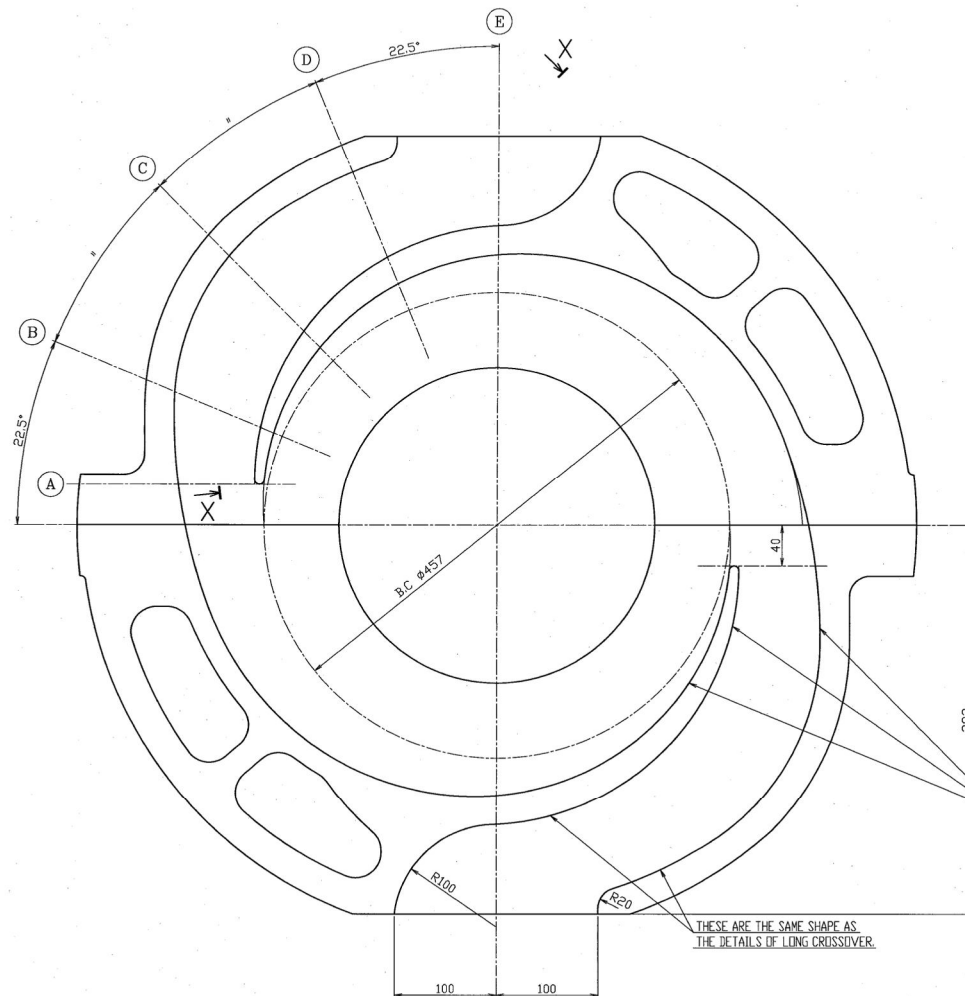


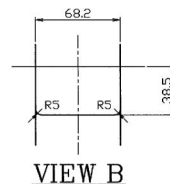
SECTION XX

THESE ARE THE SAME SHAPE AS
THE DETAILS OF SHORT CROSSOVER.

THESE ARE THE SAME SHAPE AS
THE DETAILS OF LONG CROSSOVER

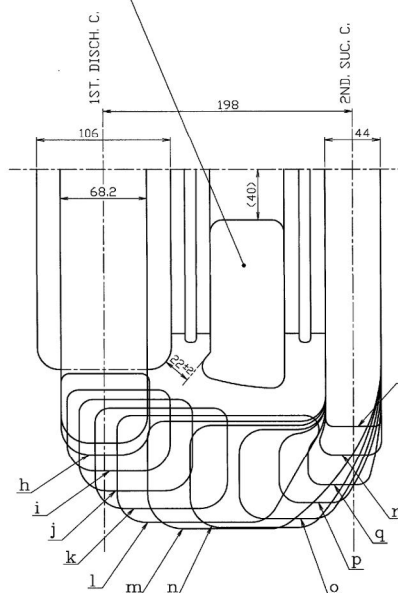
[illegible]

ITEM	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL, SIZE OR CASTING DRG. NO. OR FORMING DRG. NO.	MATERIAL CODE	MET. WT. (GROSS)	MATERIAL SPEC.	QUANTITY
THE FOLLOWING CONDITIONS APPLY TO THIS SPECIFICATION STATEED...				TYPE OF PRODUCT NAME OF CUSTOMER/PROJECT		MDC455		
1.	REF TO HYD30261 FOR UNSPECIFIED TOLERANCES			 भारत भारत भारत HYDREX भारत भारत HYDREX		DATE: 20/03/12 DESIGNED BY: NA DRAWN BY: M.S.R.N. CHECKED BY: NA		
2.	CHAMFER W/CD SHARP EDGES			DEPTH: 4MM  SCALE: NA 850		DATE: 20/03/12 DESIGNED BY: NA DRAWN BY: M.S.R.N. CHECKED BY: NA		
3.	INTERNAL W/CD CORNER RADI			DEPTH: 4MM  SCALE: NA 850		DATE: 20/03/12 DESIGNED BY: NA DRAWN BY: M.S.R.N. CHECKED BY: NA		
4.	THE SURFACE ROUGHNESS WHENEVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACES INDICATED ON THE TOP MOST RIGHT CORNER OF THE DRG.			TITLE DISCHARGE VALVE		DATE: 01/04/12 DESIGNED BY: NA DRAWN BY: M.S.R.N. CHECKED BY: NA		



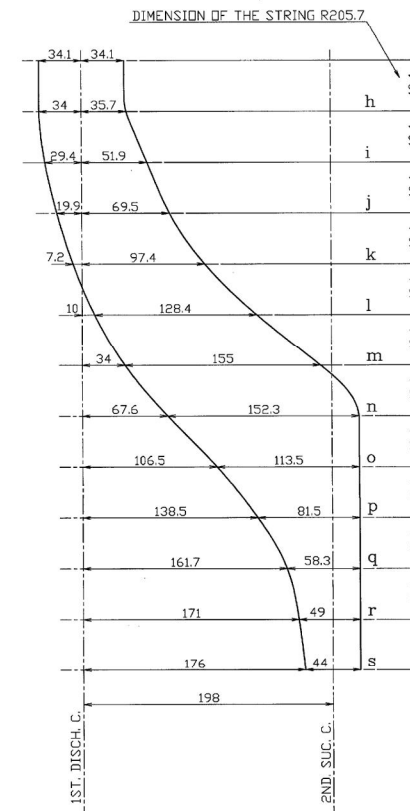
VIEW B

SUCTION HOLES BEHIND CLOSSEOVER ARE
IMPORTANT FOR PERFORMANCE.
THEREFORE DON'T BRIDGE THESE HOLES
DUE TO CASTING PROCESS.
(REFER TO THE SECTION AA IN INNER CASING
OUTLINE DRAWING.)



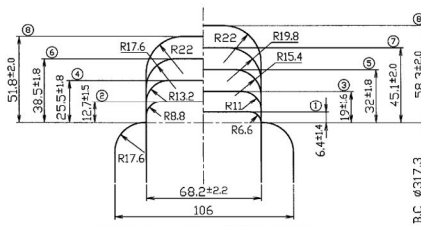
SECTION AA

THIS SECTION IS REFERENCE.
THE DETAILS SHALL FOLLOW
CROSSOVER DEVELOPMENT.



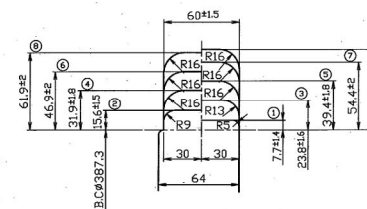
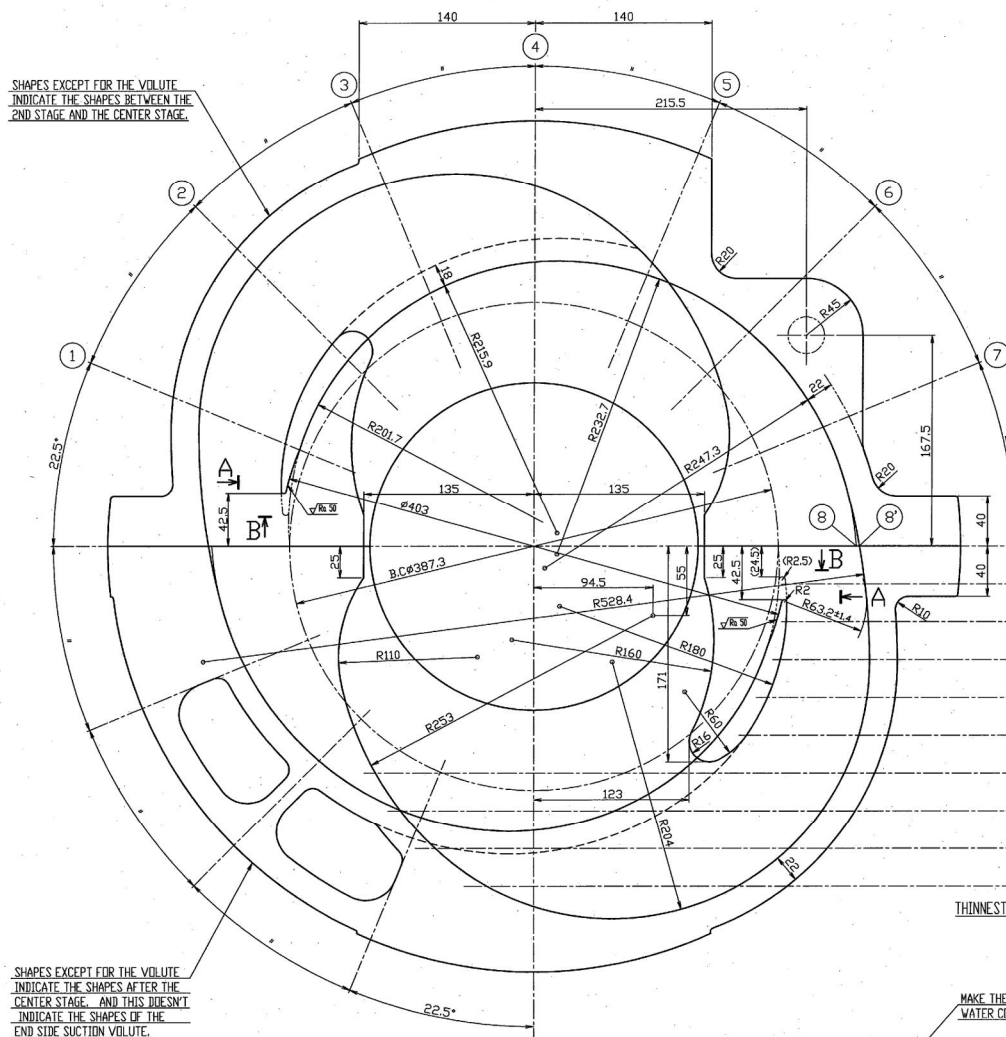
CROSSOVER DEVELOPMENT

VIEW C



DETAIL OF VOLUTE

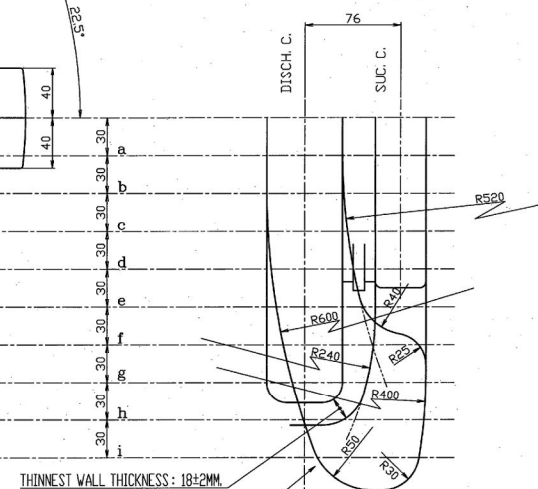
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DETAIL OF VOLUTE

