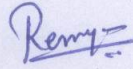
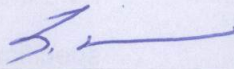
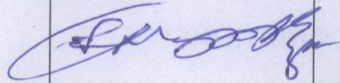


TITLE : TECHNICAL SPECIFICATION FOR BOUGHT ITEMS FOR ESP
 ITEM : GALVANISED CONTROL JUNCTION BOX
 PROJECT : BHEL STANDARD

	NAME	DESIGNATION	SIGNATURE	DATE
PREPARED	REMYA KUKKILLIYA	ENGINEER		01.03.2011
CHECKED	S.RANGARAJAN	DGM		01.03.2011
APPROVED	S.JAYAPRAKASAM	AGM		01.03.2011

ISSUED BY

EDC - ECI

REVISION NO :00 INITIAL RELEASE 01.03.2011

1.0 SCOPE OF SUPPLY:

The scope of supply of Junction box includes manufacturing, inspection, testing, packing and delivery of junction Boxes (galvanized) as per this specification and attached drawings.

2.0 APPLICATION:

The Junction boxes are used in Power station to interconnect various field-mounted electrical equipments pertaining to boiler auxiliaries.

3.0 APPLICABLE STANDARDS:

The Junction boxes shall be manufactured and tested as per the following standards.

- IS 13947 - Low voltage Switchgear and Control Gear specification.
- IS 6005 - Code for Practice for Phosphate Coatings of Iron & Steel.
- IS 694 - PVC insulated Cables for working voltages up to and including 1100V specification.

4.0 SITE CONDITIONS:

- 4.1 Ambient temperature : 1 Deg.C to 50 Deg.C
- 4.2 Relative humidity : 100% RH
- 4.3 Atmospheric condition : Highly dusty, abrasive and polluted, conducive to fungus growth, climate is tropical. Environment is as prevalent in a coal fired thermal power station
- 4.4 Design temperature : 50 Deg.C
- 4.5 Location : Out door

5.0 GENERAL REQUIREMENTS:

- 5.1 Enclosure material : 2 mm Cold rolled sheet steel
- 5.2 Material of removable gland plate : 3mm Hot rolled sheet steel
- 5.3 Material of continuous hinge pin, rider clamp, rider spring, washers & rider bolt : SS 316
- 5.4 Pre treatment of sheet steel : Seven tank process as per IS 6005.
- 5.5 General construction : As per drawings forming part of this specification.
- 5.6 Enclosure protection : IP 55 as per IS 13947

-
- 5.7 Terminal block type & arrangement : ELMEX CST 2.5 or equivalent type of BHEL approved make mounted on DIN rail.
- 5.8 Terminal block insulating material : Melamine
- 5.9 Terminal block voltage grade : 650 V (Minimum)
- 5.10 Door Gasketing : Neoprene gasket 6 mm thick of shore hardness 20 to 30 & density 0.4 gm/cc shall be provided on all mating surfaces.
- 5.11 Gland plate Gasketing : Neoprene gasket 3 mm thick of shore hardness 30 to 40 & density 0.4 gm/cc shall be provided on all mating surfaces.
- 5.12 Door Opening : Suitable for 180 ° opening.
- 5.13 Lug type : Crimping type insulated ATC lugs shall be provided for all the terminals on both sides. Lug type shall be Dowell's CPI-17 pin type (insulated) or equivalent type of BHEL approved make.
- 5.14 Cable Gland type : Nickel chromium plated Brass Double Compression type cable glands fixed on the gland plate, with dummy plugs.
- 5.15 Cable Gland size & quantity : As per attached drawing
- 5.16 Number of earthing terminals : Two as per attached drawing.
- 5.17 Size & location of earthing terminals : As per attached drawing
- 5.18 Location of earthing symbol : Just above the earthing terminal symbol to be black lines on yellow background.
- 5.19 Rated voltage grade of junction box : 415V.
- 5.20 Mounting fasteners : 4 sets of chromium plated bolts, nuts and spring washers for mounting the JB shall be supplied.
- 5.21 All seams are to be continuously welded. There shall be no holes or sockets on top and sides.
- 5.22 Suitable DIN rails along with clamps and screws shall be provided for terminal block mounting. All terminals are to be numbered serially by suitable identification label of PVC material in white background with black numbers. Terminal blocks shall be fixed to T.B supporting DIN rail by means of suitable end plates with screws.
- 5.23 Stickers have to be fixed over the cable glands to indicate the cable size.

