

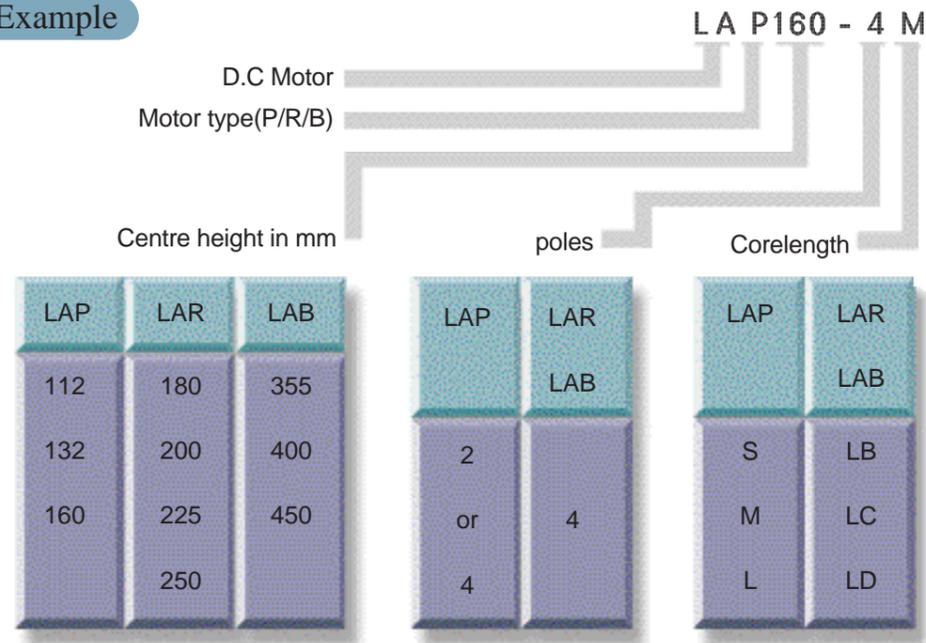


HYOSUNG DC MOTOR

## Type designation

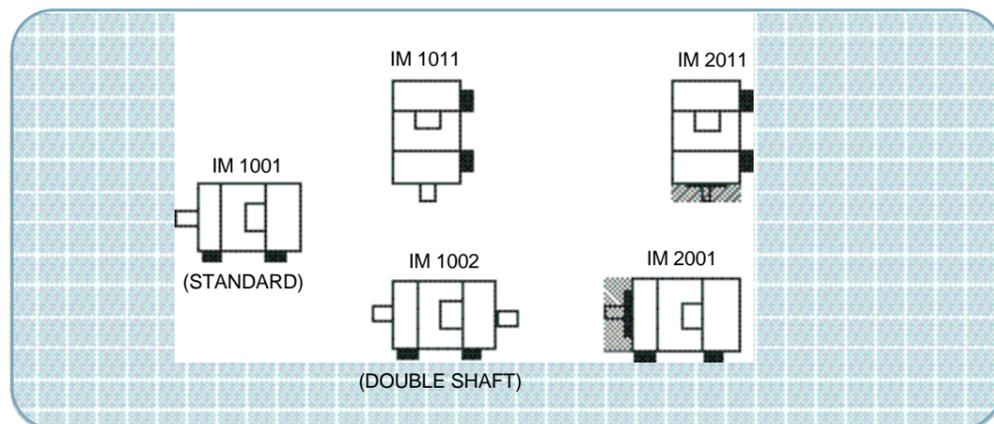
The motors series has ten different centre heights.  
 For each centre height there are several types with lengths increasing by steps.  
 For each motor length there are a number of armature windings giving various base speeds with the same voltage.

### Example



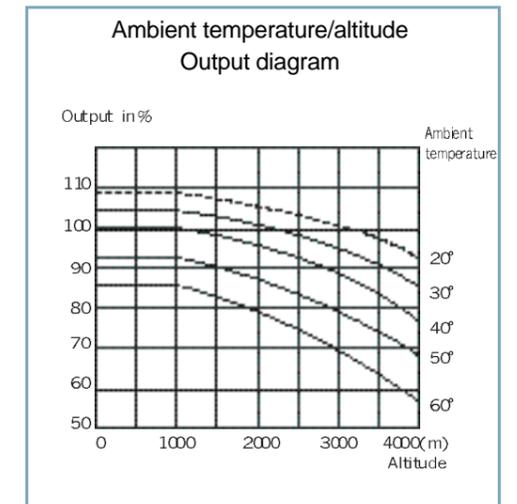
## Standards

The motors comply with the requirements of the international standard IEC Publ. 34-1  
 Terminal markings  
 The terminal markings are in agreement with the recommendations in IEC Publ. 34-8  
 Mounting arrangements  
 The motor is manufactured in accordance with IEC Publ. 34-7



## Internal and external environmental conditions

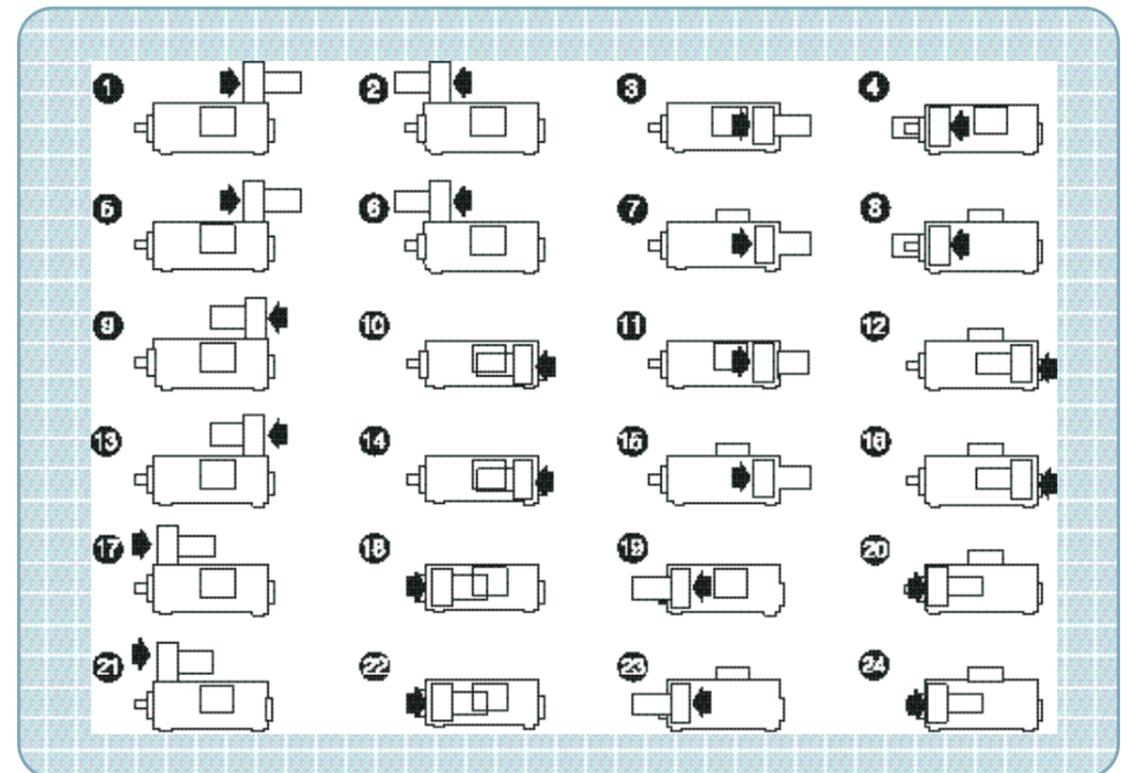
Motors can be installed in difficult environments, however the correct method of cooling and degree of protection must be chosen to ensure that the interior of the motor is as clean as possible.  
 Proper machine alignment during installation are important to ensure low machine vibration.  
 The motors are designed to be used with pure d.c. or 3-phase bridge convertors. They are nominally rated for ambient temperatures of 40°C at altitudes up to 1000 metres(3300 feet).  
 For ambient temperatures above or below 40C and altitudes, over 1000 metres(3300 feet) the motor output can be obtained from the adjacent diagram.



Note: This diagram is not valid for IC 0041, IC 0641  
 Contact Hyosung.

## Fan motor

The fan motor can be mounted above or on either side, at the drive end or at the non-drive end.  
 The location does not affect the output of the motor  
 It can be delivered with a slotted cover, a filter or a flange for an air-duct  
 On request a pressure relay can be installed on the fan motor.  
 The fan motor and terminal box can be arranged in 24 different mounting combinations



Note : If no information is given with the order, the motor is delivered as shown in figure 21.



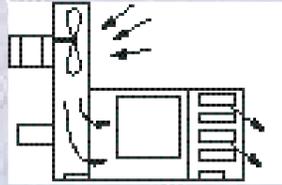
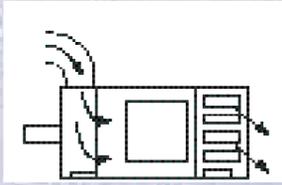
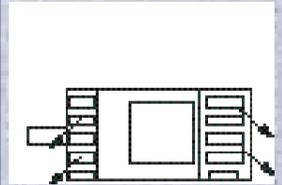
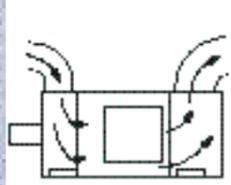
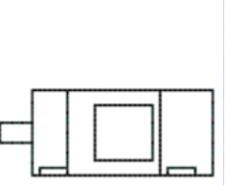
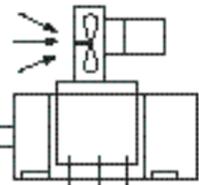
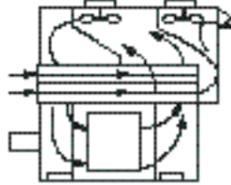
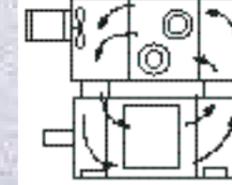
## Degrees of protection and method of cooling

### • Degrees of protection

The motor can be supplied with the following degrees of protection in accordance with IEC 34-5. For degrees of protection other than IP23S and IP54, please contact Hyosung.

