

Technical Specification for Rolling BearingsDRAWINGS AND TECHNICAL INFORMATION TO BE SUBMITTED WITH QUOTATION EVERY TIME ON BEARING OFFERED

1. Dimensioned drawing of the bearing.
2. Type & Make of bearing.
3. Significance of each suffix/prefix.
4. Accuracy class: (Normal/P5/P6)
5. Suitability for application : (Traction / Industrial)
6. Number of rollers & size.
7. Radial internal clearance.
8. Axial clearance.
9. Type of cage construction : (Standard/Drop roller).
10. Type of cage guiding : (Roller/Outer race)
11. Cage Material : (Brass/Steel)
12. Material specification for rollers & races.
13. Surface finish on rollers and races.
14. Dynamic capacity of bearing.
15. Static capacity of bearing.
16. Maximum permissible speed (with Grease lubrication)

GENERAL REQUIREMENTS:

Bearings offered should conform to the below mentioned requirements :

1. Bearings should be of special execution for traction application with suffix VA301 (SKF), F1(FAG), SV1(STEYR), MT(RHP) etc. Following special features may be envisaged in design and manufacturing processes.
  - 1.1 Improved and uniform surface finish by grinding of track chamfers, honning of tracks and lapping of rollers.
  - 1.2 Optimized cage construction for efficient lubrication.
  - 1.3 Vibration and noise level specially controlled.
  - 1.4 Bearings rings stabilised for higher temperatures.
  - 1.5 Uniform hardness on bearing rings and rollers, variation not exceeding 1/2 RC with in the same element.
  - 1.6 WE REQUIRE BEARINGS WITH INTERCHANGABLE ASSEMBLY ONLY.
2. Boundary dimensions and its tolerance to be as per this drawing and is generally based on ISO 15:1981 and ISO 492:1981.
3. Radial Bearing clearance & Axial clearance in roller bearing to be as per this drawing and is generally based on draft ISO 5742 Rev., DIN 620 & DIN 43283 unless stated otherwise in the drawing.
4. Accuracy class for internal dimensions of bearing to be P5/P6.
5. Rollers should be designed to cater for increased load carrying capacity.

REV. REVISED &amp; REDRAWN.

15

ISSUED *QMS*APPD. *QMS*

ISSUED BY:

TRACTION MNS D O

BHARAT HEAVY ELECTRICALS LTD

BHOPAL

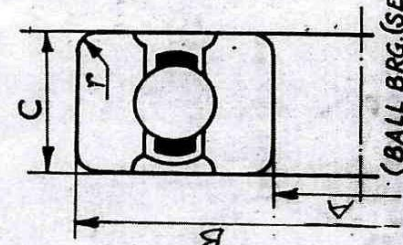
DRAWING PREPARED BY: *QMS - 1, PAM-2*

SCALE: MTS C450067(SH/2)

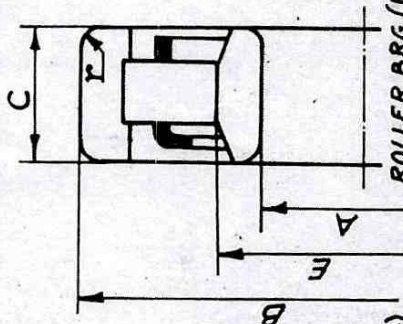


#### DIVISIONAL STANDARDS

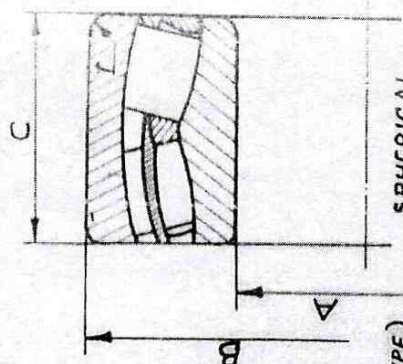
C4500674



(BALL BRG. (SERIES 62,63,64)



ROLLER BRG. (NU TYPE)



SPHERICAL  
ROLLER BEARING

**NOTE:- SUPPLIER TO FURNISH INFORMATION EVERY TIME WITH OFFERS AS PER DRG. C450067 (SHEET-1)**

# DIVISIONAL STANDARDS

C450067

SPHERICAL  
ROLLER BRG.

ROLLER BRG. (NUT TYPE)

(BALL BRG. (SERIES 62, 63, 64))

NOTE:- SUPPLIER TO FURNISH INFORMATION EVERY TIME  
WITH OFFERS AS PER DRG. C450067 (SHEET-1)