- 5.24 Rolled lip shall be provided around three sides of door and around all sides of enclosure opening. This lip is to increase the strength and to keep dirt and liquid from dropping into the enclosure when the door is opened.
- 5.25 Non rusting name plate of 2 ply lamicoid in white colour with the following inscription in black letters shall be fixed to the name plate mounting bracket on top of the junction box with plated screws.

EP JUNCTIONBOX (CONTROL) VAR *
BHEI./BAP/RANIPET

* - As applicable

The name plate shall be provided on the door. It shall contain details like name of the supplier, year of manufacture, weight of the job, BHEL PO number and date.

- 5.26 The different variants of JB shall have dimensions & cable glands as per the following table.

VARIANT	NO. OF WAYS	NO OF ROWS X TB/ROW	DIMENSION IN MM				GLANDS FOR ARMOURED, COPPER CABLES					
							INCOMING			OUTGOING		
			A	B	C	D	CABLE SIZE	GLAND SIZE	QTY	CABLE SIZE	GLAND SIZE	QTY
C1	24	2X12	300	340	50	330	7C-2.5 12C-2.5	CBW 01A CBW03SP	2 2	4C-2.5	CBW01A	8
C2	48	3X16	360	485	75	470	14C-2.5	CBW04A	5	4C-2.5	CBW01A	13

- 5.27 Number of bolts along the breadth of gland plate is fixed for all sizes as shown. Number of bolts along D direction (length of gland plate) is shown typical for 24 ways. For other sizes, number of bolts to be distributed keeping equal distance between them.
- 5.28 The un toleranced dimensions shall be as per IS 2102.
- 5.29 For cable glands, the type reference indicated in above table is that of a particular manufacturer. Equivalent type of cable glands of other BHEL approved makes given in this specification can also be used.
- 5.30 Alternate arrangement of fixing the gland plate to the bottom of the Junction box by suitable steel, zinc plated rivet nuts is also acceptable in which case the make of rivet nut and fixing arrangement is subject to BHEL approval. Make shall be BOLLHOFF, Germany or equivalent.
- 5.31 Terminal blocks to be supplied and mounted by vendor.
- 5.32 Terminal block shall be ELMEX, TOSHA or CONNECTWELL make. All terminal blocks are to be mounted vertically properly stacked. Suitable DIN rails along with clamps and screws shall

be provided. All terminals are to numbered 1 thro.36, by suitable identification label and fixing it on to the terminal block. Terminal block identification label shall be PVC white back ground with black numbers.

- 5.33 Bolts and nuts required for mounting the junction boxes are to be electro galvanised and supplied by vendor. Necessary spring washers shall also be supplied.
- 5.34 Earth tag (black lines on yellow back -ground)of dia 20 mm shall be provided hear each earth terminal with co-ordinates as 30 mm from rear of the box and 25 mm above center-line of earth terminal.
- 5.35 The terminal block shall be clip on type (CSLT-1) with melamine housing mounted in standard channel with end plate and end clamps
- 5.36 Earthing bolts and nuts with rose courtney lug shall be provided at opposite points on outside of the junction box body with earth symbol.

6.0 MAKE OF COMPONENTS

- 6.1 Terminal block : ELMEX, TOSHA/ CONNECTWELL
- 6.2 Crimping type lug : DOWELL
- 6.3 Cable glands : COMET / BRACCO / ARUP ENGG. / QPIE / SUNIL & Co.
- 6.4 PVC wires : ISI (BIS) APPROVED/CERTIFIED MAKES

7.0 GALVANIZING

- Galvanising of all sheet steel, fasteners : As per IS 2629 & IS 4759.
- Amount of zinc coating : (i) 610gm/sq.m.
(ii) Min coating thickness on junction box. Shall not be less than 86 microns.

