

BEARINGS

AKD Copy

Technical Specification for Rolling Bearings

DRAWINGS 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. 15 REVISED & REDRAWN

BHARAT HEAVY ELECTRICALS LTD
BHOPAL

ISSUED BY
APPD. [Signature]

ISSUED BY
TRACTION MTS D.O

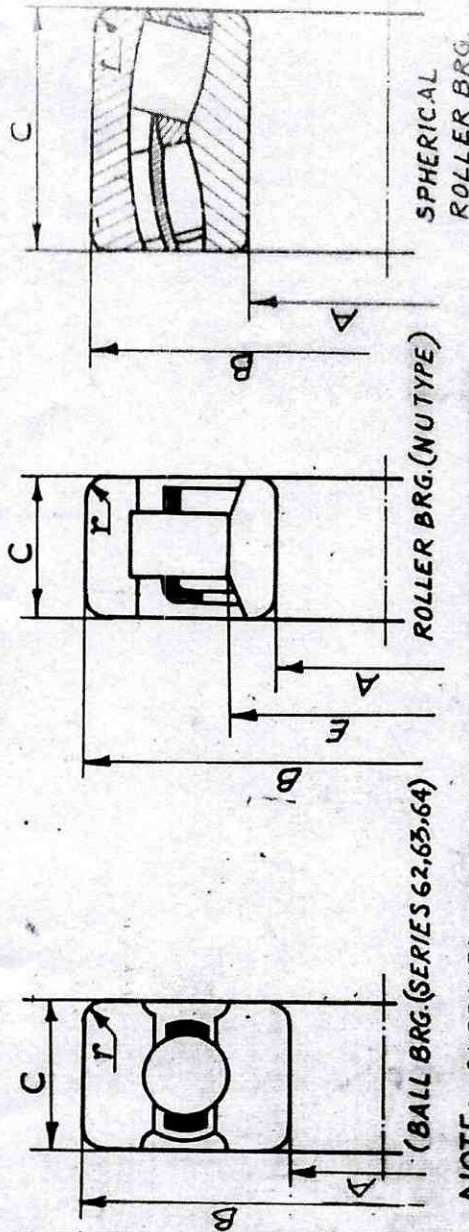
CHANGED TO BE MADE BY
[Signature]

SCALE: MTS C450067 (SKF)

BEARINGS

DIVISIONAL STANDARDS

C450067(SH.2/5)



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

R26	M/C REF. TG 4302 STYLE NO. CHANGED
R25	IT NO. 24 WAS NOT ON. 16/8/07 OR 6/8/07
REV 24	IT NO. 17 DESCRIPTION 4318 MCA WRS 6318 CA.
REV 23	IT NO. 17 DESCRIPTION 4318 MCA WRS 6318 CA.
REV 22	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 SH. 3 BRG. NO. FOR IT. 001 WAS NU 310. THE BRG. REF. DRG. NO. WERE NOT ON (0.001) 1000 (UKA)
REV 20	IT. 014 MODIFIED FOR POLYAMIDE CAGE.
REV 19	IN BOM SL. NO. 19 & 20 WERE NOT ON. 0.002/0.002 26.7.99
REV 18	IN BOM M/C REF. N/A 309/CA & 310/CA ASSY. DRG. REF. 3-439-44-53002 & 3-439-43-53002 FOR IT. 120-13
REV 17	IN SL. NO. 13 DIA. CLEARANCE WAS 0.030/0.031 IN SL. NO. 15 ASSY. DRG. REF. 2-443-44-47001, 2-443-43-47002 & SL. NO. 18 WERE NOT ON.
REV 16	IN ITS. 5 & 7 ASSY. DRG. 6-4515-445 WAS NOT ON. 11-6-93

ISSUED	ISSUED BY:
APPD. RABAS	TRACTION M/Cs. D.O.
CHANGES TO BE APPD BY DIVISIONAL STD. ENGR. ONLY.	O/C - 1, TAM-3 TNK-1 TXM-3

