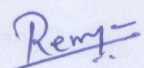
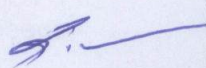
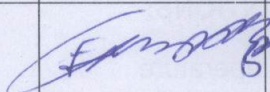


TITLE : TECHNICAL SPECIFICATION FOR BOUGHT ITEMS FOR ESP				
ITEM : GALVANIZED POWER JUNCTION BOX				
PROJECT : BHEL STANDARD				
NAME		DESIGNATION	SIGNATURE	DATE
PREPARED	REMYA KUKKILLIYA	ENGINEER		01.03.2011
CHECKED	S.RANGARAJAN	DGM		01.03.2011
APPROVED	S.JAYAPRAKASAM	AGM		01.03.2011
ISSUED BY				
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 upto and including 1100 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 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   | : | Annealed tinned solder less crimping type copper lugs shall be provided for all the terminals on both sides. Lug type shall be as mentioned in attached drawing. |
| 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. The enclosure box shall meet hose proof and weather proof requirement.   |   |  |
| 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 (POWER) VAR *
BHEL/BAP/RANIPET

\* - As applicable

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

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

VARIANT	INCOMING					OUTGOING				
	CABLE SIZE (AL)	CABLE GLAND		T.B. TYPE	LUG TYPE	CABLE SIZE (CU)	CABLE GLAND		T.B. TYPE	LUG TYPE
		SIZE	QTY				SIZE	QTY		
P1	3C-16 SQMM	CBW01A CBW03SP	02 02	CST-16	CP8	2C-2.5 SQMM	CBW01S	10	CST-10	CPI 19
P2	3C-35 SQMM	CBW04A	02	CBT-110	CUS12	2C-2.5 SQMM	CBW01S	12	CST-10	CPI 19
P3	3C-70 SQMM	CBW05A CBW06SP	02 02	CBT-170	CUS18	2C-2.5 SQMM	CBW01S	12	CST-10	CPI 19

- 5.27 The un-toleranced dimensions shall be as per IS 2102.
- 5.28 For cable glands, lugs & TBs, the type reference indicated in above table is that of a particular manufacturer. Equivalent type of cable glands, lugs & TBs of other BHEL approved makes given in this specification can also be used.
- 5.29 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.
- 5.30 Terminal block to be supplied and mounted by vendor. Terminal block shall be of NTPC approved make and rating as recommended in the table. Terminal blocks are to be mounted horizontally. Suitable din rail/base for mounting terminal shall be provided. All terminals are to be identified by suitable identification label the strip shall be of PVC white background with black letters.

- 5.31 Bolts and nuts required for mounting the junction boxes and fittings are to be electro galvanised and supplied by the vendor.
- 5.32 Internal looping shall be made with 1100v grade PVC insulated stranded copper conductor cable and termination with crimping type annealed tinned copper lugs of Dowells make.
- 5.33 Earthing bolts and nuts with rose courtney washer shall be provided at opposite points on outside of the junction box body with earth symbol made of aluminium.
- 5.34 The lugs shall be flat pin crimping type for CST-10 outgoing terminals & tube terminal for CBT-10 incoming terminals.
- 5.35 For external cable termination, two numbers lugs shall be fitted and supplied inn each terminal. The TB shall be suitable for terminating two lugs in a single block for both incoming and outgoing cables.

#### **6.0 MAKE OF COMPONENTS**

- 6.1 Terminal block : ELMEX
- 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**

