


12

PSGSG/ 2015- 16/001	<b>Product Specifications</b> <b>For</b> <b>Surge Arrester Housing for 145kV GSM</b>	Drg. No.	RD 15 320 100
		Date	04.02.16
		Product	<b>GSM145</b>

<b>1.0</b>	<b>Application:</b> The stainless steel Surge arrester housing to Drawing. No. RD 15 320 100 is used for gas filled applications. The gas pressure in this metal enclosure is maintained at 0.5-0.7 MPa. The surge arrester housing shall meet following Specifications.
<b>2.0</b>	<b>Drawings</b> : Main Assembly Drawing Surge arrester housing: RD 15 320 100 Pipe assembly: RD 15 320 200 Dish assembly: RD 15 320 300
<b>3.0</b>	<b>SPECIFICATIONS:</b>
<b>3.1</b>	<b>Material:</b> Low Carbon Austenitic <b>stainless steel</b> confirming to AISI-304L.
<b>3.2</b>	Standard seamless or ERW (straight/ spiral) tubular sections shall be used for construction, here ever applicable in design. Fabricated (allowing rolled and seam welded) / drawn sections can be used for other areas not conforming to standard pipe schedules.
<b>3.3</b>	Drawn profiles, to size, only shall be used for direct welding with the flanges (To be machined to the drawing only after welding). No smithy is allowed for formation/ matching of profiles in view of defect inception. Pipe and flanges shall be MIG/TIG welded with suitable SS electrode.
<b>3.4</b>	The welded sections shall be sized as per drawing and verified /tested using Dye Penetration (D.P.) technique at all stages of welding. Inside edges/weld shall be fused to obtain near smooth weld surface.

1/3	PSGSG/2015-16/001.doc		<i>Agency</i> <b>Signature</b>
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PSGSG/ 2015- 16/001	<b>Product Specifications For Surge Arrester Housing for 145kV GSM</b>	Drg. No.	RD 15 320 100
		Date	04.02.16
		Product	<b>GSM145</b>
<b>3.5</b>	The flanges shall be manufactured to drawings after welding only. The flanges shall be machined as per instructions and maintaining parallelism of faces and Perpendicularity as prescribed. To ensure parallelity, it is must to machine the components after welding all the sections as prescribed. The flange sealing surfaces shall be polished to RA 0.6 or better and the bolting holes shall be machined fine, using CNC milling, and shall have uniform chamfer. The tolerances, wherever not mentioned in the drawing, shall be within 0.10. Any sharp corners shall be removed as per the drawing. Wherever not specified in the drawing, a chamfer of 0.5x45° shall be provided at the sharp corners and edges.		
<b>3.6</b>	All flanges of different dimensions shall be welded by maintaining parallelity as per limits of manufacturing drawing.		
<b>3.7</b>	Weld splatter, if any, shall be removed by chipping or grinding on completion of the weld. Particular care should be taken to avoid any splatter on the inside of the chamber, at the joint or other locations.		
<b>3.8</b>	Dye penetration report shall be generated and submitted to BHEL.		
<b>3.9</b>	The tested assembly should be cleaned, degreased and prepared for pressure test. The assembly shall be tested at 8.5 bar pressure for 4 hours and pressure drop shall be recorded and communicated to BHEL. The leak shall be rectified and the test repeated to satisfaction. Components indicating drop in pressure during this test will not be accepted. The arrangement shall be kept at 15 bar for 15 minutes prior to this test to verify pressure withstanding capabilities specified in drawing.		
<b>3.10</b>	The supplier shall stress relieve tested component to ensure zero post supply deformation.		
2/3	PSGSG/2015-16/001.doc		 <b>Signature</b>

PSGSG/ 2015- 16/001	<b>Product Specifications For Surge Arrester Housing for 145kV GSM</b>	Drg. No.	RD 15 320 100
		Date	04.02.16
		Product	<b>GSM145</b>
<b>3.11</b>	The supplier shall stress relieve tested component to ensure zero post supply deformation.		
<b>3.12</b>	Stress relieved component shall be electro-polished on the inside surface using moderate current densities.		
<b>3.13</b>	The assemblies further shall be sandblasted on the outer surface and powder coated (> 50 Micron) as specified in drawing. During this operation all flanges shall be masked at the sealing surfaces and at the rim.		
<b>3.13</b>	The dimensional checks and the leak test shall be carried out in presence of BHEL inspector.		
<b>3.14</b>	The accepted component shall be packed in wooden boxes with suitable PVC covers on the flanges to prevent transit damages. A thick polyethylene cover shall be used to seal to component from ingress of moisture and water. For transit time higher than 2-weeks, adequate quantity of moisture absorbent shall also be placed with the component.		
<b>3.15</b>	<p>Following certificates shall be furnished for acceptance of the component:</p> <p>3.15.1 Material source certificate,</p> <p>3.15.2 Material test certificate ,</p> <p>3.15.3 Stage wise DP tests,</p> <p>3.15.4 Pressure drop test and pressure withstand test report,</p> <p>3.15.5 Electro-polishing schedule.</p> <p>A certified copy of above documents shall be sent along with the delivery not.</p>		
<b>4.0</b>	The components shall be guaranteed against all manufacturing defects.		
<b>5.0</b>	<b>Qualification requirements:</b> Suppliers shall submit references of similar jobs for past three YEARS.		
<b>6.0</b>	<b>Guarantee Certificate:</b> Guarantee certificate for the period of 12 Months from the date of supply shall be furnished along with the supply.		
3/3	<b>PSGSG/2015-16/001.doc</b>		<i>Authentic</i> <b>Signature</b>

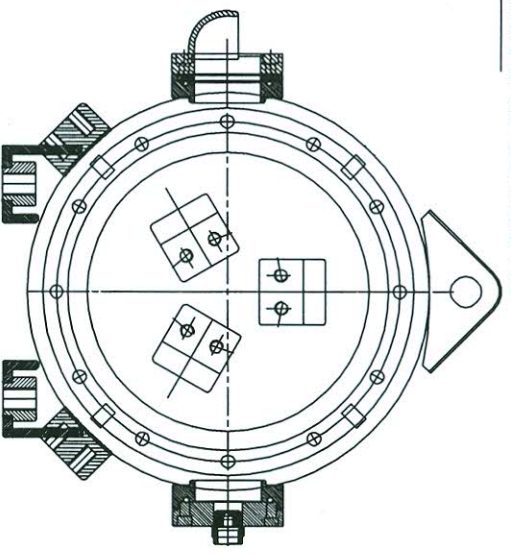
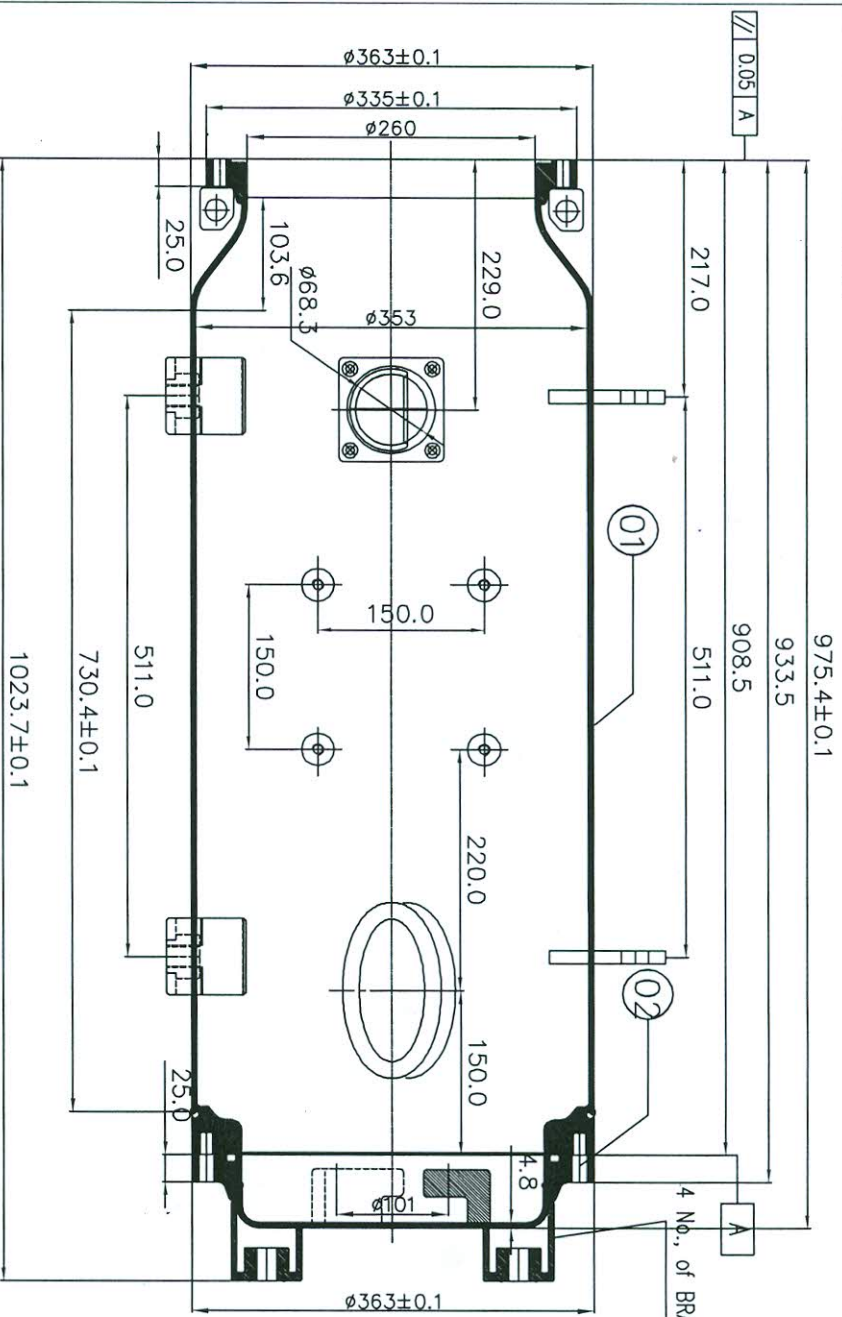
512

