PARALLELISM: ± 2 mm for 500 mm

3.2.2. Tolerance on sheared dimensions (cut lengths) for sheared Plates: - Reference is taken from Corporate standard AA023 04 09.

Thickness		Nominal Dimensions Range		
Above	Upto	Upto 1000	1000 - 2500	2500 - 5000
-	3	± 1	± 2	± 2
3	6	± 2	± 2	± 3

3.2.3 ALLOWABLE TOLERANCE FOR BEND TWIST AND BOW IN SHEET

METAL FORMING AND BENDING OPERATIONS: UPTO 20 mm.

3.3 TOLERANCE ON ASSEMBLY OF CUBICLE OUTER DIMNS: ± 2.0 mm

3.3.1 BOLTED ASSEMBLY FOR INTERIOR DIMENSIONS: ± 2.0 mm

3.3.2 BOLTED ASSEMBLY FOR STRAIGHTNESS, FORM & POSITION: ± 2.0 mm

3.3.3 WELDED ASSEMBLY FOR LINEAR & ANGULAR DIMENSIONS: As per Corporate Standard: AA 062 11 04 CLASS A.

- 3.4 WELDED ASSEMBLY FOR FORM & POSITION: As per Corporate Standard AA 062 11 05 CLASS E.
- 4.0 ANGULAR TOLERANCE: As per Corporate Standard AA 023 02 08
- 5.0 Tolerance for mounting of components in Regulation/ Control Cubicles.
- 5.1) For location and mounting arrangement of components, the General Arrangement Drawing for the cubicle is to be referred.
- 5.2) The relative arrangement of component shall be as per General Arrangement Drawing. The minimum distance between two adjacent rows of components shall not be less than 10 mm.
- 5.3) Mounting of components on C-channel are sliding type can be varied by ± 10 mm for every 100 mm distance. However, a minimum gap as per clause 5.2 is to be maintained.
- 5.4) A minimum of 10 mm distance is to be kept between component assembly and side/top/ end covers.
- 6.0 GENERAL PRACTICES
- Unless otherwise specified:
Remove all sharp corners.
Bending radius shall be equal to material thickness.