### • Method of cooling

The Cooling forms comply with IEC Publ.34-6. The recommended method of cooling is determined by the environment and the location of the motor

								
<b>Method of cooling</b>	IC 06 Motor mounted fan and free circulation	IC 17 Pipe ventilated inlet duct and free circulation	IC 01 Self ventilated motor with shaft mounted fan and free circulation	IC 37 Pipe ventilated inlet and Outlet ducts	IC 0041 Totally enclosed	IC 0641 Totally enclosed fan cooled	IC 0666 Motor mounted air/air cooler	ICW 37A86 Motor mounted air/water cooler
<b>Degree of protection</b>	IP 23 S	IP 23 S	IP 23 S	IP 54				
<b>Type</b>	LAP LAR LAB	LAP LAR LAB	LAP LAB	LAP LAR LAB	LAP	LAP	LAP 160 LAP LAB	LAR LAB
<b>Torque</b>	30 - 9831 Nm	30 - 9831 Nm	On request	30 - 9831 Nm	7 - 51 Nm	9 - 97 Nm	225 - 8022 Nm	30 - 9831 Nm

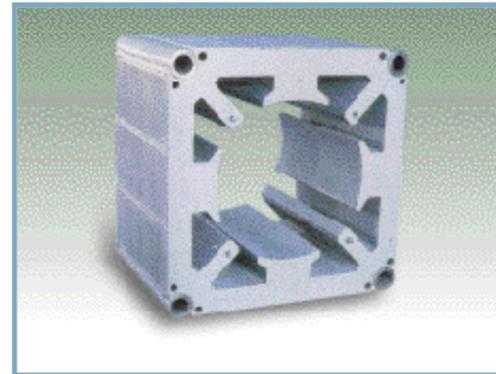
# DESIGN

## Stator

The frame, main poles and interpoles consist of one stamping and are fully laminated. This makes the stator assembly exceptionally sturdy.

This method of construction eliminates the noise and vibrations experienced when the main and auxiliary poles are mounted within the frame and heat dissipation is significantly better.

This design improves the symmetry of repartition of flux. The laminated frame allows a reduction of the time constant of the lamination flux, and keeps it proportional to the armature current in normal conditions, which gives good commutation to the motor.



## Stator windings

The stator windings are of varnish insulated copper wire and are impregnated after assembly.

The connections are crimped carefully to withstand overloads.



## Armature

The armature core consists of discs of high class insulated electro-plates, containing a large number of cooling ducts. Low losses together with the effective cooling result in an efficient motor with high output/weight ratio, without overstressing the materials.

The armature has a high critical speed and is resistant in bending to permit V-belt drive (see further under "bearings").



## Armature winding

The armature winding consists of enamel insulated copper wire and is held in the slots by glass-fiber slot wedges or bandages. The coils are connected to the commutator by brazing or by TIG welding to withstand overloads.

The complete armature is dip-impregnated with polyester-varnish.

## End shields

The end shields are of cast iron. The motor feet are integrated in the end shield close to bearing and they are accessible from the outside.

This results in a rigid and simple motor installation with low vibrations and high critical speed.

End shields and stator are bolted together by four heavy duty studs with a pre-determined torque.

Seals are mounted between the stator and the end shields in order to keep the inside of the motor clean.

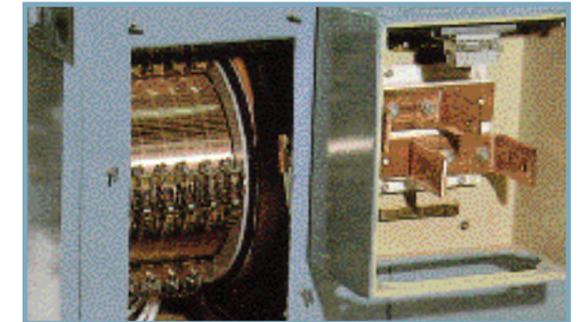
The square form of the stator and the end shields permits simple installation of accessories and air ducts.

## Terminal box and terminals

A large cast iron terminal box is provided for ingoing copper cables which are connected to an insulated terminal board.

All cable connections are easily accessible.

The terminal box can be fitted on top or either side of the motor.



## Brush gear

The brush gear is carefully engineered to give a rigid assembly.

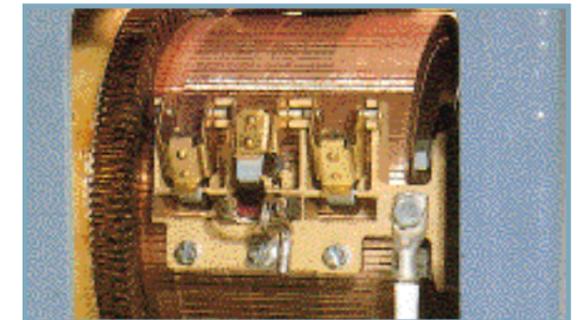
The brush holder tension springs are designed to give ;

- \*constant pressure

- \*mechanical stability independent of direction of rotation

- \*a high degree of reliability in contaminated surroundings.

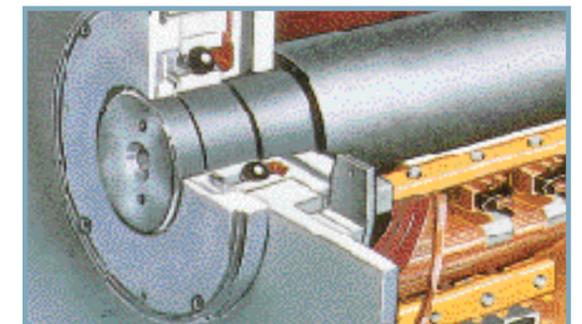
These factors have a positive influence on the commutation.



## Bearings

All motors are fitted with grease nipples and are designed for greasing while the machine is in operation.

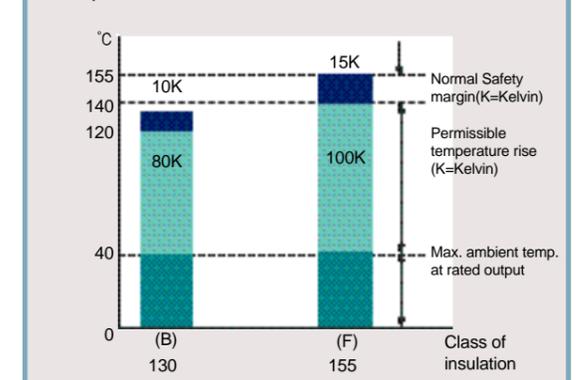
(except forms IC 0041, and IC 0641) The drive end is furnished with ball or roller bearings depending on the type of application. Independent greasing covers enable inspection of the bearings.



## Insulation system

The copper used for stator and armature windings is insulated with esterimide varnish and is of thermal class H. The complete insulation of the motor complies with class F (155°C), according to IEC 34-1, and permits a temperature rise of 100°C above an ambient temperature of 40°C, the insulation system is moisture resistant and suitable for use in tropical climate without modification.

Temperature limits for different classes of insulation



HYOSUNG DC MOTOR

# ELECTRICAL PROPERTIES



HYOSUNG DC MOTOR

## Definitions

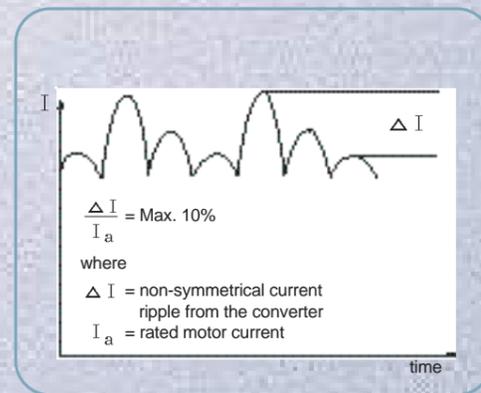
- **Base speed** = The rated motor speed at rated output, rated voltage, full excitation and normal operating temperature.
- **Field weakening range** = The ratio of the maximum electrical speed to the base speed.
- **Max. mech. speed** = The speed to which the motor is limited by mechanical factors
- **Max. electr. speed** = The highest speed which can be quoted for a given application without reduction of armature current.

## Excitation

Standard motors are delivered with separate excitation. The standard voltages are 180 volts. Other excitation voltages between 110V and 440V can be supplied on request.

## Non-symmetrical current

Current ripple affects the commutating capability and the motor losses. The motor data assumes that the maximum asymmetry is 10%.

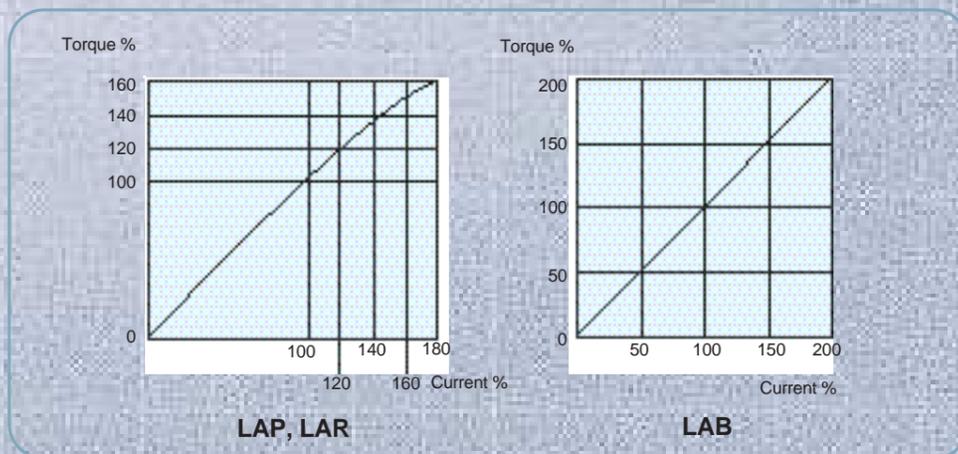


## Overload currents

LAP LAR motors are designed for an overload current of 180% for 30sec. every 30 minutes. Lower overloads can be applied for longer times. For overloads above the max. electrical speed see under "Field Control." Overloads must be followed by periods of low loads so that the motor current RMS value over a load cycle is not greater than 100% rated current.

## Maximum Torque

In accordance with IEC publ. 34-1 the motors can be loaded with 160% rated torque for 15 seconds every 5 minutes. the motors can give higher torques as shown in the diagram below.