001 020 51 RD ON 2000

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

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**Note:**

1. FLANGE TO BE TIG / MIG WELDING WITH SUITABLE SS ELECTRODE
2. THE ROOT SHOULD BE HOMOGENEOUS AND CONTINUOUS.
3. PRESSURE TEST AS PER ENCLOSED SPECIFICATION.
4. TESTED ASSEMBLIES TO BE DEGREASED, SAND BLASTED AND POWDER COATED ON OUTSIDE.
5. ELECTRO POLISH INSIDE SURFACE.
6. LIFTING LUGS AND SUPPORT BRACKETS SHALL BE FULLY WELDED TO PIPE AND FLANGE.
7. ALL WELDINGS SHALL BE GROUNDED TO DIMENSIONS.

REV.	DATE	ALTERED	ZONE
		CHECKED	

ITEM NO.	DESCRIPTION	DRAWING NO.	ITM NO.	MATL CODE	UNIT	UNIT WT.	QTY.	ZONE
02	DISH ASSY	RD 15 320 300		SS-304L		01		
01	PIPE ASSY	RD 15 320 200		SS-304L		01		

TYPE OF PRODUCT		NAME OF CUSTOMER	
GSM-145		GSM-145	

DEPT.	GRADE OF	SCALE	WEIGHT(KG)
HYDRA	C/M/P	NTS	

DRN NAME	SRN	DATE	NO. OF
AL		12/12/14	100
APPD	MR/AD	12/12/14	02
REF. TO		12/12/14	

TITLE	CARD CODE	DRAWING NO.	NO. OF SHEETS
SA ENCLOSURE ASSY.		RD 15 320 100	100



29

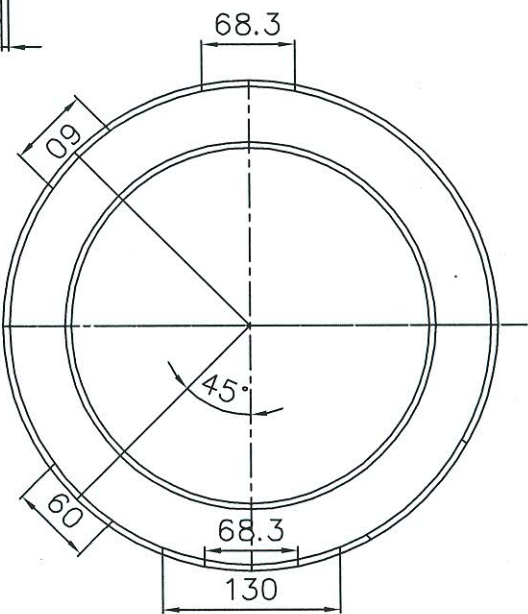
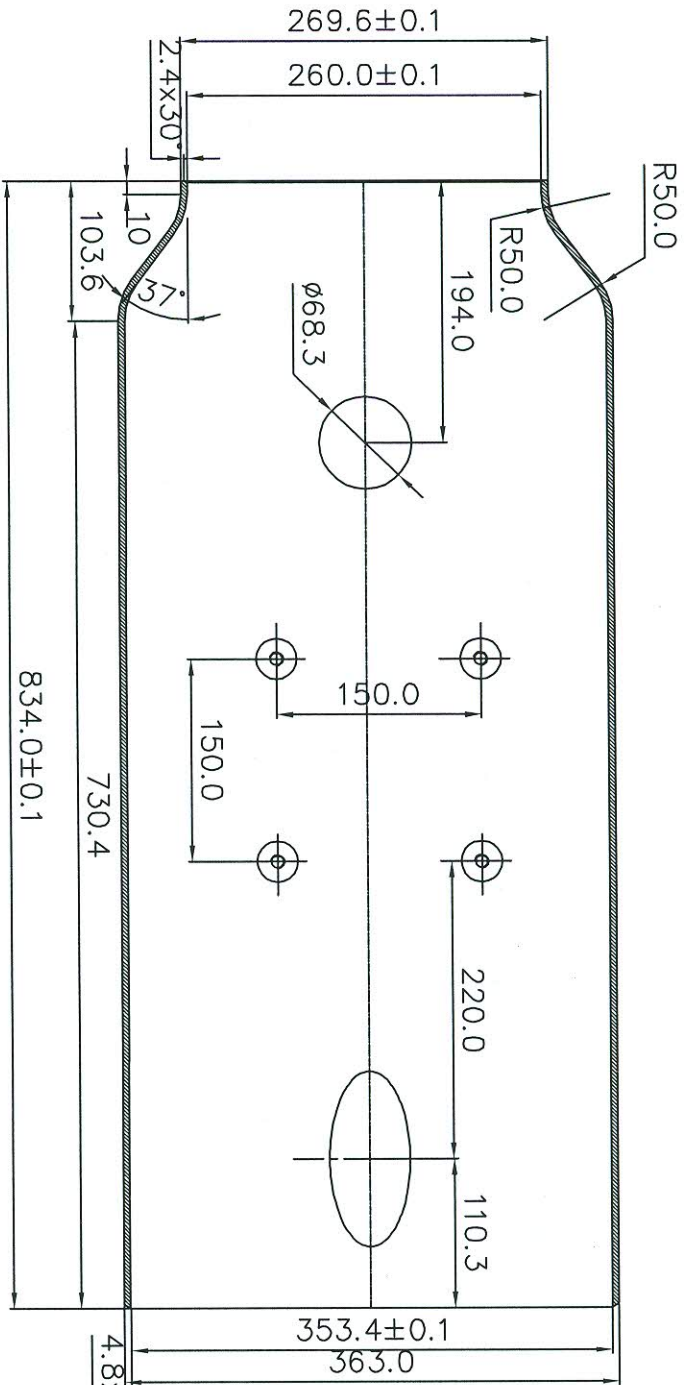
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INVENTORY NO. SIGN. AND DATE REF. DRG. NO.

DRG. NO. RD 15 320 210

FIRE PROTECTION

(ALL DIMEN ARE IN mm)



