

SABINA

DC motors, LAK 2114-4279, NEMA

LAK 7.5 - 700 HP

NEMA frames: 185AT-4412ATZ

Fully laminated

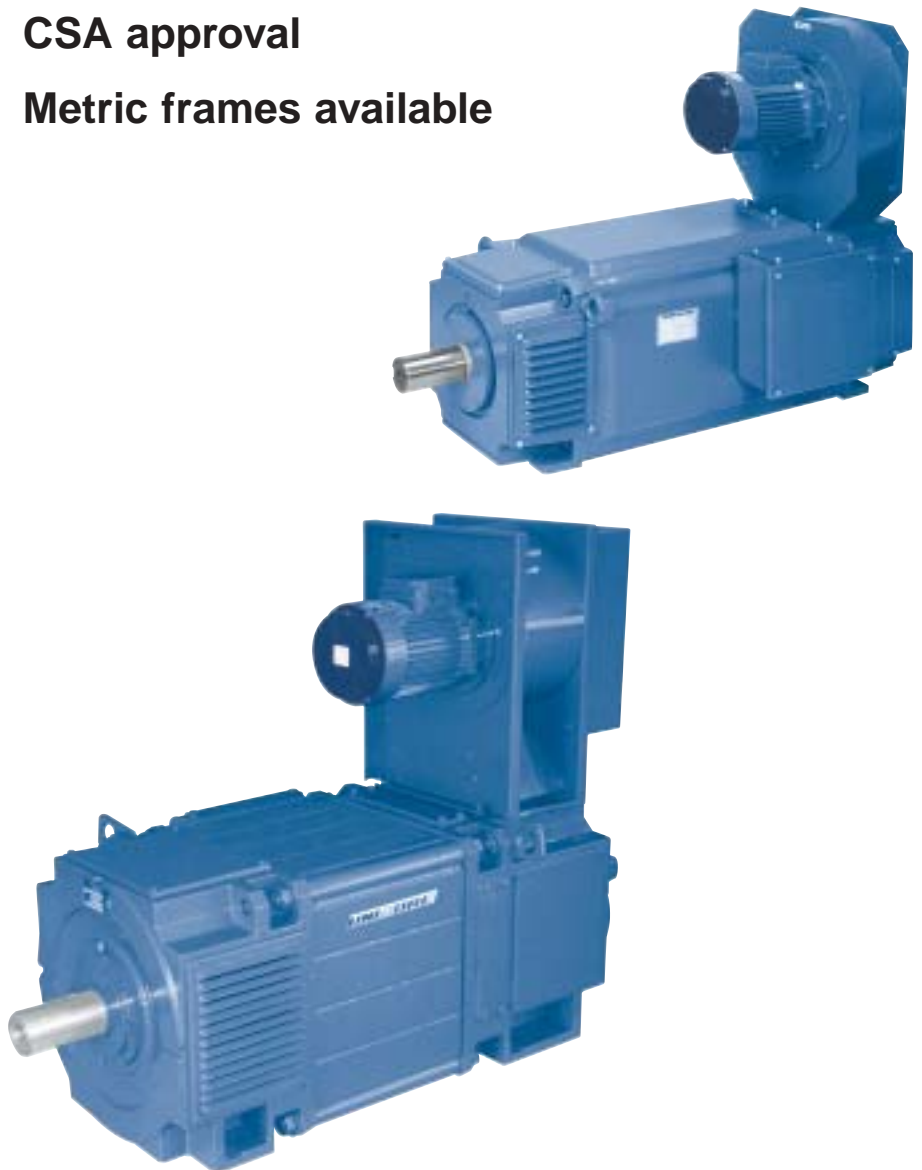
Square frame motors

2 pole and 4 pole

Shunt winding

CSA approval

Metric frames available



List of contents

Introduction	4
Output data	5
Cooling data	7
Mechanical data	7
Bearing data	8
Technical data	11
Dimension drawings	12

Introduction

LAK motors are fully laminated d.c. motors for use in variable speed drives in various types of industrial machinery and processes.

They are produced according to ISO 9001 quality assurance system.

Motor ranges:

2000: LAK 2114-2133

4000: LAK 4114-4178
LAK 4203-4279

Type designation example

Example LAK 4229A:

LAK = Type of motor
4 = 4 poles
229 = Centre height (mm)
A = Core length

Motor design

- Fully laminated stator, main poles, inter poles and armature
- 2 or 4 pole design
- Shunt winding
- Scrambled armature laminations for low torque ripples

Standards:

NEMA
CSA approval

Insulation:

LAK 2000: Class F (155° C)
LAK 4000: Class H (180° C)

Balance:

ISO 2373, grade "N"

Cooling air:

The motor outputs are based on cooling air flow from non-drive end to drive end.

Terminal box:

Mounting of terminal box on either side of the motor.

On request

- Other voltages
- Other speed ranges
- Compound winding
- Cooling:
 - Totally enclosed
 - Separately ventilated
 - Air/air – air/water
- Grade "R" balance
- Terminal box on top
- Metric IEC frames
- d.c. motors up to 3000 HP
- d.c. generators

Output data

Drip-proof fully guarded
 Separately ventilated
 3-phase fully controlled supply (code C)

Output HP	Base speed rpm	240 V arm.			500 V arm.		
		Frame size	NEMA	Top speed	Frame size	NEMA	Top speed
7.5	2500	LAK 2114A	185AT	5000	LAK 2114A	185AT	4000
	1750	LAK 2114B	188AT	5000	LAK 2114B	188AT	2900
	1150	LAK 2133A	215AT	1800	LAK 2133A	215AT	4000
10	2500	LAK 2114B	188AT	5000	LAK 2114B	188AT	5000
	1750	LAK 2133A	215AT	4500	LAK 2133A	215AT	2800
	1150	LAK 4114B	1813ATZ	2000	LAK 2133C	219ATZ	2500
15	2500	LAK 2133A	215AT	4500	LAK 2133A	215AT	3500
	1750	LAK 4114B	1813ATZ	2300	LAK 4114B	1813ATZ	2000
	1150	LAK 4133A	2112ATZ	2000	LAK 4133 A	2112ATZ	1700
20	2500	LAK 4114B	1813ATZ	3000	LAK 4114B	1813ATZ	2800
	1750	LAK 4133A	2112ATZ	2300	LAK 4133A	2112ATZ	2300
	1150	LAK 4133B	2113ATZ	2000	LAK 4133C	2114ATZ	2000
	850	LAK 4133D	2116ATZ	1700	LAK 4133D	2116ATZ	1500
25	2500	LAK 4114B	1813ATZ	3000	LAK 4114B	1813ATZ	2700
	1750	LAK 4133B	2113ATZ	2300	LAK 4133A	2112ATZ	2300
	1150	LAK 4133D	2116ATZ	2000	LAK 4133D	2116ATZ	2000
	850	LAK 4133D	2116ATZ	1700	LAK 4133D	2116ATZ	1700
30	2500	LAK 4133A	2112ATZ	3000	LAK 4133A	2112ATZ	3000
	1750	LAK 4133C	2114ATZ	2300	LAK 4133B	2113ATZ	2300
	1150	LAK 4159A	2511ATZ	2000	LAK 4133D	2116ATZ	2000
	850	LAK 4159C	2513ATZ	1700	LAK 4159BB	2512ATZ	1400
40	2500	LAK 4159A	2511ATZ	3000	LAK 4133B	2113ATZ	3000
	1750	LAK 4159B	2512ATZ	2100	LAK 4133C	2114ATZ	2100
	1150	LAK 4159BB	2512ATZ	2000	LAK 4133D	2116ATZ	1800
	850	LAK 4159CC	2513ATZ	1700	LAK 4159D	2515ATZ	1700
50	2500	LAK 4159A	2511ATZ	3000	LAK 4159A	2511ATZ	3000
	1750	LAK 4159B	2512ATZ	2100	LAK 4133D	2116ATZ	2100
	1150	LAK 4159CC	2513ATZ	2000	LAK 4159CC	2513ATZ	1600
	850	LAK 4159D	2515ATZ	1700	LAK 4159D	2515ATZ	1500

Top speed by field control

Output data

Drip-proof fully guarded
 Separately ventilated
 3-phase fully controlled supply (code C)