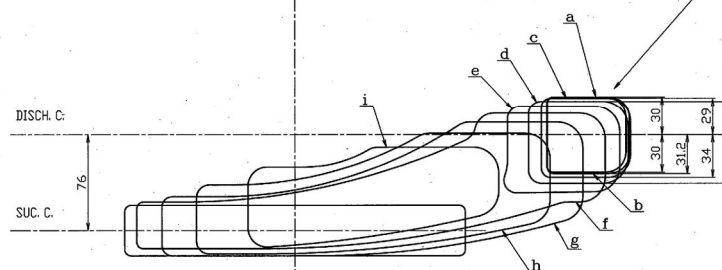


VIEW A

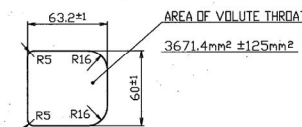


THINNEST WALL THICKNESS: 18±2M

MAKE THE SHAPE SO THAT
WATER COULD FLOW SMOOTHLY



VIEW E



AREA OF WHITE THROAT

3671.4mm² ±125mm²

						FPM9218XZ017	1560	1660
						HYI0593		1
			VAR NO.	RAW MATERIAL SIZE OR CASTING DRG.NO. OR FORGING DRG.NO.	MATERIAL CODE	NET WT. GROSS		
			DRAWING NO.		MATERIAL SPECN	QUANTITY		

THE FOLLOWING CONDITIONS APPLY EXCEPT OTHER STATEMENT...
 1. REF TO HYDROCBEST FOR UNSPECIFIED TOLERANCES.
 2. CHAMFER M/CD SHARP EDGES AND 1.2x 1.0 to 1.5 at 45°.
 3. INTERNAL M/COD CORNER RADI 1 TO 0.7.
 4. THE SURFACE REQUIREMENTS INDICATED NOT SHOW SHALL BE TAKEN FROM THE SURFACE FINISHES SECTION OUT OF EACH SLACK BACKS OVER AT THE TOP MOST RIGHT CORNER OF THE Dwg.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PURCHASER

BHARAT HEAVY ELECTRICALS LTD.
HYPHCABEST

 DEPT. PLANTS OFFICE DIVISION
 CODE - 410 INTS NTS

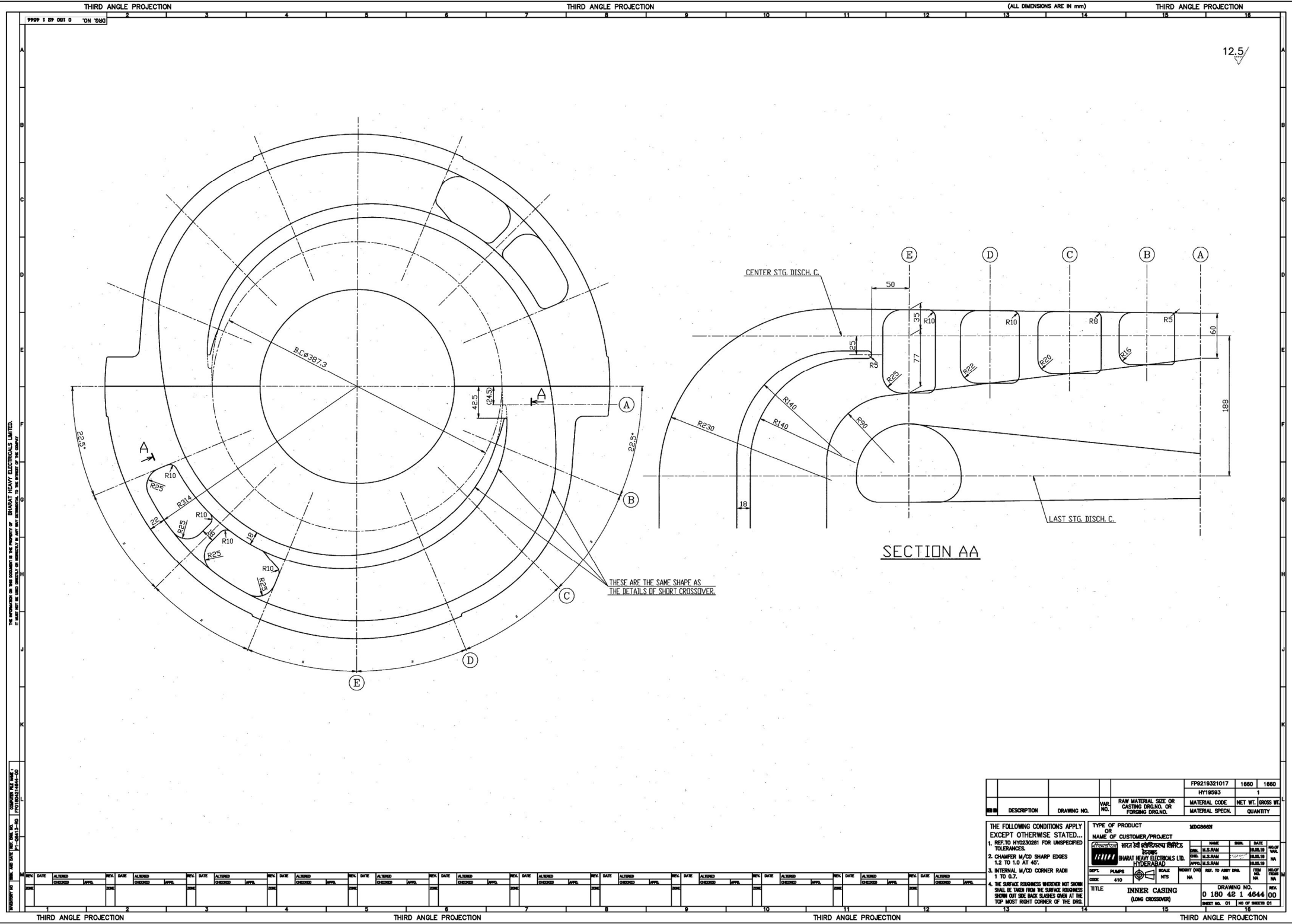
TITLE INNER CASING

SIDE VALTUE AND SHORT CROSSOVER

DRAWING NO.

NO 0 180 42 1 4843 OC

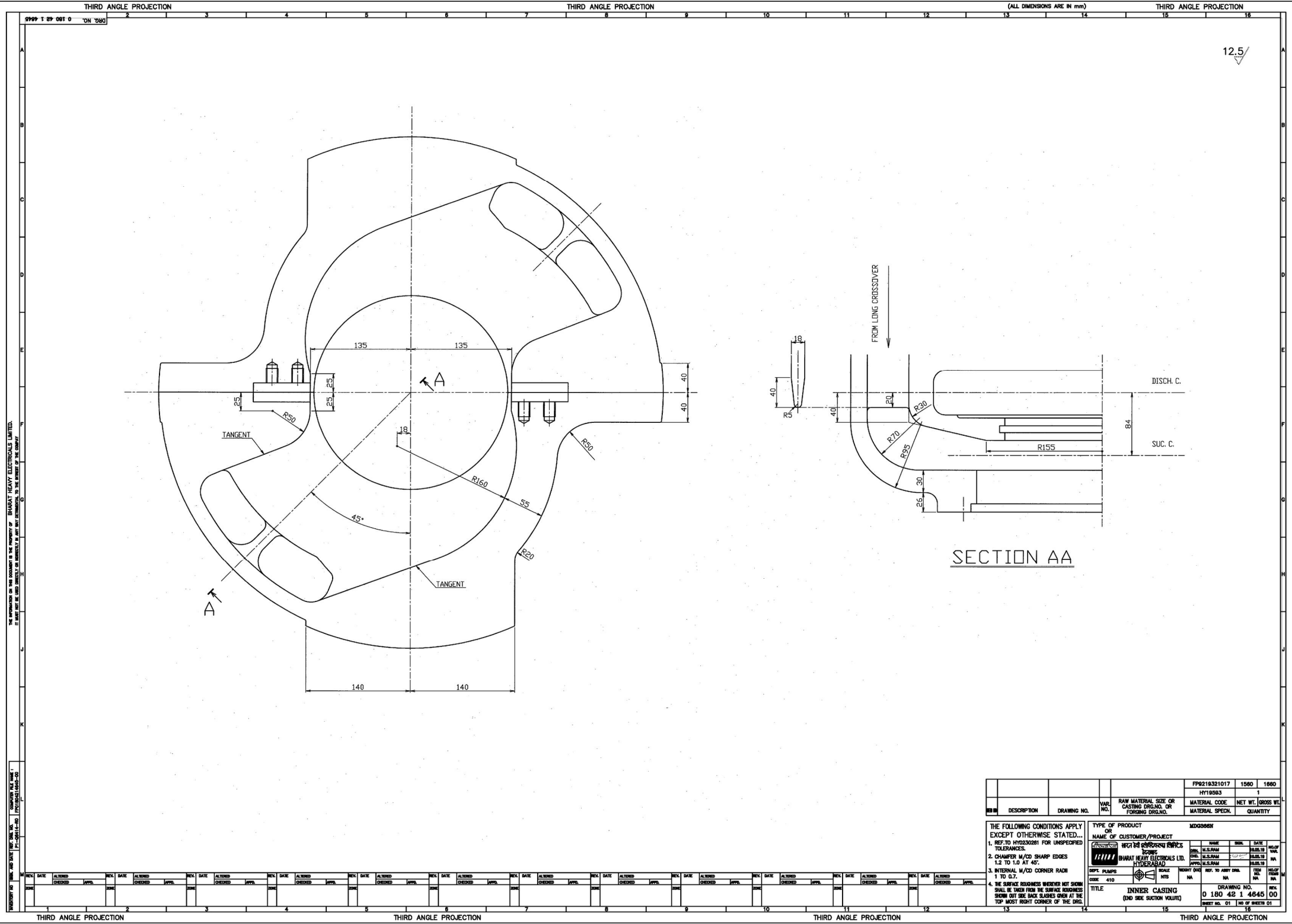
SHEET No. 01 OF SHEETS 01



ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED
IT SHALL BE THE RESPONSIBILITY OF THE CUSTOMER TO VERIFY THE DIMENSIONS OF THE COMPONENT

THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...
1. REF. TO HYDRO20281 FOR UNSPECIFIED TOLERANCES
2. CHAMFER M/C/D SHARP EDGES 1.2 TO 1.0 AT 45°
3. INTERNAL M/C/D CORNER RADI 1 TO 0.7
4. THE SURFACE ROUGHNESS WHENEVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON THE SURFACE SLASHED OVER AT THE TOP MOST RIGHT CORNER OF THE DRG.