ITEM NO.	DESCRIPTION	STD	DRAWING NO.	VAR	ITNO	MATL. CODE	UNIT	QTY.
01	PIPE					SS-304L	01	

TYPE OF PRODUCT: GSM-145

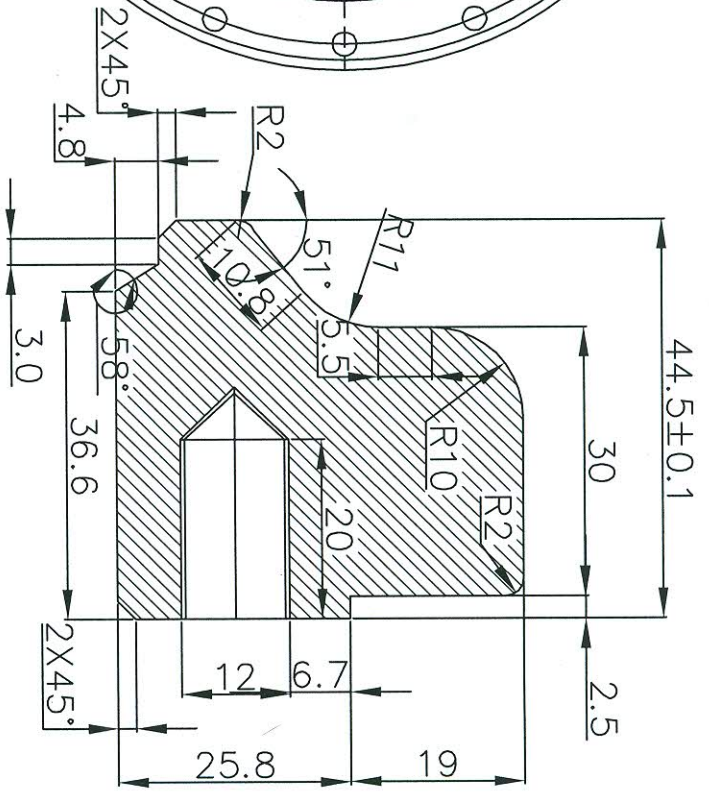
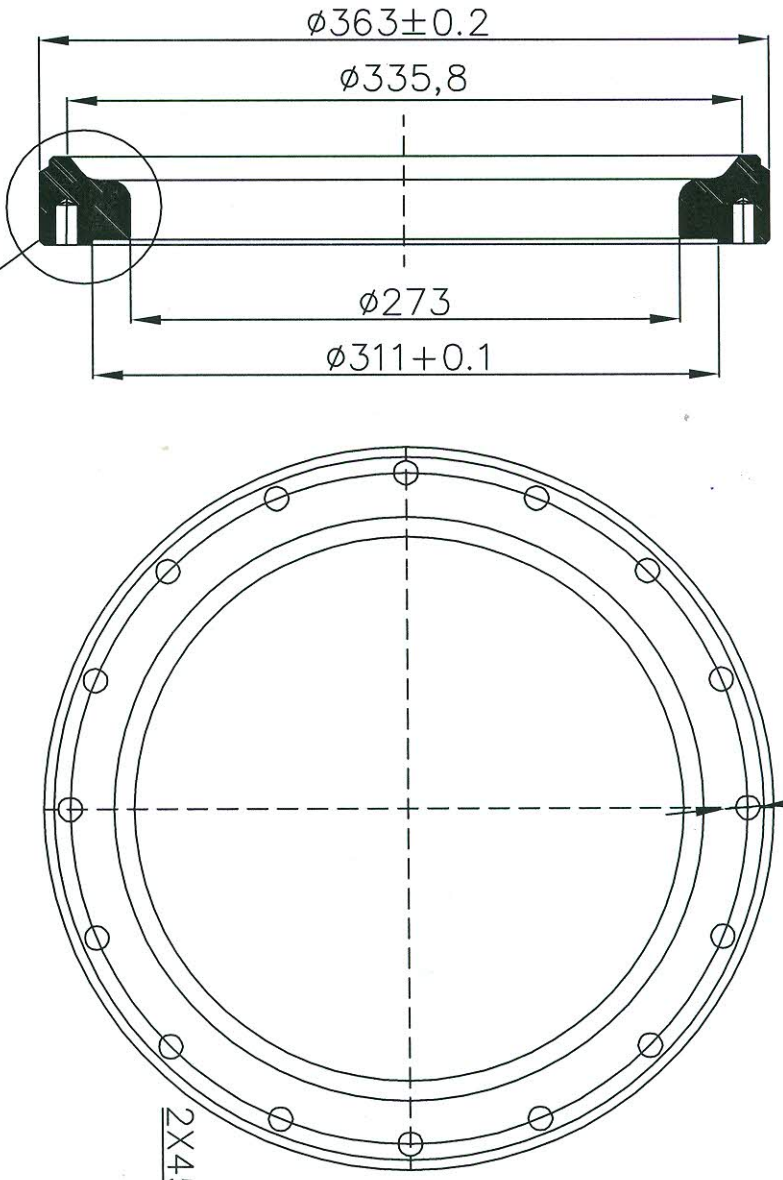
NAME OF CUSTOMER: BHARAT HEAVY ELECTRICALS LTD. HYDERABAD

DEPT. CODE	GRADE OF TOL. DIM. (C/A/M)	SCALE	WEIGHT(KG)	DRN. NO.	APPD.	REF. TO	DATE	NO. OF ITEMS
	NTS			21214	MM/RAO		21214	02

REV.	DATE	ALTERED	CHECKED	TITLE	CARD CODE	DRAWING NO.	NO. OF SHEETS
				PIPE	RD 15 320 200	RD 15 320 210	100

REV.	DATE	ALTERED	CHECKED	TITLE	CARD CODE	DRAWING NO.	NO. OF SHEETS
				PIPE	RD 15 320 200	RD 15 320 210	100

16- M12 Threaded holes @337±0.1 PCD



DETAIL A

Note: REFER DETAIL 'A'

1. Sealing area shall be polished to RA 0.8 or better.
2.  $\phi$  14.0 holes shall be chamfered uniformly (0.8x45°).
3. PCD and flange centre shall be concentric within  $\pm 0.05$
4. Finished flange shall be degreased and packed in 125 micron poly bag and sealed.
5. Component shall be Machined to dimensions after welding to pipe

VAR NO	REMARKS	VAR NO	ITEM NO	DESCRIPTION	DRAWING NO	TT NO	MATL CODE	UNIT WT
		01		FLANGE	#363.0X44.5		SS-304L	01

TYPE OF PRODUCT  
NAME OF CUSTOMER  
GSM-145

DEPT.	HYDRABAD	SCALE	WEIGHT(KG)	CARD CODE	DRAWING NO.	SHEET NO.	NO. OF SHEETS
CODE	C/M/F				RD 15 320 220	02	1

REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHECKED			CHECKED

INVENTORY NO.	SIGN. AND DATE	REF. DRG. NO.
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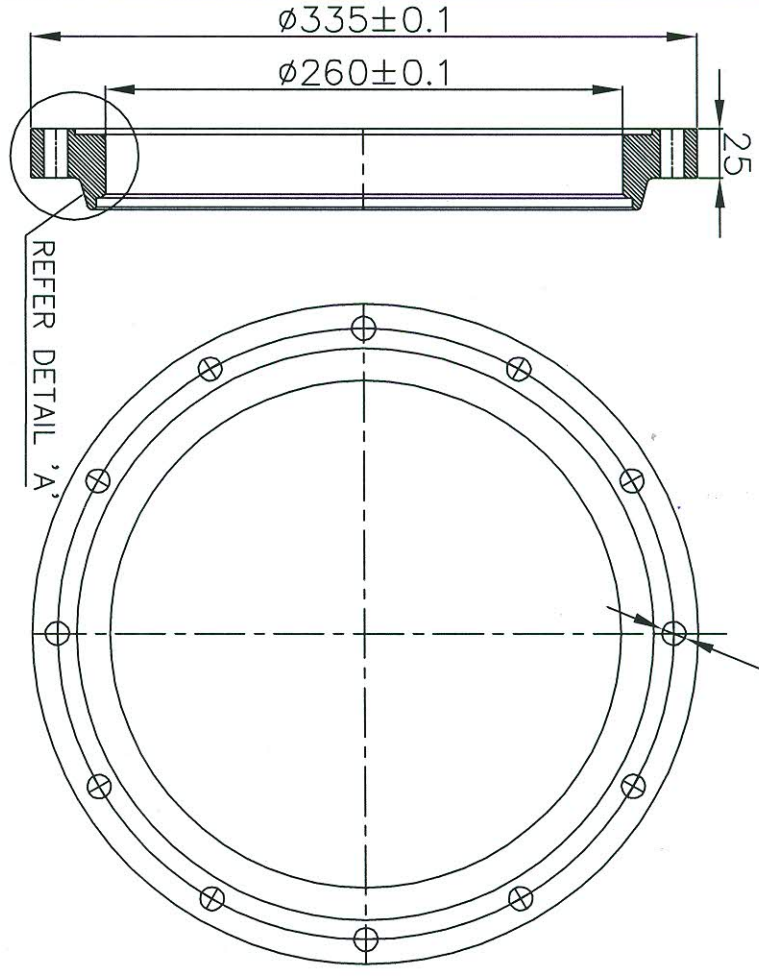
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032 020 51 RD  
ON DRG

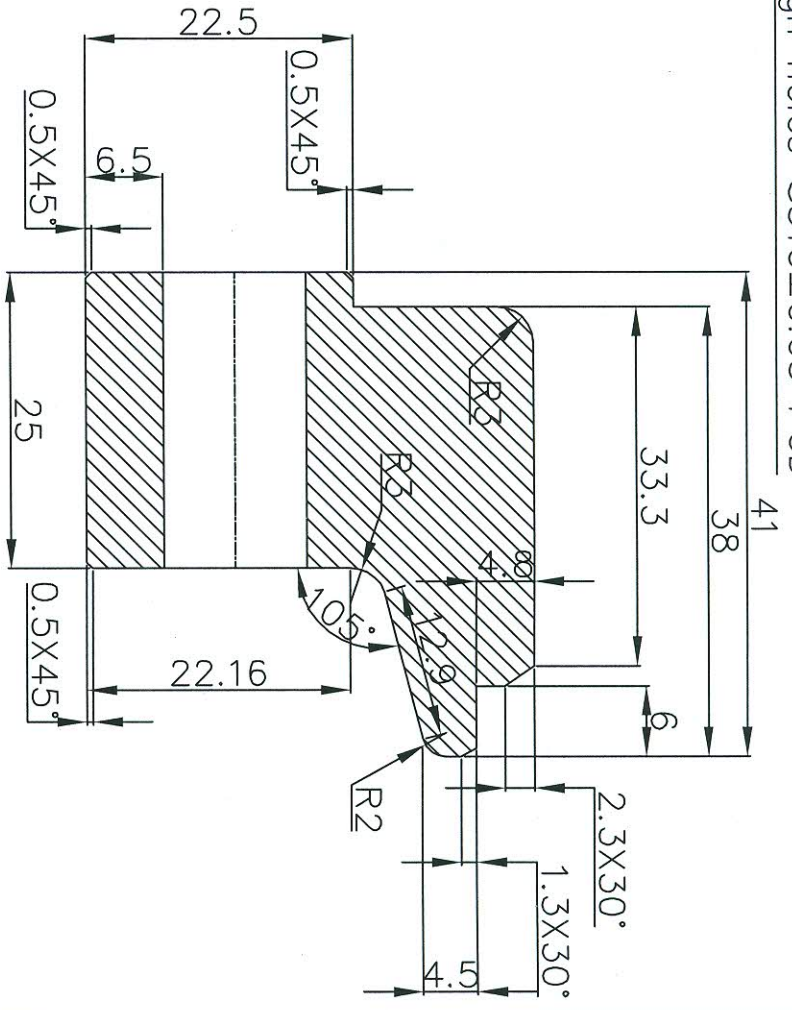
FIRST ANGLE PROJECT

(ALL DIMENSIONS ARE IN mm)