Output HP	Base speed rpm	240 V arm.			500 V arm.		
		Frame size	NEMA	Top speed	Frame size	NEMA	Top speed
60	2500	LAK 4159B	2512ATZ	3000	LAK 4133D	2116ATZ	3000
	1750	LAK 4159BB	2512ATZ	2100	LAK 4159B	2512ATZ	2100
	1150	LAK 4159D	2515ATZ	2000	LAK 4178AA	2812ATZ	2000
	850	LAK 4159D	2515ATZ	1700	LAK 4178DA	2814ATZ	1700
	650	LAK 4203A	3211ATZ	1950	LAK 4203B	3212ATZ	2170
75	2500	LAK 4159B	2512ATZ	3000	LAK 4159B	2512ATZ	3000
	1750	LAK 4159CC	2513ATZ	2100	LAK 4159C	2513ATZ	2100
	1150	LAK 4159D	2515ATZ	2000	LAK 4159D	2515ATZ	1800
	850	LAK 4178EA	2814ATZ	3400	LAK 4178EA	2814ATZ	2060
	650	LAK 4203B	3212ATZ	2330	LAK 4203B	3212ATZ	1640
100	2500	LAK 4178BA	2812ATZ	3000	LAK 4159C	2513ATZ	3000
	1750	LAK 4178DA	2814ATZ	2100	LAK 4159D	2515ATZ	2000
	1150	LAK 4178EA	2814ATZ	2100	LAK 4178EA	2814ATZ	1500
	850	LAK 4203B	3212ATZ	3400	LAK 4203B	3212ATZ	1890
	650	LAK 4229A	3611ATZ	2600	LAK 4229A	3611ATZ	1990
125	2500				LAK 4159D	2515ATZ	3000
	1750				LAK 4178DA	2814ATZ	2000
	1150				LAK 4203B	3212ATZ	1690
	850				LAK 4229A	3611ATZ	1690
	650				LAK 4229B	3612ATZ	1410
150	2500				LAK 4159D	2515ATZ	3000
	1750				LAK 4178DA	2814ATZ	2000
	1150				LAK 4203C	3213ATZ	2260
	850				LAK 4229A	3611ATZ	1370
	650				LAK 4229C	3613ATZ	960
200	2500				LAK 4178DA	2814ATZ	3000
	1750				LAK 4178FA	2815ATZ	1900
	1150				LAK 4229A	3611ATZ	3600
	850				LAK 4254A	4011ATZ	1940
	650				LAK 4254B	4012ATZ	1620
250	2500				LAK 4178EA	2814ATZ	2500
	1750				LAK 4229A	3611ATZ	3460
	1150				LAK 4229C	3613ATZ	2360
	850				LAK 4254B	4012ATZ	2040
	650				LAK 4279A	4410ATZ	1050
300	1750				LAK 4229A	3611ATZ	2870
	1150				LAK 4254A	4011ATZ	2320
	850				LAK 4254C	4013ATZ	1690
	650				LAK 4279B	4411ATZ	1730
400	1750				LAK 4254A	4011ATZ	2700
	1150				LAK 4254C	4013ATZ	1960
	850				LAK 4279B	4411ATZ	1440
500	1750				LAK 4254C	4013ATZ	2400
	1150				LAK 4279B	4411ATZ	1840
600	1750				LAK 4279A	4410ATZ	2400
	1150				LAK 4279C	4412ATZ	1740
700	1750				LAK 4279C	4412ATZ	1880

Top speed by field control

Data subject to change without notice.

Cooling data

Mechanical data

LAK 2000

LAK	Cooling form DPSV	
	Air volume CFM	Pressure drop in motor inch WG
2114	118	2.6
2133	177	2.5

LAK 2000

LAK	Frame	Inertia-WR ² lb ft ²	Max. mechanical speed rpm
2114A	185AT	0.36	5500
2114B	188AT	0.53	
2114C	188AT	0.62	
2133A	215AT	0.83	5000
2133B	217AT	0.98	4500
2133C	219AT	1.36	4500

LAK 4000

LAK	Cooling form DPSV	
	Air volume CFM	Pressure drop in motor inch WG
4114	159	1.9
4133A-C	277	2.2
4133D	301	3.2
4159A-C	519	3.9
4159D	354	3.6
4178AA-BA	619	4.0
4178CA	696	3.2
4178DA	696	3.4
4178EA-FA	1121	5.6
4203	620	4.6
4229	1090	5.8
4254	1600	8.4
4279	2120	10.4

LAK 4000

LAK	Frame	Inertia-WR ² lb ft ²	Max. mechanical speed rpm
4114A	1812ATZ	0.88	5500
4114B	1813ATZ	1.18	
4133A	2112ATZ	2.34	4500
4133B	2113ATZ	2.84	4500
4133C	2114ATZ	3.32	4500
4133D	2116ATZ	4.74	3500
4159A/AA	2511ATZ	5.21	4200
4159B/BB	2512ATZ	5.92	4200
4159C/CC	2513ATZ	7.34	4200
4159D	2515ATZ	10.89	3500
4178AA	2812ATZ	10.66	4000
4178BA	2812ATZ	12.55	4000
4178CA	2813ATZ	15.16	3800
4178DA	2814ATZ	16.34	3800
4178EA	2814ATZ	21.79	3500
4178FA	2815ATZ	24.86	3000
4203A	3211ATZ	22.50	4000
4203B	3212ATZ	28.44	
4203C	3213ATZ	33.18	
4229A	3611ATZ	45.03	3600
4229B	3612ATZ	52.14	
4229C	3613ATZ	59.25	
4254A	4011ATZ	78.21	3200
4254B	4012ATZ	90.06	
4254C	4013ATZ	101.90	
4279A	4410ATZ	139.80	2800
4279B	4411ATZ	161.10	
4279C	4412ATZ	184.80	

Bearings

LAK	Comm. end	Drive end	
	Ball bearing	Ball bearing	Roller bearing
2114	6205-2RS/C3	6207/C3	NU 207-EC/C3
2133	6207-2RS/C3	6308/C3	NU 308-EC/C3
4114	6208-2RS/C3	6308/C3	NU 308ECP
4133	6307-2RS/C3	6309/C3	NU 309ECP
4159	6309-2RS/C3	6310/C3	NU 310ECP
4178AA-CA	6310-2RS/C3	6312/C3	NU 312ECP
4178DA	6311-2RS/C3	6313/C3	NU 313ECP
4178EA	6312-2RS/C3	6315/C3	NU 315ECP
4178FA	6312-2RS/C3	6315/C3	NU 315ECP
4203	6214/C3	6216/C3	NU 216-EC/C3
4229	6216/C3	6218/C3	NU 218-EC/C3
4254	6218/C3	6220/C3	NU 220-EC/C3
4279	6220/C3	6222/C3	NU 222-EC/C3

LAK 2114-2133

Max. radial forces - ball and roller bearings (horizontal shaft - operating life 20,000 hours)

LAK	Dist. from shaft shoulder (inches)	Max. radial force in lbs								
		Ball bearings								Roller bearings
		630rpm	800rpm	1000rpm	1250rpm	1600rpm	2000rpm	2500rpm	3200rpm	3200rpm
2114	1.18	520	480	445	410	380	350	320	300	710
	2.36	355	355	355	355	355	325	300	275	355
2133	1.57	825	765	710	650	605	555	515	475	875
	3.14	560	560	560	560	560	520	475	440	560

Max. axial forces - ball bearings (vertical shaft - operating life 20,000 hours)

LAK	Frame	Max. radial force in lbs							
		Ball bearings							
		630rpm	800rpm	1000rpm	1250rpm	1600rpm	2000rpm	2500rpm	3200rpm
2114A	185AT	165	150	135	125	115	105	98	85
2114B	188AT	155	140	125	110	105	95	80	75
2114C	188AT	145	130	120	105	95	85	75	70
2133A	215AT	305	280	255	230	215	195	175	160
2133B	217AT	290	265	240	215	200	180	165	145
2133C	219AT	275	250	225	200	185	165	150	135

Data subject to change without notice.