Note : The tolerance for standard motors with shunt winding is  $\pm 5\%$

## Field control

### A. Trimming

Motors can be quoted for trimmed base speed adjustment of the base speed by trimming should not exceed 25% of the base speeds listed in the data sheets. The new speed is not to exceed the max. mechanical speed listed in this catalogue.

### B. Field control

The technical data lists a speed limits which can be quoted for motors with field regulation with full motor current and overcurrent, n2, n3, and n4 are the limits for different types of motor application.

For speeds above these limits the motors must be operated with reduced current and overcurrent according to the diagram below.

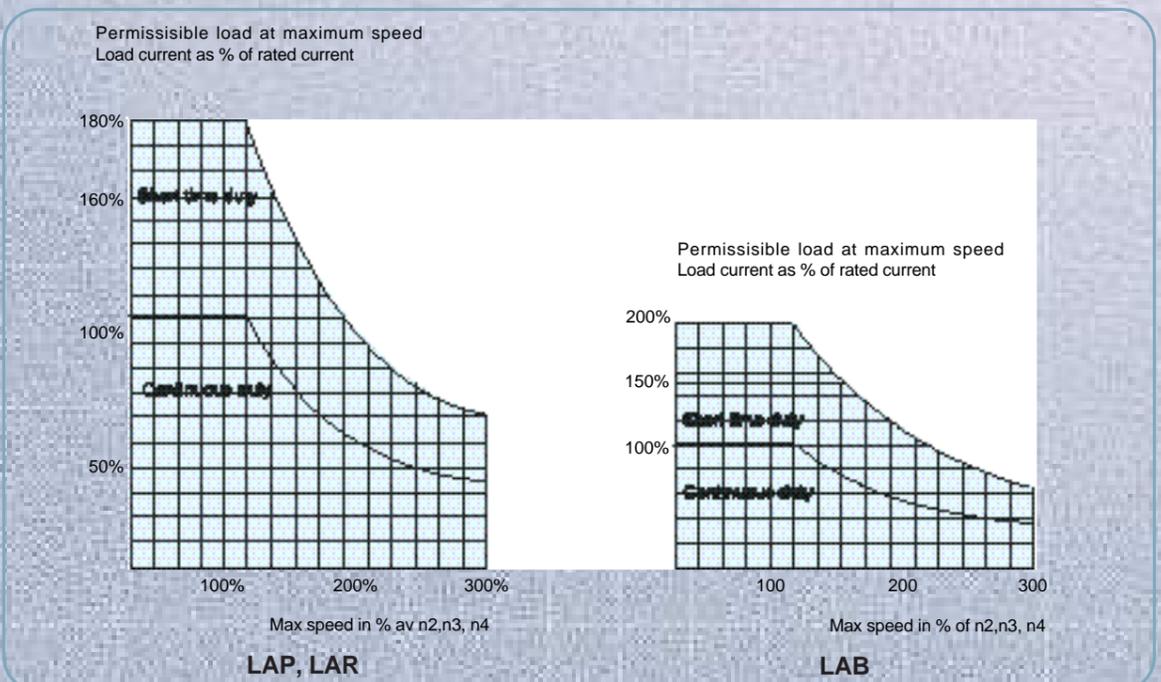
Note that the maximum operating speed must not be exceeded by means of field control.

**n2** is the limit for pumps, fans extruders and propellers and other applications where the motor may run continuously at the maximum speed.

**n3** is the limit for continuous steel mills, wire mills, hot and cold strip mills, all paper machine applications where the motor may run at the maximum speed for a "production run", but not continuously.

**n4** is the limit for coilers, machine tool spindles, brake generators and other applications where the maximum speed occurs for only a short time.

Max. current as a function of speed



### Standstill current

Permissible load current when the machine is at a standstill with ventilating system in operation.

Load current in % of the rated current	Time
180	10s
100	30s
50	90s
20	10 min
10	continuous

### Current derivative

A rate of change of current of 200 times rated current per second and higher is permitted at all speeds below  $n_2$  and with all loads.

### Testing

#### • Routine test

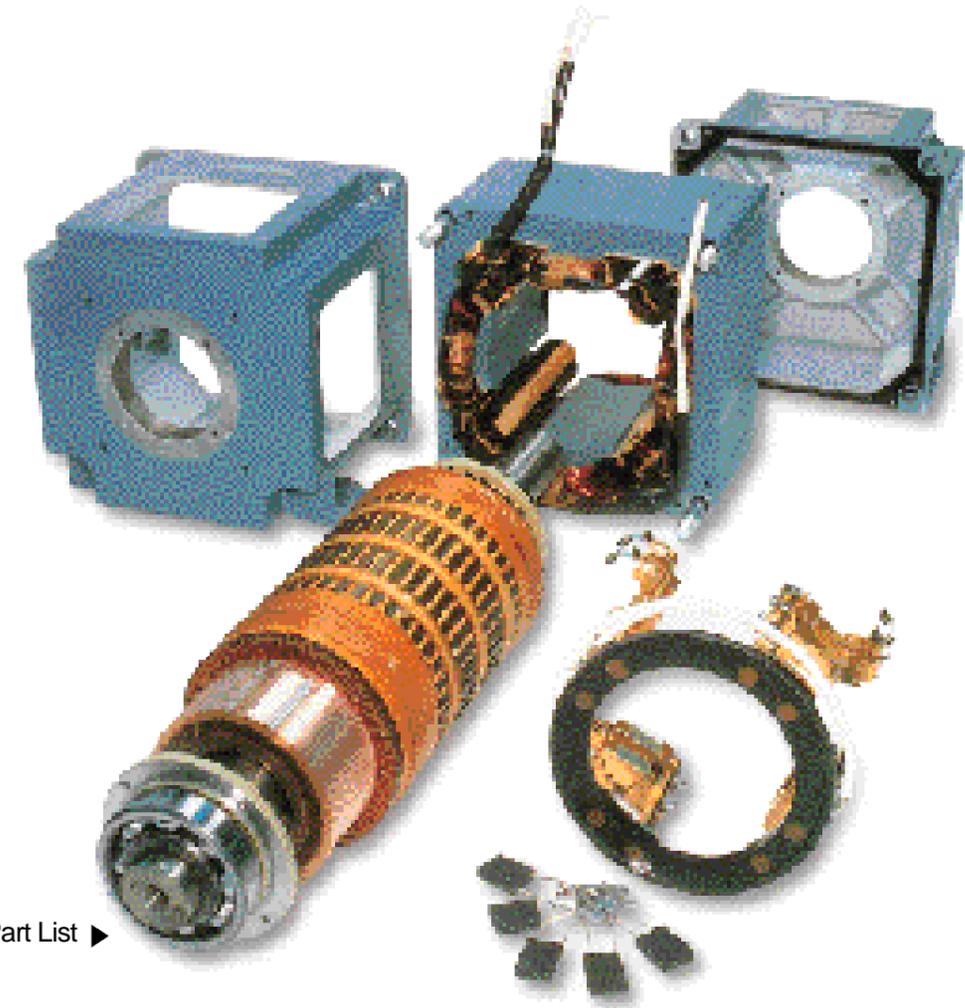
The final quality control procedure during the manufacture of a motor is a routine test. Each motor is subjected to such a routine test.

#### • Test reports

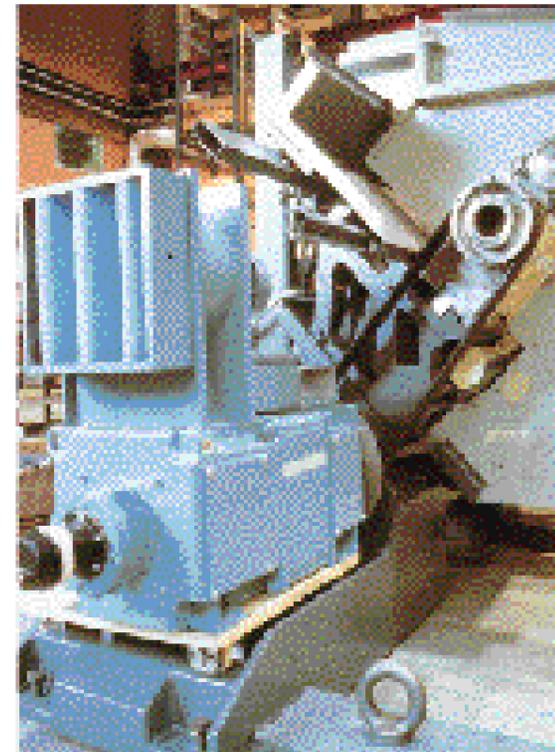
A formal protocol of the routine test can be obtained upon request.

#### • Type test

The type test is performed on the first machine of a series. The result is then used as a reference for subsequent machines of the same type. A type test must be requested with the order. A formal test protocol of the type test will be sent to the customer.