R26	M/C REF. T014302 STYLE NO. CHANGED
R25	IT NO. 24 WAS NOT ON. 11/6/87
REV. 1	IT. NO. 17 DESCRIPTION 4318 M/C4 WAS 56318 CA.
REV. 2	SL. NO. 17 ASSY. DRG. REF. 3-439-44-53002 WAS 3-439-43-53002.
REV. 21	IN SH. 2 BRG. NO. FOR IT. 001 WAS NU 309/C3 IN CH. 3 BRG. NO. FOR IT. 001 WAS NU 310/C3 BASIC REF. DRG. WERE NOT ON. 01/11/88
REV. 20	IT. 014 MODIFIED FOR POLYAMIDE CAGE.
REV. 19	IN BOM SL. NO. 19 & 20 WERE NOT ON. 01/11/88
REV. 18	IN BOM M/C REF. 114302 & 114303 ASSY. DRG. REF. 3-439-44-53002 & 3-439-43-53002 WERE NOT ON. 01/11/88
REV. 17	IN SL. NO. 15 DIA. CLEARANCE WAS 0.030 (0.001 IN) 3/4 NO. 15 ASSY. DRG. REF. 2-443-44-47001, 2-443-43-47002 & SL. NO. 18 WERE NOT ON. 01/11/88
REV. 16	IN ITS. 5 & 7 ASSY. DRG. 64515465 WAS NOT ON. 11/6/87

ISSUED BY: TRACTION MICS. D.O.	ISSUED BY: TRACTION MICS. D.O.
APPD. R.R.W.	APPD. R.R.W.
CHANGES TO BE APPD BY DIVISIONAL STD. ENGR. ONLY.	CHANGES TO BE APPD BY DIVISIONAL STD. ENGR. ONLY.

SL. NO.	BEARING NO.	M/C REF.	ASSY. DRG. REFERENCE	STYLE/ CODE NO.	BOUNDARY DIMENSIONS (MM)						CLEARANCE		MAX. SPEED OVER SPEED	DYN. LOAD (N)	STAT. LOAD (N)
					A	B	C	E	T	DIA.	AXIAL				
1	NU 309/C4	AG 51-DE PTU-NDE AG-51/M	04334017001	BP7211532807	45.000 44.988	100.000 99.985	25.00 24.88	58.5	1.5	0.070 0.100	-	2380 3000	99000 100000		
2	6308Z/C4	AG 51/M (CE)	04334017001	BP7210144994	40.000 39.988	90.000 89.986	23.00 22.88	-	2	0.028 0.046	-	2380 3000	41000 24000		
3	6309/C4	GB 15 A GB 15 A/M PTU (DE)	04341016001	BP7210143971	45.000 44.988	100.000 99.985	25.00 24.88	-	2	0.03 0.051	-	2380 3000	52700 51500		
5	6308/C4	MG 51 BY MG 51 BY AG-51/M (CE)	04354451001	BP7210143904	40.000 39.988	90.000 89.985	23.00 22.88	-	2	0.028 0.046	-	1320 2400	41000 24000		

BHARAT HEAVY ELECTRICALS LTD.  
BHOPAL

SCALE :- N.T.S.

C450067(SH2/5)



DIVISIONAL STANDARDS													C450067
SL. NO.	BEARING NO.	M/C REF.	ASSY DRG. REFERENCE	STYLE/ CODE NO.	BOUNDARY DIMENSIONS					CLEARANCE		MAX. SPEED OVER SPEED	DYN. LOAD (N) 37AT LOAD (N)
					A	B	C	E	F	DIA.	AXIAL		
6	6310/C4	MG 51BY (GE)	24414333001	BP 7210143912	50.000 49.988	110.000 109.985	27.00 26.88	-	2	0.050 0.080	-	1320 2400	61500 58000
7	NU310/C4	MG 51BX MG 51BX/M MG 51 CW. AG-2702 AX	24414333001 G 4515445(5) 2 433 43 2600(4)	BP 7211532815	50.00 49.988	110.000 109.985	27.00 26.88	65	3	0.070 0.100	-	1320 2400	110000 112000
8	SPHERICAL ROLLER BRG 23230CC/C3	TG 10901 AZ	H 4505015(52)	BP 721233899	150.00 149.975	270.000 269.965	96.00 95.75	-	2.5	0.170 0.220	-	1000 1250	957000 1460000
9	NU415/C4	TM2701/AZ (PE)	34394452003	BP 7211553987	75.000 74.985	190.000 189.970	45.00 44.85	104.5	4	0.090 0.125	-	850 1710	264000 280000
10	NU313/C4	TM2701AZ TM3604AZ (CE)	34394352004	BP 7211532831	65.000 64.985	140.000 139.982	35.00 32.85	82.5	3.5	0.080 0.110	0.000 0.000	850 1710 2230	185000 196000
11	6216/C4	TM2701AZ (CE)	24414333001	-	80.000 79.985	140.000 139.982	26.00 25.85	-	3	0.046 0.071	-	850 1710	70200 55000
12	6316/C3	MA3501AZ (NCE) MA3505AZ	24324450004 2-432-44-34-002	BP 7210143920	80.000 79.985	170.000 169.975	39.00 38.85	-	3.5	0.025 0.051	-	1800 2250	124000 86500
13	NU316/C3	MA3501AZ (CE) MA3501AZ	24324350001 2-432-43-34-001	BP 7211532858	80.000 79.985	170.000 169.975	39.00 38.85	101.5	3.5	0.065 0.100	-	1800 2250	260000 290000
REV.													
ISSUED. 0002		ISSUED BY:											
APPD. AKAS		TRACTION M/Cs D.O.											
CHANGES TO BE APPD. BY		O/C - 1, TAM - 3											
DIVISIONAL STD. ENGR. ONLY		TAM - 1, TAM - 2, TAM - 3											
		SCALE:- N.T.S											
		C450067(SH 3/5)											
		BHARAT HEAVY ELECTRICALS LTD. BHOPAL 10											

REV.

