


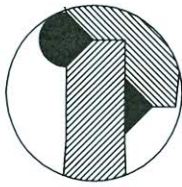
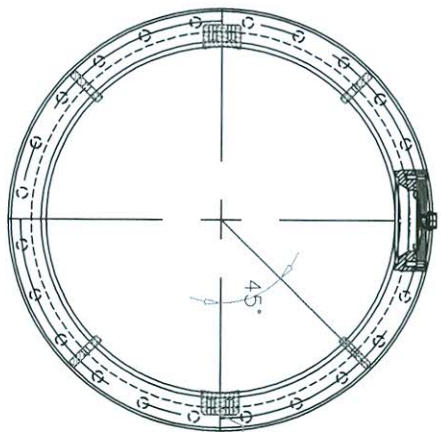
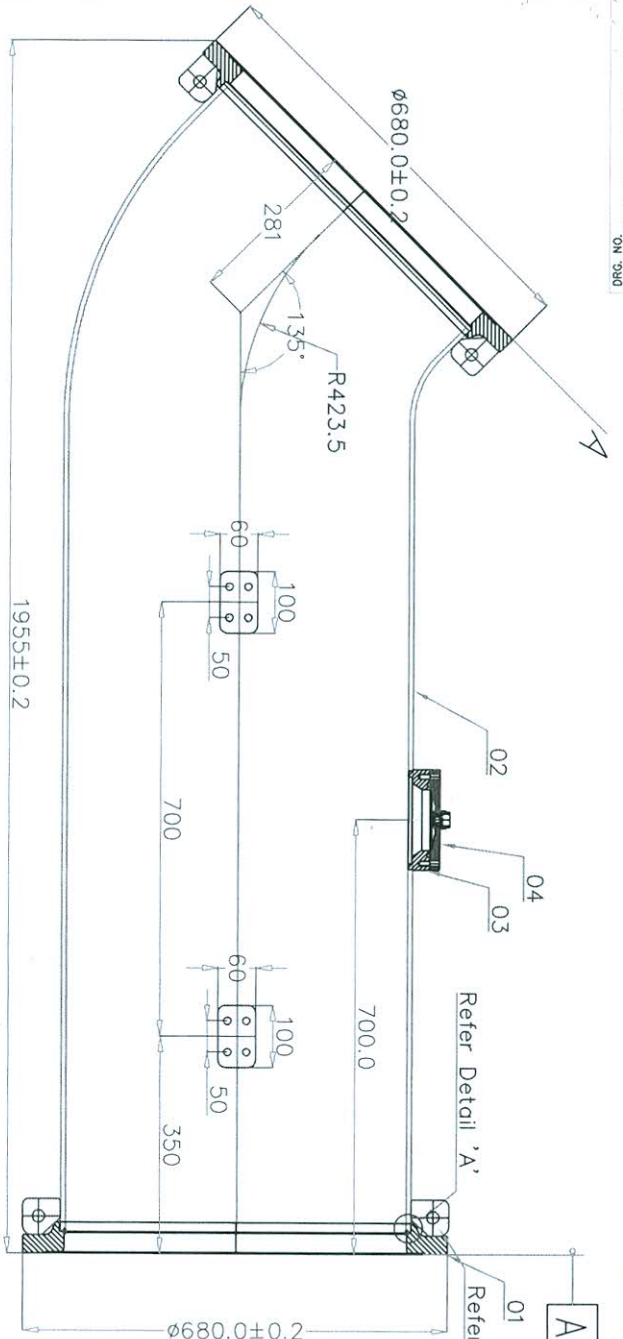


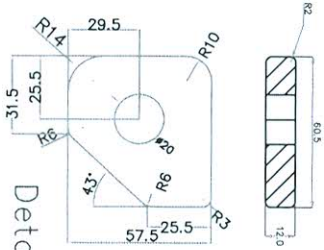
| | | | |
|---------------------------|---|----------|---|
| PSGSG/ 2015- 16/002 | Product Specifications for Angled Enclosures Assembly | Drg. No. | RD DG 4 35 0617 0040 RD DG 4 35 0617 0041 |
| | | Date | 20.03.2015 |
| | | Product | GSM420 |
| 1.0 | Application: The stainless steel Angled Enclosures Assembly Drawing. No. RD DG 4 35 0617 0040 and RD DG 4 35 0617 0041 is used for gas filled applications. The gas pressure in this metal enclosure is maintained at 0.5-0.7 MPa. The Bend Enclosures shall meet following Specifications. | | |
| 2.0 | Drawings Main Assembly Drawing 135° Enclosure Assembly : RD DG 4 35 0617 0040 Bend Pipe I: RD DG 4 35 0617 0040A 45° Enclosure Assembly : RD DG 4 35 0617 0041 Bend Pipe II: RD DG 4 35 0617 0041A Flange I: RD DG 4 35 0617 0951 Flange VI RD DG 4 35 1133 4320 GAS VALVE COVER: RD DG 4 35 1133 4161 | | |
| 3.0 | SPECIFICATIONS: | | |
| 3.1 | Material: Low Carbon Austenitic stainless steel confirming to AISI-304L. | | |
| 3.2 | Standard seamless or ERW (straight/ spiral) tubular sections shall be used for construction, where ever applicable in design. Fabricated (allowing rolled and seam welded) / drawn sections can be used for other areas not conforming to standard pipe schedules. | | |
| 3.3 | 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. | | |
| 3.4 | 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/2015-16/002.doc | |  Signature |

| | | | |
|---------------------------|---|----------|---|
| PSGSG/ 2015- 16/002 | Product Specifications for Angled Enclosures Assembly | Drg. No. | RD DG 4 35 0617 0040 RD DG 4 35 0617 0041 |
| | | Date | 20.03.2015 |
| | | Product | GSM420 |
| 3.5 | 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 parallality, 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. | | |
| 3.6 | All flanges of different dimensions shall be welded by maintaining parallallity and angularity as per limits of manufacturing drawing. | | |
| 3.7 | 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. | | |
| 3.8 | Dye penetration report shall be generated and submitted to BHEL. | | |
| 3.9 | 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. | | |
| 3.10 | The supplier shall stress relieve tested component to ensure zero post supply deformation. | | |
| 2/3 | PSGSG/2015-16/002.doc | |  Signature |