LAK 4114-4178

Max. radial forces - ball bearings (horizontal shaft - operating life 20,000 hours)

LAK	Frame	Dist. from shaft shoulder (inches)	Max. radial force in lbs							
			500rpm	1000rpm	1500rpm	2000rpm	2500rpm	3000rpm	3500rpm	4000rpm
4114A 4114B	1812ATZ 1813ATZ	1.38	880	685	595	550	485	440	420	375
4133A 4133B 4133C 4133D	2112ATZ 2113ATZ 2114ATZ 2116ATZ	1.61	905	705	615	575	530	485	440	420
4159A/AA 4159B/BB 4159C/CC 4159D	2511ATZ 2512ATZ 2513ATZ 2515ATZ	1.89	1015	770	685	615	550	505	465	440
4178AA 4178BA 4178CA	2812ATZ 2812ATZ 2813ATZ	2.13	1325	1080	905	795	730	685	640	595
4178DA	2814ATZ	2.36	1655	1320	1100	1015	905	840	795	750
4178EA 4178FA	2814ATZ 2815ATZ	2.87	2095	1565	1325	1170	1080	990	880	840

Max. radial forces - roller bearings (horizontal shaft - operating life 20,000 hours)

LAK	Frame	Dist. from shaft shoulder (inches)	Max. radial force in lbs							
			500rpm	1000rpm	1500rpm	2000rpm	2500rpm	3000rpm	3500rpm	4000rpm
4114A 4114B	1812ATZ 1813ATZ	1.38	1655	1655	1435	1324	1255	1170	1100	1060
4133A 4133B 4133C 4133D	2112ATZ 2113ATZ 2114ATZ 2116ATZ	1.61	1920	1920	1720	1565	1475	1365	1325	1255
4159A/AA 4159B/BB 4159C/CC 4159D	2511ATZ 2512ATZ 2513ATZ 2515ATZ	1.89	2095	2095	1875	1720	1585	1500	1435	1370
4178AA 4178BA 4178CA	2812ATZ 2812ATZ 2813ATZ	2.13	3085	2955	2580	2380	2205	2070	1985	1920
4178DA	2814ATZ	2.36	3525	3525	3085	2800	2625	2445	2360	2250
4178EA 4178FA	2814ATZ 2815ATZ	2.87	5070	4630	3970	3525	3305	3625	3085	-

Max. axial forces - ball bearings (vertical shaft - operating life 20,000 hours)

LAK	Frame	Max. axial force in lbs							
		500rpm	1000rpm	1500rpm	2000rpm	2500rpm	3000rpm	3500rpm	4000rpm
4114A 4114B	1812ATZ 1813ATZ	265	200	165	145	120	110	100	90
4133A 4133B 4133C 4133D	2112ATZ 2113ATZ 2114ATZ 2116ATZ	375	285	220	185	155	145	130	120
4159A/AA 4159B/BB 4159C/CC 4159D	2511ATZ 2512ATZ 2513ATZ 2515ATZ	595	440	375	285	265	220	175	130
4178AA 4178BA 4178CA	2812ATZ 2812ATZ 2813ATZ	660	465	420	355	285	245	200	155
4178DA	2814ATZ	685	485	440	375	330	265	220	175
4178EA 4178FA	2814ATZ 2815ATZ	640	330	165	110	-	-	-	-

Data subject to change without notice.

LAK 4203-4279

Max. radial forces - ball bearings (horizontal shaft - operating life 20,000 hours)

LAK	Frame	Dist. from shaft shoulder (inches)	Max. radial force in lbs							
			500rpm	1000rpm	1500rpm	2000rpm	2500rpm	3000rpm	3500rpm	4000rpm
4203A	3211ATZ	2.75	1460	1130	970	870	795	740	700	665
4203B	3212ATZ		1455	1120	960	855	780	725	680	645
4203C	3213ATZ		1440	1100	935	835	760	705	660	620
4229A	3611ATZ	3.34	1975	1525	1305	1170	1065	990	930	-
4229B	3612ATZ		1965	1510	1285	1150	1045	970	910	-
4229C	3613ATZ		1935	1480	1260	1120	1020	945	880	-
4254A	4011ATZ	3.34	2540	1955	1670	1490	1360	1265	-	-
4254B	4012ATZ		2520	1930	1640	1455	1330	1230	-	-
4254C	4013ATZ		2495	1880	1610	1425	1295	1200	-	-
4279A	4410ATZ	4.13	2850	2175	1845	1640	1490	-	-	-
4279B	4411ATZ		2815	2135	1805	1595	1445	-	-	-
4279C	4412ATZ		2490	2075	1745	1535	1385	-	-	-

Max. radial forces - roller bearings (horizontal shaft - operating life 20,000 hours)

LAK	Frame	Dist. from shaft shoulder (inches)	Max. radial force in lbs							
			500rpm	1000rpm	1500rpm	2000rpm	2500rpm	3000rpm	3500rpm	4000rpm
4203A	3211ATZ	2.75	3745	3015	2655	2425	2255	2130	2030	1945
4203B	3212ATZ		3785	3040	2670	2440	2270	2140	2035	1950
4203C	3213ATZ		3790	3035	2665	2430	2260	2130	2025	1935
4229A	3611ATZ	3.34	4975	4000	3515	3210	2985	2820	2680	-
4229B	3612ATZ		4990	4005	3520	3210	2985	2815	2675	-
4229C	3613ATZ		4960	3980	3490	3180	2955	2785	2645	-
4254A	4011ATZ	3.34	6815	5480	4815	4400	4090	3860	-	-
4254B	4012ATZ		6830	5485	4815	4395	4080	3845	-	-
4254C	4013ATZ		6570	5490	4815	4390	4075	3840	-	-
4279A	4410ATZ	4.13	5950	5950	5530	5040	4680	-	-	-
4279B	4411ATZ		4365	4365	4365	4365	4365	-	-	-
4279C	4412ATZ		2490	2490	2490	2490	2490	-	-	-

Max. axial forces - ball bearings (vertical shaft - operating life 20,000 hours)

LAK	Frame	Max. radial force in lbs							
		500rpm	1000rpm	1500rpm	2000rpm	2500rpm	3000rpm	3500rpm	4000rpm
4203A	3211ATZ	880	580	450	370	305	260	225	195
4203B	3212ATZ	815	515	385	300	240	195	160	130
4203C	3213ATZ	750	450	315	235	175	125	95	65
4229A	3611ATZ	875	535	390	290	220	165	125	-
4229B	3612ATZ	810	470	320	220	150	100	60	-
4229C	3613ATZ	740	405	255	155	85	35	-	-
4254A	4011ATZ	1175	715	510	375	275	210	-	-
4254B	4012ATZ	1080	615	410	275	180	110	-	-
4254C	4013ATZ	980	520	310	175	80	-	-	-
4279A	4410ATZ	1465	855	585	415	285	-	-	-
4279B	4411ATZ	1335	720	450	280	155	-	-	-
4279C	4412ATZ	1200	590	320	150	-	-	-	-

Data subject to change without notice.

Technical data: 500V — 1750RPM — 300V field

LAK 2000

LAK	NEMA	HP	Winding data Resistance at 20° C			Arm. amps	Armature Inductance mH	Voltage drop U V	Field current A	Field inductance H
			Arm.	Comm.	Shunt					
2114B	188AT	7.5	2.22	1.71	131	13.5	45.0	73.0	1.6	22.8
2133A	215AT	10	1.63	0.92	91	17.9	42.6	61.6	2.3	15.2