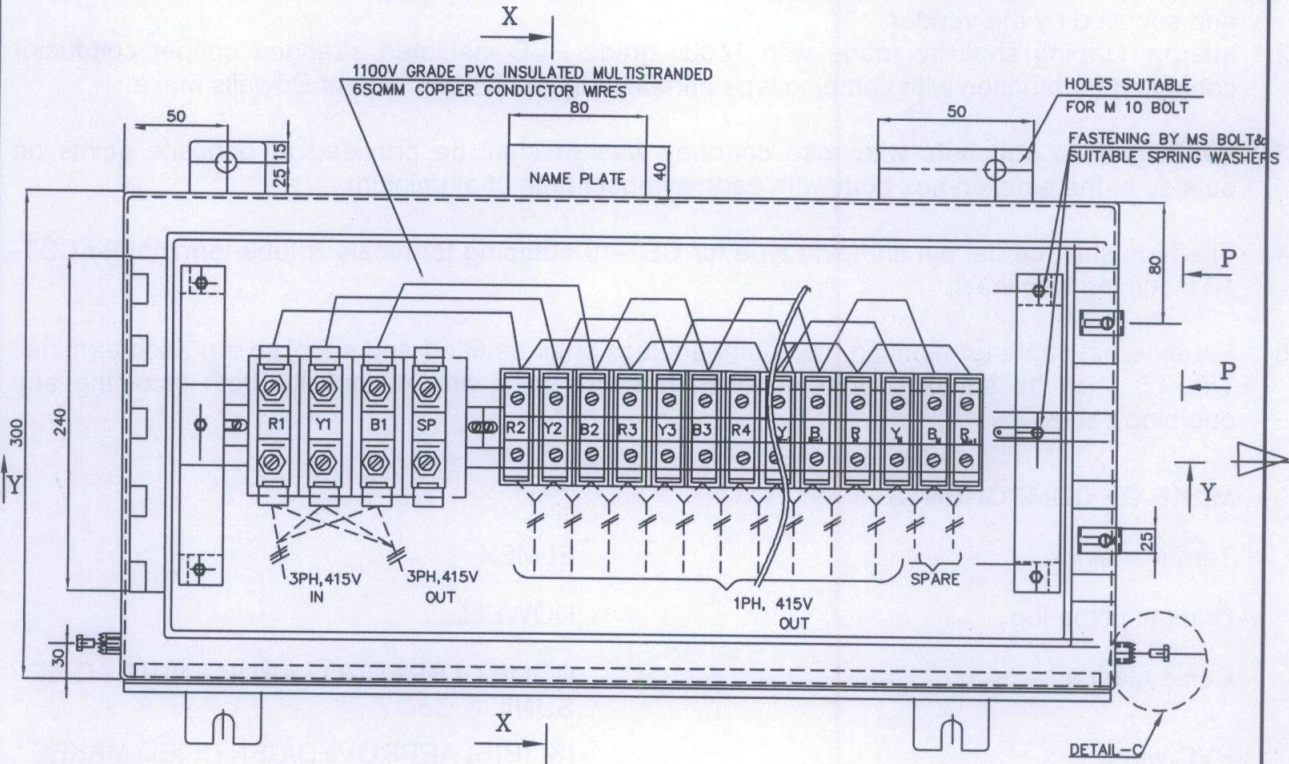
Each JB shall be fully wrapped in a polythene cover to avoid water entry and then packed separately in cardboard box. Finally all such boxes shall be packed in a wooden crate.