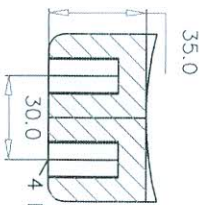
| | | | |
|---------------------------|--|----------|---|
| PSGSG/ 2015- 16/002 | Product Specifications for Angled Enclosures Assembly | Drg. No. | RD DG 4 35 0617 0040 RD DG 4 35 0617 0041 |
| | | Date | 20.03.2015 |
| | | Product | GSM420 |
| 3.12 | Stress relieved component shall be electro-polished on the inside surface using moderate current densities. | | |
| 3.13 | 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. | | |
| 3.14 | The dimensional checks and the leak test shall be carried out in presence of BHEL inspector. | | |
| 3.15 | 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. | | |
| 3.16 | <p>Following certificates shall be furnished for acceptance of the component:</p> <p>3.15.1 Material source certificate, 3.15.2 Material test certificate , 3.15.3 Stage wise DP tests, 3.15.4 Pressure drop test and pressure withstand test report, 3.15.5 Electro-polishing schedule.</p> <p>A certified copy of above documents shall be sent along with the delivery not.</p> | | |
| 4.0 | The components shall be guaranteed against all manufacturing defects. | | |
| 5.0 | Qualification requirements: The supplier shall be of national repute with proven record and should have supplied similar enclosures. Supplies reference list shall be provided along with the offer. | | |
| 3/3 | PSGSG/2015-16/002.doc | |  Signature |



Detail 'A'



Detail 'B'



Detail 'C'

1. The Root should be Homogeneous and Continuous.
2. Pressure Test as per Enclosed Specification.
3. Tested Assemblies to be Degreased, sand Blasted and Powder Coated on Outside.
4. Electro Polish inside Surface.
5. Machining of flanges shall be done after Welding.
6. The PCD of flanges shall be within Tolerances.
7. Pipe and Flanges should be TIG/MIG welded with suitable Electrode.

| VAR. NO. | REMARKS | VAR. NO. | VAR. ITEM NO. | DESCRIPTION | PLS | DRAWING NO. | VAR. | ITM. NO. | MATL. CODE | MATL. SPECN. | A | C | UNIT WT. | NO. OF |
|----------|-----------------|----------|---------------|-------------|-----|----------------------|------|----------|------------|--------------|---|---|----------|--------|
| 04 | GAS VALVE COVER | | | | | RD DG 435 11 4161 | | | SS-304L | | | | 01 | |
| 03 | Flange VI | | | | | RD DG 435 1133 4320 | | | SS-304L | | | | 01 | |
| 02 | Pipe I | | | | | RD DG 435 0617 0040A | | | SS-304L | | | | 01 | |
| 01 | Flange | | | | | RD DG 435 0617 0951 | | | SS-304L | | | | 02 | |

GSM-420

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

DEPT. GRADE OF TOL. DIM. C/M/A/7

SCALE: NTS

WEIGHT(KG):

DRN. NAME: SA

CHKD. SA

APRD. MMR AO

REF. TO: RDDG435-0617-0040

DATE: 01.05.13

NO. OF VARS: 01

| REV. | DATE | ALTERED | REV. | DATE | ALTERED | ZONE | REMARKS |
|------|------|---------|------|------|---------|------|---------|
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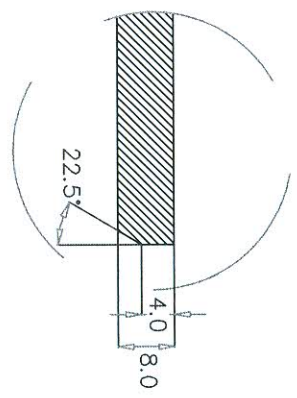
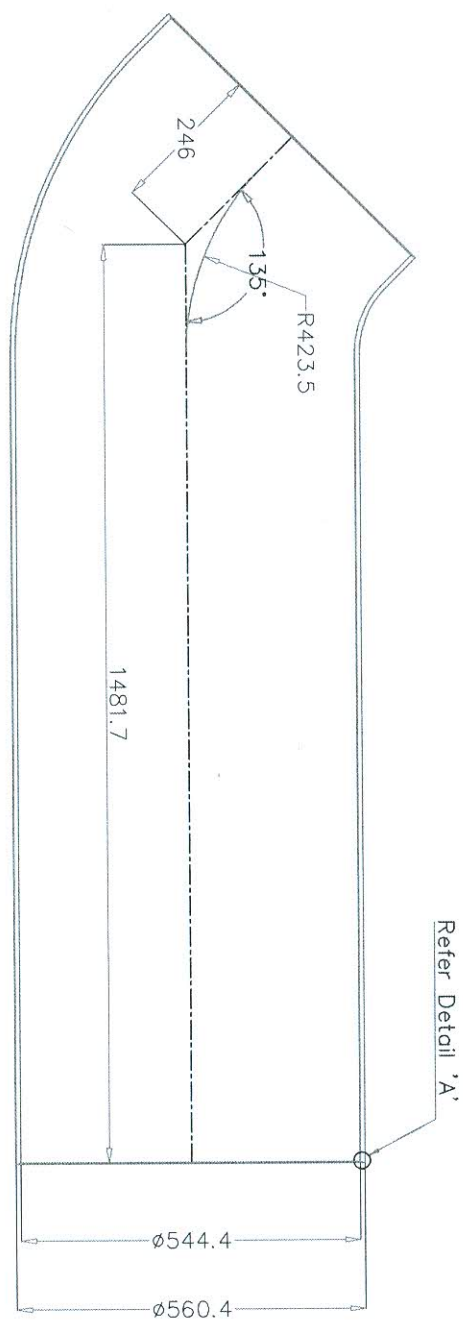
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DRAWING NO.:

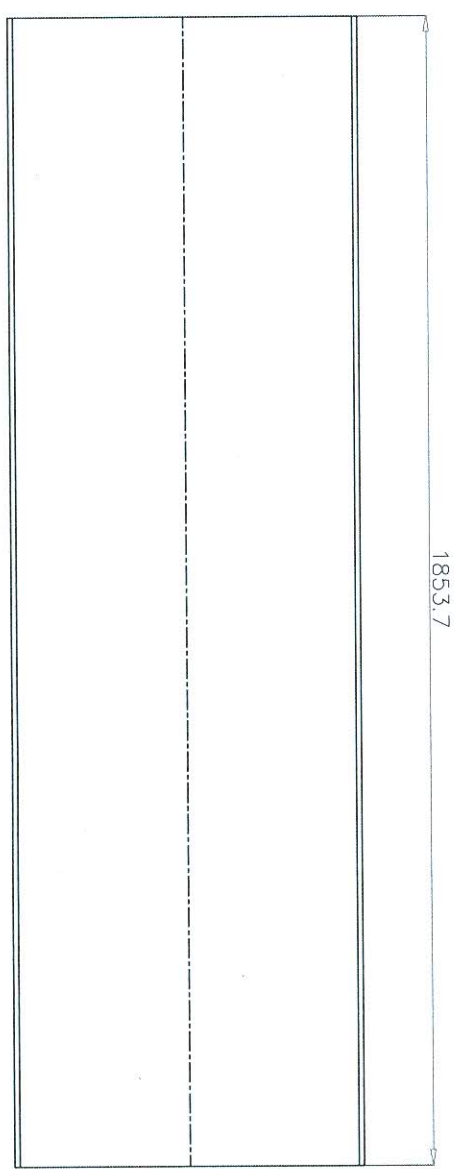
SHEET NO.:

NO. OF SHEETS:

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Enlarged View of 'A'



| VAR. NO. | REMARKS | VAR. ITEM NO. | DESCRIPTION | ST | DRAWING NO. | VAR. | ITNO. | MATL. CODE | A | UNIT WT. | ZONE |
|----------|---------|---------------|-------------|----|-------------|------|-------|------------|---|----------|------|
| | | | | | | | | | | | |

TYPE OF PRODUCT
NAME OF CUSTOMER
GSM-420

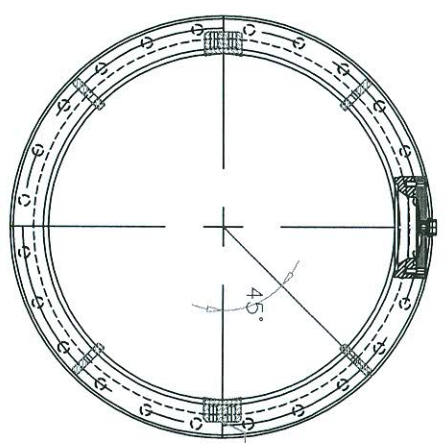
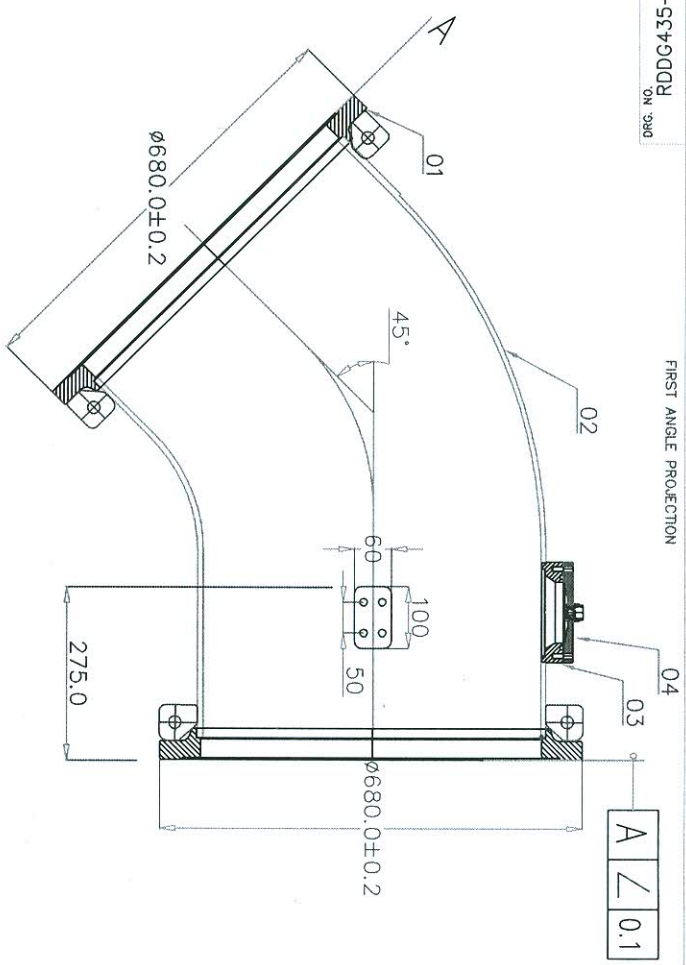
BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD
DRN SA
CHK SA
APPR. MARRAO
DATE 01.05.13
NO. OF SHEETS 01.05.13