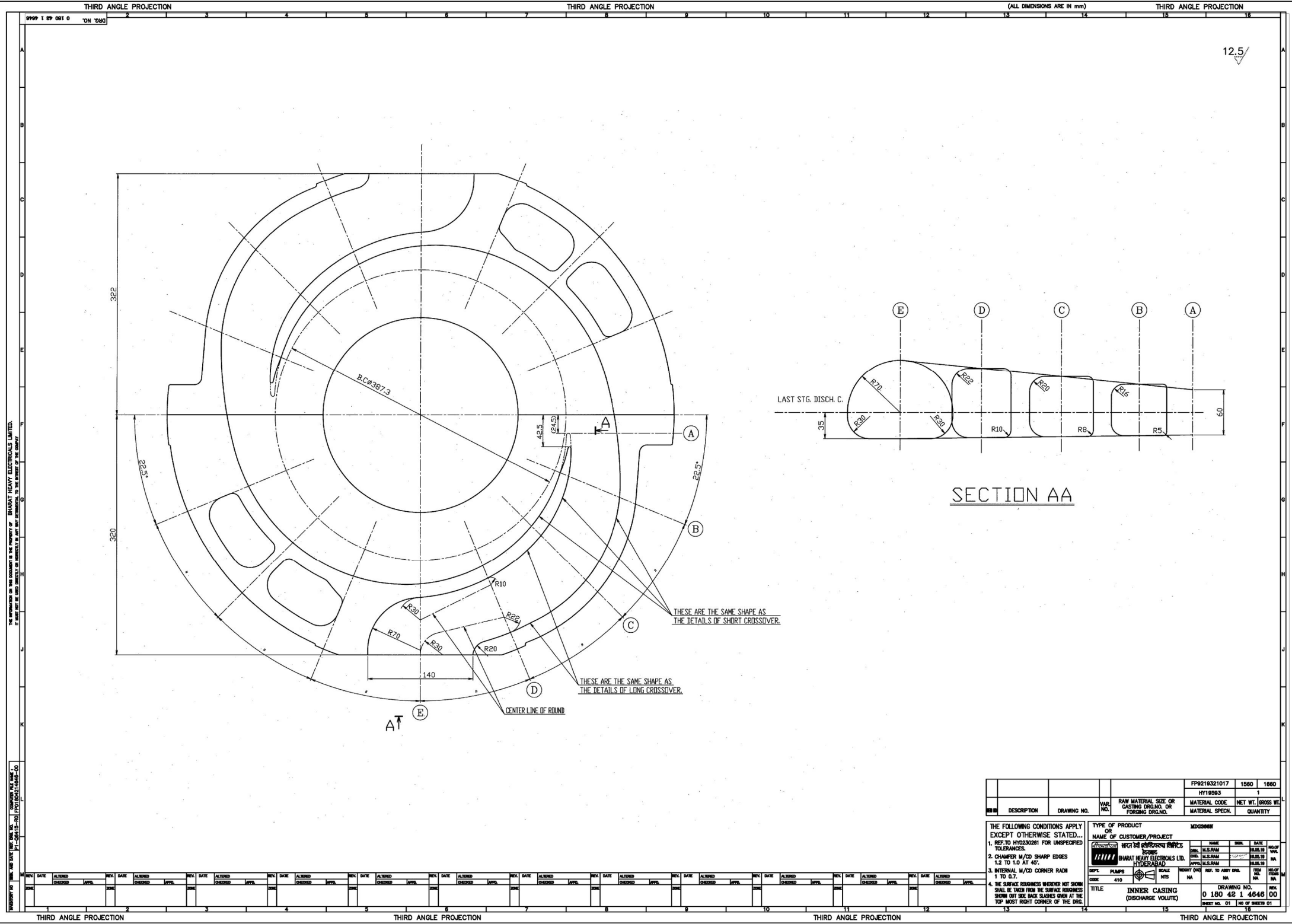
DRAWING NO.		VAR. NO.		RAW MATERIAL SIZE OR CASTING DRG. NO. OR FORGING DRG. NO.		FP9219321017		1880		1880	
DESCRIPTION		NAME OF CUSTOMER/PROJECT		MATERIAL CODE		NET WT.		GROSS WT.		QUANTITY	
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.	
1. REF. TO HYDRO20281 FOR UNSPECIFIED TOLERANCES		HYDRO20281		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.	
2. CHAMFER M/C/D SHARP EDGES 1.2 TO 1.0 AT 45°		HYDRO20281		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.	
3. INTERNAL M/C/D CORNER RADI 1 TO 0.7		HYDRO20281		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.	
4. THE SURFACE ROUGHNESS WHENEVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON THE SURFACE SLASHED OVER AT THE TOP MOST RIGHT CORNER OF THE DRG.		HYDRO20281		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.		MATERIAL SPEC.	
TITLE		INNER CASING (LONG CROSSOVER)		DRAWING NO.		0 180 42 1 4844		00		00	
DATE		DATE		DATE		DATE		DATE		DATE	
1		2		3		4		5		6	
7		8		9		10		11		12	
13		14		15		16		17		18	



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REVISIONS TO BE MADE BY THE DESIGNER ONLY. NO CHANGES TO BE MADE BY THE USER.

DESCRIPTION		DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING ORG.NO. OR FORGING ORG.NO.	PP0218321017	1580	1060
					HY19063		
					MATERIAL CODE	NET WT.	GROSS WT.
					MATERIAL SPECN.	QUANTITY	
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...							
1. REF. TO HYD200281 FOR UNSPECIFIED TOLERANCES.							
2. CHAMFER M/C/D SHARP EDGES 1.2 TO 1.0 AT 45°.							
3. INTERNAL M/C/D CORNER RADI 1 TO 0.7.							
4. THE SURFACE ROUGHNESS WHENEVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON THE SURFACE SLASHED OVER AT THE TOP MOST RIGHT CORNER OF THE DRG.							
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		MD0368N					
BHARAT HEAVY ELECTRICALS LTD. HYDERABAD							
CODE 410		SCALE 1:1		WEIGHT (KG)		REF. TO ARMY DRG.	
TITLE		INNER CASING (END SIDE SUCTION VOLUTE)		DRAWING NO.		REV.	
				0 180 42 1 4645		00	
				SHEET NO. 01		NO OF SHEETS 01	



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REVISIONS
REV. NO. DATE BY
1 15/08/2018 12-100 (P) 1000111442-00

DESCRIPTION		DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING ORG.NO. OR FORGING ORG.NO.	FPW219321017	1560	1060
					HY190983		
					MATERIAL CODE	NET WT.	GROSS WT.
					MATERIAL SPEC.	QUANTITY	
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...							
1. REF TO HY0230281 FOR UNSPECIFIED TOLERANCES.							
2. CHAMFER M/CD SHARP EDGES 1.2 TO 1.0 AT 45°.							
3. INTERNAL M/CD CORNER RADII 1 TO 0.7.							
4. THE SURFACE ROUGHNESS WHENEVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON THE SURFACE SLASHED OVER AT THE TOP MOST RIGHT CORNER OF THE DRG.							
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		MDD0000W					
BHARAT HEAVY ELECTRICALS LTD. HYDERABAD							
EMPL. CODE	PLMPS 410	SCALE	HTS	WEIGHT (KGS)	REF. TO ARMY DRG.	ITEM NO.	REMARKS
TITLE		INNER CASING (DISCHARGE VOLUME)					
DRAWING NO.		0 180 42 1 4648 00					
SHEET NO.		01					

DRG. NO.

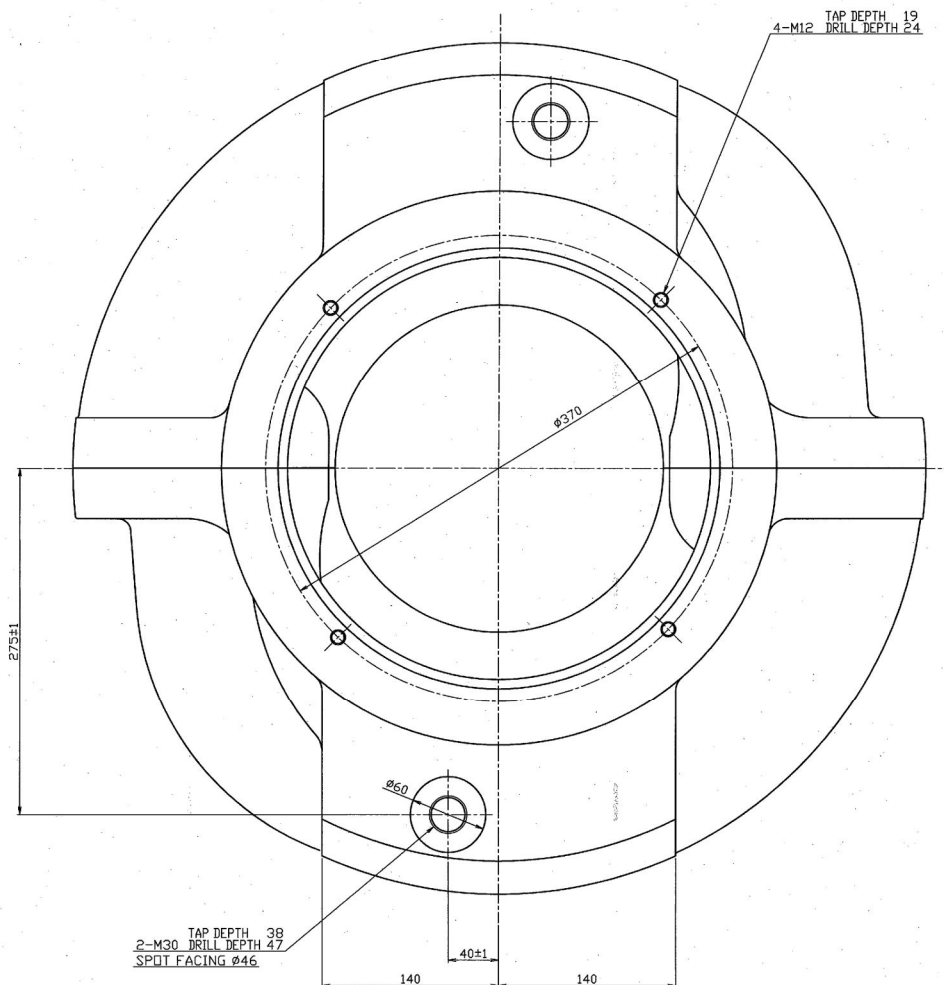
12.5 ✓



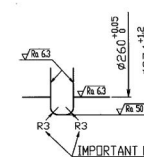
(PREPARE THE SCREW ACCORDING TO THE DRAWING OF SPLITTER.)

				PP212301017	1580	1680
				HY19593	1	
				RAW MATERIAL SIZE OR CASTING DRG.NO. OR FORGING DRG.NO.	MATERIAL CODE	NET WT. GROSS WT.
					MATERIAL SPEC.	QUANTITY
1	DESCRIPTION	DRAWING NO.	VAR. NO.			
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED... 1. REF. TO HYDRO-20261 FOR UNSPECIFIED TOLERANCES. 2. CHAMFER 1/4" SHARP EDGES 1.2 TO 1.4 AT 45° 3. INTERNAL W/4 CORNER RADIUS 1 TO 0.7. 4. THE SURFACE FINISHES UNLESS NOT SHOWN SHALL BE TAKEN FROM THE SURFACE FINISHES SHOWN ON SET BACK SLASHES UNLESS AT THE TOP MOST RIGHT CORNER OF THE DRG.				TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT MDDG5668  HYDRO-20261 BRYANT BROTHERS LTD. HYDRO-20261 DRG. NO. 410  NTS DRG. NO. 410 REF. TO ADPT. DRG. NO. NA TITLE INNER CASING (COUPLING SIDE DRAWING) DRAWING NO. 0 180 42 1 4647 00 REV. 01 SHEET NO. 01 OF 01 14 15 16		

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[illegible]

SUCTION HOLES BEHIND CLOSSEOVER ARE IMPORTANT FOR PERFORMANCE. THEREFORE DON'T BRIDGE THESE HOLES DUE TO CASTING PROCESS.