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12-  $\phi 14.0$  through holes @  $310 \pm 0.05$  PCD



REFER DETAIL 'A'

- Note:
1. Sealing area shall be polished to RA 0.8 or better.
  2.  $\phi 14.0$  holes shall be chamfered uniformly (0.8x45°).
  3. PCD and flange centre shall be concentric within  $\pm 0.05$
  4. Finished flange shall be degreased and packed in 125 micron poly bag and sealed.
  5. Component shall be Machined to dimensions after welding to pipe

VAR ID	REMARKS	VAR NO	ITEM NO	DESCRIPTION	DRAWING NO	IT NO	MATL CODE	MATL SPECN	UNIT WT	QTY	ZONE
		01		FLANGE	4363.0X41.0		SS-304L		01		

TYPE OF PRODUCT  
NAME OF CUSTOMER  
GSM-145

REV	DATE	ALTERED	BY	CHKD	DATE	ALTERED	BY	CHKD	DATE	ALTERED	BY	CHKD

DEPT.	GRADE OF	SCALE	WEIGHT(KG)	CARD CODE	DRAWING NO.	SHEET NO.	NO. OF SHEETS

REV	DATE	ALTERED	BY	CHKD	DATE	ALTERED	BY	CHKD

INVENTORY NO.	SIGN. AND DATE	REF. DRG. NO.

TITLE  
FLANGE-II

BHARAT HEAVY ELECTRICALS LTD.  
HYDERABAD

DRN AL  
SKD AL  
APPD MNRAD  
REF. TO RD 15 320 200  
DATE 12/12/14  
NO. OF VARS 02  
ITEM NO. 03  
NO. OF ITEMS 1

21

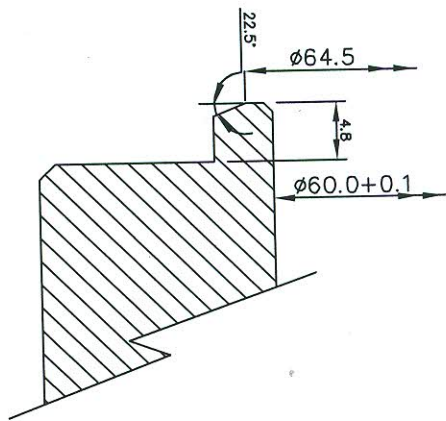
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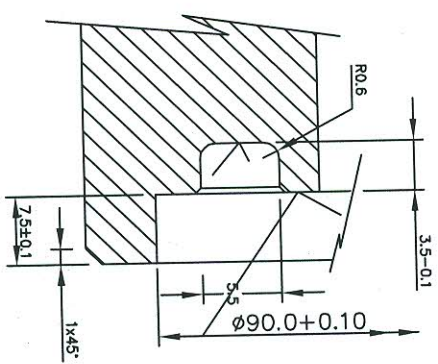
FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

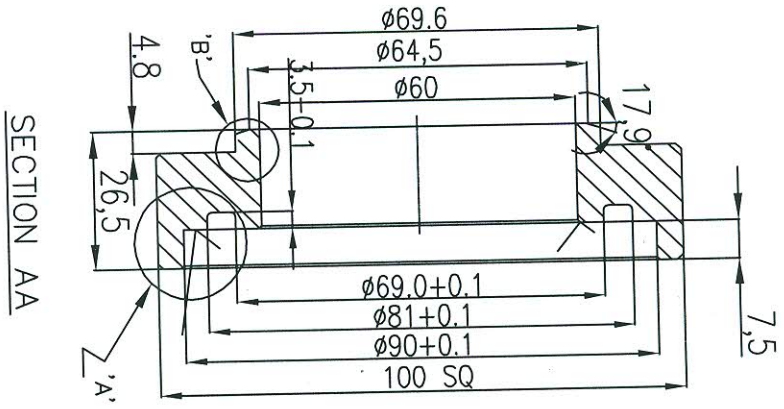
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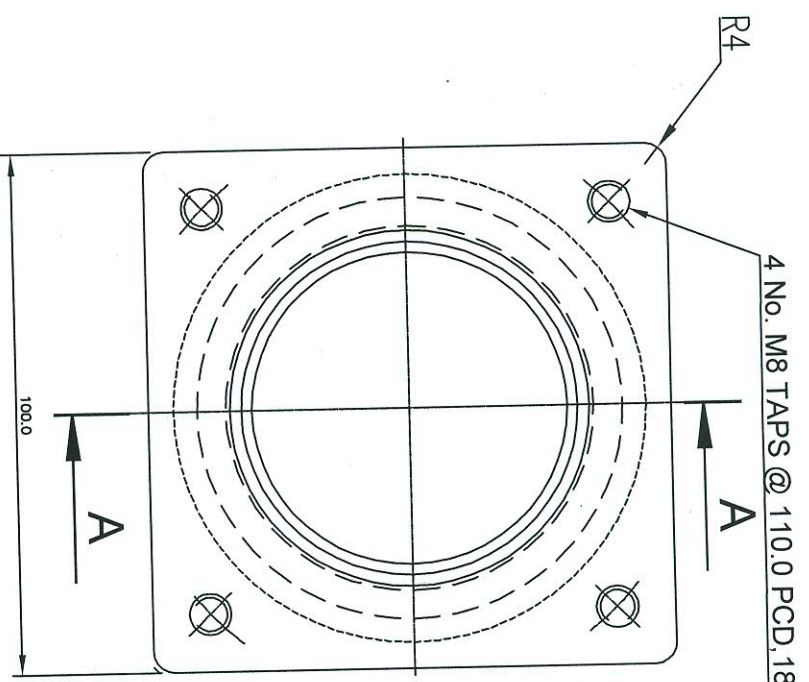
ENLARGED VIEW 'B'



ENLARGED VIEW 'A'



SECTION AA



4 No. M8 TAPS @ 110.0 PCD, 18 mm DEEP

A

A

100.0

VAR. NO.	REMARKS	VAR. NO.	ITEM NO.	DESCRIPTION	DR. NO.	VAR.	UNIT	QTY.	ZONE
01				SS PLATE	105.0 SQ x 30.0				

TYPE OF PRODUCT		NAME OF CUSTOMER		DATE	
GSM 145		BHARAT HEAVY ELECTRICALS LTD.		01.02.03	
DEPT. CODE		SCALE		SHEET NO.	
GSM		MNS		RD 99 320 600 2	
HYDERABAD		WEIGHT(KG)		RD 99 320 610 10	
DRN. NO.		MATERIAL CODE		NO. OF SHEETS	
01.02.03		SS 304		2	
APPD. NO.		MATERIAL SPECN.		REV.	
01.02.03		A		RD 99 320 610 10	
REF. TO		C		NO. OF SHEETS	
RD 99 320 600 2		E		2	
RD 99 320 610 10		F		10	

O-RING GROOVE SURFACE SHALL BE FINISHED TO RA 0.8  
MARKED SURFACE SHALL BE FINISHED TO RA 1.6

INVENTORY NO.	SIGN. AND DATE	REF. DRG. NO.
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REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHECKED			CHECKED

FLANGE IV



57

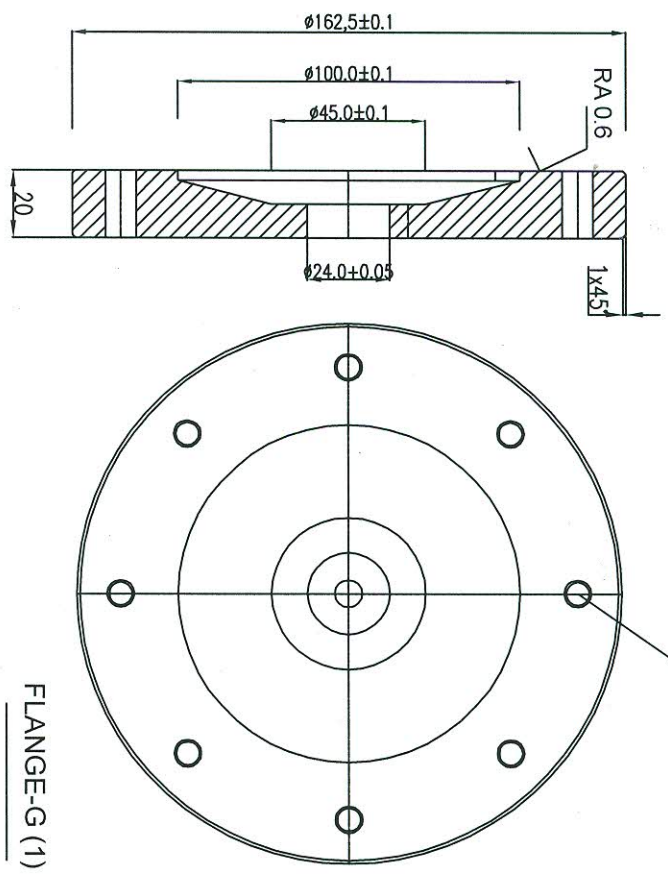
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FIRST ANGLE PROJECTION