DEPT. GRADE OF TOL. DIM. C/M/F
SCALE NTS
WEIGHT(KG)
APPD. MARRAO
REF. TO RDDG435-0617-0040
DRAWING NO. RDDG435-0617-0040A
SHEET NO. NO. OF SHEETS

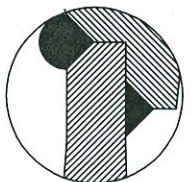
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| | | | | | | |

REMARKS

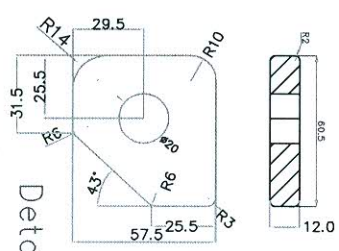
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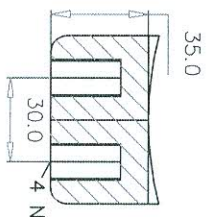
Refer Detail 'C'



Detail 'A'



Detail 'B'



Detail 'C'

1. The Root should be Homogeneous and Continuous.
2. Pressure Test as per Enclosed Specification.
3. Tested Assemblies to be Degreased, sand Blasted and Powder Coated on Outside.
4. Electro Polish inside Surface.
5. Machining of flanges shall be done after Welding.
6. The PCD of flanges shall be within Tolerances.
7. Pipe and Flanges should be TIG/MIG welded with suitable Electrode.

| VAR/CD | REMARKS | VAR NO. | ITEM NO. | DESCRIPTION | IS | DRAWING NO. | VAR | TTNO | MATL CODE | MATL SPECN. | UNIT | WT. | QTY. | REVISION |
|--------|---------|---------|----------|-----------------|----|----------------------|-----|------|-----------|-------------|------|-----|------|----------|
| | | | 04 | GAS VALVE COVER | | RD DG 435 11 4161 | | | SS-304L | | 01 | | | |
| | | | 03 | Flange VI | | RD DG 435 1133 4320 | | | SS-304L | | 01 | | | |
| | | | 02 | Pipe II | | RD DG 435 0617 0041A | | | SS-304L | | 01 | | | |
| | | | 01 | Flange | | RD DG 435 0617 0951 | | | SS-304L | | 02 | | | |

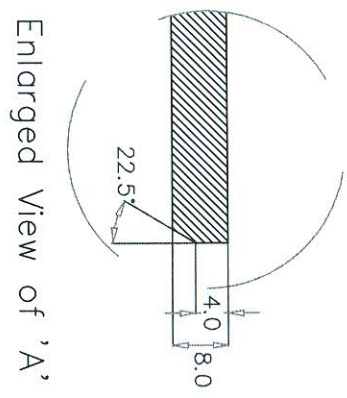
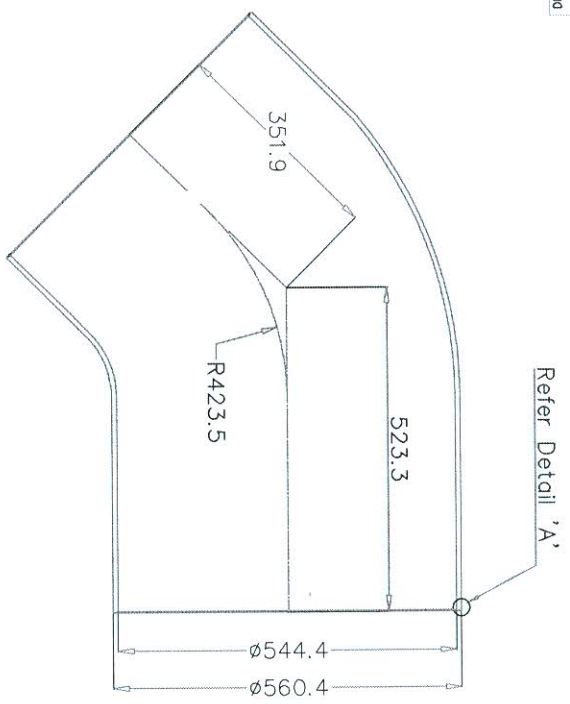
INVENTORY NO. SIGN. AND DATE REF. DRG. NO.