DETAIL A
(S=1/1)

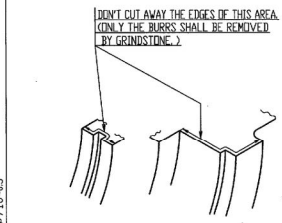
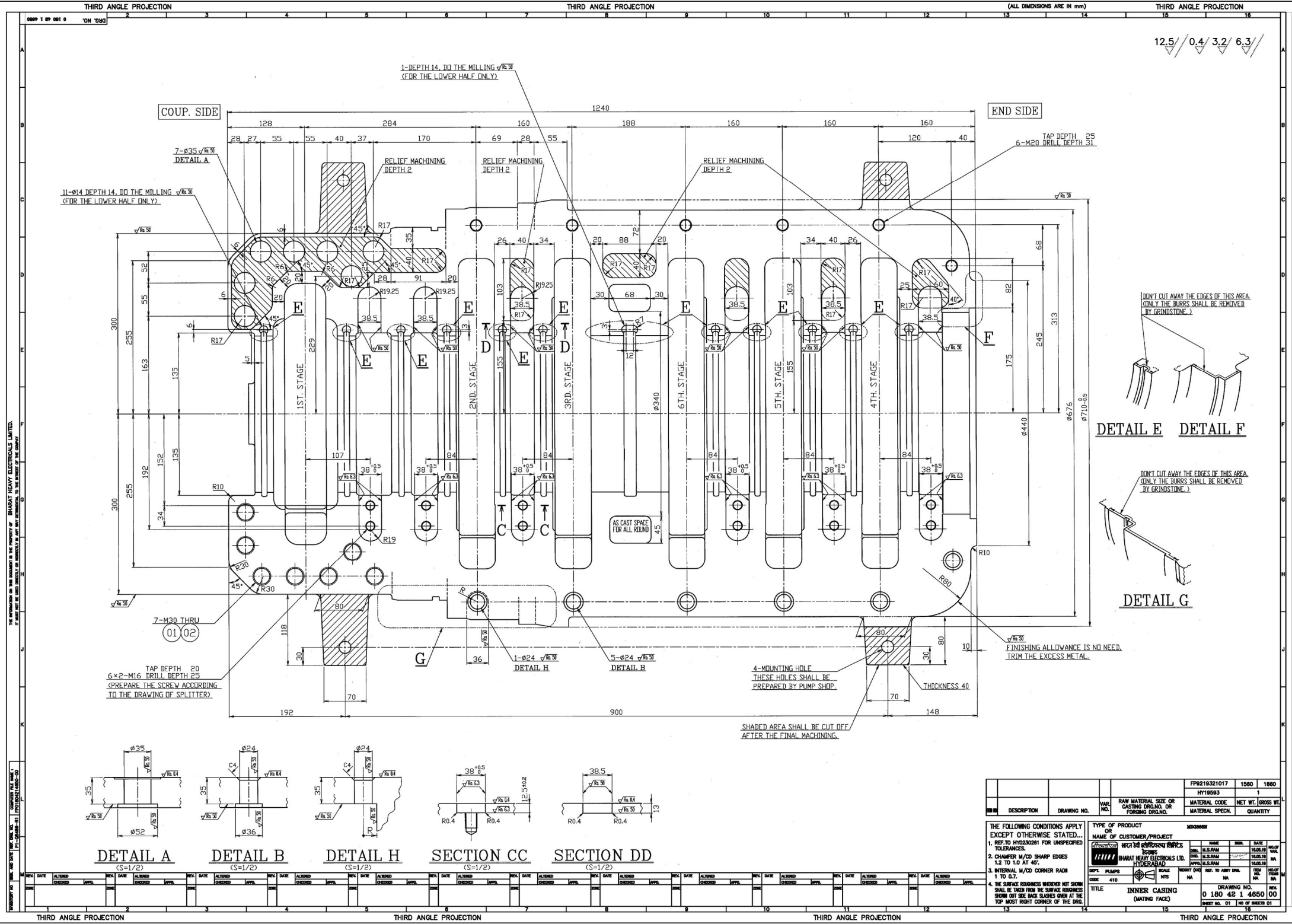
NOTE

1. AFTER ASSEMBLING THE UPPER AND THE LOWER CASINGS TO MAKE THE PART OF 'X' EVEN, MACHINE THE BOTH END OF 878 ± 0.1 AND THE OUTSIDE.

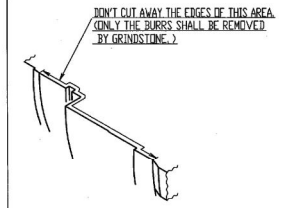
GAP AT THE MATCHING FACE BETWEEN
THE UPPER AND LOWER HALF, INDICATED
BY THE MARK OF 'X',
SHALL BE LESS THAN 1/100.
IF IT IS OVER, CORRECT IT BY THE DILSTONE.

				FP821323017		1560		1	
				HY19593				1660	
DESCRIPTION		DRAWING NO.		VAR. NO.		RAW MATERIAL SIZE OR CASTING DRG.NO. OR FORGING DRG.NO.		MATERIAL CODE NET WT. (GROSS QUANTITY)	

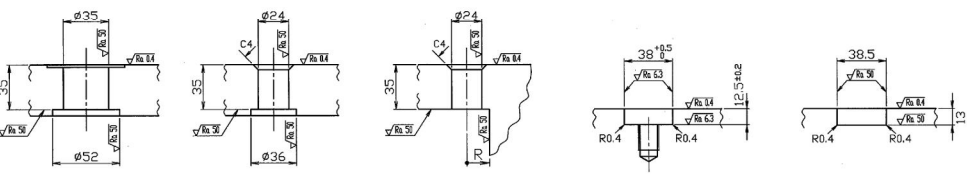
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED....				TYPE OF PRODUCT				MDG368N			
1. REF TO HY0302081 FOR UNSPECIFIED TOLERANCES.				NAME OF CUSTOMER/PROJECT				MUSE			
2. CHAMFER 1/4" ON SHARP EDGES 1.2 TO 0.47.				 BHEI IN CONVERSION FROM BHARAT HEAVY ELECTRICALS LTD. HYDERABAD				DATE		DATE	
3. INTERNAL 1/4" CORNER RADIUS 1.2 TO 0.7.								MATERIAL		MATERIAL	
4. THE SURFACE ROUGHNESS RATHER NOT SHOW SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOW ON THE BACK CLASH OVER AT THE TOP MOST RIGHT CORNER OF THE DRG.				DEPT. PLUMS		SCALE		REF. TO ADPT. DRG.		REF. TO ADPT. DRG.	
				4:1		1:1		NA		NA	
				TITLE		INNER CASING		DRAWING NO.		REV. NO.	
						(LONGITUDINAL SECTION)		0 180 42 1 4649 0		0	
								SHEET NO.		NO. OF SHEETS	



DETAIL E DETAIL F



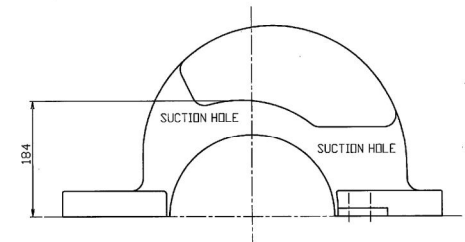
DETAIL G



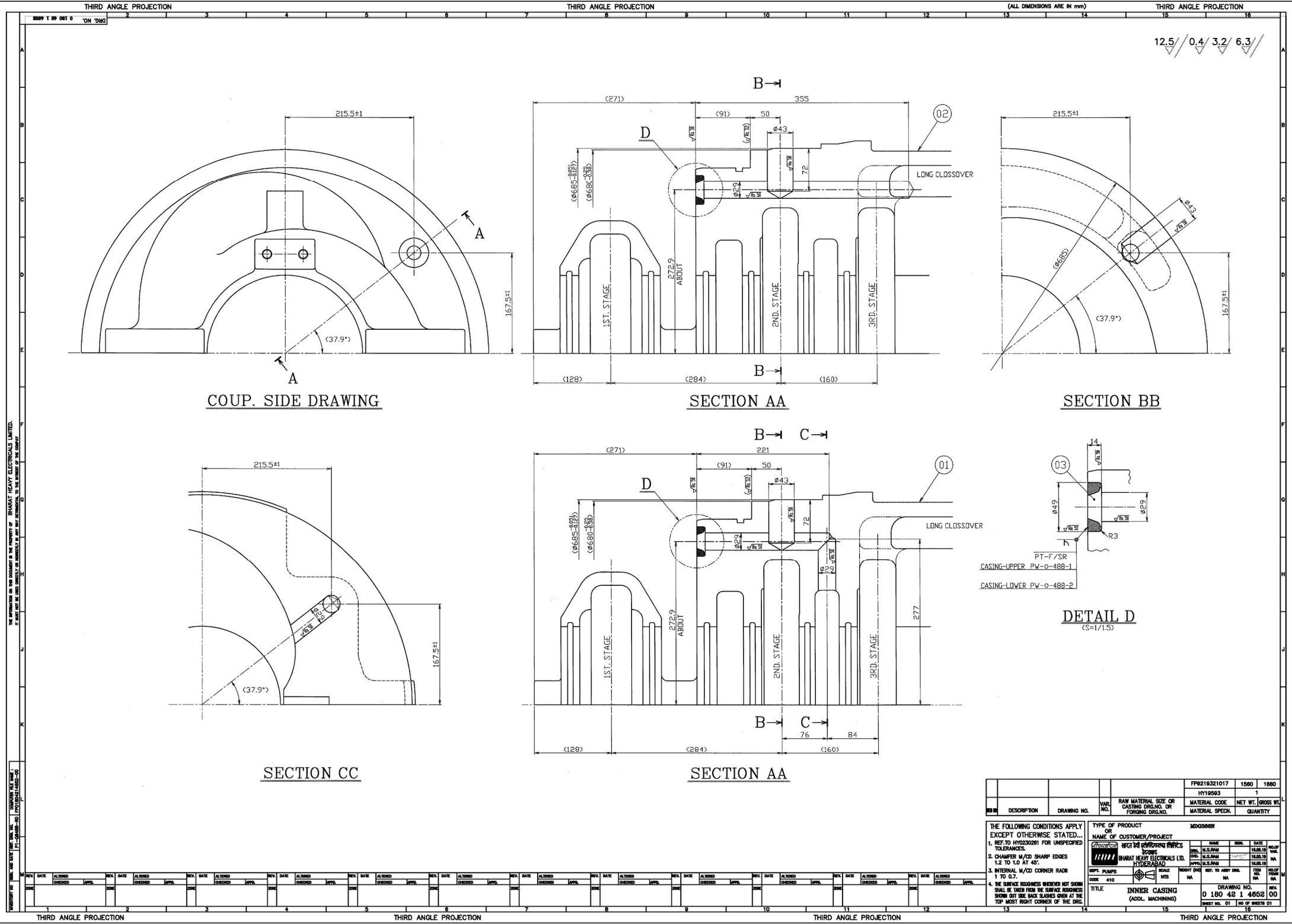
DETAIL A DETAIL B DETAIL H SECTION CC SECTION DD

						FP0219321017		1560		1660	
						HY19093		1			
				VAR. NO.		RAW MATERIAL SIZE OR CASTING ORG. NO. OR FORGING ORG. NO.		MATERIAL CODE		NET WT. GROSS WT.	
ITEM		DESCRIPTION		DRAWING NO.				MATERIAL SPEC.		QUANTITY	
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...						TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		REMARKS			
1. REF. TO HY020281 FOR UNSPECIFIED TOLERANCES.						HYDRO 20281		HYDRO 20281			
2. CHAMFER M/OD SHARP EDGES 1.2 TO 1.0 AT 45°.						BURNT HEAVY ELECTRICAL COIL. HYDRO 20281		BURNT HEAVY ELECTRICAL COIL. HYDRO 20281			
3. INTERNAL M/OD CORNER RADII 1 TO 0.7.						DEPT. PLIMS		DEPT. PLIMS			
4. THE SURFACE ROUGHNESS WHEN NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON THE SURFACE ROUGHNESS SHOWN ON THE TOP RIGHT CORNER OF THE DRG.						1		1			
						TITLE		INNER CASING (MATING FACE)			
						DRAWING NO.		0 180 42 1 4650 00			
						BATCH NO. 01		NO. OF BATCHES 01			
13						15					
						THIRD ANGLE PROJECTION					

SECTION AA
(S=1/4)



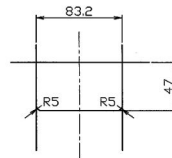
					FP921932017	1580	1680
					HY19593		
REV	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRGNO. OR FORMING DRGNO.	MATERIAL CODE	NET WT.	GROSS WT. QUANTITY
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED... 1. REF TO HYPO302891 FOR UNSPECIFIED TOLERANCES. 2. CHAMFER M/CX SHARP EDGES 1.5 TO 1.0 AT 45°. 3. INTERIOR M/CX CORNER RADIUS 1 TO 0.7. WE SUGGEST BUYERS WHEN NOT SHOW SHOWN ON DRAW FROM THE SURFACE BUSHINGS SHOW OUT SIDE BACK SLASHES WHEN A TOP MOST RIGHT CORNER OF THE END.				TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT  REF TO HYDRO PUMPS CATALOGUE BRAAT HETZEL GROUPS LTD. HYDRA-BRAK EMPL. PUMPS  NTS SHORT O.D. NA REF. TO ADAPT DIA. NA REF. TO ADAPT DIA. NA CODE 410 NA NA NA NA NA NA NA TITLE INNER CASING (OUTLINE DRAWING) DRAINING NO. 0 180 42 1 4651 01 REV. Q1 Q2 Q3 Q4 Q5 Q6 Q7			
				14	15	16	17



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IT IS TO BE USED ONLY FOR THE PURPOSES FOR WHICH IT IS ISSUED AND NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION IN WRITING FROM BHARAT HEAVY ELECTRICALS LIMITED.