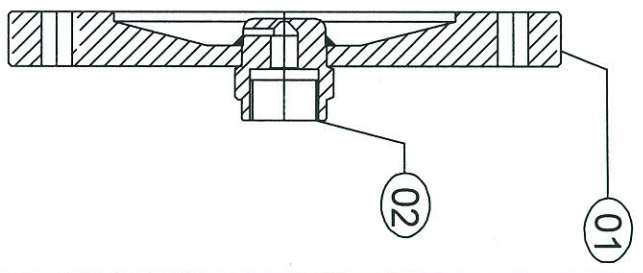
(ALL DIMENSIONS ARE IN mm)

8 NO., 9.2 CLEAR HOLES  
@135±0.07 PCD WITH 0.4X45° C/F

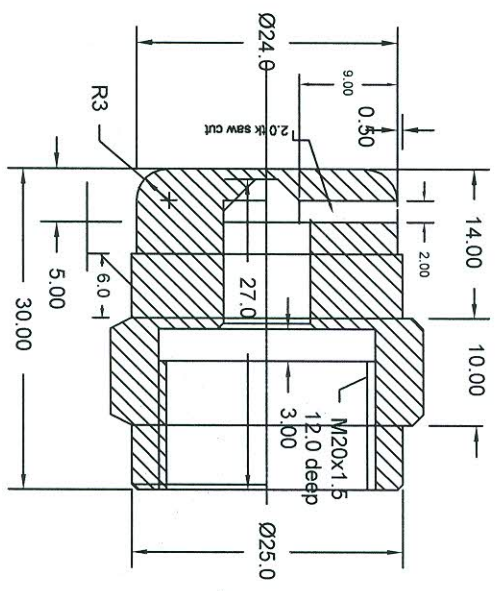
(~1.6)



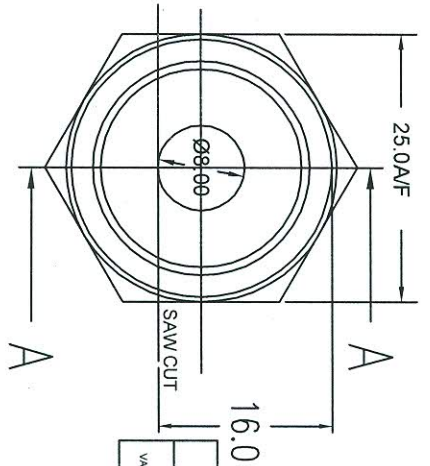
FLANGE-G (1)



ASSEMBLY



SECTION AA



GAS STUD (2)

VAR. NO.	REMARKS	VAR. NO.	ITEM NO.	DESCRIPTION	FL. NO.	DRAWING NO.	VAR. NO.	IT. NO.	MATL. CODE	MATL. SPECN.	A	B	C	QTY.	ZONE
02				GAS STUD					SS-304L					0.16 KG	
01				FLANGE-G					SS-304L					2.3 KG	

TYPE OF PRODUCT  
NAME OF CUSTOMER  
GSM-420

REV.	DATE	ALTERED	CHECKED	ZONE	REV.	DATE	ALTERED	CHECKED	ZONE

DEPT. CODE: **NTS** SCALE: **2.5** WEIGHT(KG): **2.5**

GRADE OF TOL. DIM. C/M/P: **NTS**

DEPT. CODE: **FLANGE-V**

NAME: **BHARAT HEAVY ELECTRICALS LTD. HYDERABAD**

DATE: **26.12.06**

NO. OF SHEETS: **1**

DRAWING NO.: **RD DG 4 35 0617 0980**

SHEET NO.: **RD DG 4 35 0617 0983**

INVENTORY NO. SIGN. AND DATE REF. DRG. NO.

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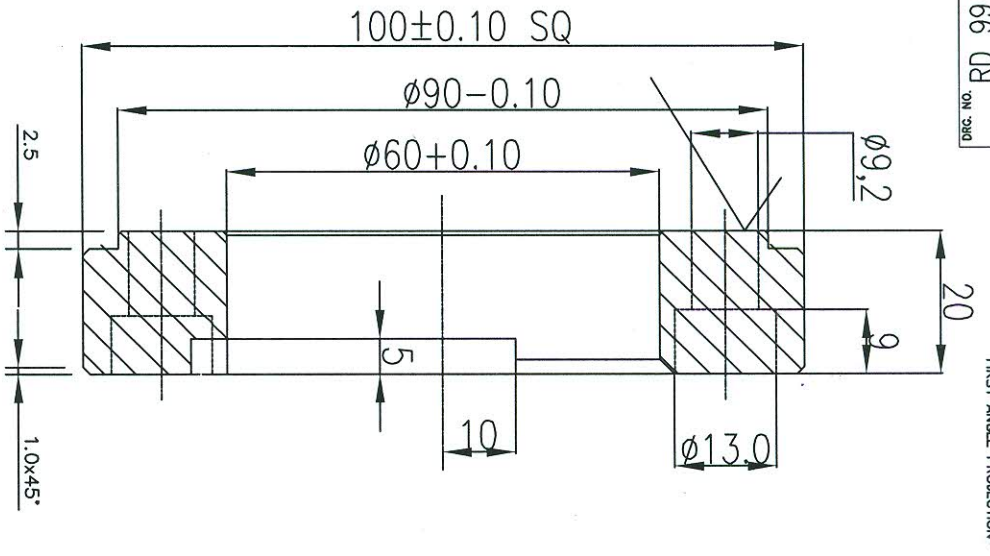
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139 026 66 RD 99 320 631

FIRST ANGLE PROJECTION

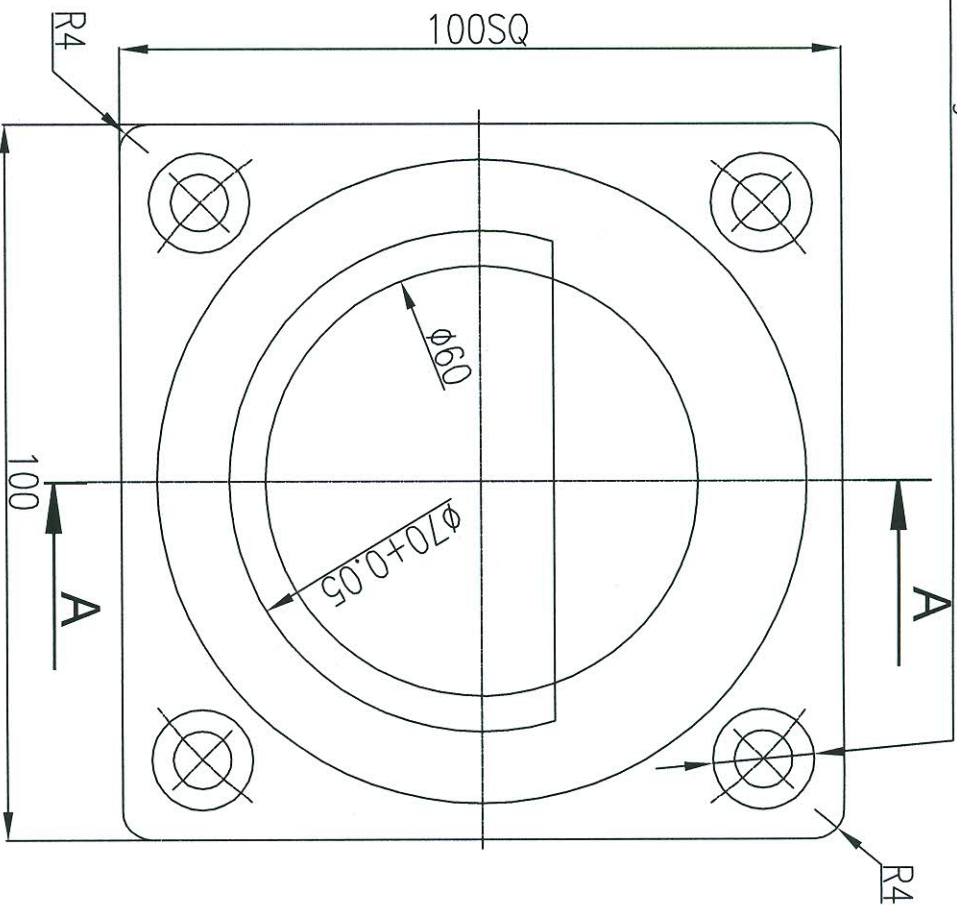
(ALL DIMS ARE IN MM)

(~1.6)



SECTION AA

MARKED SURFACE SHALL BE FINISHED TO RA 1.6  
ALL SHARP EDGES SHALL BE MACHINED TO 0.4X45°



4 No., Ø9.2 through Holes With Counters @ 110.0 PCD

VAR. NO.	REMARKS	VAR. NO.	ITEM NO.	DESCRIPTION	QTY	DRAWING NO.	VAR.	IT. NO.	MATL. CODE	MATL. SPECN.	UNIT WT.	QTY.	ZONE
		01		SS PLATE		105.0 SQ x 25.0			SS 304				

