Part number:

HYDROMA
HYDRAULICKÉ SYSTÉMY

HIDROMA SISTEMS
UKŁADY HYDRAULICZNE

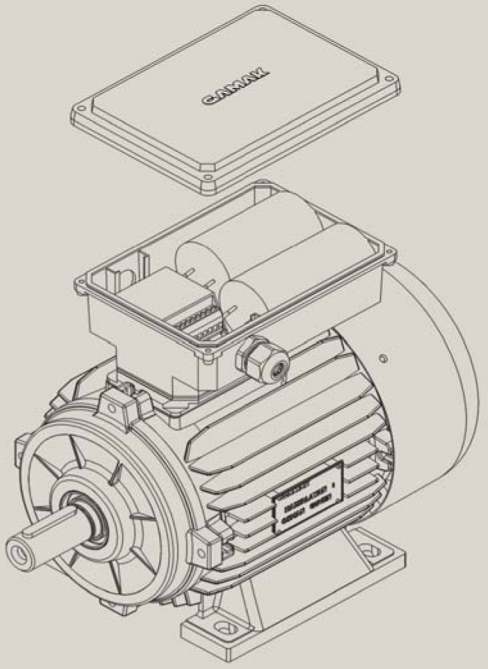
HYDROMA
ГИДРАВЛИЧЕСКИЕ СИСТЕМЫ

SINGLE PHASE MOTORS

- **Standard Induction Motors**

  - Permanent Split Capacitor Motors
  - Capacitor Start / Capacitor Run Motors

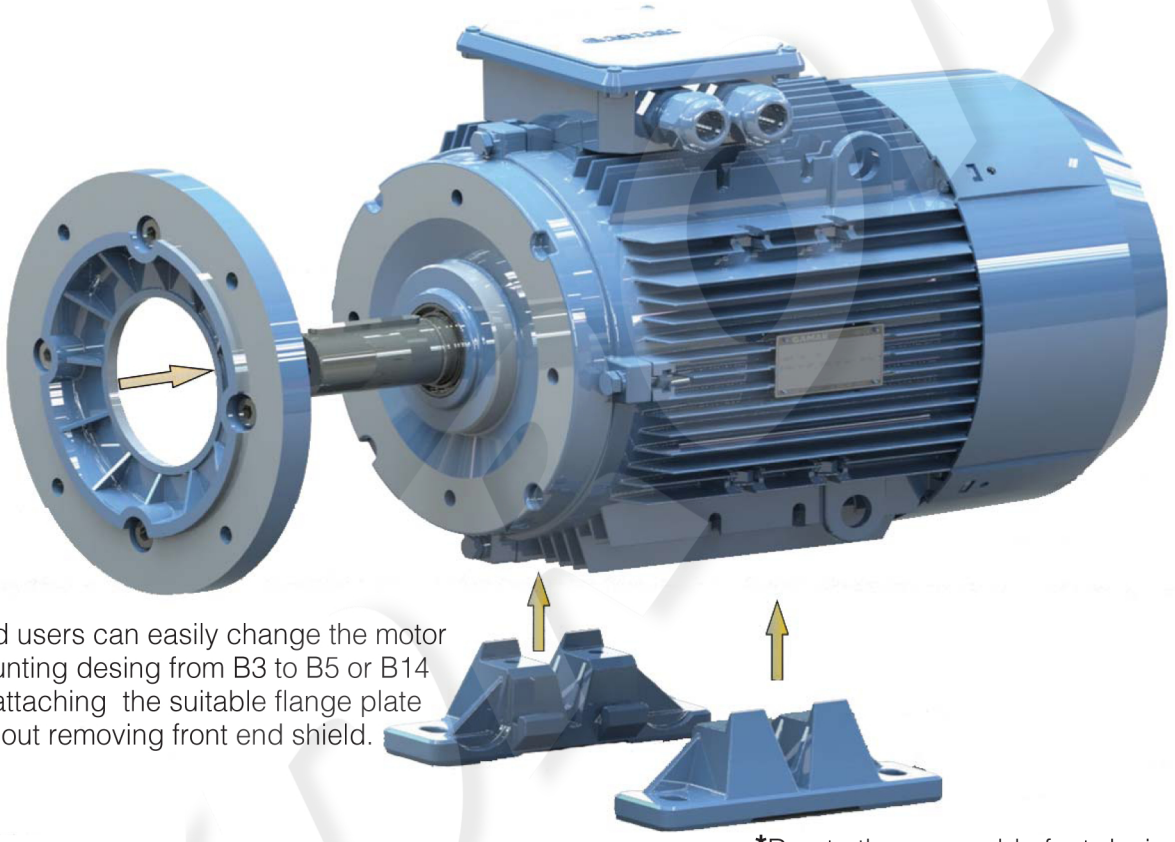
- **Shaded Pole Motors**



NEW MODULAR ELIT SERIES

MSD EL 100 L 4 a

EL : Elit Series



* End users can easily change the motor mounting desing from B3 to B5 or B14 by attaching the suitable flange plate without removing front end shield.

*Due to the removable feet design motor terminal box can also be rotated at 90 degrees allowing motor leads to be connected on 3 side of the motor.

SINGLE PHASE, TOTALLY ENCLOSED (IP 55) GENERAL PURPOSE CAGE INDUCTION MOTORS

In many respects, single phase motors have the same properties as three-phase motors and mechanically they meet the same standards. The rotating field which develops the torque of the motor is formed by main and auxiliary windings. Dependent on the application, it is possible to use either permanent split capacitor motor or capacitor start/capacitor run motor. Each type has its benefits and limitations as described below :

Permanent split capacitor motors

This type of single-phase motors have one capacitor mounted in the terminal box, permanently connected in series with the auxiliary winding. Efficiency and power factors are improved. Starting torque is between 50% - 80% of full load torque which makes this design particularly suitable for applications that require a light starting torque, such as circular saws, drilling machines, polishing machines, lawn movers, fans and blowers.

Capacitor start / Capacitor run motors

This type of single-phase motors have two capacitors, short time rated high value starting capacitor and continuously rated low value permanent capacitor and an electronic start relay altogether mounted in the terminal box. The starting torque is between 200% - 250% of full load torque which makes this design particularly suitable for applications that require a high starting torque, such as compressors, hydraulic pumps and centrifugal pump drives with high starting requirements.