				FPW219321017		1580	1060
				HY10593		1	
				MATERIAL CODE		NET WT.	GROSS WT.
				MATERIAL SPECN.		QUANTITY	
REF	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG. NO. OR FORGING DRG. NO.			
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...							
1. REF. TO HY020281 FOR UNSPECIFIED TOLERANCES.							
2. CHAMFER M/C/D SHARP EDGES 1.2 TO 1.0 AT 45°.							
3. INTERNAL M/C/D CORNER RADI 1 TO 0.7.							
4. THE SURFACE ROUGHNESS WHENEVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON THE SURFACE SLASHED ON AT THE TOP MOST RIGHT CORNER OF THE DRG.							
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT				MDG368H			
NAME OF CUSTOMER/PROJECT				BHARAT HEAVY ELECTRICALS LTD. HYDERABAD			
SHEET NO.				01		OF 01	
DATE				18.05.19		DATE	
BY				S.S.S.N.		BY	
CHECKED				S.S.S.N.		CHECKED	
APPROVED				S.S.S.N.		APPROVED	
TITLE				INNER CASING (ADD. MACHINING)		DRAWING NO.	
				01804214652		00	
REV.				00		REV.	
SHEET NO.				01		SHEET NO.	

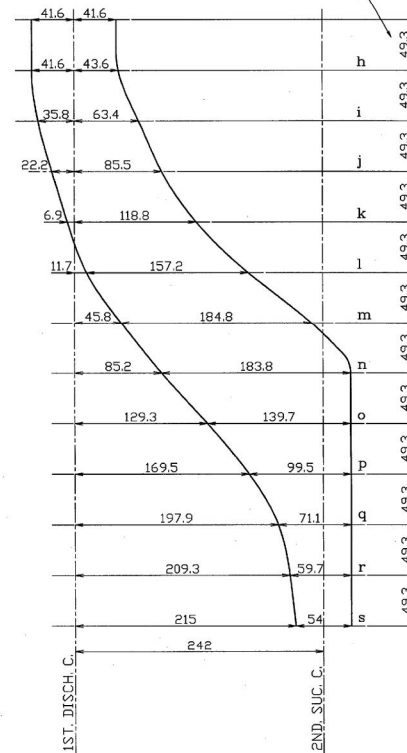
A horizontal beam is shown with an arrow pointing to the right at its right end. The beam is slightly curved upwards, and the angle of deflection at the right end is labeled as 5° .



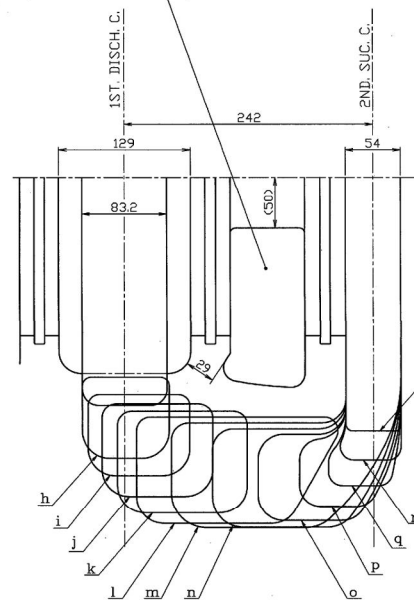
VIEW B

SUCTION HOLES BEHIND CLOSURE ARE IMPORTANT FOR PERFORMANCE. THEREFORE DON'T BRIDGE THESE HOLES DUE TO CASTING PROCESS. (REFER TO THE SECTION AA IN INNER CASING OUTLINE DRAWING.)

DIMENSION OF THE STRING R251

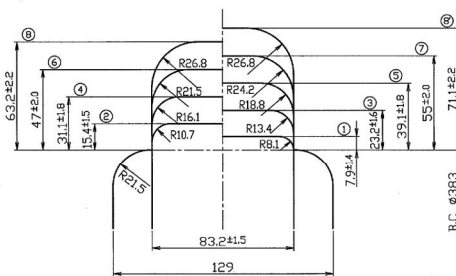


CROSSOVER DEVELOPMENT



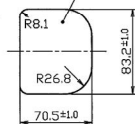
SECTION AA

THIS SECTION IS REFERENCE.
THE DETAILS SHALL FOLLOW
CROSSOVER DEVELOPMENT.



DETAIL OF VOLUTE

AREA OF VOLUTE THROAT
5529mm² ±155mm²

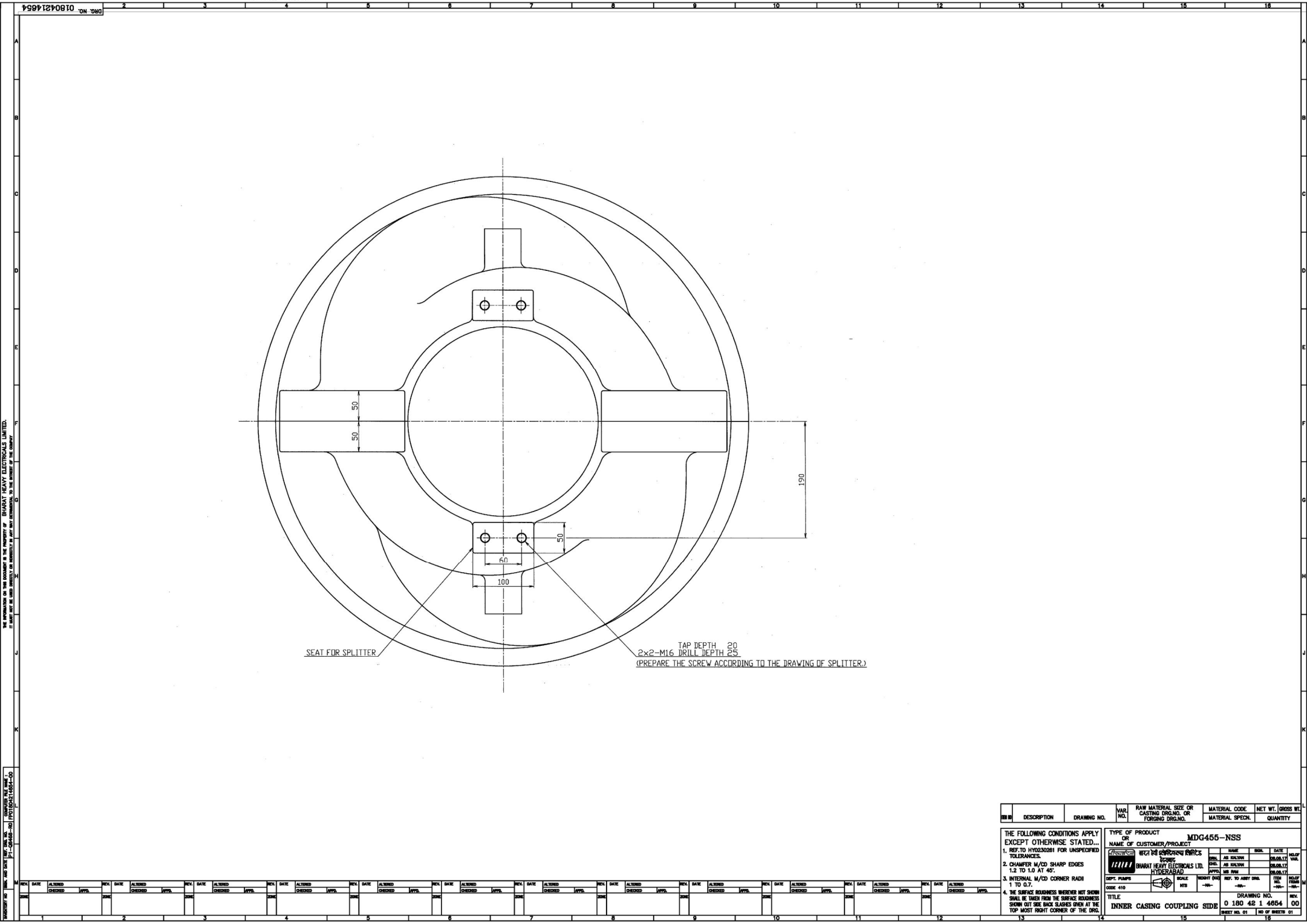


VIEW C

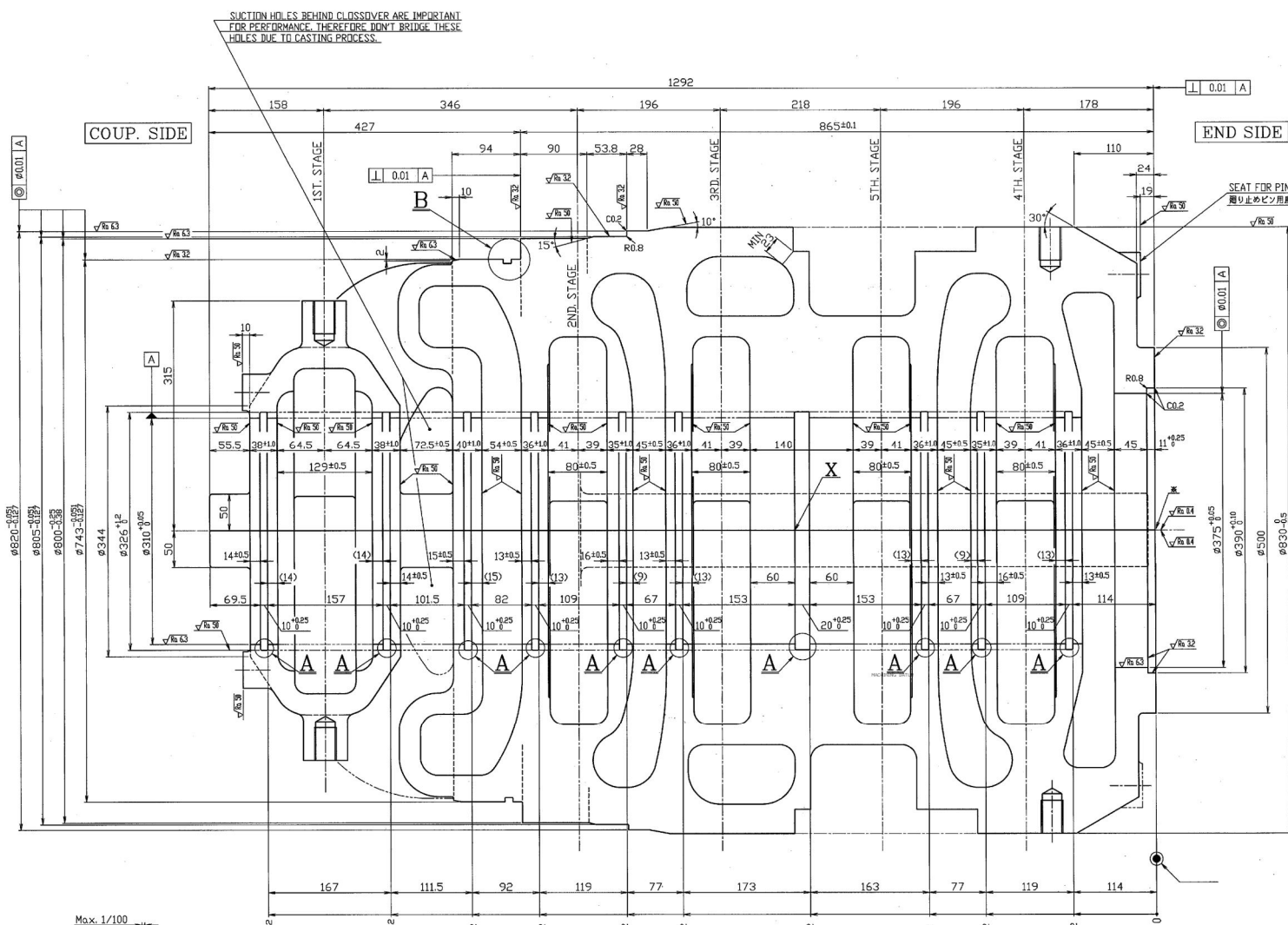
[illegible]