Part List ►



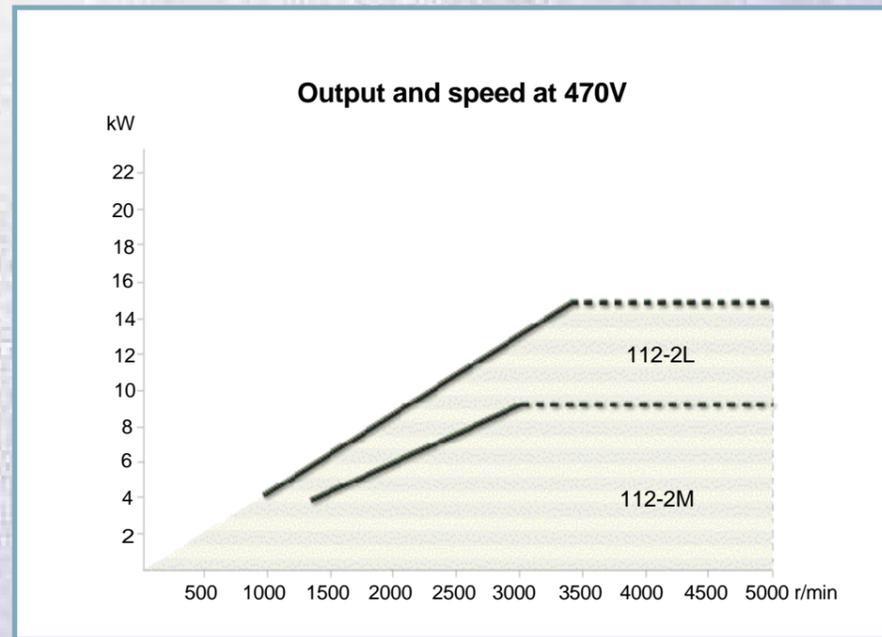
▲ Load Test



▲ Field and Interpole Winding

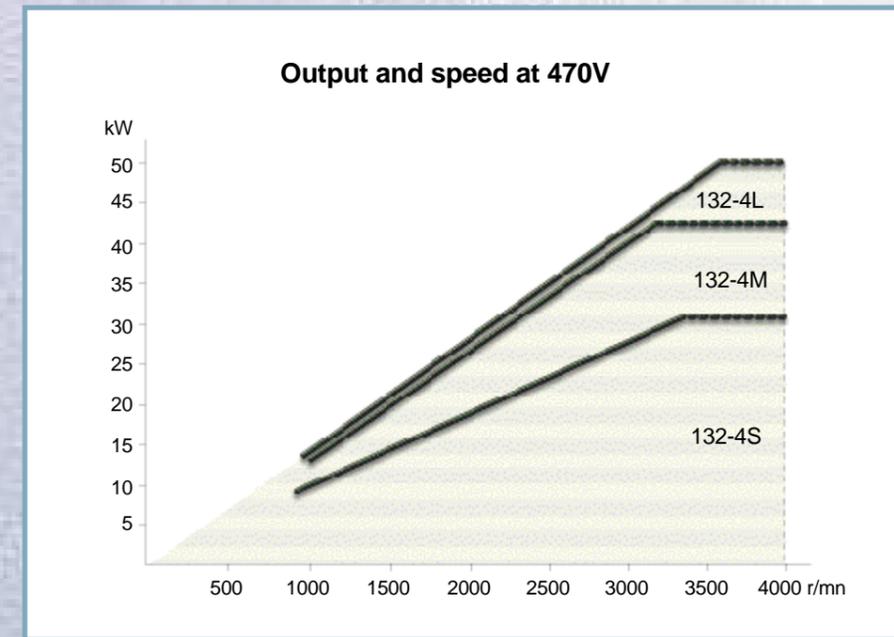
# Technical data for LAP 112-2M, 112-2L

with cooling forms IC 17, IC 37 and IC 06



# Technical data for LAP 132-4S, 132-4M, 132-4L

with cooling forms IC 17, IC 37 and IC 06



Common technical data	Units	LAP 112-2M	LAP 112-2L
Max.mechanical speed	r/min	5000	5000
Min.speed at constant torque	r/min	40	40
Moment of inertia	kgm <sup>2</sup>	0.03	0.04
Excitation power	W	420	500
Maximum rated voltage	V	620	620
Excitation voltage(at rated voltage)	V	180/220/370	180/220/370
Volume of cooling air	m <sup>3</sup> /h	235	235
Internal air pressure drop(with IC 17, IC 37)	Pa	375	375
Weight(excl.accessories)			
• Foot mounting	kg	90	96
• Flange mounting	kg	102	108

### Conversion table

1kg=2.20lb  
 1kgm<sup>2</sup>=23.73lb.ft<sup>2</sup>  
 1kW=1.34HP  
 1Nm=0.7375 lbf.ft  
 1m<sup>3</sup>/s=35.31 cu.ft/s  
 1m<sup>3</sup>/h=0.59 cu ft/min  
 1Pa=1N/m<sup>2</sup>=0.1mmH<sub>2</sub>O=1.45 × 10<sup>-4</sup>lbf/sq.in(Psi)  
 1atm=1.0 × 10<sup>5</sup>Pa

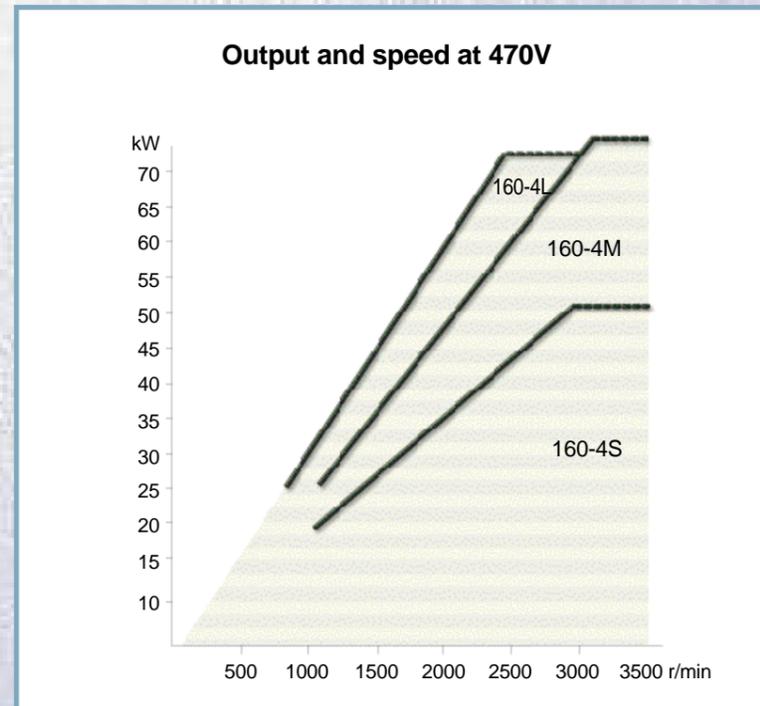
Common technical data	Units	LAP 132-4S	LAP 132-4M	LAP 132-4L
Max.mechanical speed	r/min	4000	4500	4000
Min.speed at constant torque	r/min	40	40	40
Moment of inertia	kgm <sup>2</sup>	0.10	0.12	0.14
Excitation power	W	750	830	1000
Maximum rated voltage	V	620	620	620
Excitation voltage(at rated voltage)	V	180/220/370	180/220/370	180/220/370
Volume of cooling air	m <sup>3</sup> /h	470	470	470
Internal air pressure drop(with IC 17, IC 37)	pa	550	550	550
Weight(excl.accessories)				
• Foot mounting	kg	115	135	160
• Flange mounting	kg	130	150	175

### Conversion table

1kg=2.20lb  
 1kgm<sup>2</sup>=23.73lb.ft<sup>2</sup>  
 1kW=1.34HP  
 1Nm=0.7375 lbf.ft  
 1m<sup>3</sup>/s=35.31 cu.ft/s  
 1m<sup>3</sup>/h=0.59 cu ft/min  
 1pa=1N/m<sup>2</sup>=0.1mmH<sub>2</sub>O=1.45 × 10<sup>-4</sup>lbf/sp.in(Psi)  
 1atm=1.0 × 10<sup>5</sup>ap

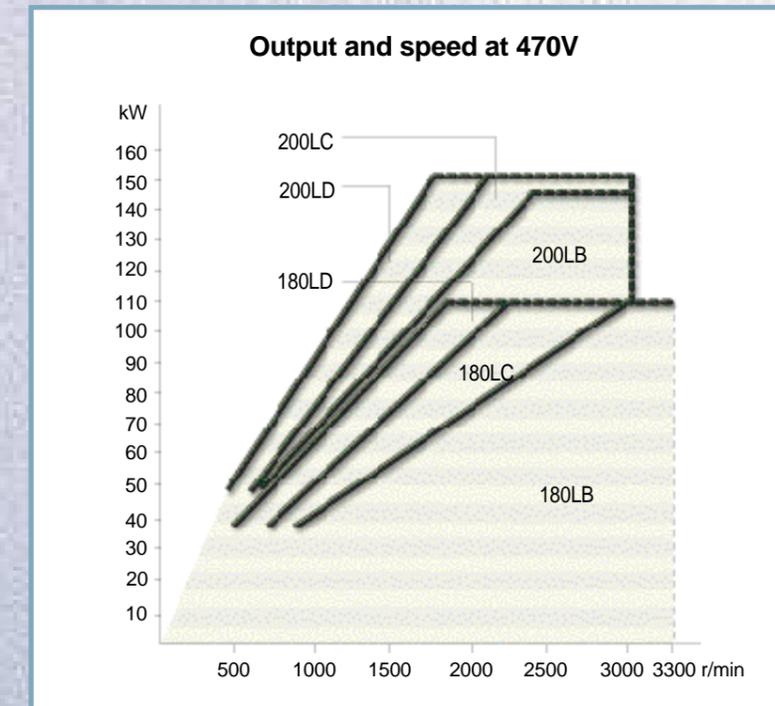
# Technical data for LAP 160-4S, 160-4M, 160-4L

with cooling forms IC 17, IC 37 and IC 06



# Technical data for LAR 180 and 200

with cooling forms IC 17, IC 37, IC 06 and IC W 37A86



Common technical data	Units	LAP 160-4S	LAP 160-4M	LAP 160-4L
Max.mechanical speed	r/min	3500	3500	3500
Min.speed at constant torque	r/min	40	40	40
Moment of inertia	kgm <sup>2</sup>	0.22	0.25	0.31
Excitation power	W	1050	1250	1400
Maximum rated voltage	V	550	550	550
Excitation voltage(at rated voltage)	V	180/220/370	180/220/370	180/220/370
Volume of cooling air	m <sup>3</sup> /h	820	820	820
Internal air pressure drop(with IC 17, IC 37)	Pa	500	500	500
Weight(excl.accessories)				
Foot mounting	kg	190	220	265
Flange mounting	kg	215	245	290

### Conversion table

1kg=2.20lb  
 1kgm<sup>2</sup>=23.73lb.ft<sup>2</sup>  
 1kW=1.34HP  
 1m<sup>3</sup>/h=0.59 cu ft/min  
 1Pa=1N/m<sup>2</sup>=0.1mmH<sub>2</sub>O=1.45 × 10<sup>-4</sup>lb/sq.in(PSI)  
 1atm=1.0 × 10<sup>5</sup>Pa