#### **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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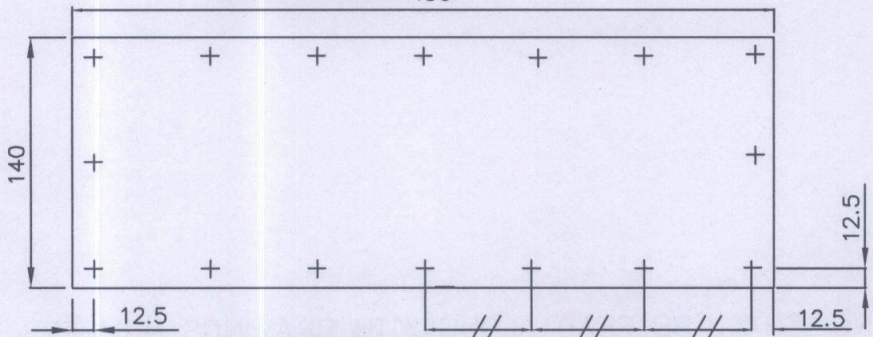
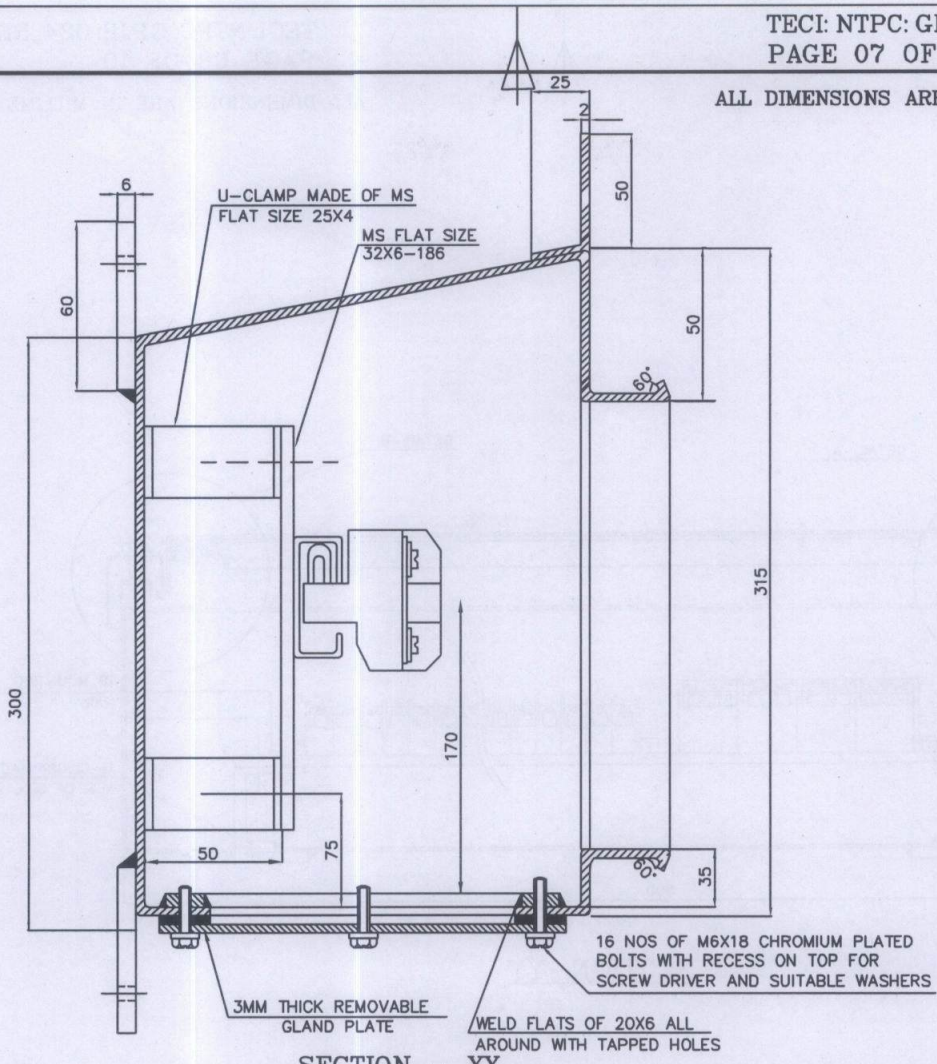


NOTE:

01. THIS DRG. SHALL BE READ ALONG WITH DRAWINGS NUMBERS 4-00-114-23316 TO 4-00-114-23319.
02. THE VALUE 'N' SHALL BE VARY WITH THE JUNCTION BOX VARIANT AS PER TABLE IN CLAUSE NO.5.26.