ALL DIMENSIONS ARE IN MM
IT SHALL BE THE RESPONSIBILITY OF THE CUSTOMER TO VERIFY THE DIMENSIONS OF THE PARTS
IT SHALL BE THE RESPONSIBILITY OF THE CUSTOMER TO VERIFY THE DIMENSIONS OF THE PARTS

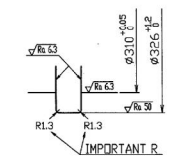
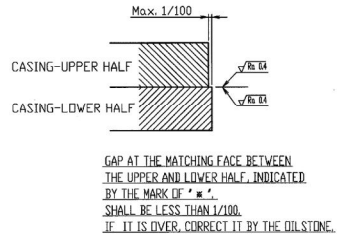
THE INFORMATION IN THIS DRAWING IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED.
IT SHALL BE THE RESPONSIBILITY OF THE CUSTOMER TO VERIFY THE DIMENSIONS OF THE PARTS
IT SHALL BE THE RESPONSIBILITY OF THE CUSTOMER TO VERIFY THE DIMENSIONS OF THE PARTS



NO.	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG. NO. OR FORGING DRG. NO.	MATERIAL CODE	NET WT.	GROSS WT.
				MDG455-NSS			
				NAME OF CUSTOMER/PROJECT			
				TYPE OF PRODUCT			
				MATERIAL SPECN.			
				QUANTITY			
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...							
1. REF. TO HYDRO20281 FOR UNSPECIFIED TOLERANCES							
2. CHAMFER M/C/D SHARP EDGES 1.2 TO 1.0 AT 45°							
3. INTERNAL M/C/D CORNER RADI 1 TO 0.7							
4. THE SURFACE ROUGHNESS WHENEVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON THE BACK SLASHES OVER AT THE TOP MOST RIGHT CORNER OF THE DRG.							
DEPT. PLMPS				SCALE			
CODE 410				MKS			
TITLE				DRAWING NO.			
INNER CASING COUPLING SIDE				0 180 4/2 1 4054			
SHEET NO. 01				NO OF SHEETS 01			



NOTE
1. AFTER ASSEMBLING THE UPPER AND THE LOWER CASINGS TO MAKE THE PART OF "X" EVEN, MACHINE THE BOTH END OF 865±0.1 AND THE OUTSIDE.



DETAIL A

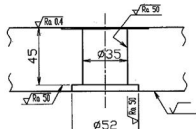
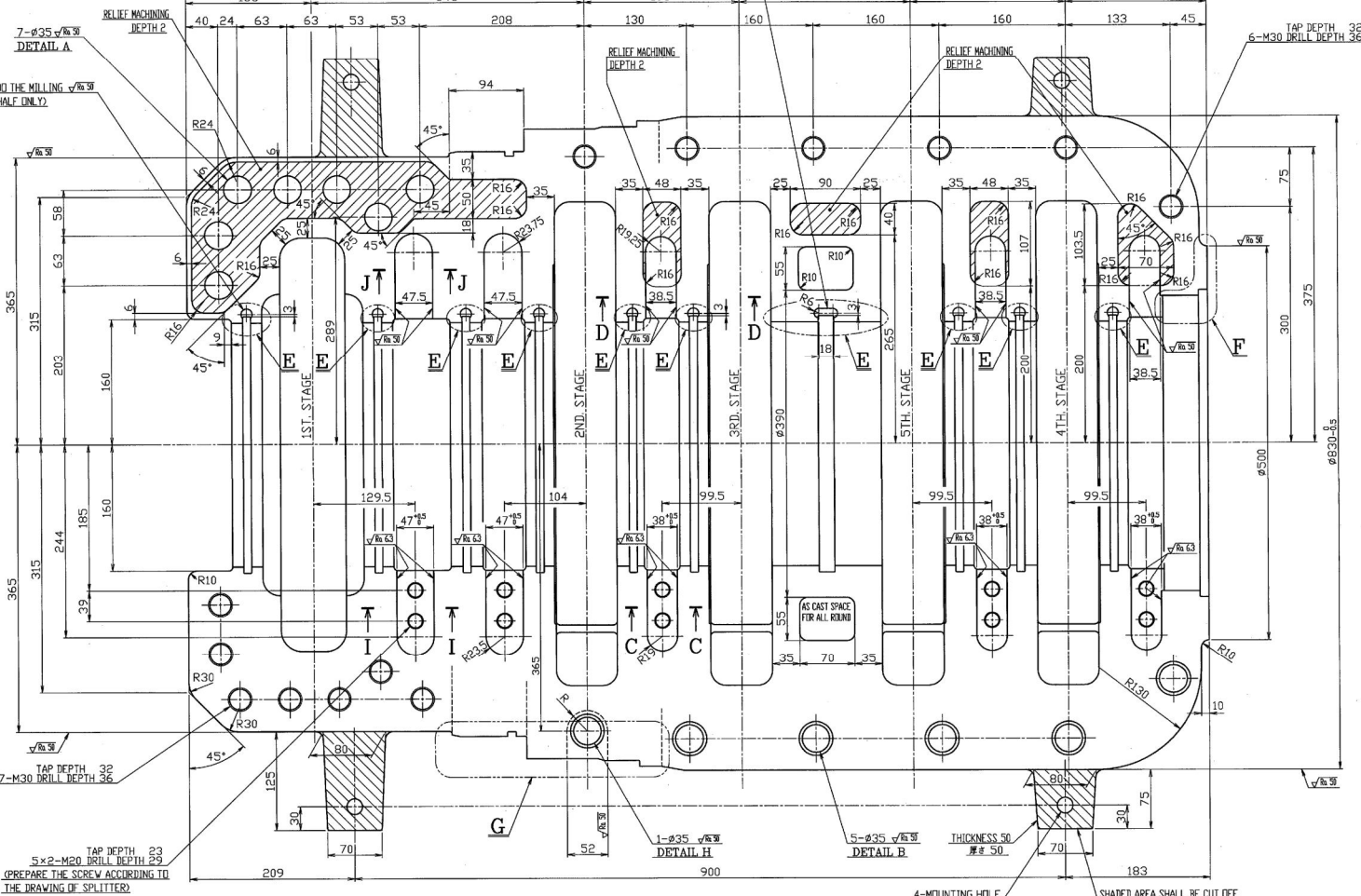
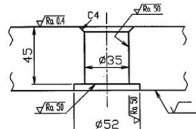
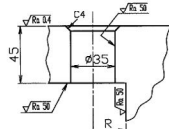
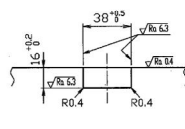
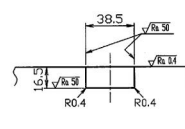
DETAIL B

DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG. NO. OR FORGING DRG. NO.	MATERIAL CODE	NET WT.	GROSS WT.
			NAME OF CUSTOMER/PROJECT	MATERIAL SPECN.	QUANTITY	
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED... 1. REF. TO HYDRO20281 FOR UNSPECIFIED TOLERANCES. 2. CHAMFER M/CD SHARP EDGES 1.2 TO 1.0 AT 45°. 3. INTERNAL M/CD CORNER RADI 1 TO 0.7. 4. THE SURFACE ROUGHNESS WHENEVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON SIZE DASH SLASHES OVER AT THE TOP MOST RIGHT CORNER OF THE DRG.			MDG455-NSS HYDRO20281 BARRY HEAVY ELECTRICALS LTD. HYDERABAD			
DEPT. PLMPS CODE 410			SCALE NAT	WEIGHT (KGS) --	REF. TO ARMY DRG. --	REF. FROM --
TITLE INNER CASING LONGITUDINAL SECTION			DRAWING NO. 0 180 42 1 4855 00 SHEET NO. 01 NO OF SHEETS 01			

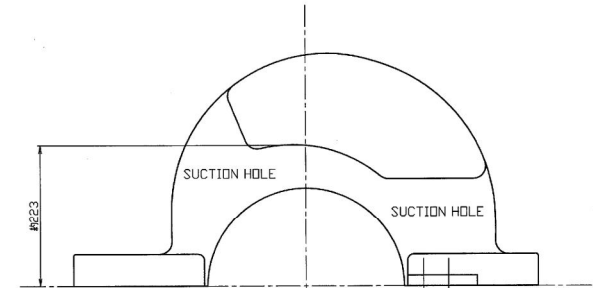
WE GUARANTEE THE QUALITY OF OUR PRODUCTS AND SERVICES. IN THE EVENT OF A DEFECT, WE WILL REPAIR OR REPLACE THE PRODUCT AT NO CHARGE TO YOU. THIS WARRANTY IS VALID FOR A PERIOD OF 12 MONTHS FROM THE DATE OF DELIVERY OF THE PRODUCT. IT DOES NOT COVER DEFECTS DUE TO MISUSE OR NEGLIGENCE. FOR MORE DETAILS, PLEASE REFER TO OUR TERMS AND CONDITIONS.

COUP. SIDE

END SIDE

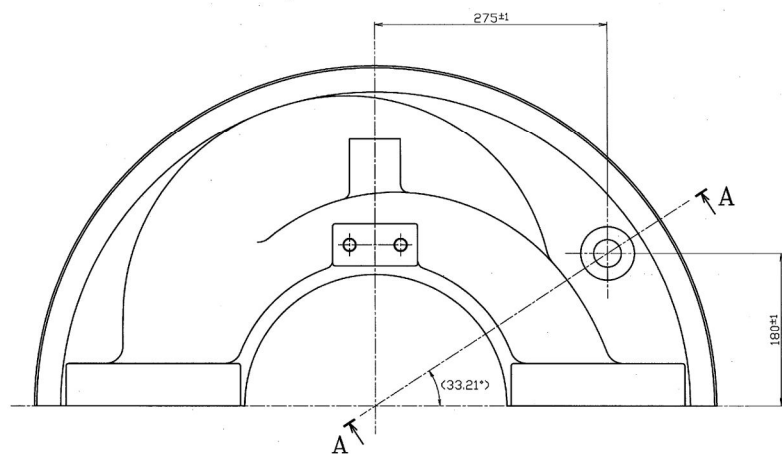
DETAIL A
(S=1/2)DETAIL B
(S=1/2)DETAIL H
(S=1/2)SECTION CC
(S=1/2)SECTION DD
(S=1/2)

REV	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG. NO. OR FORGING DRG. NO.	MATERIAL CODE	NET WT.	GROSS WT.
					MATERIAL SPECN.		QUANTITY
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...							
1. REF TO H02030261 FOR UNSPECIFIED TOLERANCES.							
2. CHAMFER M/C/D SHARP EDGES 1.2 TO 1.0 AT 45°.							
3. INTERNAL M/C/D CORNER RADI 1 TO 0.7.							
4. THE SURFACE ROUGHNESS WHEN NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON THE SURFACE SLASHES OVER AT THE TOP MOST RIGHT CORNER OF THE DRG.							
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT				MDG455-NSS			
DATE				08.08.17			
DEPT.				PUMPS			
SCALE				NSS			
REF. TO ASSY DRG.				0 180 42 1 4656			
ITEM NO.				00			
NO. OF SHEETS				01			