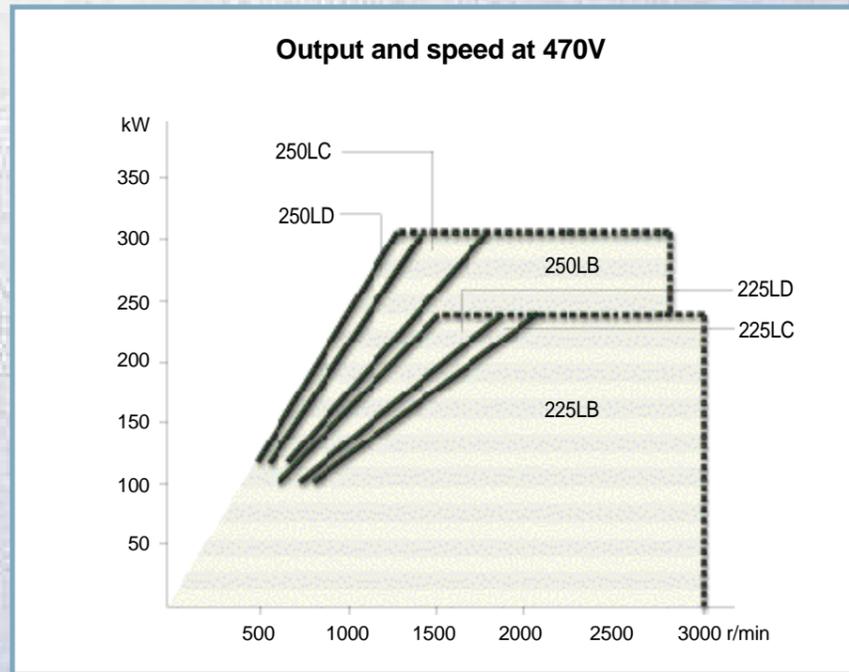
Common technical data	Units	LAR 180LB	LAR 180LC	LAR 180LD	LAR 200LB	LAR 200LC	LAR 200LD
Max.mechanical speed	r/min	3300	3300	3300	3000	3000	3300
with IM 2101, IM 2111	r/min	3300	2900	2200	2400	2000	1600
Moment of inertia	kgm <sup>2</sup>	0.4	0.5	0.65	1.1	1.2	1.4
Excitation power	kW	1700	1800	1900	1700	1900	2100
Maximum rated voltage	V	620	620	620	620	620	620
Excitation voltage	V	220	220	220	220	220	220
Volume of cooling air	m <sup>3</sup> /h	900	900	900	1120	1120	1120
Internal air pressure drop (with IC 17, IC 37)	Pa	950	950	950	1200	1200	1200
Weight(excl.accessories)	kg	335	385	445	525	565	640

### Conversion table

1kg=2.20lb  
 1kgm<sup>2</sup>=23.73lb.ft<sup>2</sup>  
 1kW=1.34HP  
 1Nm=0.7375 lb.ft  
 1m<sup>3</sup>/s=35.31 cu.ft/s  
 1m<sup>3</sup>/h=0.59 cu ft/min  
 1Pa=1N/m<sup>2</sup>=0.1mmH<sub>2</sub>O=1.45 × 10<sup>-4</sup>lb/sq.in(PSI)  
 1atm=1.0 × 10<sup>5</sup>Pa

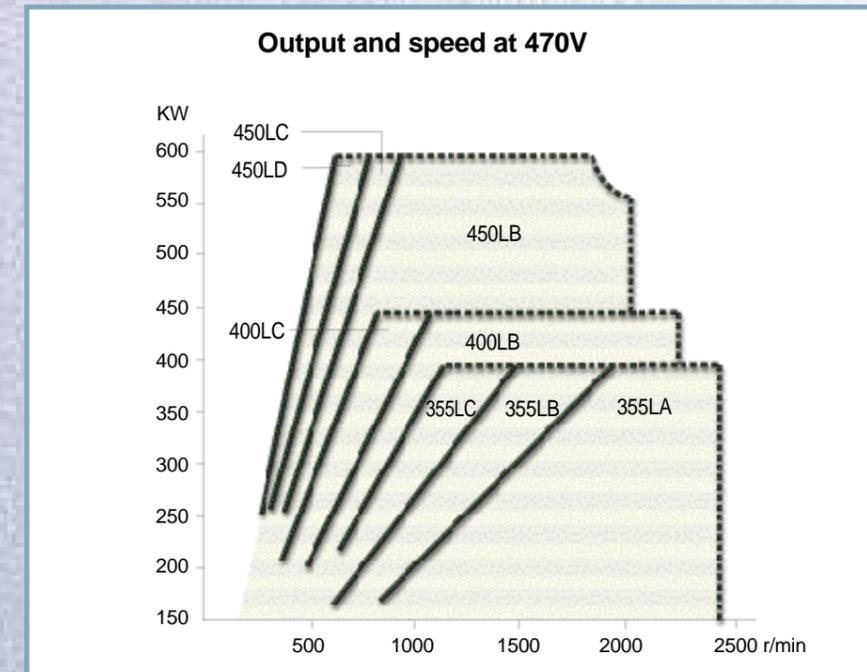
# Technical data for LAR 225 and 250

with cooling forms IC 17, IC 37, IC 06 and IC W37A86



# Technical data for LAB 355, 400 and 450

with cooling forms IC 17, IC 37, IC 06 and IC W37A86



Common technical data	Units	LAR 225LB	LAR 225LC	LAR 225LD	LAR 250LB	LAR 250LC	LAR 250LD
Max.mechanical speed	r/min	3000	3000	3000	2800	2800	2800
with IM 2101, IM 2111	r/min	2000	1800	1600	1600	1350	1300
Moment of inertia	kgm <sup>2</sup>	2.0	2.2	2.5	3.7	4.1	4.6
Excitation power	kW	2700	3000	3300	3000	3300	3600
Maximum rated voltage	V	620	620	620	620	620	620
Excitation voltage	V	220	220	220	220	220	220
Volume of cooling air	m <sup>3</sup> /s	0.5	0.5	0.5	0.6	0.6	0.6
Internal air pressure drop (with IC 17, IC 37)	Pa	1400	1400	1400	1500	1500	1500
Weight(excl.accessories)	kg	760	830	890	1040	1140	1260

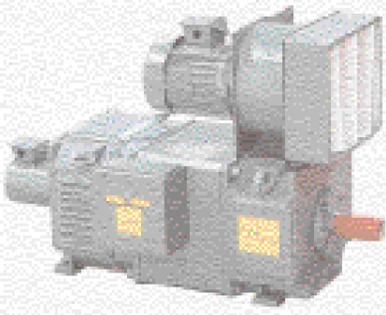
Common technical data	Units	LAB 355LA	LAB 355LB	LAB 355LC	LAB 400LB	LAB 400LC	LAB 450LB	LAB 450LC	LAB 450LD
Max.mechanical speed	r/min	2400	2400	2400	2200	2200	2000	2000	1800
Moment of inertia	kgm <sup>2</sup>	6.1	7.1	8.4	13.2	15.3	25.2	29.5	33.8
Excitation power	kW	1.9	2.1	2.3	2.4	3.6	3.5	3.2	3.0
Maximum rated voltage	V	815	815	815	815	815	815	815	815
Excitation voltage	V	180	180	180	180	180	180	180	180
Quantity of cooling air	m <sup>3</sup> /s	1.3	1.3	1.3	1.4	1.4	1.8	1.8	1.8
Internal air pressure drop (with IC 17, IC 37)	Pa	1200	1200	1200	1100	1100	1200	1200	1200
Weight(excl.accessories)	kg	1660	1900	2180	2740	3070	3500	4010	4520

### Conversion table

1kg=2.20lb	1Nm=0.7375 lbf.ft	1m <sup>3</sup> /h=0.59 cu ft/min
1kgm <sup>2</sup> =23.73lb.ft <sup>2</sup>	1Nm=0.7375 lbf.ft	1Pa=1N/m <sup>2</sup> =0.1mmH <sub>2</sub> O=1.45 × 10 <sup>-4</sup> lbf/sq.in(Pa)
1kW=1.34HP	1m <sup>3</sup> /s=35.31 cu.ft/s	1atm=1.0 × 10 <sup>5</sup> Pa

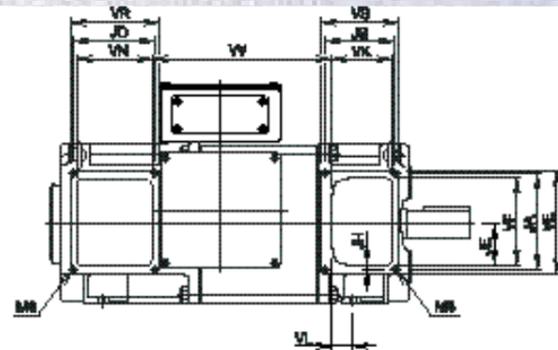
### Conversion table

1kg=2.20lb	1Nm=0.7375 lbf.ft	1m <sup>3</sup> /h=0.59 cu ft/min
1kgm <sup>2</sup> =23.73lb.ft <sup>2</sup>	1m <sup>3</sup> /s=35.31 cu.ft/s	1Pa=1N/m <sup>2</sup> =0.1mmH <sub>2</sub> O=1.45 × 10 <sup>-4</sup> lbf/sq.in(Pa)
1kW=1.34HP		1atm=1.0 × 10 <sup>5</sup> Pa