SL. NO.	BEARING NO.	M/C REF.	ASSY. DRG. REFERENCE	STYLE/ CODE NO.	BOUNDRY DIMENSIONS (MM)						CLEARANCE		MAX. SPEED OVER SPEED	DYN. (N) LOAD	
					A	B	C	E	T	DIA.	AXIAL	STAT. LOAD		STAT. LOAD	
1	NU309/CA	AG 51-DE PTU-NDE AG-51/M	04334017001	BP 7211532807	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/CA	AG 51/M (CE)	04334017001	BP 7210144994	40.000 39.988	90.000 89.986	23.00 22.88	-	2	0.028 0.046	-	2380 3000	41000 24000		
3	6309/CA	GB 15A GB 15A/M PTU (DE)	04341016001	BP 7210143971	45.000 44.988	100.000 99.985	25.00 24.88	-	2	0.03 0.051	-	2380 3000	52700 51500		
5	6308/CA	AG 51-BY AG 51-BY AG 51/M (CE)	043515445 (DE)	BP 7210143904	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(SH.2/5)

C450067 (6/13)

C450067 (6/13)

DIVISIONAL STANDARDS													C450067	
SL. NO.	BEARING NO.	M/C REF.	ASSY. DRG. REFERENCE	STYLE/ CODE NO.	BOUNDRY DIMENSIONS					CLEARANCE		MAX. SPEED OVER SPEED	DYN. LOAD (N) STAT. LOAD (N)	
					A	B	C	E	F	DIA.	AXIAL			
6	6310/C4	MG 51BY (GE)	24414333001	BP7210143912	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 51 BX MG 51 BX/M MG 51 CW. AG-2702 AX	24414333001 G4515445(59) 2 433 43 26001(4)	BP7211532815	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 25230CC/ C3	TG 10901AZ	H 4505015 (52)	BP721233899	150.00 149.975	270.000 269.965	96.00 95.75	-	2.5	0.170 0.220	-	1000 1250	937000 1460000	
9	NU415/ C4	TM2701/AZ (PE)	34394452003	BP7211553987	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	BP7211532831	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 1512 2230	183000 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	BP7210143920	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	BP7211532858	80.000 79.985	170.000 169.975	39.00 38.85	101.5	3.5	0.065 0.100	-	1800 2250	260000 290000	

ISSUED. *[Signature]*

APPD. *[Signature]*

CHANGES TO BE APPD. BY
DIVISIONAL STD. ENGR. ONLY

ISSUED BY:

TRACTION M/C'S D.O.

O/C - 1, TAM-3
TXX-1
TXX-3

BHARAT HEAVY ELECTRICALS LTD.

BHOPAL

SCALE :- N.T.S

C450067(SH.3/5)

10

DIVISIONAL STANDARDS

C450067(SN4/5)

BEARINGS

SL. NO.	BEARING NO.	M/C REF.	ASSY DRG. REFERENCE	STYLE/ CODE NO.	BOUNDARY DIMENSIONS					CLEARANCE		OVER SPEED	DYN. (N) STAT. LOAD (N)
					A	B	C	E	T	DIA.	AXIAL		
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	-	35	0.038 0.061	-	2380 3000 4151/2 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 0.035	-	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	0.040 0.070	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	0.025 0.065	3400 4500	146000 112000

REV.

ISSUED. *2009*

APPD.

ISSUED BY

TRACTION MCB D.O.

BHARAT HEAVY ELECTRICALS LTD.
BHOPAL

CHANGES TO BE APPD. BY

QC - 1, TAM - 3

SCALE - MTS

C450067(SN4/5)

C450067

DIVISIONAL STANDARDS

BEARINGS																
SL NO	BEARING NO.	M/C REF	ASSY. DRG REFERENCE	STYLE/ CODE NO.	BOUNDARY DIMENSION								CLEARANCE		MAX SPEED OVER SPEED	DYN LOAD STAT LOAD
					A	B	C	E	E1	B1	C1	T	DIA	AXIAL		
21	6326-M/C5 VA 309 TO DIN 43283	144807 NDE	24454492001	9024720133	130 129.975	280 279.965	58 57.75	-	-	-	-	4	0.105 0.160	X	-	229000 216000
22	22324 VAJ DOUBLE ROW SPHERICAL ROLLER BEAR- ING/ROW	T49901	44304476001	9024677766	199.999 119.979	259.999 259.963	85.99 85.746	-	-	-	-	3	0.160 0.210	-	-	409600 325350
23	6312/C3	632608 AZ	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) T46301 (NDE) T47001 (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

BEARINGS

REV 173.21 & 22 WERE NOT ON. 23
NOT ON.

ISSUED BY
TRACTION M/C/D.O.

CHANGES TO BE APPD BY
DIVISIONAL STD. ENGR ONLY

OC
TNX

BHARAT HEAVY ELECTRICALS LTD
BHOPAL.

SCALE: C450067