LAK 4000

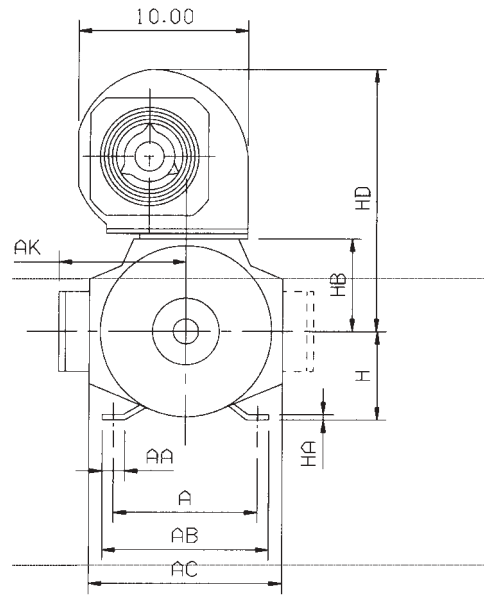
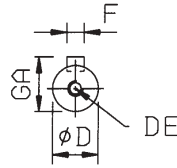
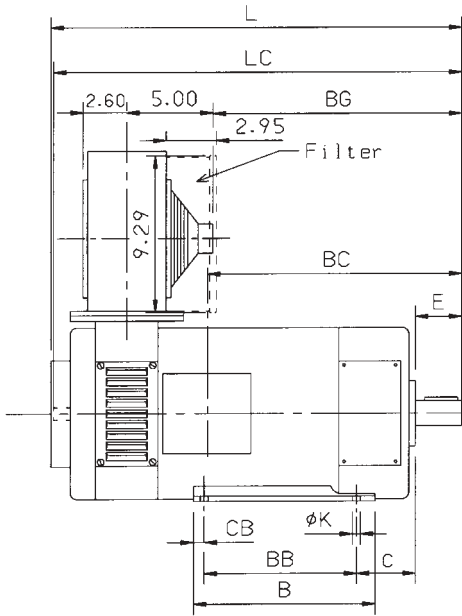
LAK	NEMA	HP	Winding data Resistance at 20° C			Arm. Amps	Armature Inductance mH	Voltage drop U V	Field current A	Field inductance H
			Arm.	Comm.	Shunt					
4114B	1813ATZ	15	0.97	0.60	101	27	27.90	60.3	2.2	24.5
4133A	2112ATZ	20	0.81	0.30	112	35	23.60	56.4	2.1	22.5
4133A	2112ATZ	25	0.81	0.30	119	43	23.60	68.8	1.9	24.8
4133B	2113ATZ	30	0.56	0.28	119	53	18.70	64.3	1.9	26.5
4133C	2114ATZ	40	0.39	0.18	66	70	13.00	57.9	3.3	13.4
4133D	2116ATZ	50	0.33	0.16	83	87	11.10	61.7	2.6	20.6
4159B	2512ATZ	60	0.18	0.10	58	100	7.05	41.2	4.1	16.4
4159C	2513ATZ	75	0.14	0.08	49	125	5.65	40.0	4.6	16.2
4159D	2515ATZ	100	0.09	0.05	40	163	4.10	34.3	5.4	15.3
4159D	2515ATZ	125	0.09	0.05	45	207	4.10	42.7	4.9	17.0
4178DA	2814ATZ	150	0.07	0.03	35	244	3.80	36.2	5.2	3.0
4178FA	2815ATZ	200	0.03	0.02	24.6	318	2.60	22.7	8.9	3.2
4229A	3611ATZ	250	0.0212	0.0140	28.3	398	1.30	20.2	8.0	13.6
4229A	3611ATZ	300	0.0212	0.0140	28.3	482	1.30	26.1	8.0	13.4
4254A	4011ATZ	400	0.0130	0.0090	22.6	637	0.96	22.6	9.6	13.1
4254C	4013ATZ	500	0.0085	0.0061	22	794	0.78	18.2	10.4	13.5
4279A	4410ATZ	600	0.0063	0.0047	16.5	946	0.65	16.5	13.6	11.8
4279C	4412ATZ	700	0.0054	0.0043	30.2	1104	0.57	17.4	8.4	30.1

Data subject to change without notice.

Dimension drawing, LAK 2114-2133

Dimensions in inches

With blower



LAK	Frame	A	AA	AB	AC	AK	B	BB	BC	BG	C	CB	D	DE	E
2114A	185AT	7.50	1.02	8.50	9.96	6.69	7.25	6.25	10.31	9.96	2.72	0.49	1.125	3/8-16UNC	2.25
2114B	188AT						10.00	9.00	12.20	11.85					
2114C	188AT						10.00	9.00	14.76	14.41					
2133A	215AT	8.50	1.34	9.84	11.42	7.52	8.27	7.00	12.13	11.80	3.50	0.63	1.375	1/2-13UNC	2.75
2133B	217AT						10.75	9.00	15.08	14.76		0.63			
2133C	219AT						13.31	11.00	17.68	17.32		1.65			

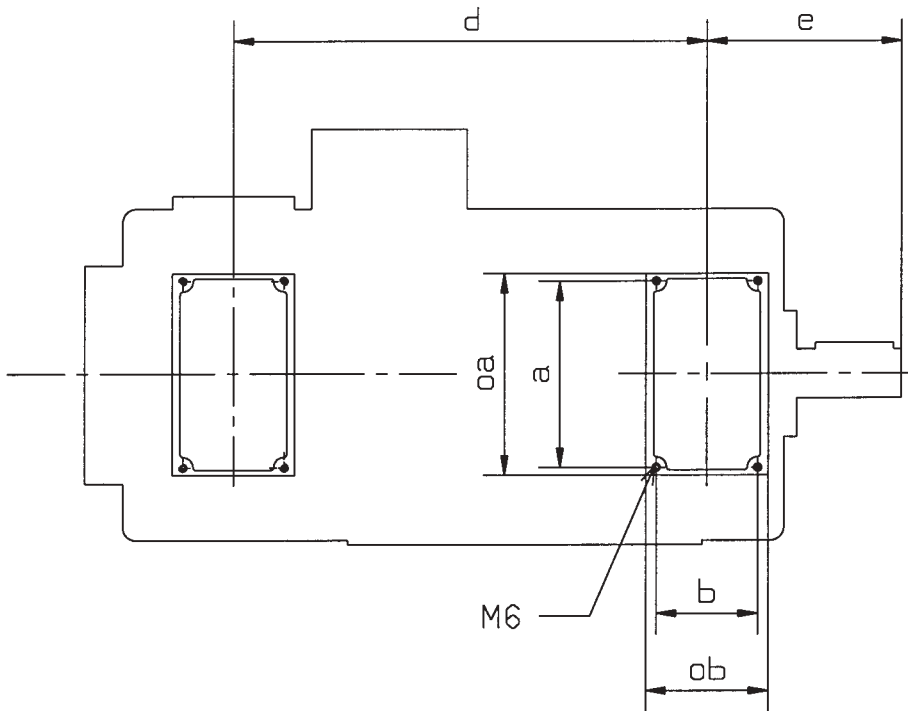
LAK	Frame	F	GA	H	HA	HB	HD	K	L	LC	Weight lbs
2114A	185AT	0.250	1.236	4.50	0.20	4.87	14.72	0.43	18.90	18.74	110
2114B	188AT								20.79	20.63	140
2114C	188AT								23.35	23.19	180
2133A	215AT	0.312	1.513	5.25	0.24	5.69	15.55	0.47	21.38	21.22	180
2133B	217AT				0.31				24.33	24.17	230
2133C	219AT				0.31				26.89	26.73	290

Data subject to change without notice.

Dimension drawing, LAK 2114-2133

Dimensions in inches

Air-inlets



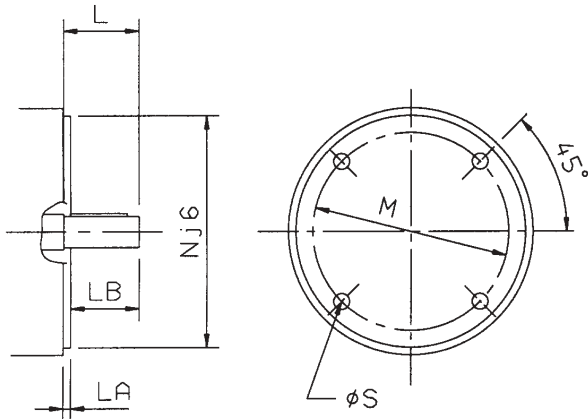
LAK	Frame	a	b	c	d	e	oa	ob	oc	Weight lbs.
2114A	185AT	4.72	2.76	2.76	10.16	4.76	5.20	3.39	3.39	112
2114B	188AT				12.05					139
2114C	188AT				14.61					178
2133A	215AT	5.71	3.07	3.07	11.42	5.47	6.18	3.70	3.70	176
2133B	217AT				14.37					231
2133C	219AT				16.93					286

Data subject to change without notice.