ISSUED. *Q22*APPD. *AKW*CHANGES TO BE APPD. BY  
DIVISIONAL STD. ENGR. ONLY

ISSUED BY:

TRACTION M/C'S D.O.

O/C - 1, TAM - 3  
TNX - 1  
TXM - 3BHARAT HEAVY ELECTRICALS LTD.  
BHOPAL

SCALE:- N.T.S

C450067(SH 3/5)



## DIVISIONAL STANDARDS

C450067(SHA)

SL. NO.	BEARING NO.	M/C REF.	ASSY. DRG. REFERENCE	STYLE/ CODE NO.	BOUNDARY DIMENSIONS				CLEARANCE		MAX. PERM. OVER SPEED	DYN. (N)	
					A	B	C	E	T	DIA.		STAT. LOAD (N)	STAT. LOAD (N)
14	6313Z/C4 (CAN BE OVER POLYAMIDE CAGE)	AG3101AY TM3604AZ (CE)	H4505048(14) H4505061	BP7210144986	65.00 64.985	140.00 139.982	33.00 32.85	-	36	0.038 0.061	2380 3000 1512 2230	92300 60000	
15	6409/C3	DY3423/M (CE & NCE)	24434447001 24434347002	BP7210161996	45.00 44.988	120.00 119.985	29.00 28.88	-	2	0.018 0.036	3500 6000	76100 45000	
16	SPHERICAL ROLLER BRG. 22312CC/C3	TG4302	14314156005	BP902467917	60.000 59.985	130.000 129.982	46.00 45.88	-	2.1	0.065 0.090	2100 2625	235000 280000	
17	6318MC4	TM4501 (CE)	34394153002	BP7210143939	90.000 89.980	190.000 189.970	43.00 42.88	-	3	0.053 0.084	3100 3800	143000 108000	
18	6314Z/C3	PTU70AZ (NDE)	14341021001	-	70.000 69.985	150.000 149.982	35.00 34.85	-	2.5	0.025 0.051	2500 3740	104000 68000	
19	NU312 EC/C3	TA-2601AZ (NDE)	24324478001	-	60.00 59.985	130.00 129.982	31.00 30.85	-	2	0.055 0.075	4300 5000	151000 98000	
20	7312B (ANGULAR CONTACT BALL BRG.)	JA2601AZ (DE)	24324378001	-	60.00 59.985	130.00 129.982	62.00 61.70	-	2	0.022 0.055	3400 4500	146000 112000	

REV.

ISSUED. 2020

APPD.

ISSUED BY

TRACTION MCB D.O.

CHANGES TO BE APPD. BY  
TAM - 3  
TAM - 3O/C - 1, TAM - 3  
TAM - 3BHARAT HEAVY ELECTRICALS LTD.  
BHOPAL

SCALE - M.T.S

C450067(SHA)



17978/2020/HEP-MNX35408

DIVISIONAL STANDARDS															C450067 (a.s.)	
SL NO	BEARING NO.	M/C REF	ASSY. DRG. REFERENCE	STYLE/ CODE NO.	BOUNDARY DIMENSION							CLEARANCE		MAX SPEED OVER SPEED	DYN LOAD	
					A	B	C	E	E1	B1	C1	T	DIA			AXIAL
21	6326-M/C5 VA 309 TO DIN 45203	144807 NDE	24454492001	9024720133	130 129.975	280 279.965	58 57.75	-	-	-	-	-	4	0.105 0.160	X	280000 286000
22	22324 VAJ DOUBLE ROW SPHERICAL ROLLER BEAR- ING	T49501	44304476001	9024677766	189.999 119.979	269.999 259.963	85.999 85.796	-	-	-	-	3	0.160 0.210	-	-	409500 325550
23	6312/C3	602608 A2	14321093001	9024812011	60.000 59.985	130.000 129.982	31.00 30.85	-	-	-	-	2-1	0.023 0.043	-	-	81500 45000
24	6326M/C4 VA 301	T47005 (NDE) TA6301 (NDE) TA7001 (NDE)	37164434004 34304411001 34304411001	130.000 129.975	280.000 279.965	58.00 57.75	-	-	-	-	-	4	0.071 0.114	0.060 0.100	1800 2160	229000 216000

REV 173. 21 &amp; 22 WERE NOT ON. 23 NOT ON.

BHARAT HEAVY ELECTRICALS LTD  
B HOPALISSUED  
APPD.ISSUED BY  
TRACTION M/C/S/D.O.CHANGES TO BE APPD BY  
DIVISIONAL STD. ENGR ONLYOC  
TMXTMX  
TMX

SCALE

C450067