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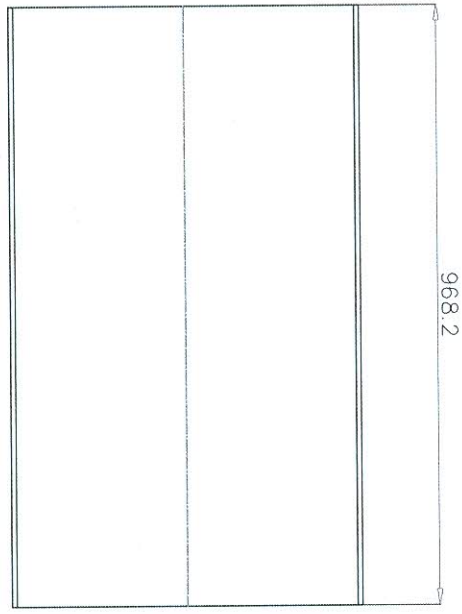
TYPE OF PRODUCT: GSM-420
 NAME OF CUSTOMER: BHARAT HEAVY ELECTRICALS LTD. HYDERABAD
 TITLE: 45° Enclosure ASSY.
 SCALE: NTS
 DEPT. CODE: 45°
 GRADE OF TOL. DIM: C/M/F
 DWN. APPD. SA: SA
 DATE: 01.05.13
 NO. OF SHEETS: 1

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



Enlarged View of 'A'



| VAR. NO. | REMARKS | VAR. ITEM NO. | DESCRIPTION | PLS | DRAWING NO. | IT. NO. VAR. | MATL. CODE | A | UNIT WT. | NO. OF |
|----------|---------|---------------|-------------|-----|-------------|--------------|------------|---|----------|--------|
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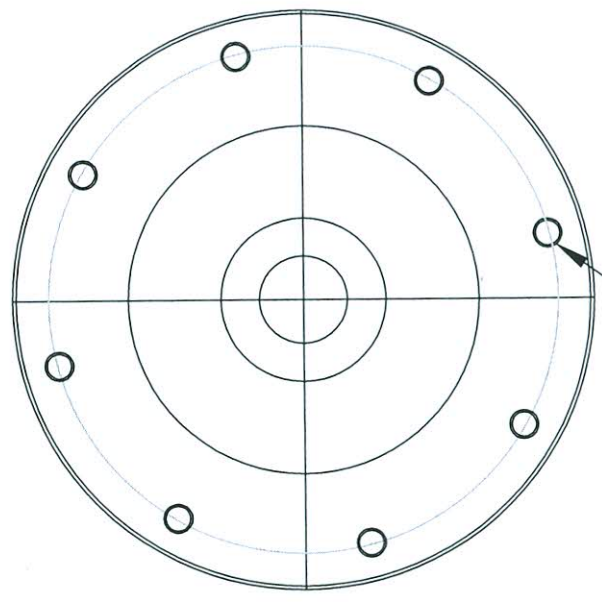
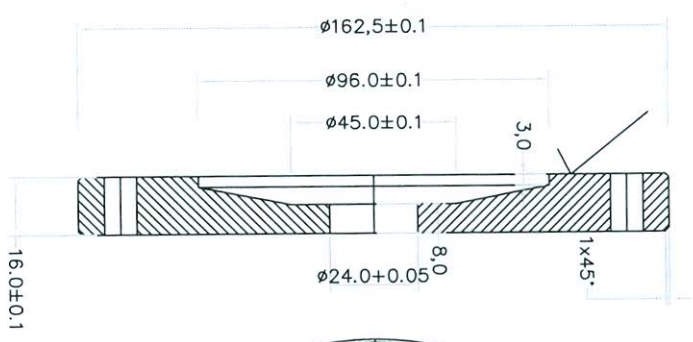
TYPE OF PRODUCT: GSM-420
NAME OF CUSTOMER:

DEPT. CODE: BHARAT HEAVY ELECTRICALS LTD. HYDERABAD
GRADE OF C/W, P/M: NTS
SCALE: NTS
WEIGHT(G):
DIN: SA
CKD: SA
APPD: M/RAO
REF. TO: RDDG435-0617-0040
DATE: 01.05.13
NO. OF SHEETS: 01

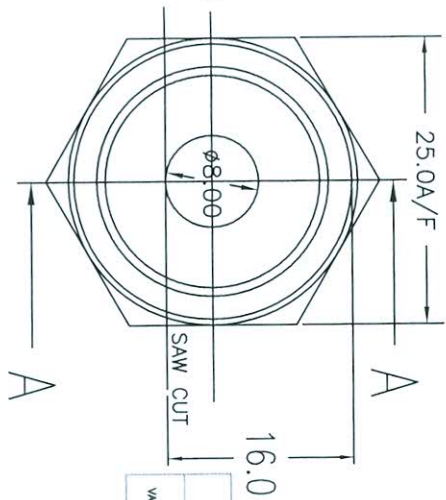
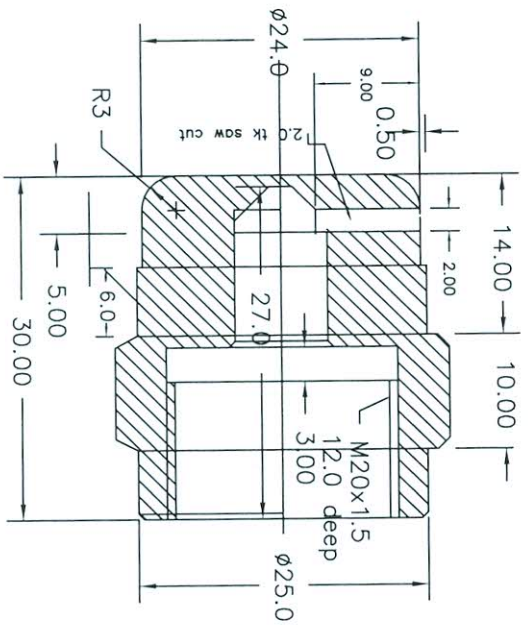
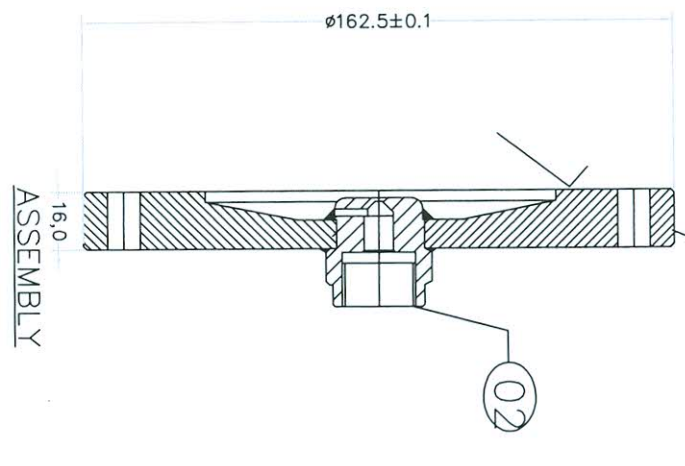
REV. DATE ALTERED CHECKED
ZONE