Face and flange dimensions, LAK 2114-2133

Dimensions in inches

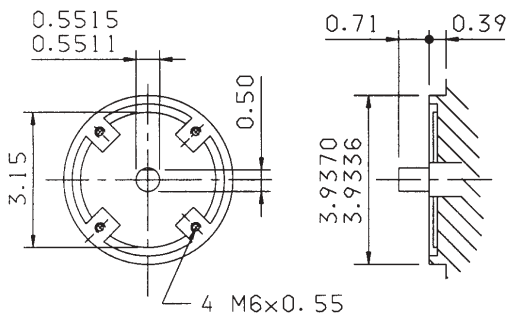
C-face



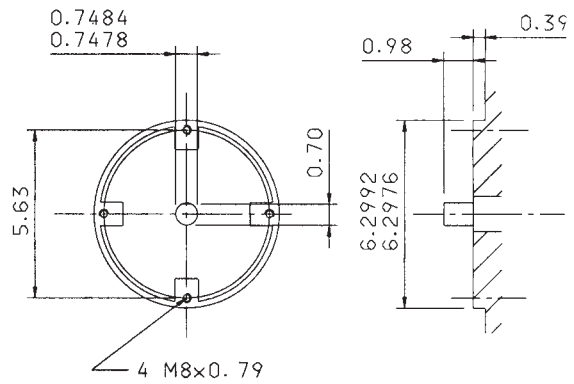
LAK	L	LA	LB	M	N	S
2114A	2.25	0.28	2.13	7.25	8.50	1/2-13UNC
2114B						
2114C						
2133A	2.75	0.28	2.50	7.25	8.50	1/2-13UNC
2133B						
2133C						

Non-drive end (for tachometer/encoder mounting)

LAK 2114



LAK 2133

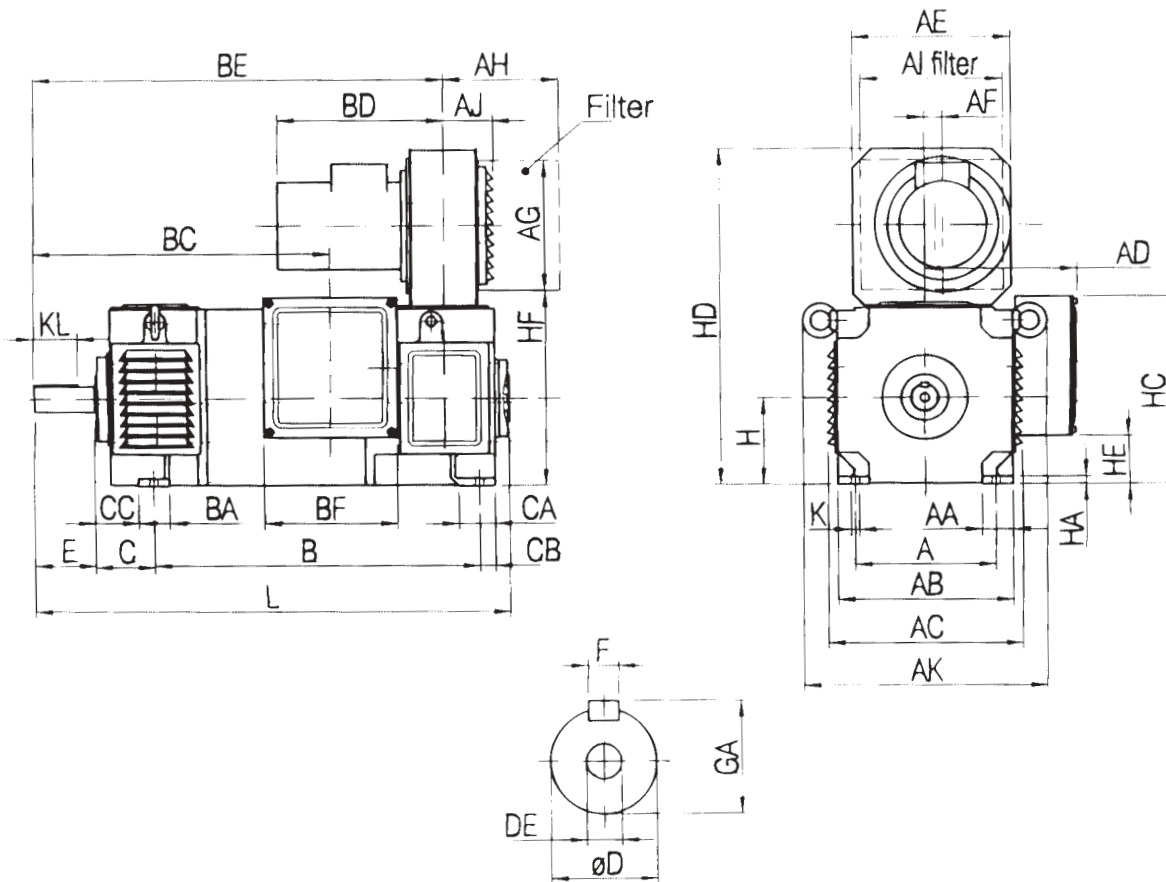


Data subject to change without notice.

Dimension drawing, LAK 4114-4133

Dimensions in inches

With blower



Type	NEMA frame	A	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	B	BA	BC	BD	BE	BF
LAK 4114A	1812ATZ	7.5	1.77	8.66	9.84	7.99	8.66	0.67	7.68	6.89	7.68	3.03	12.84	14	1.97	12.83	9.25	19.84	7.48
LAK 4114B	1813ATZ													16		14.99		22.00	
LAK 4133A	2112ATZ	8.5	1.87	10.24	11.42	8.78	8.66	0.67	7.68	6.89	7.68	3.03	14.41	16	1.97	14.83	9.25	21.56	7.48
LAK 4133B	2113ATZ													18		16.60		23.33	
LAK 4133C	2114ATZ													20		18.57		25.30	
LAK 4133D	2116ATZ													25		22.90		29.69	

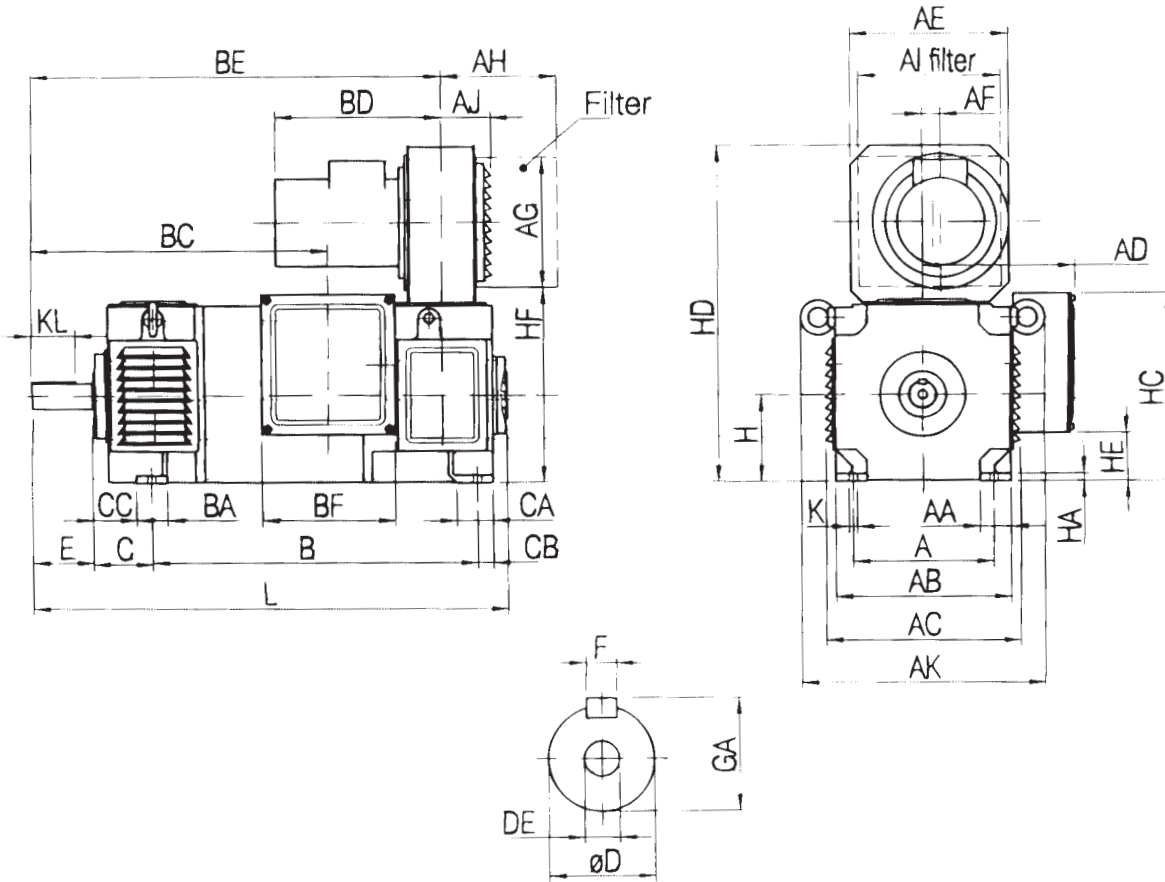
Type	NEMA frame	C	CA	CB	CC	D	DE	E	F	GA	H	HA	HC	HD	HE	HF	K	KL	L	Weight (lbs)
LAK 4114A	1812ATZ	2.75	2.17	2.31	1.77	1.375	3/8" UNC	2.75	0.31	1.51	4.50	0.48	9.58	17.85	2.69	9.84	0.41	1.77	23.12	268
LAK 4114B	1813ATZ			2.47															25.29	284
LAK 4133A	2112ATZ	3.50	2.36	2.17	2.52	1.625	3/8" UNC	3.25	0.38	1.81	5.25	0.53	10.33	19.38	3.44	11.42	0.41	2.28	25.83	301
LAK 4133B	2113ATZ			1.94												27.60			367	
LAK 4133C	2114ATZ			1.91												29.57			422	
LAK 4133D	2116ATZ			1.24												33.90			552	