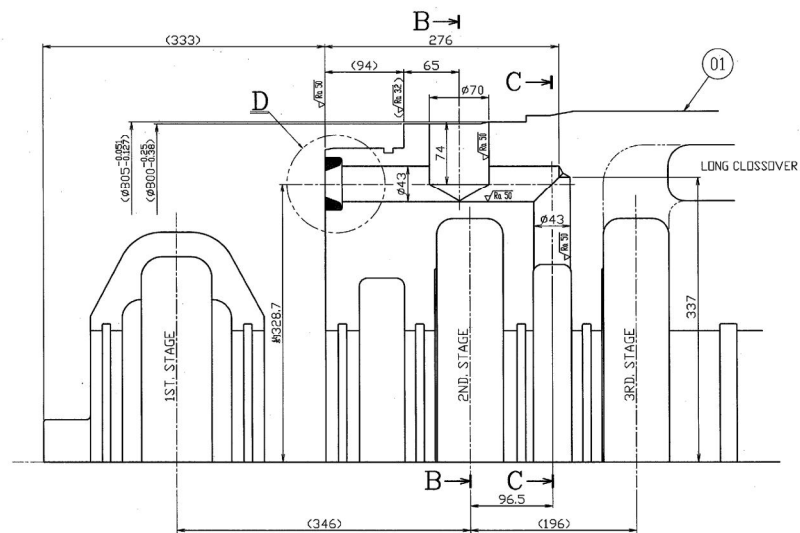


SECTION AA
(S=1/4)

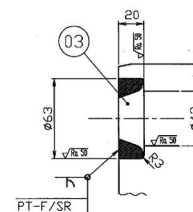
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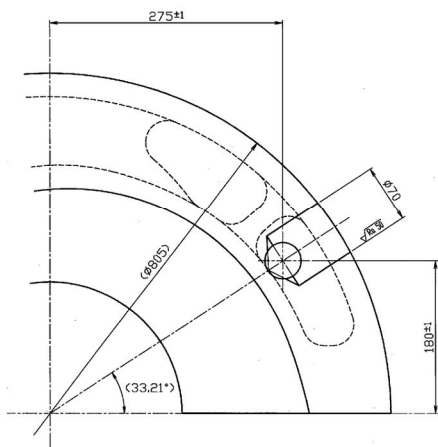
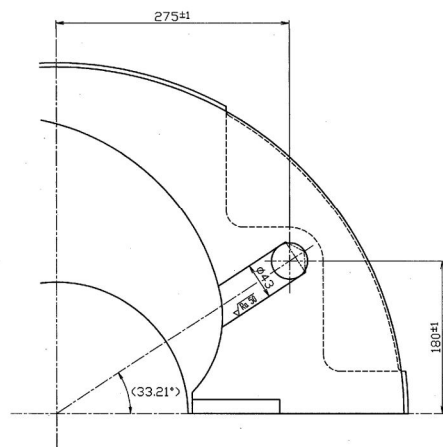
COUP. SIDE DRAWING



SECTION AA



DETAIL D
(S=1/2)

SECTION BB

SECTION CC

NO.	DESCRIPTION	DRAWING NO.	MAT. NO.	RAW MATERIAL SPEC. OR CASTING DRG. NO. OR FORGING DRG. NO.	MATERIAL CODE	NET WT. (GROSS WT.)	QUANTITY																																																																																																																																																																																																																																																																																																																																																																																																								
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED..... 1. NET HYDROGEN FOR UNSPECIFIED TOLERANCES. 2. CHAMFER M/C/D SHARP EDGES 1:2 TO 10:1 AT 45°. 3. INTERNAL M/C/D CORNER RADI 1:1 TO 0.7. 4. THE SURFACE REQUIREMENTS WERE NOT SHOWN SHALL BE TAKEN FROM THE SURFACE REQUIREMENTS SHOWN OUT SIDE EACH SLASHES GIVEN AT THE SHOWN MOST RIGHT CORNER OF THE DRG.				TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT MDG455-NSS WETA INC. SHERBORNE PLANT BRANAT HART ELECTRICAL LTD. HYDROBAR <table border="1"> <thead> <tr> <th>ITEM</th> <th>QTY</th> <th>NAME</th> <th>UNIT</th> <th>PRICE</th> <th>TOTAL</th> <th>UNIT PRICE</th> <th>TOTAL</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>2</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>3</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>4</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>5</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>6</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>7</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>8</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>9</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>10</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>11</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>12</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>13</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>14</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>15</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>16</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>17</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>18</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>19</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>20</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>21</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>22</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>23</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>24</td> <td>1</td> <td>WETA</td> <td>PC</td> <td>22.00</td> <td>22.00</td> <td>1</td> <td>22.00</td> </tr> <tr> <td>25</td> 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PRICE	TOTAL	1	1	WETA	PC	22.00	22.00	1	22.00	2	1	WETA	PC	22.00	22.00	1	22.00	3	1	WETA	PC	22.00	22.00	1	22.00	4	1	WETA	PC	22.00	22.00	1	22.00	5	1	WETA	PC	22.00	22.00	1	22.00	6	1	WETA	PC	22.00	22.00	1	22.00	7	1	WETA	PC	22.00	22.00	1	22.00	8	1	WETA	PC	22.00	22.00	1	22.00	9	1	WETA	PC	22.00	22.00	1	22.00	10	1	WETA	PC	22.00	22.00	1	22.00	11	1	WETA	PC	22.00	22.00	1	22.00	12	1	WETA	PC	22.00	22.00	1	22.00	13	1	WETA	PC	22.00	22.00	1	22.00	14	1	WETA	PC	22.00	22.00	1	22.00	15	1	WETA	PC	22.00	22.00	1	22.00	16	1	WETA	PC	22.00	22.00	1	22.00	17	1	WETA	PC	22.00	22.00	1	22.00	18	1	WETA	PC	22.00	22.00	1	22.00	19	1	WETA	PC	22.00	22.00	1	22.00	20	1	WETA	PC	22.00	22.00	1	22.00	21	1	WETA	PC	22.00	22.00	1	22.00	22	1	WETA	PC	22.00	22.00	1	22.00	23	1	WETA	PC	22.00	22.00	1	22.00	24	1	WETA	PC	22.00	22.00	1	22.00	25	1	WETA	PC	22.00	22.00	1	22.00	26	1	WETA	PC	22.00	22.00	1	22.00	27	1	WETA	PC	22.00	22.00	1	22.00	28	1	WETA	PC	22.00	22.00	1	22.00	29	1	WETA	PC	22.00	22.00	1	22.00	30	1	WETA	PC	22.00	22.00	1	22.00	31	1	WETA	PC	22.00	22.00	1	22.00	32	1	WETA	PC	22.00	22.00	1	22.00	33	1	WETA	PC	22.00	22.00	1	22.00	34	1	WETA	PC	22.00	22.00	1	22.00	35	1	WETA	PC	22.00	22.00	1	22.00	36	1	WETA	PC	22.00	22.00	1	22.00	37	1	WETA	PC	22.00	22.00	1	22.00	38	1	WETA	PC	22.00	22.00	1	22.00	39	1	WETA	PC	22.00	22.00	1	22.00	40	1	WETA	PC	22.00	22.00	1	22.00	41	1	WETA	PC	22.00	22.00	1	22.00	42	1	WETA	PC	22.00	22.00	1	22.00	43	1	WETA	PC	22.00	22.00	1	22.00	44	1	WETA	PC	22.00	22.00	1	22.00	45	1	WETA	PC	22.00	22.00	1	22.00	46	1	WETA	PC	22.00	22.00	1	22.00	47	1	WETA	PC	22.00	22.00	1	22.00	48	1	WETA	PC	22.00	22.00	1	22
ITEM	QTY	NAME	UNIT	PRICE	TOTAL	UNIT PRICE	TOTAL																																																																																																																																																																																																																																																																																																																																																																																																								
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INVENTORY NO.

REF.DRG.NO.
P2-Q8482-R0

COMP. FILE NAME
FP21804215002-01

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FIRST ANGLE PROJECTION

2009 1 24 08 22 ON'DRD

DRG.NO.

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NOTE TO SUPPLIER:

1. TECHNICAL DELIVERY CONDITIONS SHALL BE AS PER HY19593.

2. ADDITIONAL QUALITY REQUIREMENTS SHALL BE AS PER FP60291.

3. STRESS RELIEVING SHALL BE DONE AFTER ANY WELDING WITHIN
-20°C OF TEMPERING TEMPERATURE.

4. MANUFACTURE THE CASING IN ACCORDANCE WITH THE FOLLOWING DRAWINGS.

DESCRIPTION	REF.DRG.NO.	BHEL DRG.NO.	
1ST VOLUTE AND CLOSSOVER DRAWING	P1-Q8483-R0	01804214642	CORE
STD VOLUTE AND SHORT CLOSSOVER DRAWING	P1-Q6411-R1	01804214643	
LONG CLOSSOVER DRAWING	P1-Q6413-R0	01804214644	
END SIDE SUC. VOLUTE DRAWING	P1-Q6414-R0	01804214645	
DISCH. VOLUTE DRAWING	P1-Q6415-R0	01804214646	
COUP SIDE DRAWING	P1-Q8484-R0	01804214647	OUTLINE MOULD
END SIDE DRAWING	P1-Q6417-R0	01804214648	
LONGITUDINAL SECTIONAL DRAWING	P1-Q8485-R1	01804214649	
MATING FACE DRAWING	P1-Q8486-R1	01804214650	
OUTLINE DRAWING	P1-Q8487-R1	01804214651	

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NOTE TO MACHINE SHOP:

1. MACHINE THE CASING IN ACCORDANCE WITH THE FOLLOWING DRAWINGS.

DESCRIPTION	REF.DRG.NO.	BHEL DRG.NO.
COUP SIDE DRAWING	P1-Q8484-R0	01804214647
END SIDE DRAWING	P1-Q6417-R0	01804214648
LONGITUDINAL SECTIONAL DRAWING	P1-Q8485-R1	01804214649
MATING FACE DRAWING	P1-Q8486-R1	01804214650
OUTLINE DRAWING	P1-Q8487-R1	01804214651
ADDL. MACHINING DRAWING	P1-Q8488-R0	01804214652
IMPELLER&INNER CASING POLISHING PROCEDURE OF WATER PASSAGES	P5-16666-R0	-
INNER CASING ASSY WITH BOM	-	01804214660

2. STRESS RELIEVING SHALL BE DONE AFTER ROUGH MACHINING AND
WELDING AS PER HY0640261, TEMPERATURE SHALL BE 590-650°C.

3. LPI SHALL BE DONE AFTER ROUGH MACHINING AND AFTER FINAL MACHINING,
AS PER AA0850131, ACCEPTANCE AS PER AA0850132, LEVEL-II.

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ITEM NO	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG.NO. OR FORGING DRG.NO.	MATERIAL CODE	NET WT.	GROSS WT.
					FP9219321017	1560	1660
					HY19593	1 SET	
					MATERIAL SPECN.	QUANTITY	

THE FOLLOWING CONDITIONS APPLY
EXCEPT OTHERWISE STATED...

1. REF.TO HY0230261 FOR UNSPECIFIED
TOLERANCES.

2. CHAMFER M/CD SHARP EDGES
1.2 TO 1.0 AT 45°.

3. INTERNAL M/CD CORNER RADII
1 TO 0.7.

4. THE SURFACE ROUGHNESS WHEREVER NOT SHOWN
SHALL BE TAKEN FROM THE SURFACE ROUGHNESS
SHOWN OUT SIDE BACK SLASHES GIVEN AT THE
TOP MOST RIGHT CORNER OF THE DRG.

TYPE OF PRODUCT
OR
NAME OF CUSTOMER/PROJECT

MDG366N

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
హైదరాబాద్
BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

DRN. M.S.RAM

CHD. M.S.RAM

APPD. M.S.RAM

NAME

SIGN.

DATE

16.05.19

16.05.19

16.05.19

NO.OF
VAR.