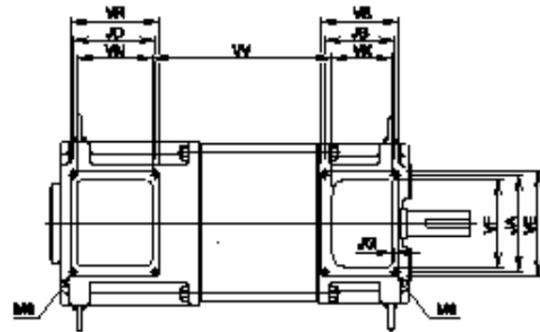


# Basic Dimensions for LAP

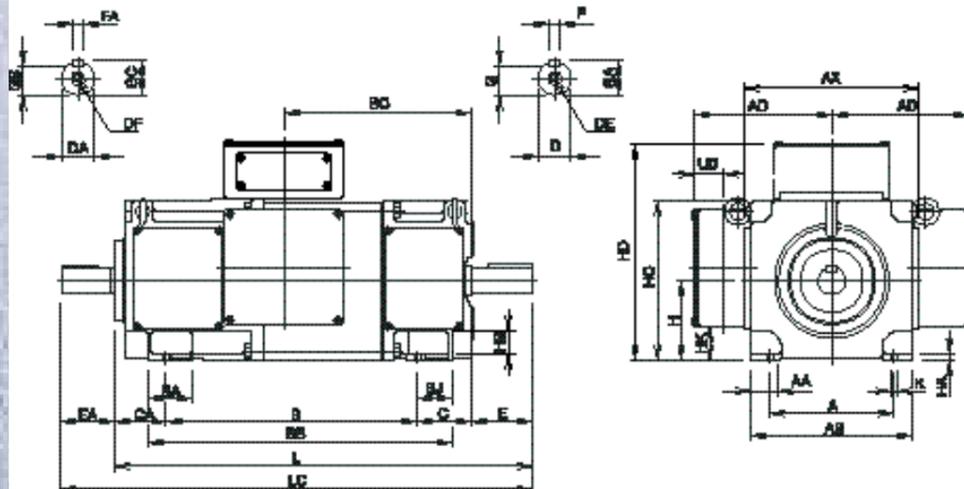
# Method of cooling IC17 and IC37



LEFT, RIGHT & TOP SIDE VENTILATOR



TOP SIDE VENTILATOR



LAP	A	AA	AB	AC	AD	B	BA	BB	BC	C	CA	D***	DA***
112-2M	190	47.5	314	220	202	403	43	439	263	70	40.0	32k6	24k6
112-2L	190	47.5	314	220	202	458	43	494	318	70	40.0	32k6	24k6
132-4S	216	47.5	354	260	222	437	50	487	293	89	49.5	38K6	32K6
132-4M	216	47.5	354	260	222	482	50	532	338	89	49.5	38k6	32k6
132-4L	216	47.5	354	260	222	532	50	582	388	89	49.5	38k6	32k6
160-4S	254	56.0	441	316	252	475	56	531	342	108	56.0	48k6	38k6
1604M	254	56.0	441	316	252	522	56	578	389	108	56.0	48k6	38k6
160-4L	254	56.0	441	316	252	587	56	643	454	108	56.0	48k6	38k6

LAP	DE	DF	E	EA	F*	FA*	G	GA	GB	GC	H**	HA	HC
112-2M	M10	M10	80	50	10	8	27.0	35.0	20.0	27.0	112	10	252
112-2L	M10	M10	80	50	10	8	27.0	35.0	20.0	27.0	112	10	252
132-4S	M10	M10	80	80	10	10	33.0	41.0	27.0	35.0	132	12	272
132-4M	M10	M10	80	80	10	10	33.0	41.0	27.0	35.0	132	12	272
132-4L	M10	M10	80	80	10	10	33.0	41.0	27.0	35.0	132	12	272
160-4S	M16	M10	110	80	14	10	42.5	51.5	33.0	41.0	160	15	316
160-4M	M16	M10	110	80	14	10	42.5	51.5	33.0	41.0	160	15	316
160-4L	M16	M10	110	80	14	10	42.5	51.5	33.0	41.0	160	15	316

LAP	HD	HK	JA	JB	K	L	LC	VG	VL	VN	VR	VT	VV
112-2M	236	54	110	110	12	591.0	643.0	105	75	100	125	125	233.0
112-2L	236	54	110	110	12	646.0	698.0	105	75	100	125	125	288.0
132-4S	276	74	150	125	12	653.5	753.5	145	65	110	140	165	255.5
132-4M	276	74	150	125	12	698.5	780.5	145	65	110	140	165	300.5
132-4L	276	74	150	125	12	748.5	830.5	145	65	110	140	165	350.5
160-4S	327	116	190	145	15	747.0	829.0	180	70	130	160	204	278.0
160-4M	327	116	190	145	15	794.0	876.0	180	70	130	160	204	325.0
160-4L	327	116	190	145	15	859.0	941.0	180	70	130	160	204	390.0

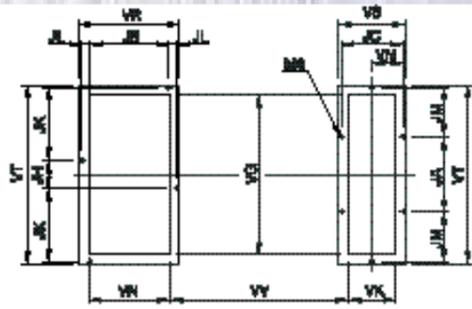
Remarks \* F, FA Tolerance ISO h9  
 \*\* H Tolerance -0.5  
 \*\*\* D, DA Tolerance ISO m6



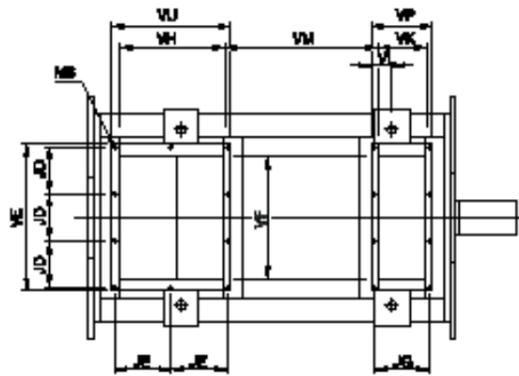


# Basic Dimensions for LAB

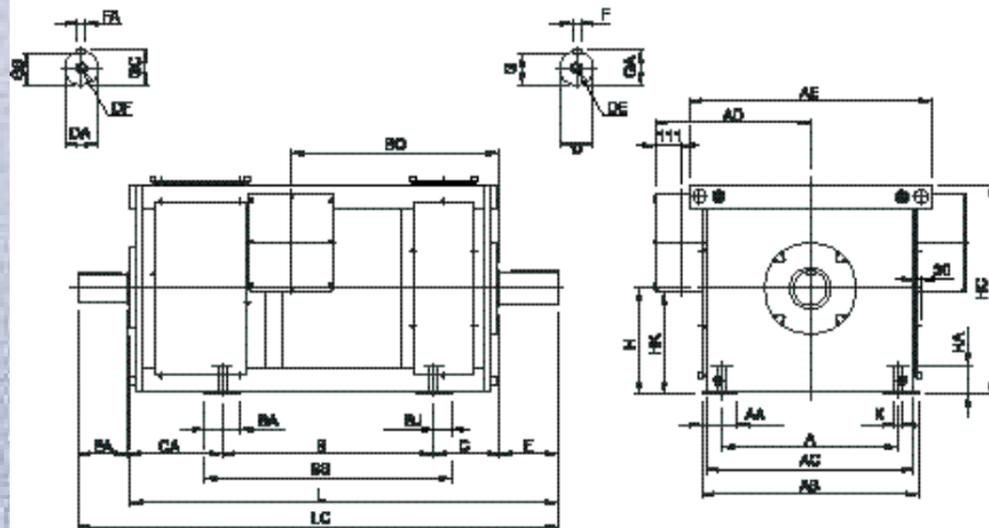
# Method of cooling IC17 and IC37



LEFT, RIGHT & TOP SIDE VENTILATOR



BOTOM SIDE VENTILATOR



LAB	A	AA	AB	AC	AD	B	BA	BB	BC	C	CA	D***	DA***	DE	DF
355LA	610	125	734	694	592	630	150	788	586	254	310	110	95	M24	M24
355LB	610	125	734	694	592	710	150	868	661	254	305	110	95	M24	M24
355LC	610	125	734	694	592	800	150	958	756	254	310	110	95	M24	M24
400LB	686	150	824	784	637	800	150	953	771	280	306	125	110	M24	M24
400LC	686	150	824	784	637	900	150	1053	871	280	306	125	110	M24	M24
450LB	750	150	924	884	687	800	150	954	786	280	402	140	125	M30	M24
450LC	750	150	924	884	687	900	150	1054	886	280	402	140	125	M30	M24
450LD	750	150	924	884	687	1000	150	1154	986	280	402	140	125	M30	M24
LAB	E	EA	F*	FA*	G	GA	GB	GC	H**	HA	HC	HD	HK	JA	JB
355LA	210	170	28	25	100	116	86	100	355	98	702	810	257	320	275
355LB	210	170	28	25	100	116	86	100	355	98	702	810	257	320	275
355LC	210	170	28	25	100	116	86	100	355	98	702	810	257	320	275
400LB	210	210	32	28	114	132	100	116	400	118	792	900	337	320	255
400LC	210	210	32	28	114	132	100	116	400	118	792	900	337	320	255
450LB	250	210	36	32	128	148	114	132	450	118	892	1000	437	320	336
450LC	250	210	36	32	128	148	114	132	450	118	892	1000	437	320	336
450LD	250	210	36	32	128	148	114	132	450	118	892	1000	437	320	336
LAB	JC	JD	JE	JG	JH	JK	JL	JM	JN	K	L	LC	VE	VF	VG
355LA	247	150	211	223	300	177	35	167	123	28	1401	1574	484	414	534
355LB	247	150	211	223	300	177	35	167	123	28	1476	1649	484	414	534
355LC	247	150	211	223	300	177	35	167	123	28	1571	1744	484	414	534
400LB	247	166	200	223	220	217	35	167	123	35	1593	1806	524	424	584
400LC	247	166	200	223	220	217	35	167	123	35	1693	1906	524	424	584
450LB	262	200	242	238	120	310	35	210	131	35	1729	1942	624	524	684
450LC	262	200	242	238	120	310	35	210	131	35	1829	2042	624	524	684
450LD	262	200	242	238	120	310	35	210	131	35	1929	2142	624	524	684
LAB	VH	VK	VL	VM	VN	VP	VR	VS	VT	VU	VV				
355LA	385	187	46	400	285	245	365	267	674	444	500				
355LB	385	187	46	475	285	245	365	267	674	444	575				
355LC	385	187	46	570	285	245	365	267	674	444	670				
400LB	365	187	45	560	265	245	345	267	674	422	660				
400LC	365	187	45	660	265	245	345	267	674	422	760				
450LB	446	202	60	560	346	260	425	282	760	506	660				
450LC	446	202	60	660	346	260	425	282	760	506	760				
450LD	446	202	60	760	346	260	425	282	760	506	860				