TYPE OF PRODUCT: GSM 145  
NAME OF CUSTOMER: BHARAT HEAVY ELECTRICALS LTD. HYDERABAD

DEPT. CODE	SSG	SCALE OF	NIS	WEIGHT(KG)	DRN. NO.	ISS. NO.	DATE	NO. OF
ZONE	35	S/V/M/F			RD 99 320 631	RD 99 320 631	01.10.2003	01.10.2003

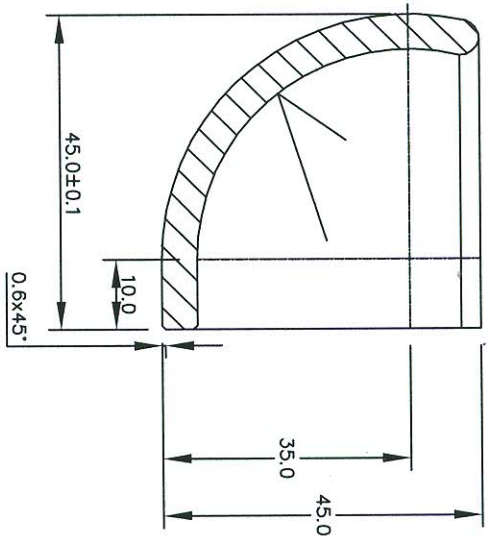
REV.	DATE	ALTERED	CHECKED	ZONE	REV.	DATE	ALTERED	CHECKED	ZONE

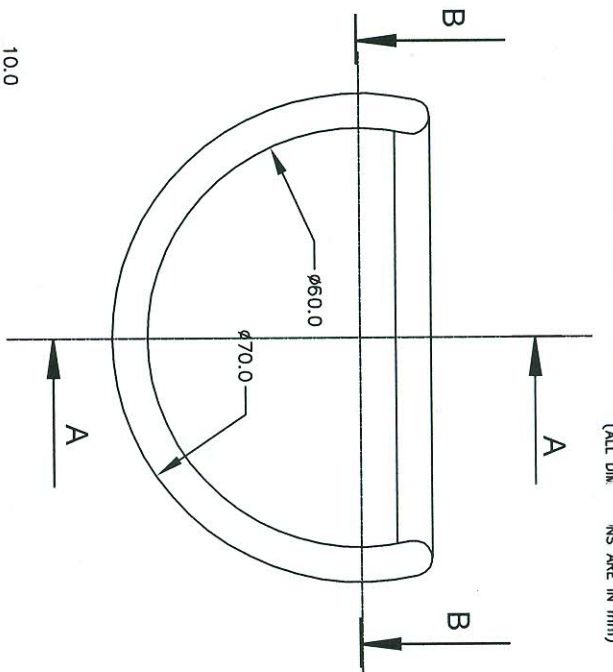
TITLE	FLANGE	CARD CODE	RD 99 320 631	SHEET NO.	10	NO. OF SHEETS	10
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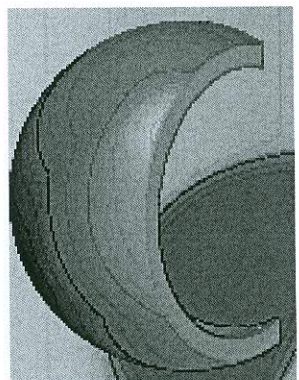
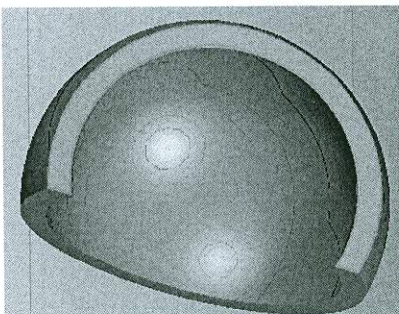
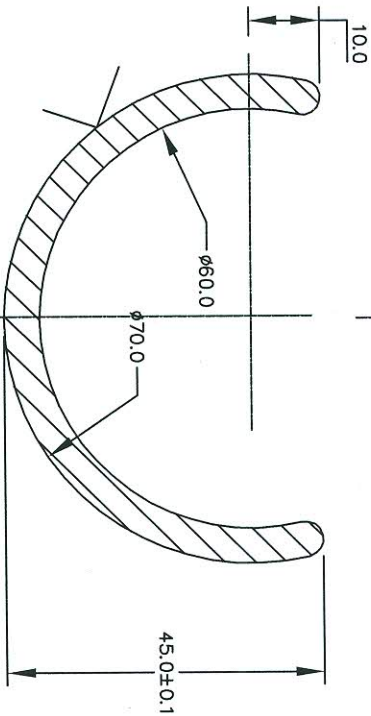
INVENTORY NO. SIGN. AND DATE REF. DRG. NO.



SECTION AA



SECTION BB



SURFACE SHALL BE FINISHED TO RA1.6  
 COMPONENT SHALL BE MADE USING SUITABLE PATTERN.  
 ALL SHARP EDGES SHALL BE MACHINED TO 0.4x45°.

VAR NO	REMARKS	VAR NO	ITEM NO	DESCRIPTION	DRAWING NO	UNIT	QTY
		01		SS PLATE			

TYPE OF PRODUCT  
 NAME OF CUSTOMER  
**GSM 145**



**BHARAT HEAVY ELECTRICALS LTD.**  
 HYDERABAD

DEN KS RAO  
 CPO MM RAO  
 APPD HS JAIN  
 REF. TO RD 99 320 630 2  
 SIGN. DATE 01.02.03  
 OF 02.03

REV.	DATE	ALTERED	DATE	ALTERED	ZONE	ZONE
		CHECKED		CHECKED		

DEPT	SCALE	WEIGHT (KG)	CARD CODE
GSM TO DIM	NIS		RD 99 320 630 2

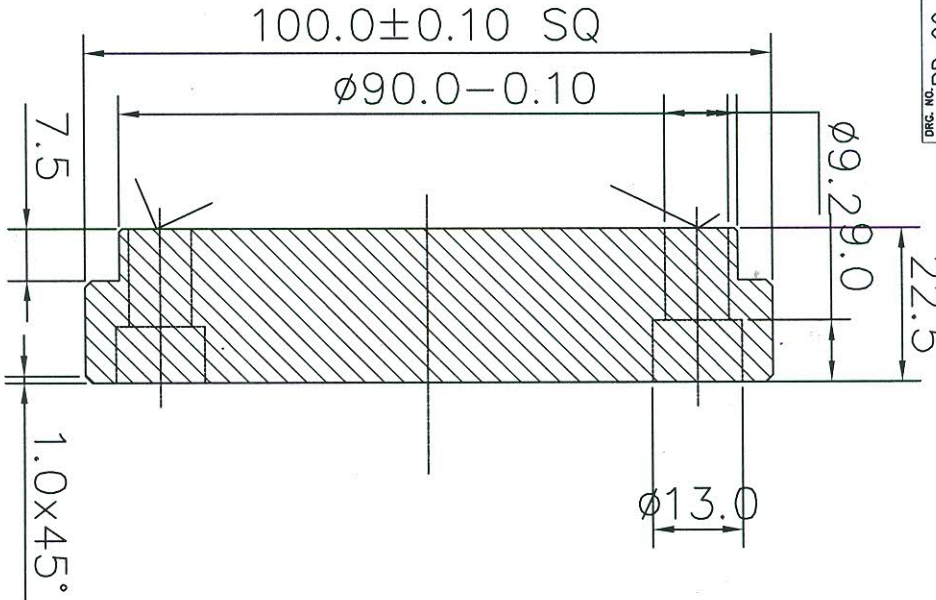
TITLE	DRAWING NO.	SHEET NO.	NO. OF SHEETS
PROTECTIVE COVER	RD 99 320 632 10		

15

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INVENTORY NO.	SIGN. AND DATE	REF. DRG. NO.
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ORG. NO. RD 99 320 640  
FIRST ANGLE PROJECTION.