TITLE: PIPE II
CARD CODE: RDDG435-0617 0041A
DRAWING NO.: RDDG435-0617-0040
SHEET NO.:
NO. OF SHEETS:

REMARKS



8 NO., 9.2 CLEAR HOLES
@140±0.07 PCD WITH 0.4X45° C/F



ALL SHARP EDGES SHALL BE MACHINED TO 0.4X45°
MARKED SURFACE SHALL BE FINISHED TO RA0.8

| VAR. NO. | REMARKS | VAR. NO. | TEMP. NO. | DESCRIPTION | STD. | DRAWING NO. | VAR. | MATL. SPECN. | UNIT WT. | QTY. | ZONE |
|----------|-------------|----------|-----------|-------------|------|-------------|------|--------------|----------|------|------|
| 02 | GAS STUD | | | | | | | SS-304L | 01 | | |
| 01 | FLANGE - IV | | | | | | | SS-304L | 01 | | |

FINAL ON 12/05

CGSM-145

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

| | | | |
|-------|----------|---------|----------|
| DATE | 26.12.05 | NG. OF | |
| SIGN. | KSRAO | DATE | 02.01.06 |
| APPD. | MNRAD | REF. TO | 01 |
| CD | AL | DATE | 09.01.06 |

| | | | | |
|------|------|---------|---------|------|
| REV. | DATE | ALTERED | CHECKED | ZONE |
| | | | | |

DEPT. CODE: NTS
SCALE: 2.5
TITLE: GAS VALVE COVER
CARD CODE: RD DG 4 35 1133 4161
SHEET NO. NO. OF SHEETS

SECTION AA

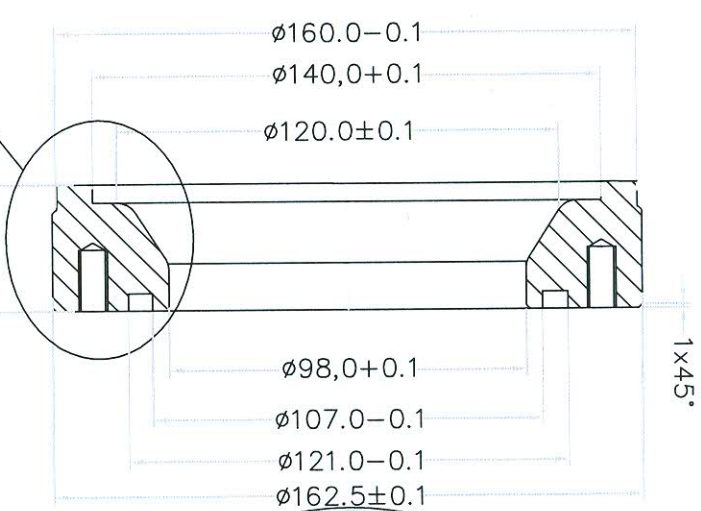
GAS STUD (2)

FLANGE-IV

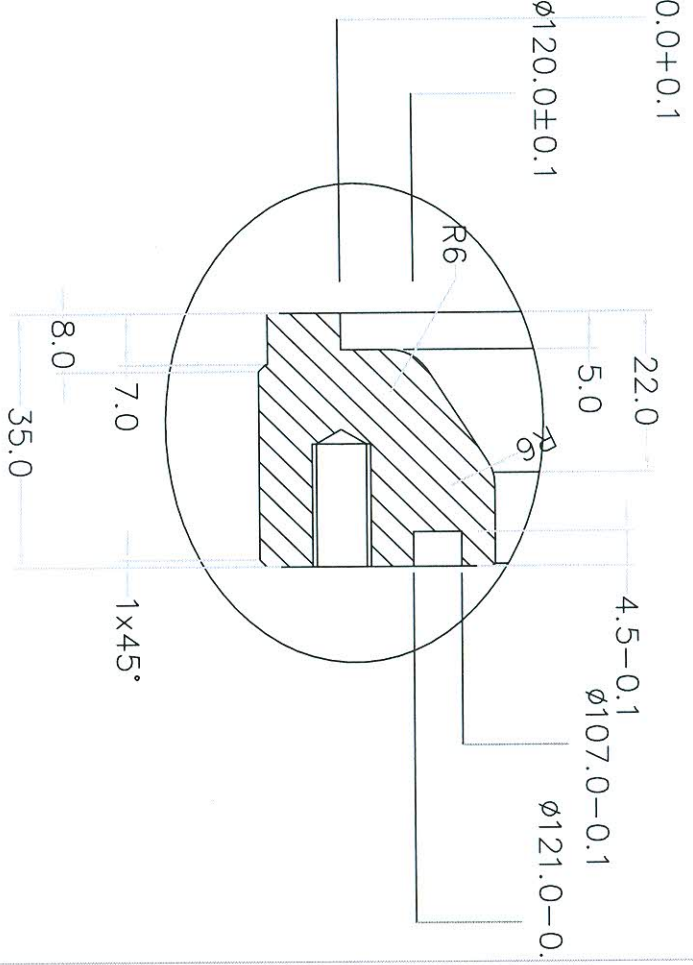
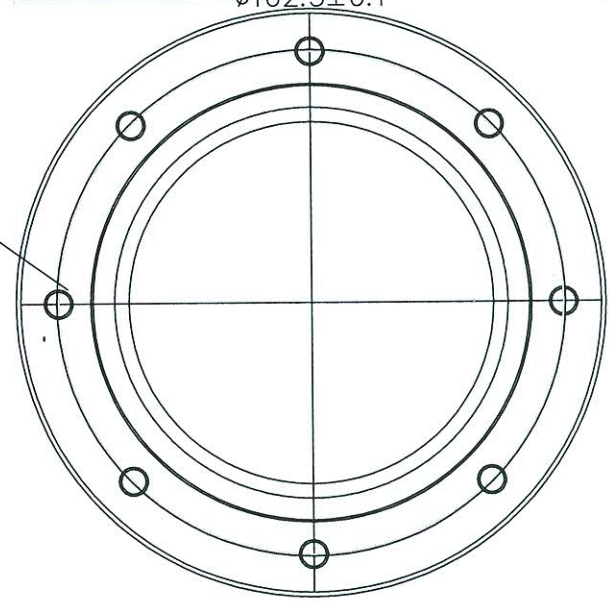
ASSEMBLY