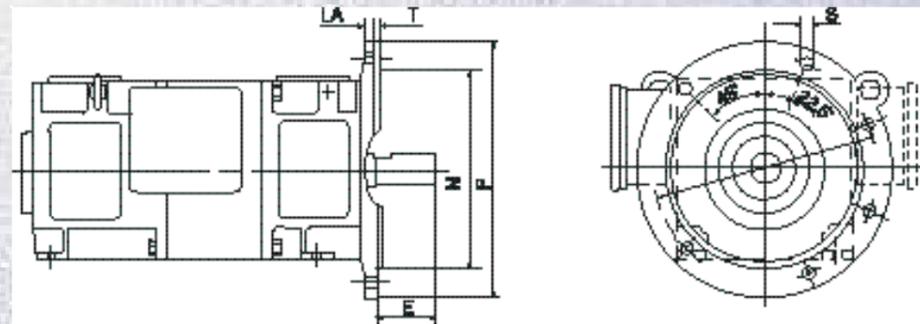
Remarks \* F, FA Tolerance ISO h9  
 \*\* H Tolerance 0  
 -1  
 \*\*\* D, DA Tolerance ISO m6



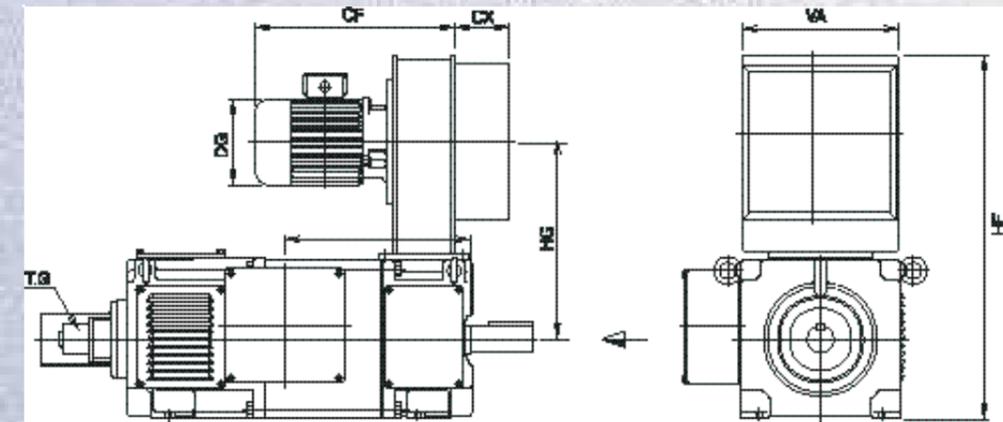
# Flange mounting (IM 2101, IM 2111)

# Additional dimensions for IC 06(cooling fan)

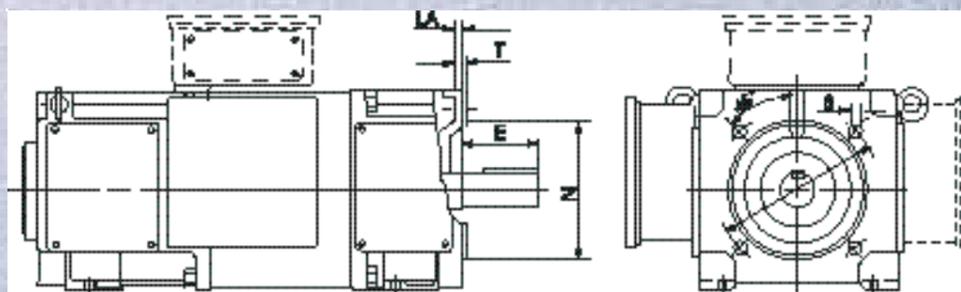
## LAP



TYPE	E	LA	M	N	P	S	T
LAP 112-2	80	21	300	250j6	350	4 × 19	5
LAP 132-4	80	21	350	300j6	400	4 × 19	5
LAP 160-4	110	20	400	350j6	450	8 × 19	5



## LAR



TYPE	E	LA	M	N	S	T
LAR 180	140	18	300	250j6	4 × 19	5
LAR 200	140	24	350	300j6	4 × 19	5
LAR 225	170	25	400	350j6	8 × 19	5
LAR 250	170	26	400	350j6	8 × 19	5

TYPE	CF	CX	DG	HF	HG	VA
LAP 112-2	321	107	154	457	133	220
LAP 132-4	339	107	154	505	153	254
LAP 160-4	357	107	180	616	183	315
LAR 180	456	125	199	824	272	356
LAR 200	471	125	199	885	287	395
LAR 225	476	125	244	933	312	395
LAR 250	501	125	244	983	337	395
LAB 355	544	225	244	1455	405	695
LAB 400	544	225	244	1545	450	695
LAB 450	602	225	284	175	540	764



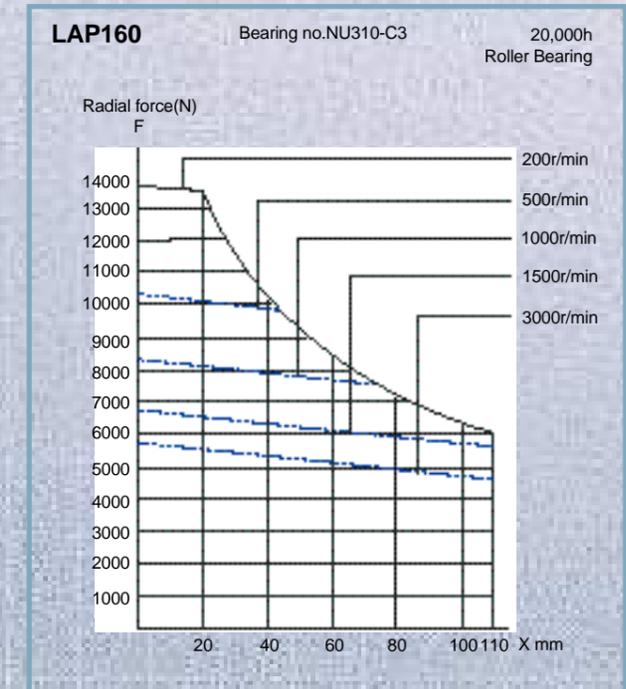
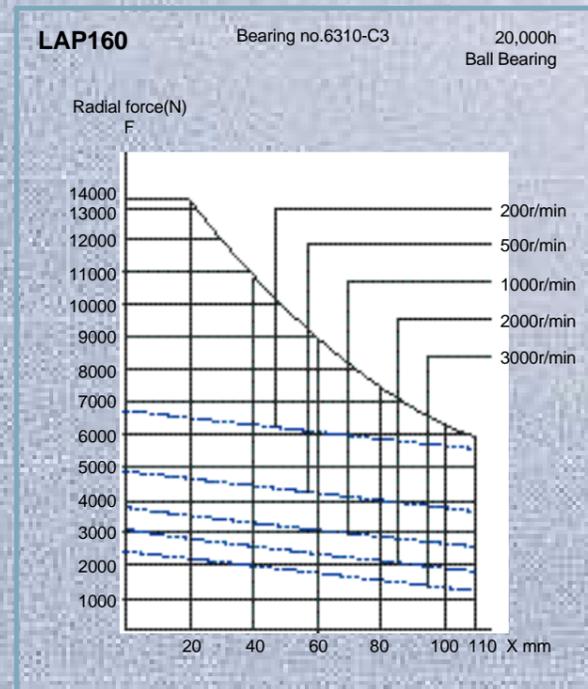
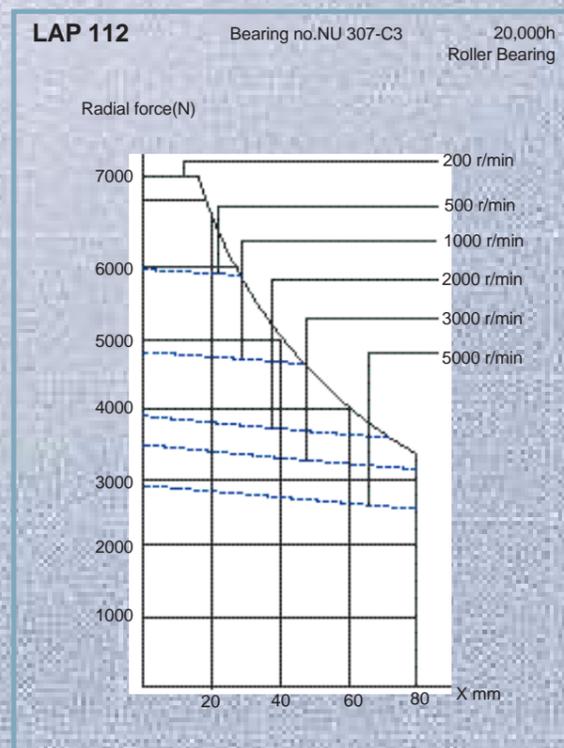
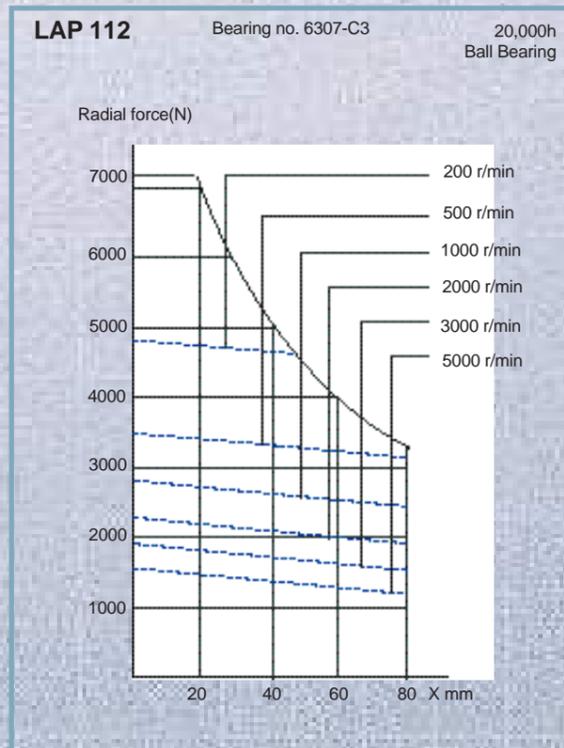
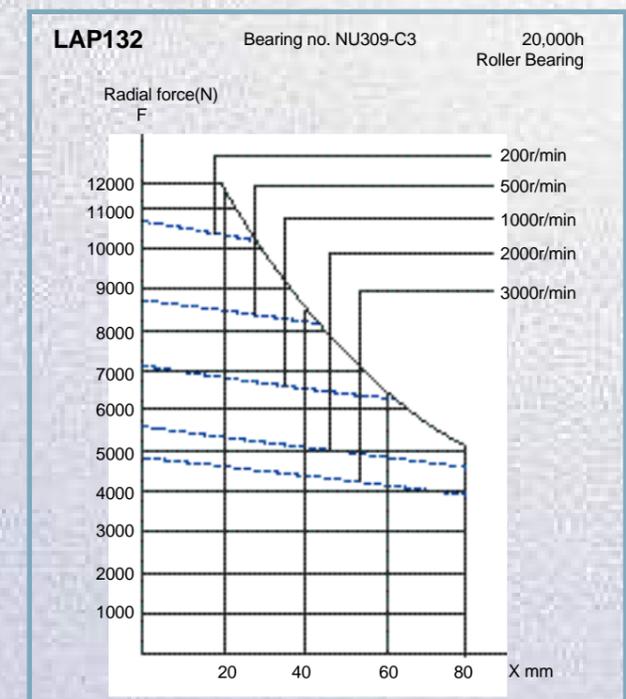
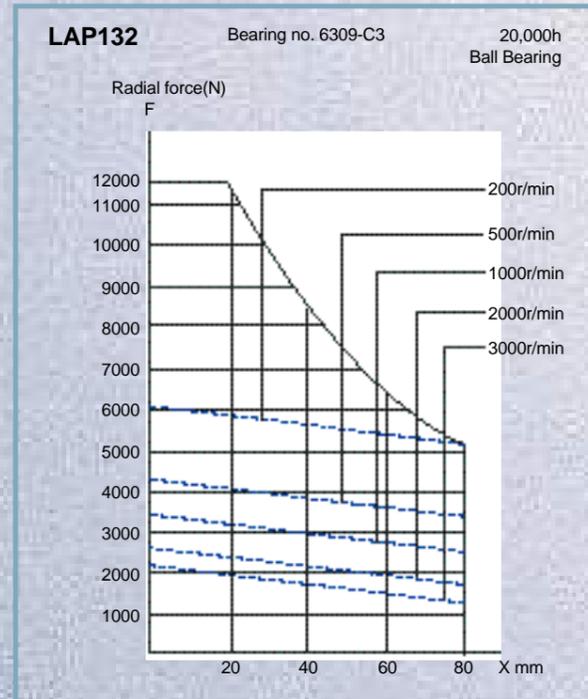
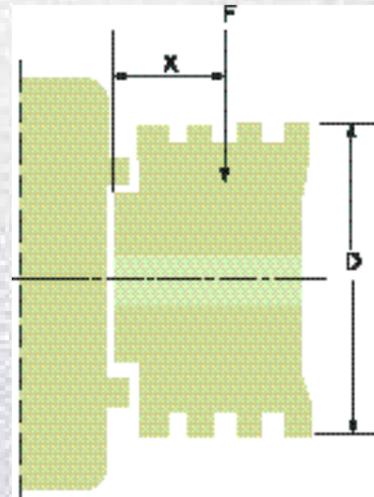
### Bearing load