SECTION AA

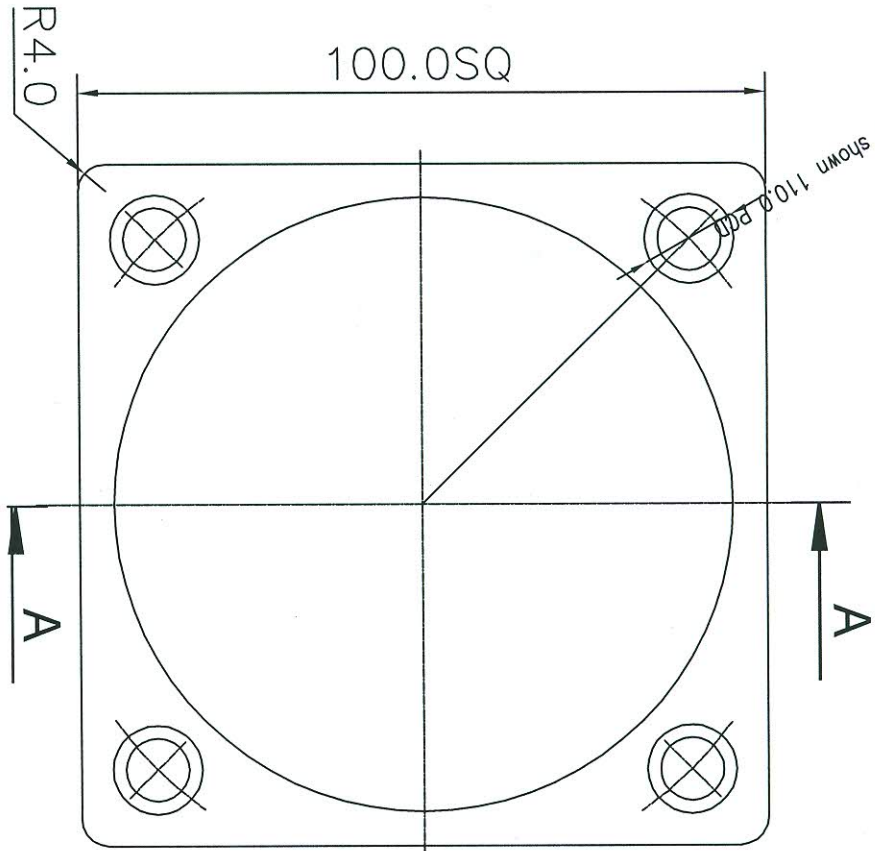
MARKED SURFACE SHALL BE FINISHED TO RA 1.6

FINAL ON 15/11/08

REV.	DATE	ALTERED	ZONE
		CHECKED	
REV.	DATE	ALTERED	ZONE
		CHECKED	

DEPT. CODE		SCALE		CARD CODE	
SS		NTS		RD 99 320 600 2	
TITLE		WEIGHTS		DRAWING NO.	
DUMMY FLANGE				RD 99 320 640 10	
SHEET NO.		NO. OF SHEETS		REV.	

VAR. NO.	REMARKS	VAR. NO.	ITEM NO.	DESCRIPTION	QTY	DRWG. NO.	VAR.	LT. NO.	MATL. CODE	MATL. SPECN.	UNIT	QTY.	ZONE
01	SS PLATE			105.0 SQ x 25.0					SS 304				



(ALL DIMENSIONS ARE IN MM)

(~1.6)



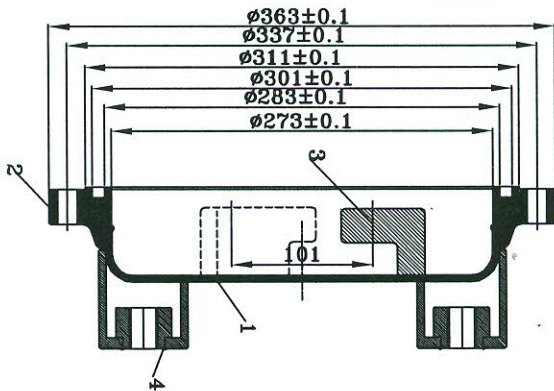
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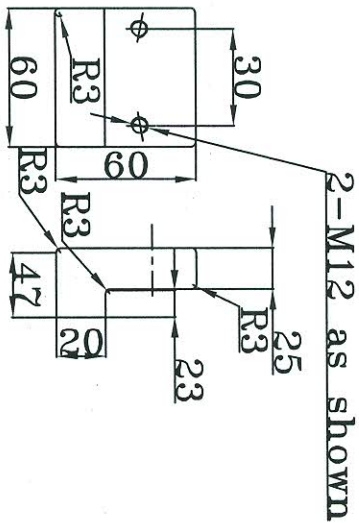
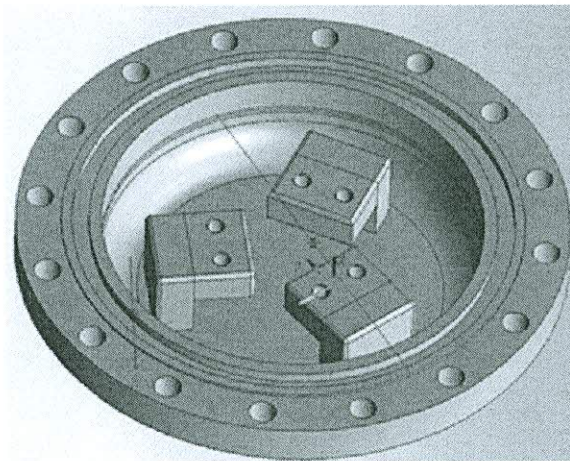
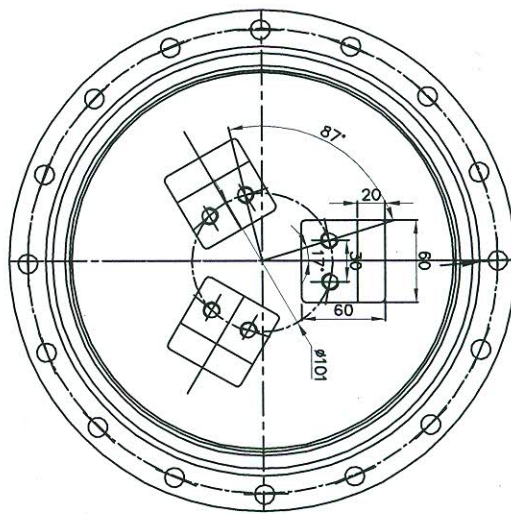
000 RD 51 320 300  
ON 2RD

FIRST ANGLE PROJECT

(ALL DIMENSIONS ARE IN mm)



16-  $\phi 14.0$  through holes  $\phi 337 \pm 0.1$  PCD



03 SUPPORT  
QTY : 3 NOS

VAR. NO	REMARKS	VAR. NO	ITEM NO	DESCRIPTION	DR. NO.	VAR.	IT. NO.	MATL. CODE	MATL. SPECN.	UNIT	QTY.	ZONE
		01		DISH	RD 15 320 310			SS-304L		01		
		02		FLANGE	RD 15 320 320			SS-304L		01		
		03		SUPPORT	60x60x47			SS-304L		03		
		04		BRACKET	RD 15 320 330			SS-304L		04		

TYPE OF PRODUCT  
NAME OF CUSTOMER  
GSM-145

BHARAT HEAVY ELECTRICALS LTD.  
HYDERABAD

DEPT. CODE  
GRADE OF TOL. DIM. C/M/P  
SCALE  
WEIGHT(KG)  
DRI. NAME  
APPD. NAME  
REF. TO  
DRAWING NO.

DISH ASSY  
RD 15 320 300

REV.	DATE	ALTERED	ZONE	REV.	DATE	ALTERED	ZONE
		CHECKED				CHECKED	

INVENTORY NO.    SIGN. AND DATE    REF. DRG. NO.

24

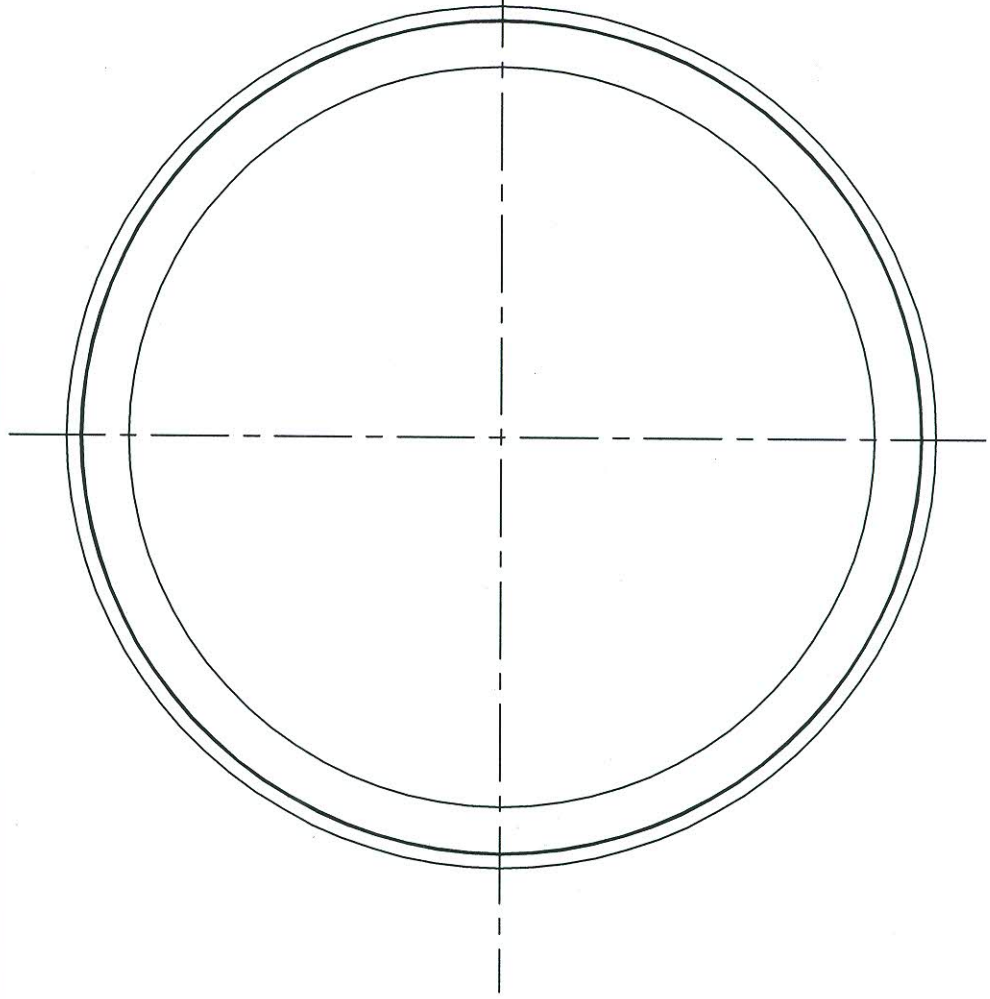
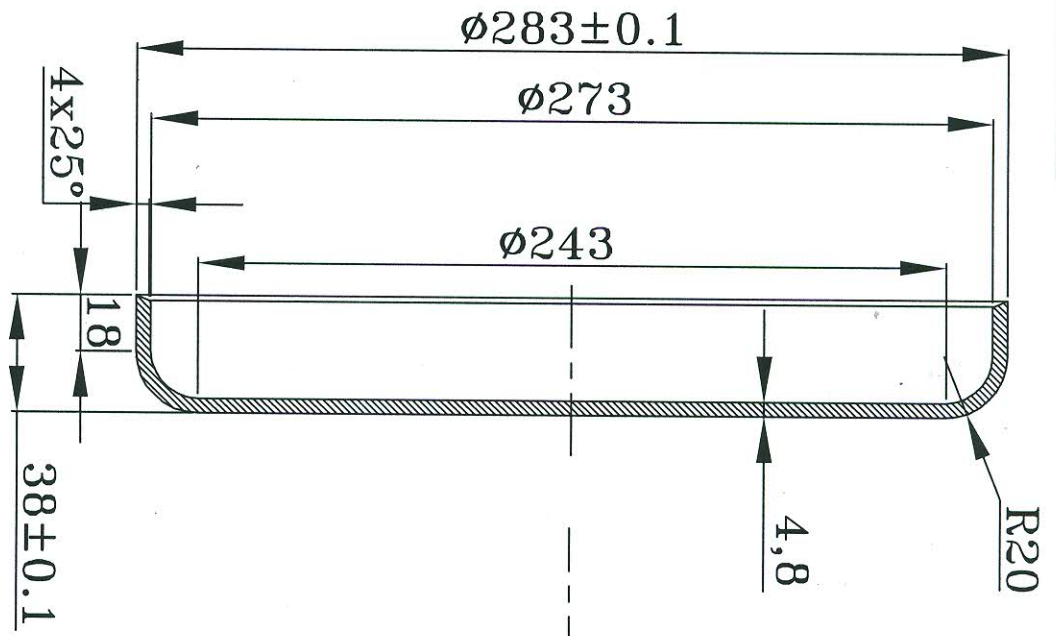
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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