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



8 NO., M8 TAPS @ 140.0 PCD, 18.0 DEEP



REFER DETAIL "A"

DETAIL 'A'

M8 TAP SHALL NOT BE MORE THAN 18.0 DEEP.
ALL SHARP EDGES SHALL BE MACHINED TO 0.4X45°.

| | | | | | | | |
|--------|---------|----------|----------|-------------|-----|------|-----|
| VAR.00 | REMARKS | VAR. NO. | ITEM NO. | DESCRIPTION | QTY | UNIT | WT. |
| | | 01 | | FLANGE - VI | | | 01 |

| | | | | | |
|------|------|---------|------|------|---------|
| REV. | DATE | ALTERED | REV. | DATE | ALTERED |
| ZONE | | CHECKED | ZONE | | CHECKED |

| | | | |
|-------|-----------------|-------|------------|
| DEPT. | GRADE OF | SCALE | WEIGHT(KG) |
| CGSM | TOL. DIM. C/M/F | 3.0 | 3.0 |

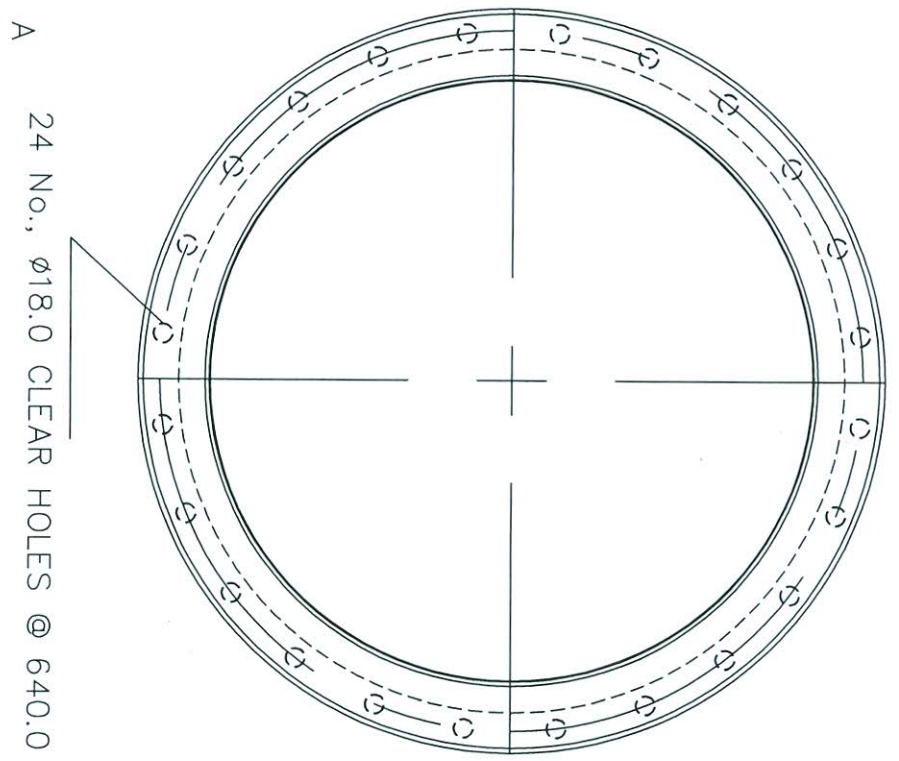
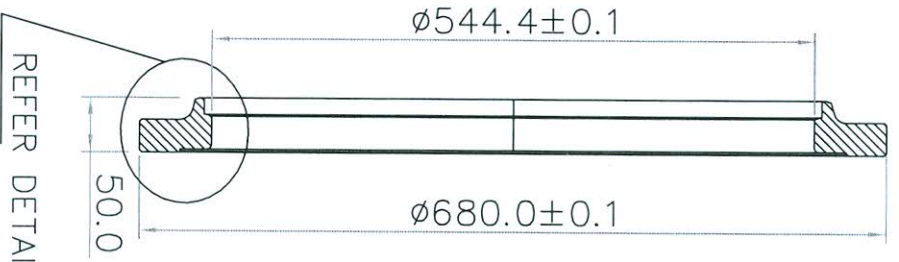
| | |
|-----------------|---|
| TYPE OF PRODUCT | NAME OF CUSTOMER |
| CGSM-145 | BHARAT HEAVY ELECTRICALS LTD. HYDERABAD |

| | | | |
|------|-------|------|----------|
| DRN | NAME | SIGN | DATE |
| AL | KSRAO | | 02.01.08 |
| APPD | MMRAO | | 09.01.08 |