Motors for v-belt drive must be ordered with a roller bearing at the d-end, instead of a ball bearing which is standard.  
The minimum belt pulley diameter  $D_r$ (mm) can be obtained from the formula:

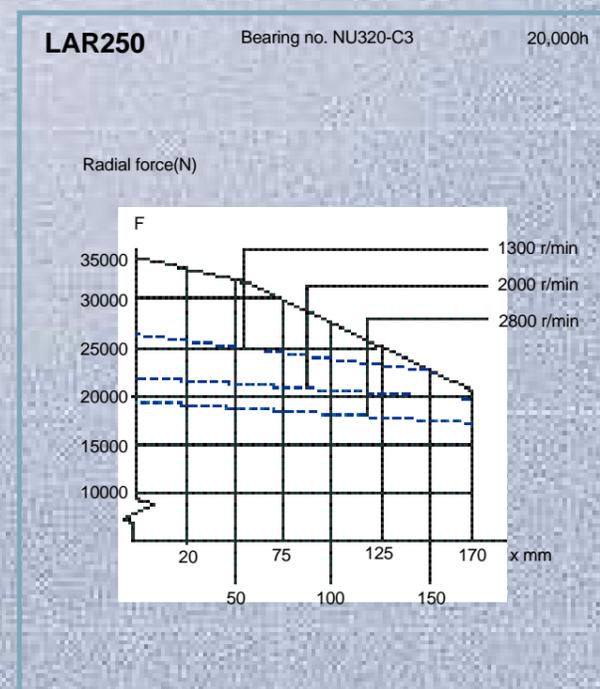
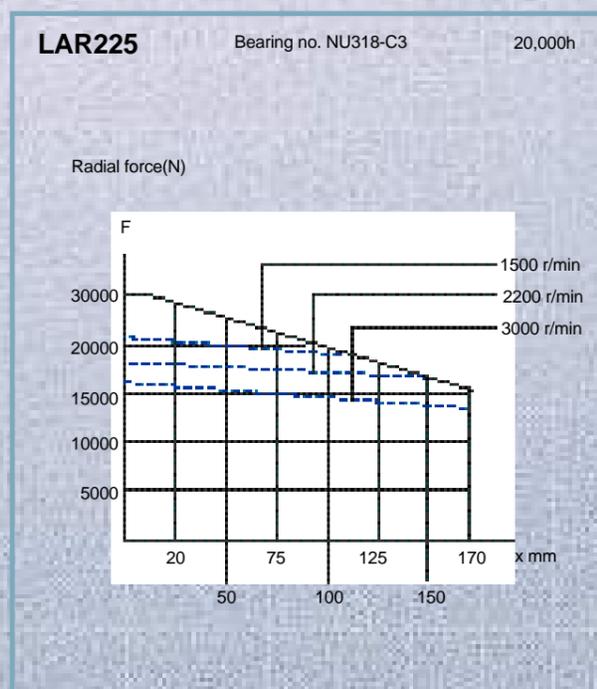
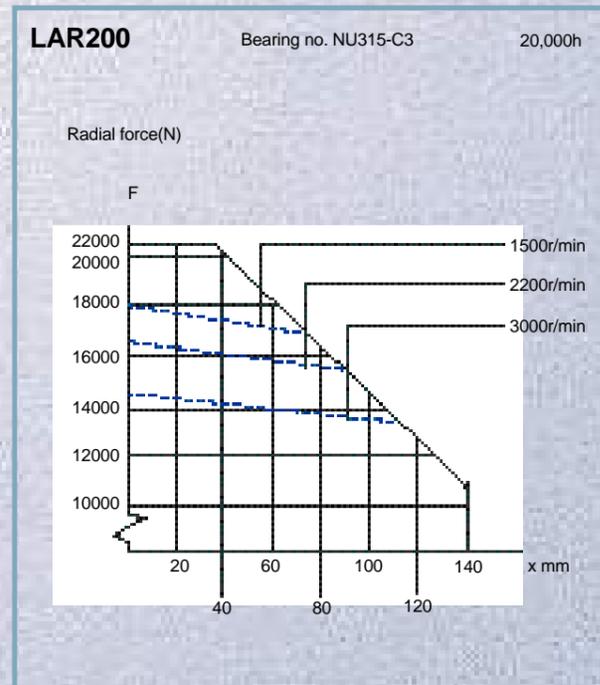
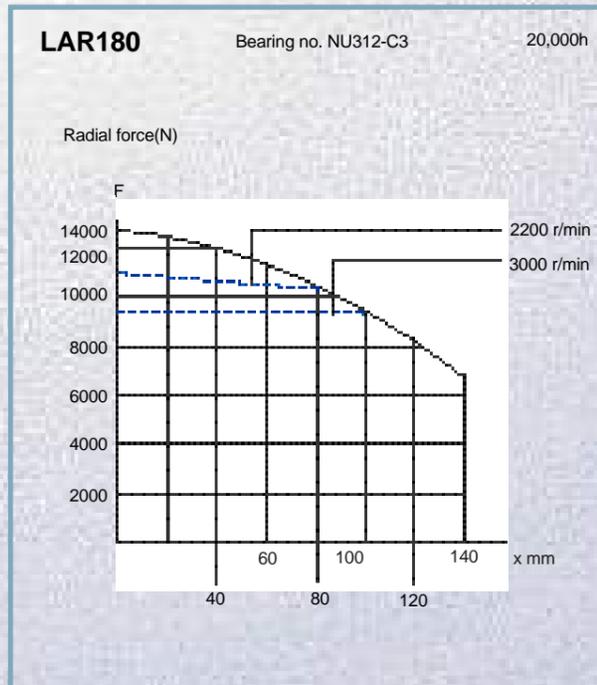
$$D_r \geq 2.5 \cdot \frac{2 \cdot T}{F_R} \cdot 10^3$$

- $D_r$  = min. pulley diameter(mm)
- 2.5 = tensioning constant for V-belts
- T = rated torque(Nm)
- $F_R$  = radial force(N)
- X = Dimension for load centre(mm)

The permissible shaft loading is based on a bearing life of 20,000 hours.



# Check list for choosing motor



<b>1. Driven object</b>	: : Direct coupled drive <input type="checkbox"/> V-belt drive <input type="checkbox"/> : Axial force on moter shaft <input type="checkbox"/> : Radial force motor shaft <input type="checkbox"/>
<b>2. Environment</b>	: Clean <input type="checkbox"/> Dirty <input type="checkbox"/> Dripping water <input type="checkbox"/> Gas <input type="checkbox"/>
<b>3. Service</b>	: Motor <input type="checkbox"/> Generator <input type="checkbox"/> Brake generator <input type="checkbox"/>
<b>4. Motor duty</b>	: T Nm torque : P = kW, n = r/min at base speed : P = kW, n = r/min at min. speed : P = kW, n = r/min at max.speed : P = kW, n = r/min
<b>5. Type of operation</b>	<input type="checkbox"/> : continuous (S1) Short time(S2) : min. Intermittent(S3) : % load(10min. period)
<b>6. Max. load in % of rated load</b>	: % for sec
<b>7. Armature voltage</b>	: V
<b>8. Excitation voltage</b>	: V
<b>9. Direction of rotation (seen from D-end)</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>10. Ambient temperature</b>	: °C
<b>11. Height above sea level</b>	: m
<b>12. Motor standards</b>	: IEC 34 <input type="checkbox"/> Other <input type="checkbox"/>
<b>13. Converter supply</b>	: A.C. supply voltage: V, phase: , Hz: fully controlled <input type="checkbox"/> , half controlled <input type="checkbox"/> other