8.0 PACKING

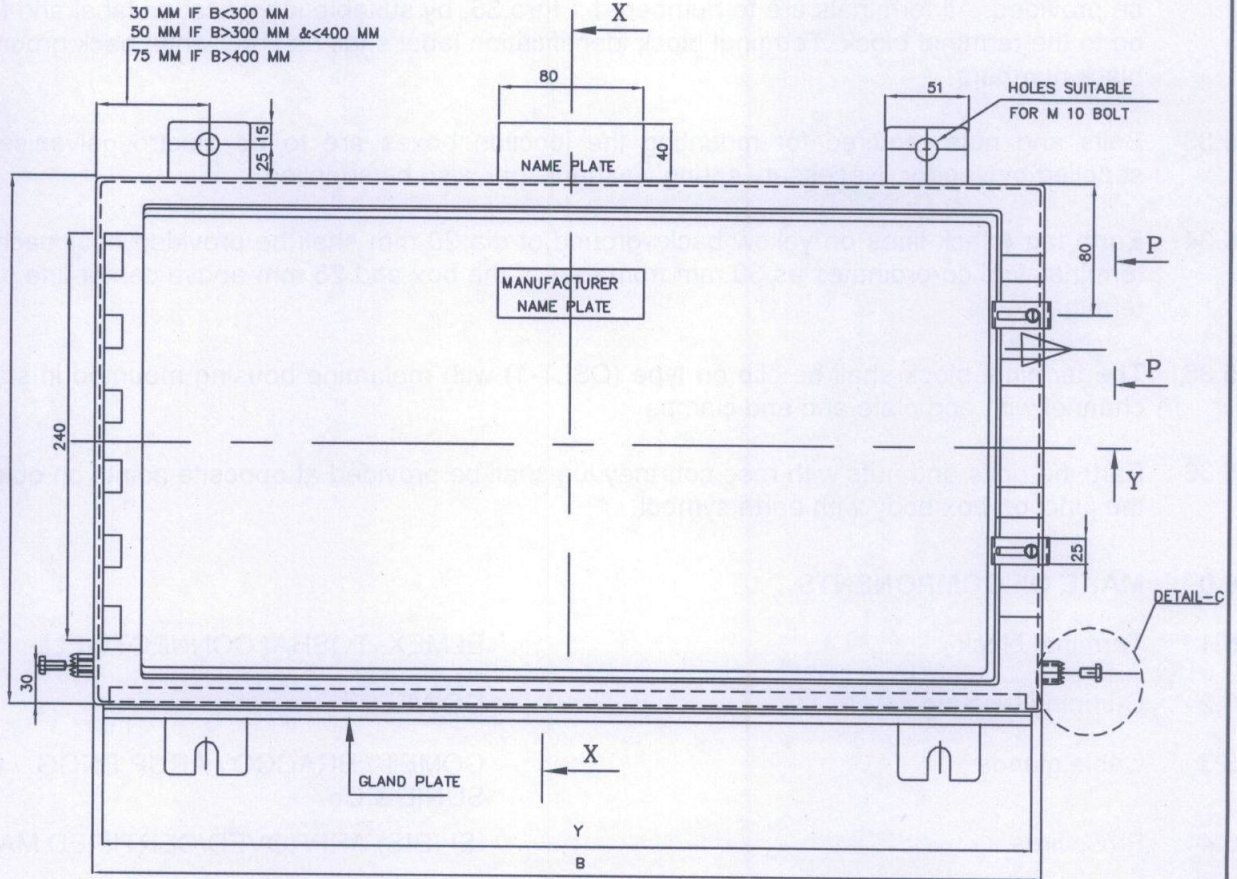
Each JB shall be fully wrapped in a polythene cover to avoid water entry and then packed separately in cardboard box. Finally all such boxes shall be packed in a wooden crate.

9.0 DRAWING

Manufacturing drawings prepared in AUTO CAD shall be submitted in SOFT MEDIA in addition to **4 sets** of hard copies for approval by BHEL, (prior to start of manufacture) within 10 days from the date of purchase order.