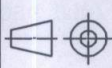
	<b>BHARAT HEAVY ELECTRICALS LTD.,</b> UNIT: BOILER AUXILIARIES PLANT. RANIPET - 632 406.		DRN	NAME	SIGN	DATE	NO. OF VAR
	CHD	REMYA	<i>Remya</i>	15.02.10			
	APPD	S.RANGARAJAN	<i>S.R.</i>	16.02.10			
DEPT ECI	GRADE OF UNTOL.DIM	SCALE NTS	WEIGHT (KG.) -	REF. TO ASSY./OLD DRG. -		ITEM NO.	NO. OF ITEMS
CODE							
TITLE GENERAL ARRANGEMENT OF GALVANISED POWER JUNCTION BOX			CARD CODE U 01	DRAWING NO. 4-00-114-23315		REV 00	

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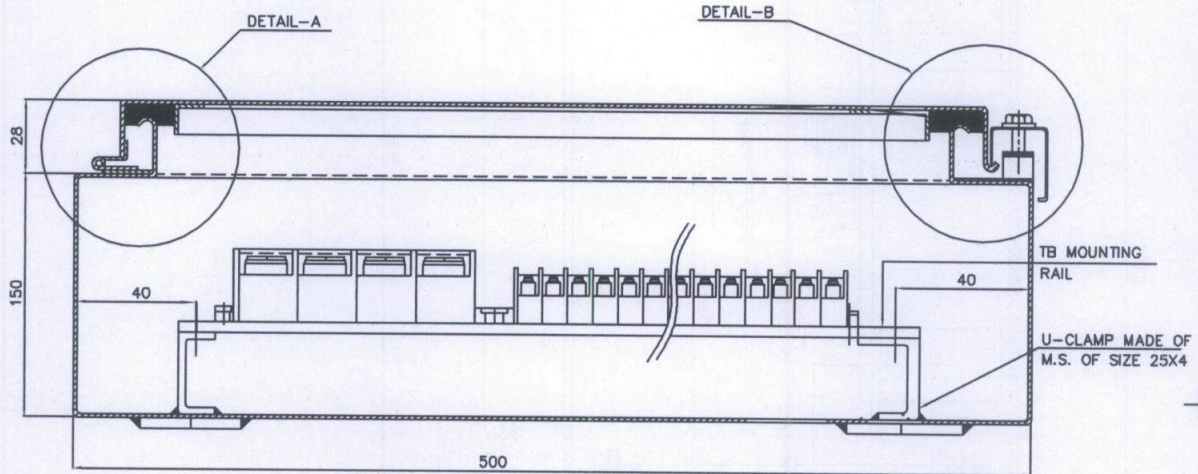
NOTE:

01. THIS DRG.NO. SHALL BE READ ALONG WITH DRAWINGS NUMBERS 4-00-114-23315, 4-00-114-23317 TO 4-00-114-23319.

 <b>BHARAT HEAVY ELECTRICALS LTD.,</b> UNIT: BOILER AUXILIARIES PLANT. RANIPET - 632 406.	DRN	K.ANAND	SIGN	<i>K. Anand</i>	DATE	15.02.10	NO. OF VAR
	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 POWER JUNCTION BOX				U 01	4-00-114-23316	00	

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SECTION-YY

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NOTE:

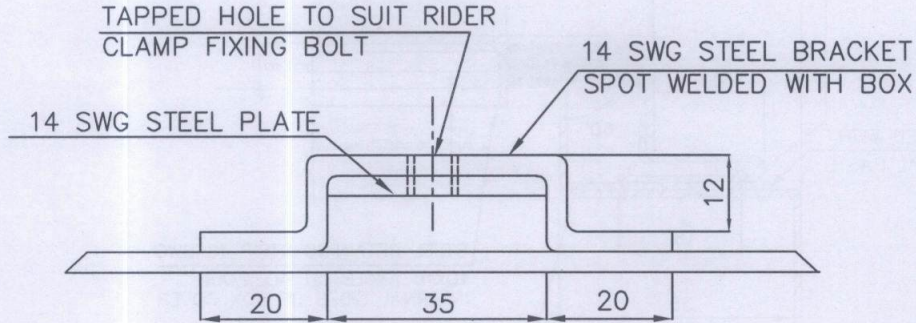
01. THIS DRG.NO. SHALL BE READ ALONG WITH DRAWINGS NUMBERS 4-00-114-23315, 4-00-114-23316 & 4-00-114-23318, 4-00-114-23319.