Data subject to change without notice.

Dimension drawing, LAK 4159-4178

Dimensions in inches

With blower



Type	NEMA frame	A	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	B	BA	BC	BD	BE	BF	
LAK 4159A/AA	2511ATZ	10	2.20	12.44	13.62	10.91	11.22	1.32	9.25	8.19	9.25	3.50	17.28	18	2.20	16.21	11.73	24.24	9.45	
LAK 4159B/BB	2512ATZ						18.06	26.09												
LAK 4159C/CC	2513ATZ						20.62	28.65												
LAK 4159D	2515ATZ						12.40	0.85	11.81					11.81		3.15		28		25.54
LAK 4178AA	2812ATZ	11	2.60	14.02	15.20	11.69	11.22	1.32	11.81	8.27	11.81	3.50	18.99	22	2.60	19.80	11.73	28.42	9.45	
LAK 4178BA	2812ATZ						21.81	30.43												
LAK 4178CA	2813ATZ						24.37	32.99												
LAK 4178DA	2814ATZ						26.05	34.67												
LAK 4178EA	2814ATZ						2.40	30.28	13.74	15.95	1.12	13.39		10.63		13.39	4.25	28		39.45
LAK 4178FA	2815ATZ									12.68	15.95	1.12		13.39		10.63	13.39	4.25		32

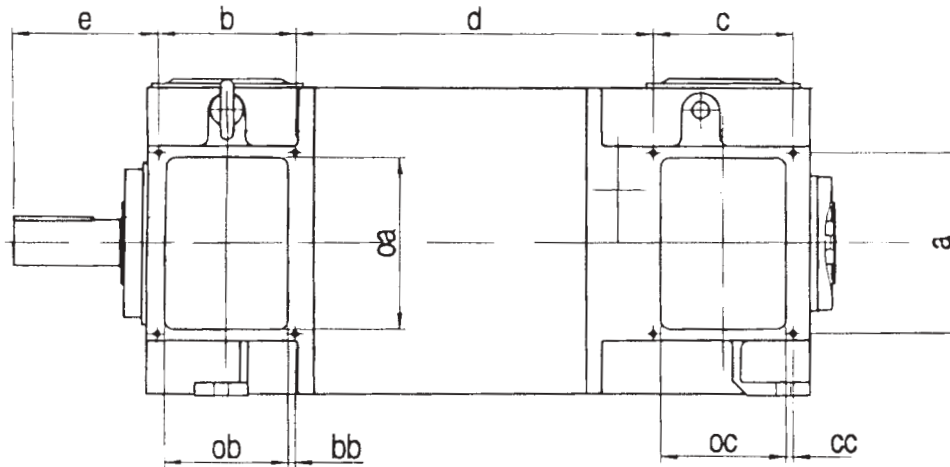
Type	NEMA frame	C	CA	CB	CC	D	DE	E	F	GA	H	HA	HC	HD	HE	HF	K	KL	L	Weight (lbs)
LAK 4159A/AA	2511ATZ	4.25	2.56	1.81	3.15	1.875	5/8" UNC	3.75	0.50	2.09	6.25	0.50	13.47	24.01	3.44	14.0	0.53	2.54	28.83	530
LAK 4159B/BB	2512ATZ			1.66												30.68			596	
LAK 4159C/CC	2513ATZ			2.21												33.24			706	
LAK 4159D	2515ATZ			1.14												38.16			930	
LAK 4178AA	2812ATZ	4.75	3.58	1.28	3.58	2.125	5/8" UNC	4.25	0.50	2.35	7.00	0.54	14.24	26.09	4.20	15.7	0.53	3.15	33.42	838
LAK 4178BA	2812ATZ			3.29												35.43			904	
LAK 4178CA	2813ATZ			2.85												37.99			1062	
LAK 4178DA	2814ATZ			1.03												39.63			1106	
LAK 4178EA	2814ATZ			3.74	1.94	2.875	3/4" UNC	5.75	0.75	3.20	7.00	0.54	14.42	31.84	4.38	17.5	0.66	4.53	46.54	1287
LAK 4178FA	2815ATZ																		0.89	3.19

Data subject to change without notice.

Dimension drawing, LAK 4114-4178

Dimensions in inches

Air-inlets



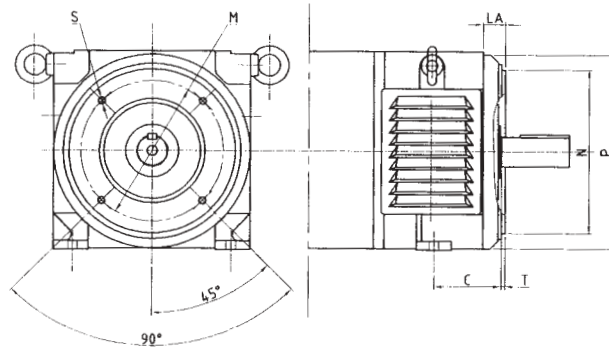
Type	NEMA frame	a	b	bb	c	cc	d	e	oa	ob	oc	Weight (lbs)				
LAK 4114A	1812ATZ	4.33	4.33	0.20	4.33	0.20	9.65	3.69	4.33	3.94	3.94	253				
LAK 4114B	1813ATZ						11.81					269				
LAK 4133A	2112ATZ	5.91	4.92	0.30	4.92	0.30	9.49	4.69	5.71	4.33	4.33	286				
LAK 4133B	2113ATZ						11.26					352				
LAK 4133C	2114ATZ						13.23					407				
LAK 4133D	2116ATZ						17.56					517				
LAK 4159A/AA	2511ATZ						10.35					495				
LAK 4159B/BB	2512ATZ	7.48	5.71	0.30	5.71	0.30	12.21	5.32	7.09	5.12	5.12	561				
LAK 4159C/CC	2513ATZ						14.76					671				
LAK 4159D	2515ATZ						19.69					891				
LAK 4178AA	2812ATZ						8.27					6.30	0.30	6.30	0.30	12.84
LAK 4178BA	2812ATZ	0.30	0.30	14.84	6.14	7.87		5.71	5.71	869						
LAK 4178CA	2813ATZ	0.30	0.30	17.40	6.14	7.87		5.71	5.71	1023						
LAK 4178DA	2814ATZ	0.30	0.30	18.58	6.64	7.87		5.71	5.71	1067						
LAK 4178EA	2814ATZ	0.39	0.39	23.03	6.97	8.27		5.51	6.10	1243						
LAK 4178FA	2815ATZ	0.39	0.39	25.98	6.97	8.27		5.51	6.10	1452						

Data subject to change without notice.