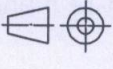
ALL DIMENSIONS ARE IN MILLIMETRES

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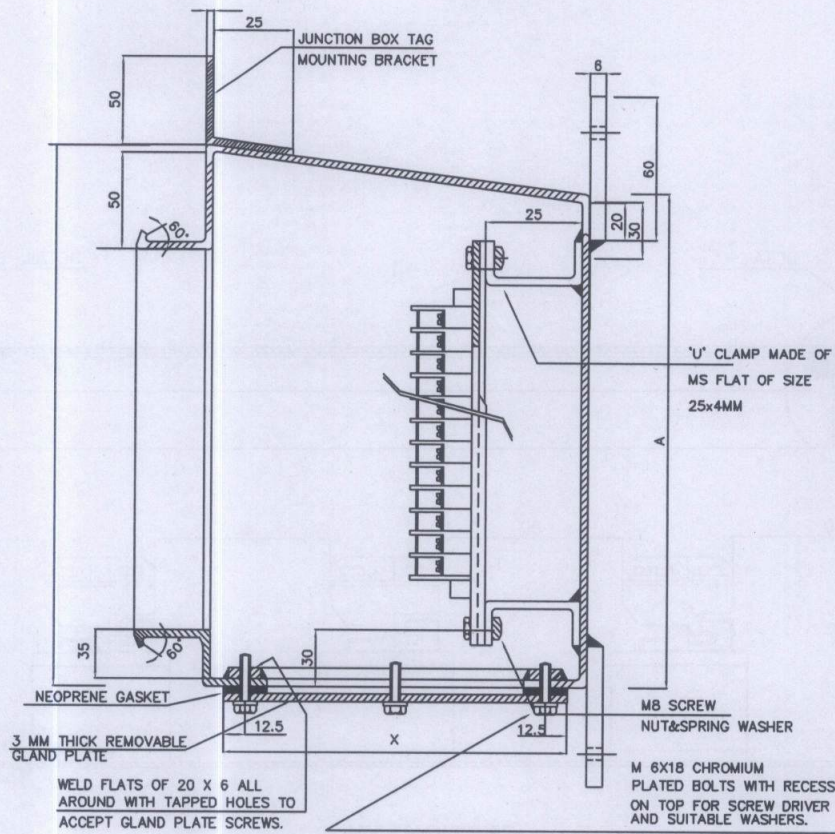
NOTE:

01. THIS DRG.NO. SHALL BE READ ALONG WITH DRAWINGS NUMBERS. 4-00-114-23321 TO 4-00-114-23324.

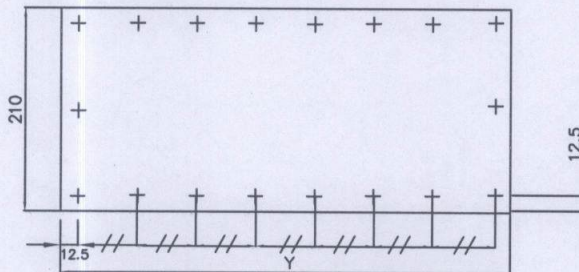
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			CHD	REMYA	<i>Remya</i>	15.02.10	
			APPD	S.RANGARAJAN	<i>S. R.</i>	16.02.10	
DEPT ECI	GRADE OF UNTOLD.DIM		SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.	ITEM NO.	NO. OF ITEMS
CODE		NTS		-	-		
TITLE			CARD CODE	DRAWING NO.		REV	
GENERAL ARRANGEMENT OF GALVANISED CONTROL JUNCTION BOX			U 01	4-00-114-23320		00	

ALL DIMENSIONS ARE IN MILLIMETRES

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SECTION - XX
(WITH FRONT DOOR REMOVED)



GLAND PLATE(TYP)