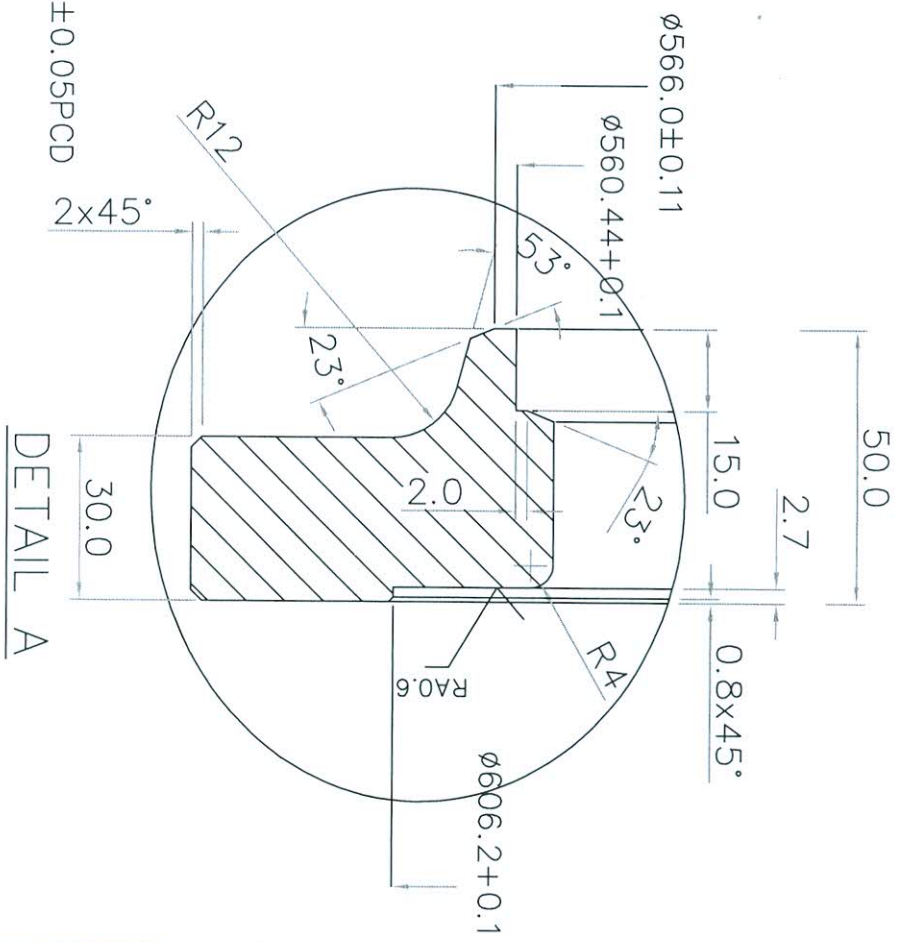
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| REF. TO | NO. OF |
| RD DG 4 35 1133 4300 | ITEMS |
| | 1 |

| | | | |
|----------------------|-------------|-----------|---------------|
| CARD CODE | DRAWING NO. | SHEET NO. | NO. OF SHEETS |
| RD DG 4 35 1133 4320 | | | |

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REFER DETAIL A 24 No., $\phi 18.0$ CLEAR HOLES @ 640.0 ± 0.05 PCD



Note:

1. Sealing area shall be plosished to RA 0.8 or better.
2. $\phi 18.0$ holes shall be chamfered uniformly (0.8x45°).
3. PCD and flange centre shall be concentric within ± 0.1
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 spherical pipe

FINAL ON 29/05/14

| VAR. NO. | REMARKS | VAR. NO. | ITEM NO. | DESCRIPTION | RD DG 4 35 0617 0113B | SS-304 L | 45.0 KG |
|----------|---------|----------|----------|-------------|-----------------------|----------|---------|
| 01 | | | | SS FLANGE | | | 02 |

| | | | | | | | | | | | |
|-----------------|-----------------|------------------|------------|----------|----------|-------------------------------|-----------|-----------|-----------|-----------|----------|
| TYPE OF PRODUCT | | NAME OF CUSTOMER | | BPHL | | BHARAT HEAVY ELECTRICALS LTD. | | HYDERABAD | | GSM-420 | |
| DEPT. CODE | TOL. DIM. C/M/P | SCALE | WEIGHT(KG) | DRW. NO. | ISS. NO. | ISS. DATE | ISS. TIME | ISS. NO. | ISS. DATE | ISS. TIME | ISS. NO. |
| | | NTS | 45.0 KG | | | | | | | | |

| REV. | DATE | ALTERED | CHECKED | REV. | DATE | ALTERED | CHECKED | ZONE | ZONE |
|------|------|---------|---------|------|------|---------|---------|------|------|
| | | | | | | | | | |

| | | | | |
|-----------|------------|----------------------|-----------|---------------|
| CARD CODE | DRWING NO. | RD DG 4 35 0617 0951 | SHEET NO. | NO. OF SHEETS |
| | | | | |