NA

NA

DEPT. PUMPS

SCALE NTS

WEIGHT(Kg) NA

REF. TO ASSY DRG. NA

ITEM NO. NA

NO.OF
ITEMS
NA

TITLE
INNER CASING M/C
(UPPER & LOWER HALVES)

DRAWING NO.
2 180 42 1 5002

REV.
01

SHEET NO. 01

NO OF SHEETS 01

REV.

DATE

ALTERED

APPD.

REV.

DATE

ALTERED

APPD.

REV.

DATE

ALTERED

APPD.

REV.

DATE

ALTERED

APPD.

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TD-150/REV.NO.03

SIZE A2

INVENTORY NO.	REF.DRG.NO.	COMP. FILE NAME
	P2-Q8468-R1	F721804215005-00

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1. TECHNICAL DELIVERY CONDITIONS SHALL BE AS PER HY19593.
2. ADDITIONAL QUALITY REQUIREMENTS SHALL BE AS PER FP60291.
3. STRESS RELIEVING SHALL BE DONE AFTER ANY WELDING WITHIN
-20°C OF TEMPERING TEMPERATURE.
4. MANUFACTURE THE CASING IN ACCORDANCE WITH THE FOLLOWING DRAWINGS.

DESCRIPTION	DRG. NO. (INTERNAL REF.)	BHEL DRG.NO.	
1ST VOLUTE AND CROSSOVER DRAWING	P1-Q8467-R0	01804214653	CORE
STD VOLUTE AND SHORT CROSSOVER DRAWING	P1-Q6121-R2	01804214609	
LONG CROSSOVER DRAWING	P1-Q6123-R1	01804214611	
SUCTION VOLUTE DRAWING	P1-Q6124-R0	01804214612	
DISCHARGE VOLUTE DRAWING	P1-Q6125-R1	01804214613	
COUP SIDE DRAWING	P1-Q8468-R0	01804214654	OUTLINE
END SIDE DRAWING	P1-Q6127-R1	01804214615	
LONGITUDINAL SECTIONAL DRAWING	P1-Q8649-R1	01804214655	
MATING FACE DRAWING	P1-Q8470-R1	01804214656	
OUTLINE DRAWING	P1-Q8471-R1	01804214657	

1. MACHINE THE CASING IN ACCORDANCE WITH THE FOLLOWING DRAWINGS.

DESCRIPTION	DRG. NO. (INTERNAL REF.)	BHEL DRG.NO.
COUP SIDE DRAWING	P1-Q8468-R0	01804214654
END SIDE DRAWING	P1-Q6127-R1	01804214615
LONGITUDINAL SECTIONAL DRAWING	P1-Q8649-R1	01804214655
MATING FACE DRAWING	P1-Q8470-R1	01804214656
OUTLINE DRAWING	P1-Q8471-R1	01804214657
ADD'L MACHINING DRAWING	P1-Q8472-R1	01804214658
ADD'L MACHINING DRAWING FOR VOLUTE EDGE(2ND TO 5TH STAGES)	P2-Q8473-R0	21804215004
ADD'L MACHINING DRAWING FOR VOLUTE EDGE(1st STAGE)	P2-Q9140-R0	21804215077
IMPELLER&INNER CASING POLISHING PROCEDURE THE WATER PASSAGE	P5-16632-R0	-
INNER CASING ASSY.	-	01804214659

2. STRESS RELIEVING SHALL BE DONE AFTER ROUGH MACHINING AND WELDING AS PER HY0640261, TEMPERATURE SHALL BE 590–650°C
3. LPI SHALL BE DONE AFTER ROUGH MACHINING AND AFTER FINAL MACHINING, AS PER AA0850131, ACCEPTANCE AS PER AA0850132, LEVEL-II.

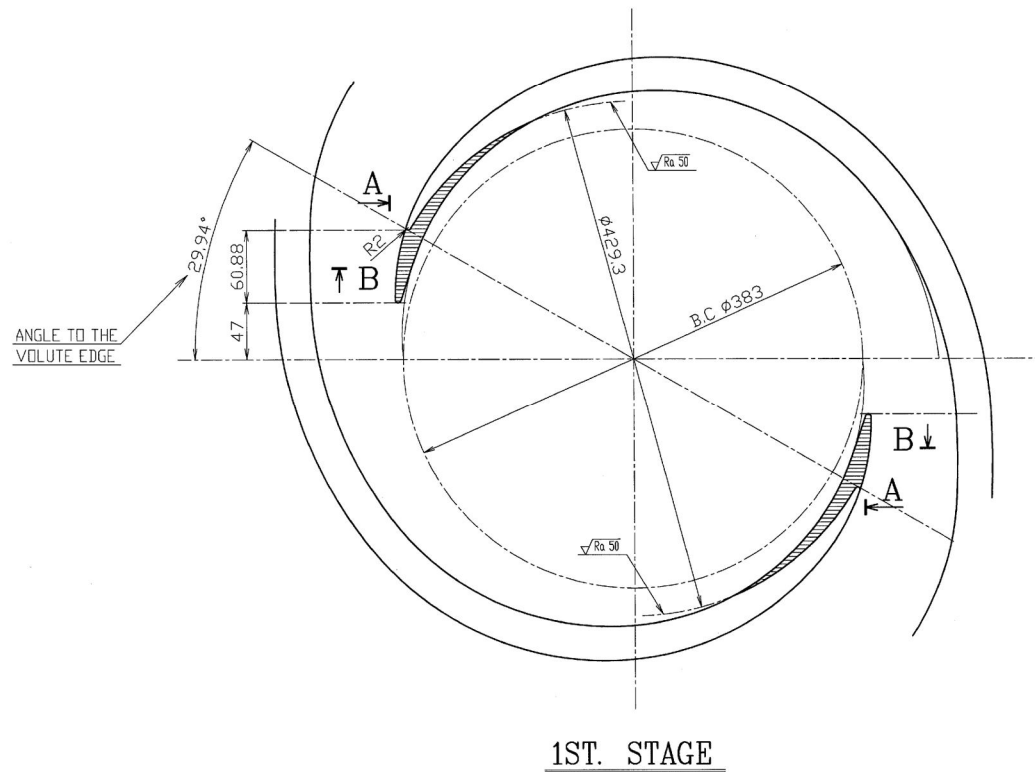
					FP9219306107	1368	1400
					HY19593	1 SET	
ITEM NO.	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG.NO. OR FORGING DRG.NO.	MATERIAL CODE	NET WT.	GROSS W
					MATERIAL SPECN.	QUANTITY	

4. THE SURFACE ROUGHNESS WHEREVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN OUT SIDE BACK SLASHES GIVEN AT THE TOP MOST RIGHT CORNER OF THE DRG.

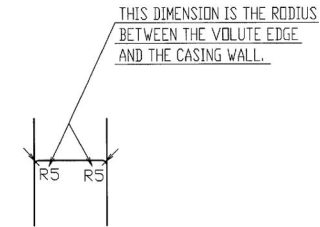
	भारत हेवी इलेक्ट्रिकल्स लिमिटेड		NAME	SIGN.	DATE	NO. OF VAR NA
	हैदराबाद		DRN.	AS KALYAN	01.11.17	
	BHARAT HEAVY ELECTRICALS LTD.		CHD.	AS KALYAN	01.11.17	
	HYDERABAD		APPD.	M.S.RAM	01.11.17	

DEPT.	PUMPS		SCALE	WEIGHT(Kg)	REF. TO ASSY DRG.	ITEM NO.	NO.OF ITEMS
CODE	410		NTS	NA	NA	NA	NA
TITLE INNER CASING M/C (UPPER & LOWER HALVES)					DRAWING NO.		REV.
					2 180 42 1 5005		
					SHEET NO. 01	NO OF SHEETS 01	

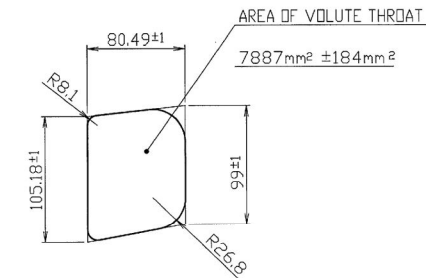
REV.	DATE	ALTERED		REV.	DATE	ALTERED		REV.	DATE	ALTERED		REV.	DATE	ALTERED	
		CHECKED	APPD.			CHECKED	APPD.			CHECKED	APPD.			CHECKED	APPD.
ZONE				ZONE				ZONE				ZONE			
	1				2				3				4		



VIEW A



VIEW B

[illegible]

NO.	DESCRIPTION	DRAWING NO.	VAL.	RAW MATERIAL SIZE OR CASTING DRG.NO.	MATERIAL CODE	NET WT. (GROSS WT. MINUS TOLERANCES)	QUANTITY
THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED... 1. REF. TO HYDRO2022 FOR UNSPECIFIED TOLERANCES 2. CHAMFER M/CD SHARP EDGES 1.2 TO 1.0 AT 45°. 3. SURFACE M/CD CORNER RADII 1.0 TO 0.7. 4. THE INTERNAL ROUGHNESS WHEN NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS (SEE NOTE 4) AND EACH CLASS SHALL BE THE TOP MOST RIGHT CORNER OF THE DRG.							
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT  MDCA455-NSS BHATNAGAR HEAVY RECYCLES LTD. HYDERABAD				DATE: 22/01/18 BY: RAJESH CHKD: RAJESH APPROVED: RAJESH			
DRAWING NO. 410		SCALE 1:1		REPLY TO: ADITYA		DATE: 22/01/18 BY: RAJESH CHKD: RAJESH APPROVED: RAJESH	
TITLE: INNER CASING				2 160 42 5 5777 00			
ADITYA ENGINEERING WORKS PVT. LTD.				INVENT NO. 01 NO OF SHEETS 01			

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12.5 / 3.2 / 6.3 / 1.6

SHAPES EXCEPT FOR THE VOLUTE
INDICATE THE SHAPES BETWEEN THE
2ND STAGE AND THE CENTER STAGE.

SHAPES EXCEPT FOR THE VOLUTE
INDICATE THE SHAPES AFTER THE
CENTER STAGE. AND THIS DOESNT
INDICATE THE SHAPES OF THE
END SIDE SUCTION VOLUTE.

MAKE THE SHAPE SO THAT
WATER COULD FLOW SMOOTHLY.

AREA OF VOLUTE THROAT
5684mm² ±155mm²

VIEW A

VIEW B

DETAIL OF VOLUTE

3. INTERNAL M/CD CORNER RADI 1 TO 0.7.																																4. THE SURFACE ROUGHNESS WHERE NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWING OUT SIDE BARK SQUARES OVER AT THE TOP RIGHT CORNER OF THE DRG.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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TITLE																																STANDARD VOLTAGE & SHORT CLOSURE 1/2																																DRAWING NO																																REV																																																																																																																																																																																																																																																																																																																																																																																																																															
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REV	DESCRIPTION	DRAWING NO.	VAR. NO.	RAW MATERIAL SIZE OR CASTING DRG. NO. OR FORGING DRG. NO.	MATERIAL CODE	NET WT.	GROSS WT.
1	STANDARD VOLUTE & SHORT Crossover 1/2	0 180 42 1 4609 01					

THE FOLLOWING CONDITIONS APPLY EXCEPT OTHERWISE STATED...

- REF TO HY0230261 FOR UNSPECIFIED TOLERANCES.
- CHAMFER M/C/D SHARP EDGES 1:2 TO 1:0 AT 45°
- INTERNAL M/C/D CORNER RADI 1 TO 0.7
- THE SURFACE ROUGHNESS WHEREVER NOT SHOWN SHALL BE TAKEN FROM THE SURFACE ROUGHNESS SHOWN ON THE BACK SQUARES OVER AT THE TOP MOST RIGHT CORNER OF THE DRG.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: **MDC455**

BRAND: **pumps** | **भारत भारी बिजली** | **BHARAT HEAVY ELECTRICALS LTD.** | **HYDERABAD**

APPV: **410** | **NA** | **850** | **NA** | **NA** | **NA**

TITLE: **STANDARD VOLUTE & SHORT Crossover 1/2** | DRAWING NO.: **0 180 42 1 4609 01** | SHEET NO.: **01** | NO. OF SHEETS: **01**