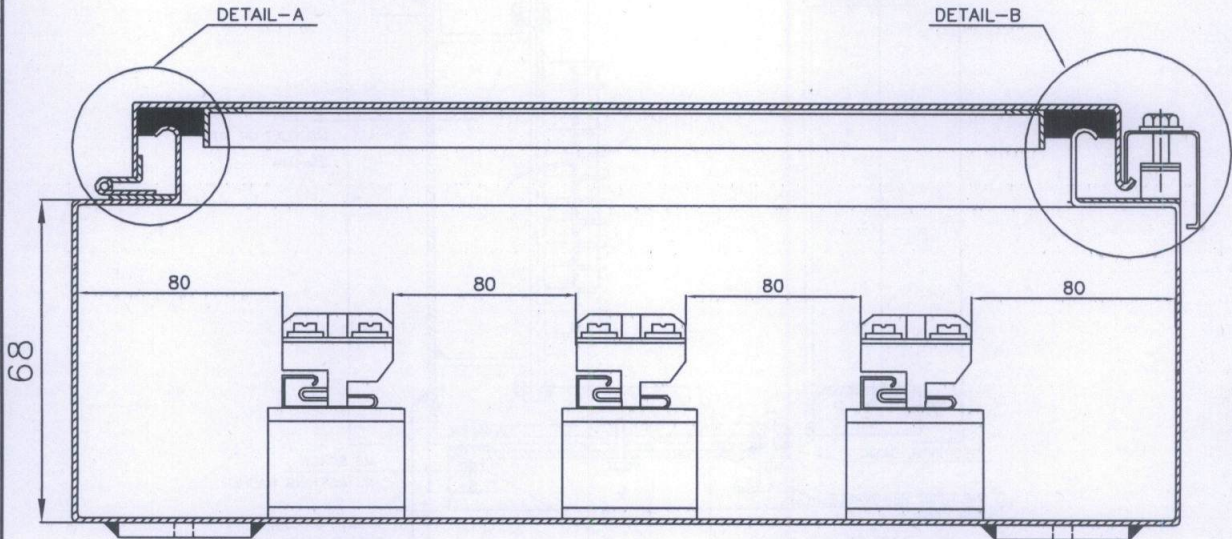
NOTE:

01. THIS DRG.NO. SHALL BE READ ALONG WITH DRAWINGS NUMBERS 4-00-114-23320&4-00-114-23322 TO 4-00-114-23324.

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		CHD	REMYA	SIGN	<i>Remya</i>	DATE	15.02.10	
		APPD	S.RANGARAJAN	SIGN	<i>S. R.</i>	DATE	16.02.10	
DEPT	ECI	GRADE OF UNTOL. DIM	SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.	ITEM NO.	NO. OF ITEMS	
CODE			NTS	-	-			
TITLE				CARD CODE	DRAWING NO.	REV		
GENERAL ARRANGEMENT OF GALVANISED CONTROL JUNCTION BOX				U 01	4-00-114-23321	00		

ALL DIMENSIONS ARE IN MILLIMETRES


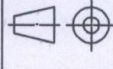
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SECTION-YY
(SHOWN FOR VARIANT C2)

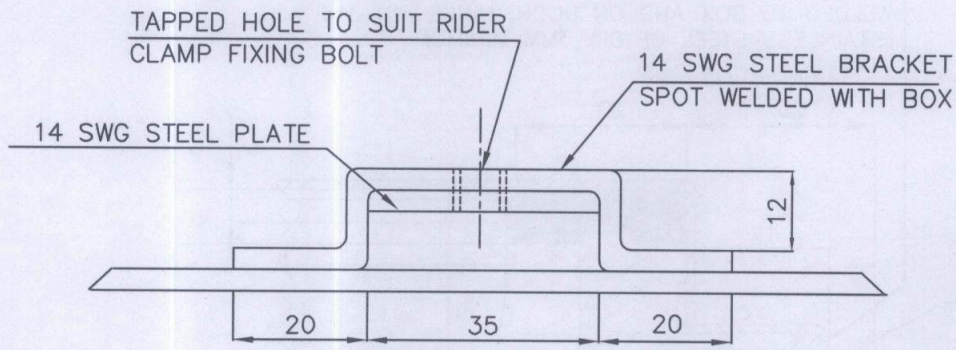
NOTE:

01. THIS DRG.NO. SHALL BE READ ALONG WITH DRAWINGS NUMBERS
4-00-114-23320,4-00-114-23321&4-00-114-23323,4-00-114-23324.

 BHARAT HEAVY ELECTRICALS LTD., UNIT: BOILER AUXILIARIES PLANT. RANIPET - 632 406.		NAME		SIGN	DATE	NO. OF VAR	
		DRN		K.ANAND	<i>K. Anand</i>		15.02.10
		CHD		REMYA	<i>Remya</i>		15.02.10
DEPT ECI		 SCALE NTS	APPD		S.RANGARAJAN	<i>S. R.</i>	16.02.10
CODE	GRADE OF UNTOL DIM		REF. TO ASSY./OLD DRG.		ITEM NO.		NO. OF ITEMS
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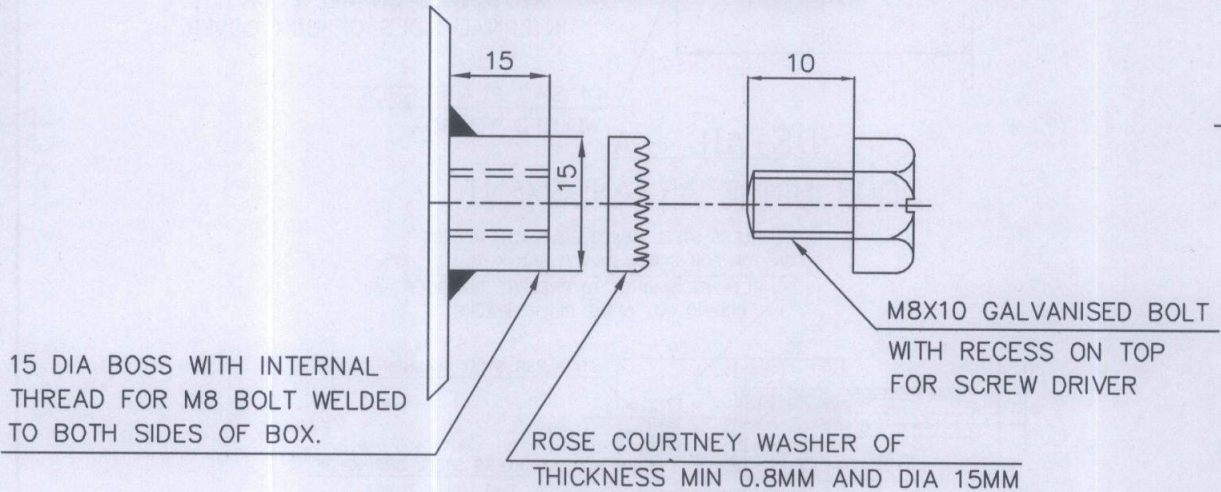
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VIEW-P

(WITH RIDER CLAMP AND BOLT REMOVED)




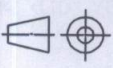
DETAIL-C

EARTHING ARRANGEMENT

(TO BE LOCATED 30 MM FROM REAR OF BOX)