 BHARAT HEAVY ELECTRICALS LTD., UNIT: BOILER AUXILIARIES PLANT. RANIPET - 632 406.		DRN	NAME	SIGN	DATE	NO. OF VAR	
		CHD	REMYA	<i>Remya</i>	15.02.10		
		APPD	S.RANGARAJAN	<i>S.R.</i>	16.02.10		
		DEPT	ECI	GRADE OF UNTOL.DIM	SCALE		WEIGHT (KG).
CODE			NTS	-	-		
TITLE		CARD CODE	DRAWING NO.		REV		
GENERAL ARRANGEMENT OF GALVANISED POWER JUNCTION BOX		U 01	4-00-114-23317		00		

Size A4

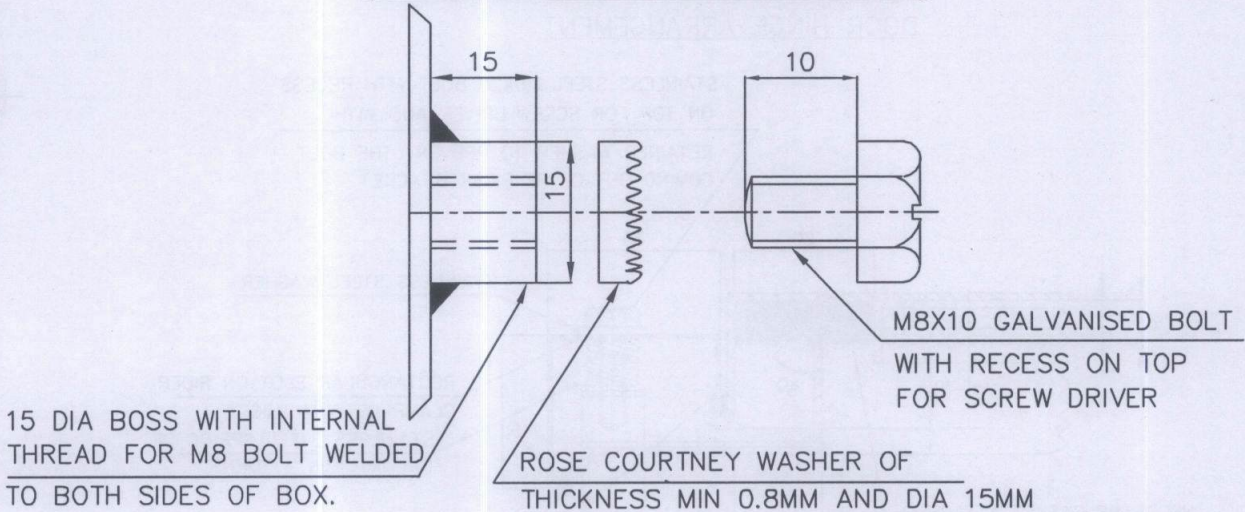
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VIEW-P

(WITH RIDER CLAMP AND BOLT REMOVED)


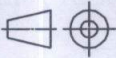


EARTHING ARRANGEMENT

(TO BE LOCATED 30 MM FROM REAR OF BOX)

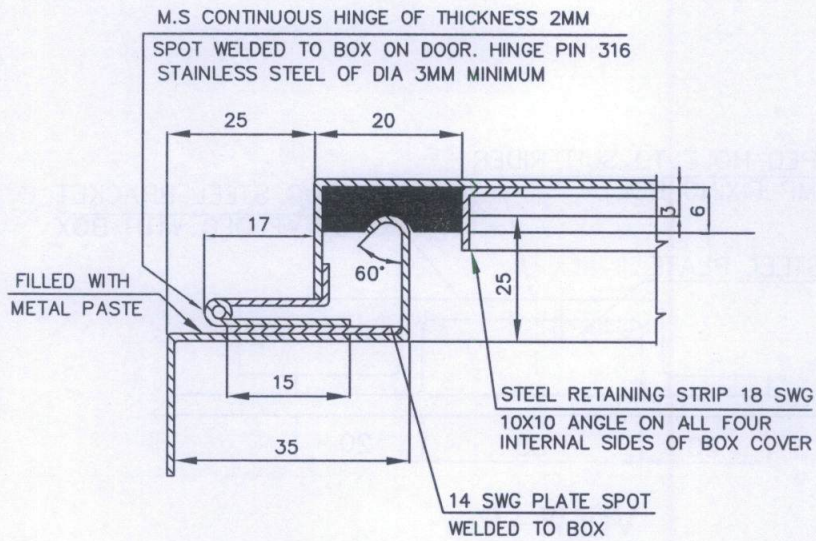
NOTE:

01. THIS DRG.NO. SHALL BE READ ALONG WITH DRAWINGS NUMBERS 4-00-114-23315 TO 4-00-114-23317 & 4-00-114-23319.

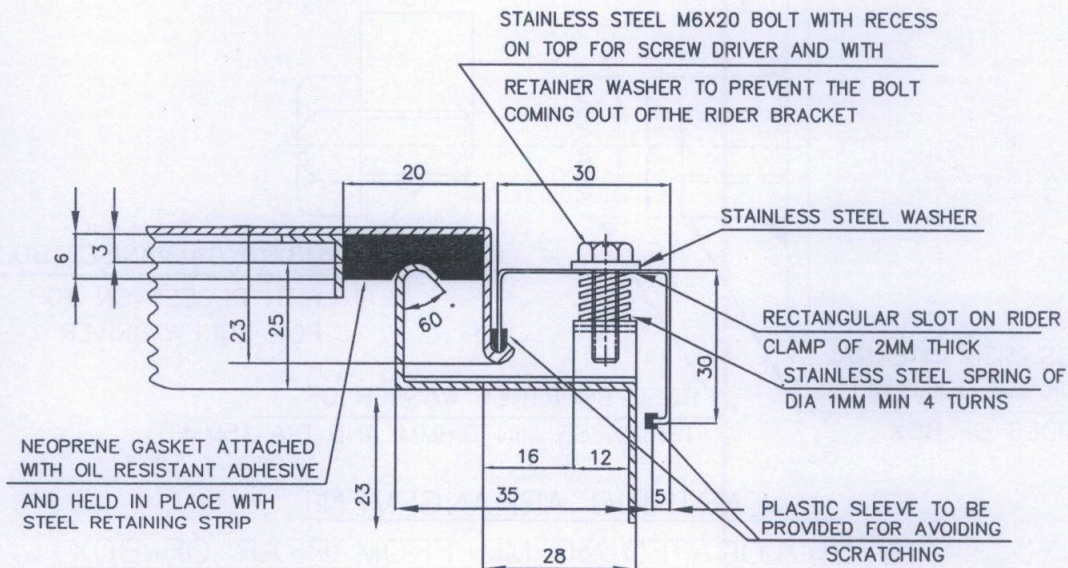
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			CHD	REMYA	SIGN	Remya	DATE	15.02.10	
			APPD	S.RANGARAJAN	SIGN	S. R.	DATE	16.02.10	
DEPT ECI	GRADE OF UNTOL DIM		SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.		ITEM NO.	NO. OF ITEMS	
CODE			NTS	-	-				
TITLE				CARD CODE	DRAWING NO.			REV	
GENERAL ARRANGEMENT OF GALVANISED POWER JUNCTION BOX				U 01	4-00-114-23318			00	

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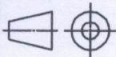
**DETAIL - A**  
**DOOR HINGE ARRANGEMENT**



**DETAIL - B**  
**RIDER CLAMP ARRANGEMENT**

**NOTE:**

01. THIS DRG.NO. SHALL BE READ ALONG WITH DRAWINGS NUMBERS  
4-00-114-23315 TO 4-00-114-23318.

	<b>BHARAT HEAVY ELECTRICALS LTD.</b> UNIT: BOILER AUXILIARIES PLANT. RANIPET - 632 406.		DRN	NAME	SIGN	DATE	NO. OF VAR	
			CHD	REMYA	<i>Remya</i>	15.02.10		
			APPD	S.RANGARAJAN	<i>S. R.</i>	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 POWER JUNCTION BOX			U 01	4-00-114-23319			00	