Face and flange dimensions, LAK 4114-4178

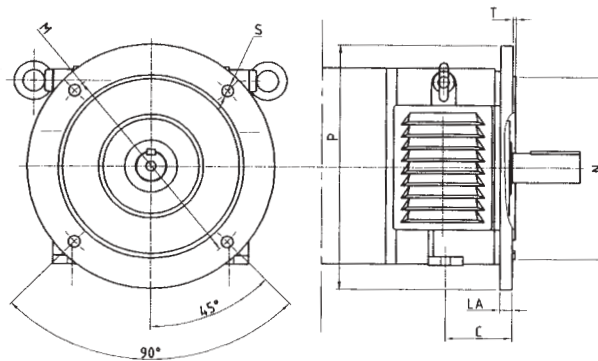
Dimensions in inches

C-face



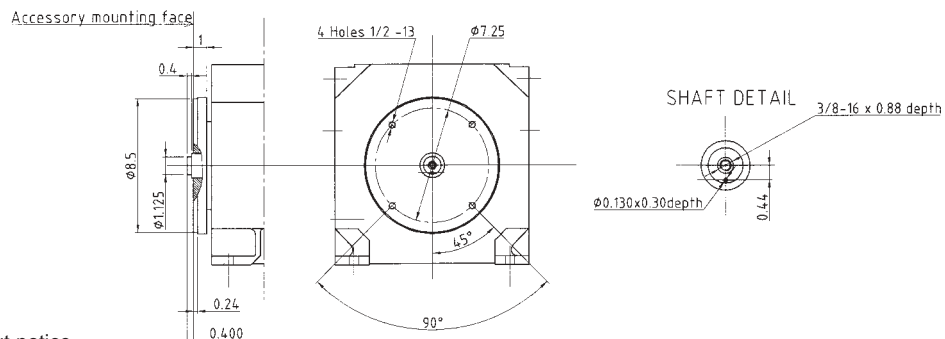
LAK	NEMA frame	Flange size	M	N	P	T	LA	C	S
4114	1812-13ATZ	7.25	7.25	8.5	8.66	0.25	0.631	2.62	1/2UNC
4133	2112-16ATZ	7.25	7.25	8.5	10.23	0.25	1.234	3.50	1/2UNC
4159	2511-15ATZ	9.00	9.00	10.5	12.40	0.25	1.391	4.25	1/2UNC
4178	2812-15ATZ	11.00	11.00	12.5	14.00	0.25	1.391	4.75	5/8UNC

D-flange



LAK	NEMA frame	Flange size	M	N	P	T	LA	C	S
4114	1812-13ATZ	12.5	12.5	11	14	0.25	0.60	2.75	0.8
4133	2112-16ATZ	12.5	12.5	11	14	0.25	0.75	3.50	0.8
4159	2511-15ATZ	16.0	16.0	14	18	0.25	0.87	4.25	0.8
4178	2812-15ATZ	16.0	16.0	14	18	0.25	0.87	4.75	0.8

Non drive end (for tachometer/encoder mounting)

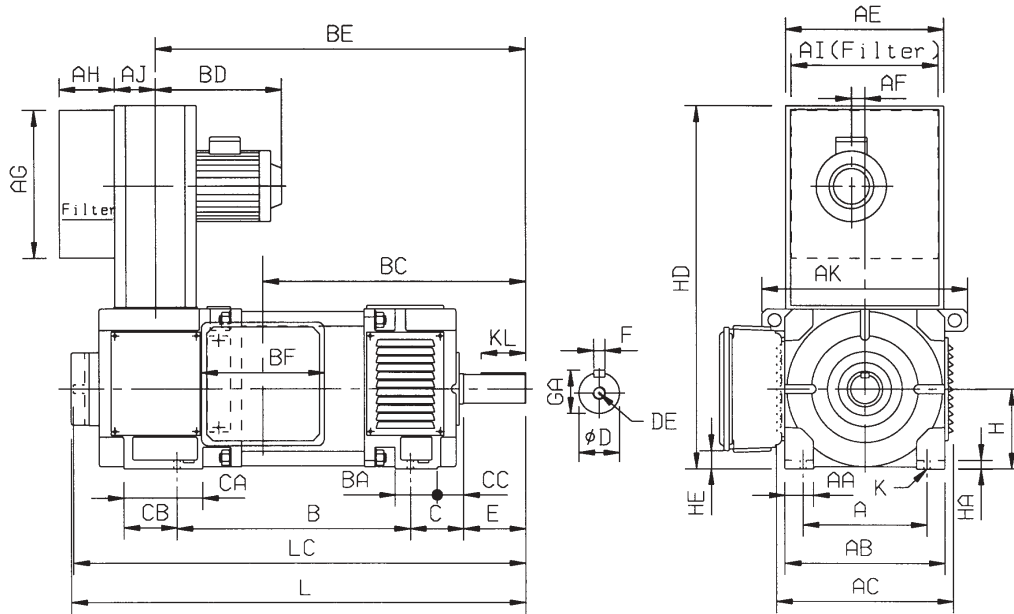


Data subject to change without notice.

Dimension drawing, LAK 4203-4229

Dimensions in inches

With blower



LAK	Frame	A	AA	AB	AC	AE	AF	AH	AG	AI	AJ	AK	B	BA	BC	BD	BE	BF	C
4203A	3211ATZ	12.50	2.76	17.44	15.55	1.26	4.92	14.60	14.60	3.94	19.68	22.00	4.21	22.99	12.76	33.88	10.94	5.25	
4203B	3212ATZ											25.00		25.67					
4203C	3213ATZ											28.00		28.34					
4229A	3611ATZ	14.00	3.07	17.90	19.37	15.63	1.38	4.92	14.60	14.60	3.94	22.83	25.00	4.37	27.07	13.78	42.23	12.91	5.88
4229B	3612ATZ												28.00		29.67				
4229C	3613ATZ												32.00		32.27				

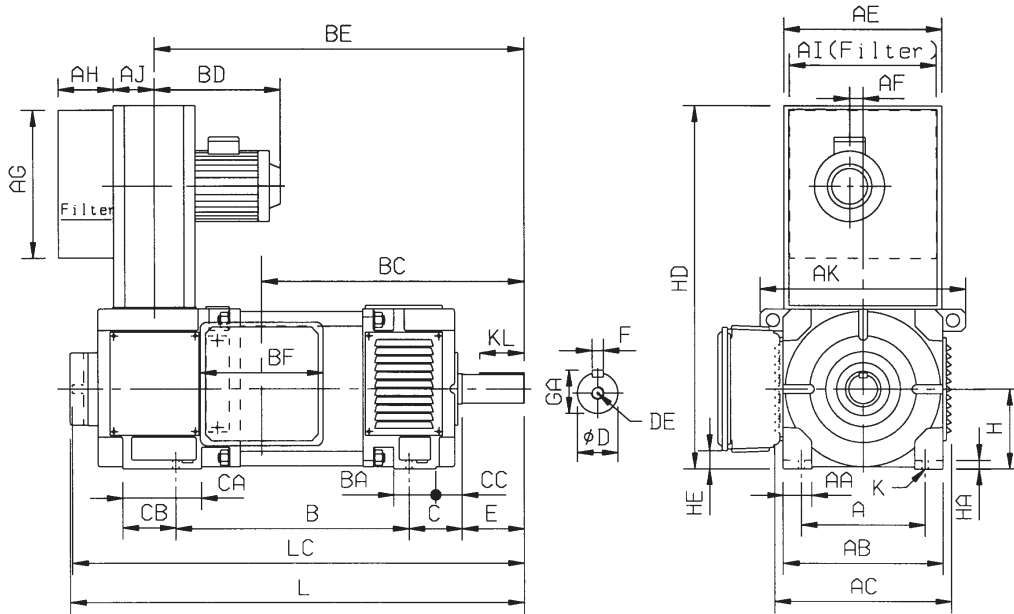
LAK	Frame	CA	CB	CC	D	DE	E	F	GA	H	HA	HC	HD	HE	K	KL	L	LC	Weight lbs
4203A	3211ATZ	7.08	4.64	2.56	2.875	M20	5.75	0.750	3.20	8	0.90	13.78	34.88	3.15	0.66	4.95	41.65	41.45	1160
4203B	3212ATZ																44.33	44.13	1290
4203C	3213ATZ																47.01	46.81	1450
4229A	3611ATZ	7.99	5.51	3.11	3.250	M20	6.50	0.750	3.58	9	0.94	16.08	38.15	3.11	0.809	5.92	47.92	47.72	1690
4229B	3612ATZ																50.51	50.31	1840
4229C	3613ATZ																53.11	52.91	2050

Data subject to change without notice.