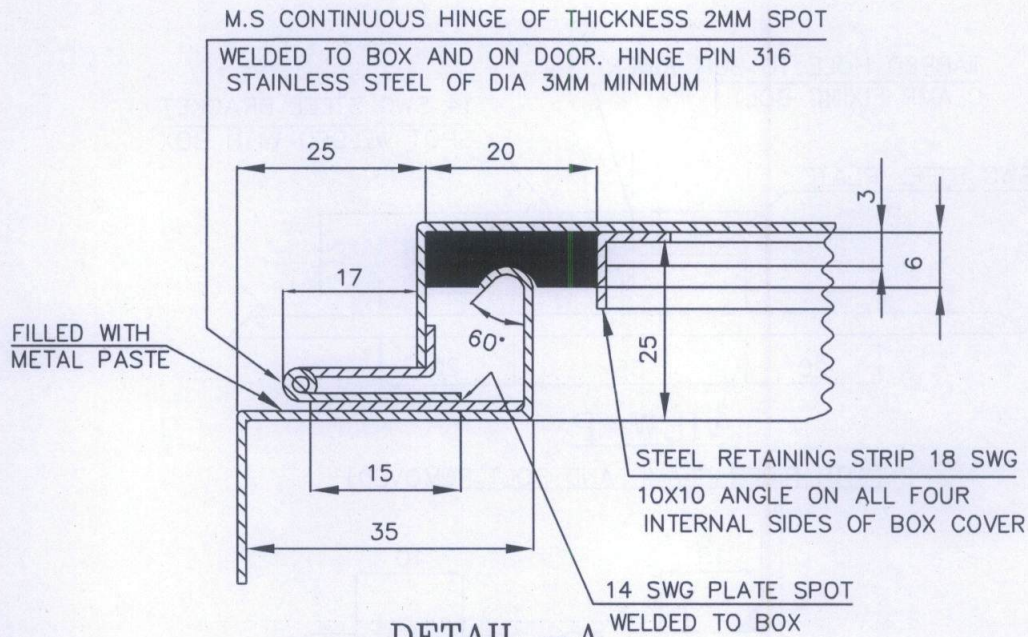
NOTE:

- THIS DRG.NO. SHALL BE READ ALONG WITH DRAWINGS NUMBERS 4-00-114-23320 TO 4-00-114-23322 & 4-00-114-23324.

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		CHD	REMYA	SIGN	<i>Remya</i>	DATE	15.02.10	
		APPD	S.RANGARAJAN	SIGN	<i>S. R.</i>	DATE	16.02.10	
DEPT ECI	GRADE OF UNTOL DIM	SCALE NTS		WEIGHT (KG).	REF. TO ASSY./OLD DRG.	ITEM NO.	NO. OF ITEMS	
CODE				-	-			
TITLE GENERAL ARRANGEMENT OF GALVANISED CONTROL JUNCTION BOX				CARD CODE U 01	DRAWING NO. 4-00-114-23323		REV 00	

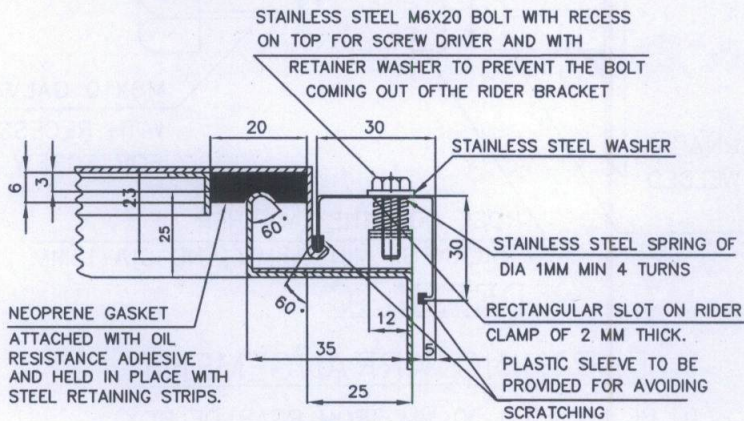
ALL DIMENSIONS ARE IN MILLIMETRES

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DETAIL - A

DOOR HINGE ARRANGEMENT



DETAIL - B

RIDER CLAMP ARRANGEMENT

NOTE:

01. THIS DRG.NO. SHALL BE READ ALONG WITH DRAWINGS NUMBERS
4-00-114-23320 TO 4-00-114-23323.

	BHARAT HEAVY ELECTRICALS LTD., UNIT: BOILER AUXILIARIES PLANT. RANIPET - 632 406.		DRN	K.ANAND	SIGN	K. Anand	DATE	15.02.10	NO. OF VAR
			CHD	REMYA	SIGN	Remya	DATE	15.02.10	
			APPD	S.RANGARAJAN	SIGN	S. R.	DATE	16.02.10	
DEPT ECI	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.		ITEM NO.	NO. OF ITEMS		
CODE		NTS	-	-					
TITLE			CARD CODE	DRAWING NO.			REV		
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