INVENTORY NO.    SIGN. AND DATE    REF. DRG. NO.

DRG. NO. RD 15 320 310

FIRST ANGLE PROJECT

(ALL DIM. UNITS ARE IN mm)



VAR. NO.	REMARKS	VAR. NO.	ITEM NO.	DESCRIPTION	DRAWING NO.	IT. NO.	MATL. CODE	UNIT/WT.	QTY.	ZONE
				DISH			SS-304L	01		

TYPE OF PRODUCT  
NAME OF CUSTOMER  
GSM-145

BHARAT HEAVY ELECTRICALS LTD.  
HYDERABAD

DEPT. CODE  
GRADE OF  
TOL. DIM.  
SCALE  
WEIGHT(KG)

TITLE  
DISH

CARD CODE  
RD 15 320 310

REV.	DATE	ALTERED	CHECKED	ZONE

DRN.	AI.	NAME	SSR.	DATE	NO. OF

APPD.	CHKD.	REF. TO	DATE	NO. OF

SHEET NO.	NO. OF SHEETS

23

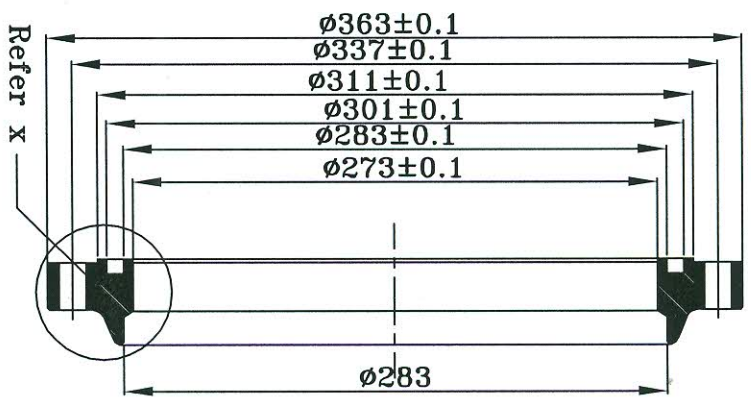
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INVENTORY NO. SIGN. AND DATE REF. DRG. NO.

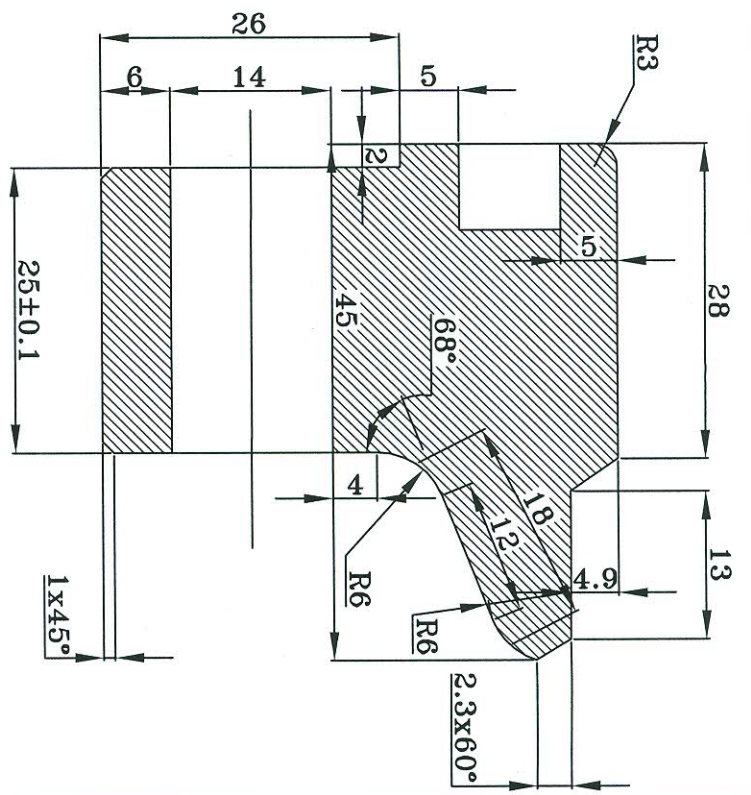
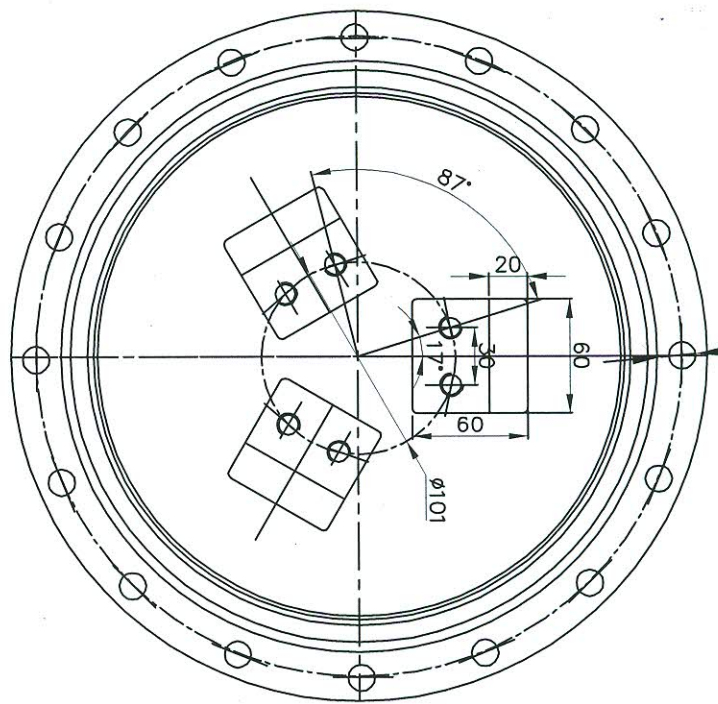
02C 02C 51 DR  
ON DRG. NO.

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)



16 -  $\phi 14.0$  through holes @  $337 \pm 0.1$  PCD



ENLARGED VIEW 'X'

VAR. NO.	REMARKS	VAR. NO.	ITEM NO.	DESCRIPTION	IS	DRAWING NO.	VAR.	ITM. NO.	MATL. CODE	UNIT WT.	QTY.
			01	FLANGE		#363.0X51.0			SS-304L	01	

TYPE OF PRODUCT: GSM-145  
NAME OF CUSTOMER:

DEPT.	GRADE OF	SCALE	WEIGHT(KG)	DRN. AL.	NAME	SIGN.	DATE	NO. OF
	TO. DIM.				BHARAT HEAVY ELECTRICALS LTD.		14/12/14	VAR.
	C/M/P				HYDERABAD		14/12/14	
					APPR. MMARAO		14/12/14	

REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHECKED			CHECKED
ZONE			ZONE		

TITLE	CARD CODE	DRAWING NO.	NO. OF SHEETS
FLANGE	RD 15 320 320	RD 15 320 300	