Dimension drawing, LAK 4254-4279

Dimensions in inches

With blower



LAK	Frame	A	AA	AB	AC	AE	AF	AH	AG	AI	AJ	AK	B	BA	BC	BD	BE	BF	C
4254A	4011ATZ	16.00	3.30	19.76	21.30	21.02	1.81	5.90	23.98	20.04	4.72	24.76	28.00	5.19	29.78	15.56	41.79	12.91	5.88
4254B	4012ATZ												32.00		32.61		44.63		
4254C	4013ATZ												36.00		35.44		47.46		
4279A	4410ATZ	18.00	3.50	22.04	23.54	21.02	1.81	5.90	23.98	20.04	4.72	27.05	28.00	5.79	31.85	18.94	47.54	16.85	7.50
4279B	4411ATZ												32.00		35.00		50.69		
4279C	4412ATZ												36.00		38.15		53.84		

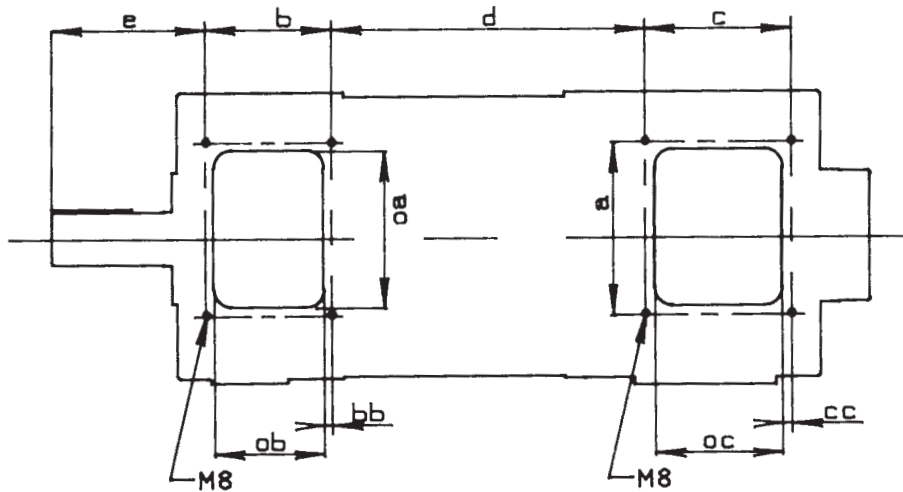
LAK	Frame	CA	CB	CC	D	DE	E	F	GA	H	HA	HC	HD	HE	K	KL	L	LC	Weight lbs
4254A	4011ATZ	9.01	6.30	3.22	3.625	M20	6.50	0.875	4.0	10	1.06	17.00	45.82	4.33	0.94	5.86	52.13	51.93	2270
4254B	4012ATZ																54.96	54.76	2510
4254C	4013ATZ																57.80	57.60	2880
4279A	4410ATZ	9.53	6.53	3.97	3.875	M20	8.25	1.00	4.3	11	0.98	20.47	47.99	3.54	1.06	7.38	58.56	58.36	2841
4279B	4411ATZ																61.71	61.51	3300
4279C	4412ATZ																64.86	64.66	3750

Data subject to change without notice.

Dimension drawing, LAK 4203-4279

Dimensions in inches

Air-inlets



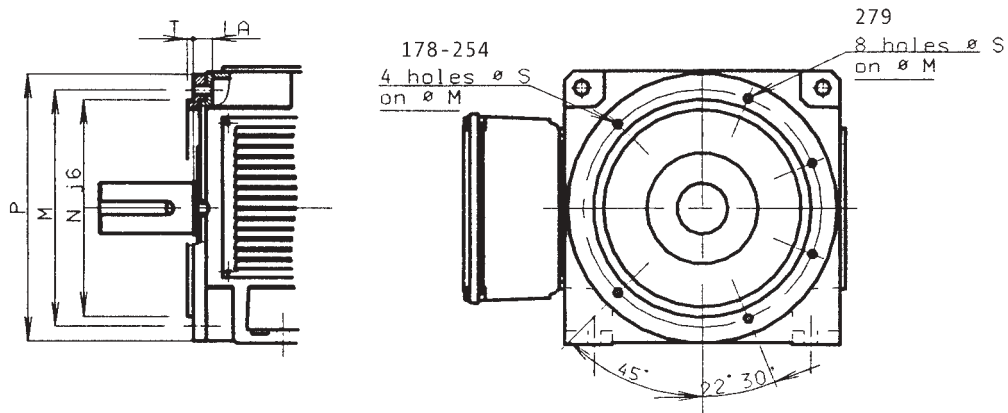
LAK	NEMA frame	a	b	bb	c	cc	d	e	oa	ob	oc	Weight (lbs)
4203A	3211ATZ	8.66	6.89	0.31	6.89	0.31	15.75	7.56	8.27	6.26	6.26	1089
4203B	3212ATZ						18.43					1232
4203C	3213ATZ						21.10					1386
4229A	3611ATZ	10.00	8.23	0.67	8.23	0.47	19.17	8.31	9.41	6.69	7.52	1606
4229B	3612ATZ						21.77					1760
4229C	3613ATZ						24.37					1980
4254A	4011ATZ	10.79	8.23	0.55	8.23	0.35	20.71	8.94	10.24	7.09	7.52	2134
4254B	4012ATZ						23.54					2354
4254C	4013ATZ						26.38					2728
4279A	4410ATZ	12.99	9.45	0.59	9.45	0.35	23.03	10.35	12.28	7.87	8.74	2662
4279B	4411ATZ						26.18					3124
4279C	4412ATZ						29.33					3564

Data subject to change without notice.

Flange dimensions, LAK 4203-4279

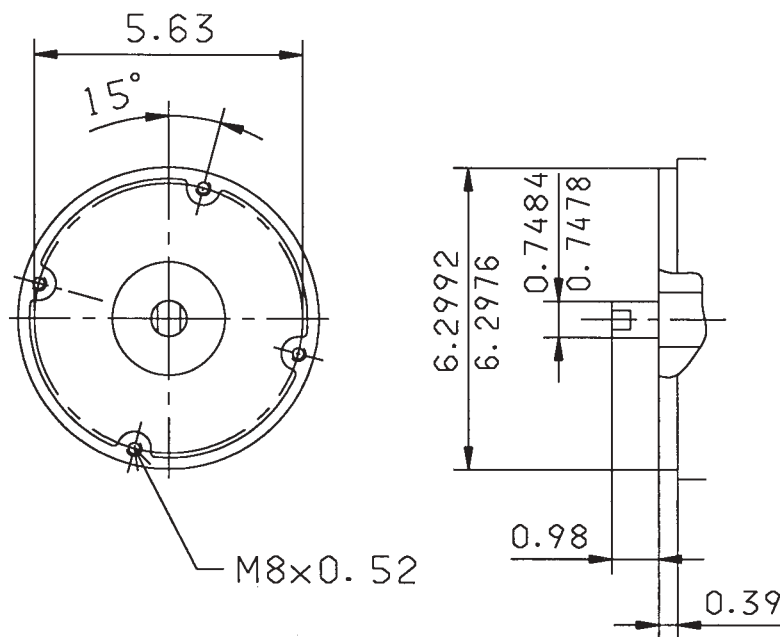
Dimensions in inches

D-flange



LAK	NEMA frame	LA	M	Nj6	P	S	T
4203	3211-13ATZ	1.23	12.5	11	14	0.81	0.25
4229	3611-13ATZ	1.31	16	14	18		
4254	4011-13ATZ	1.46	16	14	18		
4279	4410-12ATZ	1.71	20	18	22		

Non-drive end (for tachometer/encoder mounting)



Data subject to change without notice.

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