The wires coming out from the main and auxiliary windings and the cables of run capacitor and starting capacitor are all connected to the terminals of the electronic start relay. When the mains voltage is switched on to terminals L1 and L2, the main winding, the series connection of the auxiliary winding, the run capacitor and the starting capacitor are energized. The motor thus yields a high starting torque and begins to accelerate. A control circuit in the relay continuously measures the voltage across the auxiliary winding. When the motor has reached about %75-80 of its nominal speed, the electronic relay disconnects the starting capacitor from the starting circuit. The motor then continues to run on the two windings and the permanent capacitor like a normal permanent split capacitor motor.

An independent safety timer is incorporated in the electronic start relay for protecting the starting capacitor, should the rotor be locked or in the event of a very long start. This time function activates the electronic start relay if the motor during a start has not reached its nominal speed within about 2 seconds.

⚠ Maximum three starts are permitted per minute in order to ensure the protection of electrolytic type starting capacitor against damage.

⚠ Starting capacitors are fitted with resistance to ensure that they are discharged. Please consult us for the resistance and capacity values if the capacitors are needed to be replaced with the new ones.

Electronic start relay is designed to function at supply voltage of 220-240 V, 50 / 60 Hz. It eliminates the harmonics associated with the network and is protected against high currents.

The life of all-electronic start relay is endless when compared to centrifugul switches and different types of electromechanical relays.

The centrifugal and automatic switches have the disadvantage that they switch the starting capacitor into the circuit again, if the motor is overloaded. This has the result that the starting capacitor will be destroyed after rather a few overloads or after an excessively long starting period. Furthermore, the auxiliary windings may be damaged. When the electronic start relay has once been actuated, it can only be made to operate again when the motor is de-energized, This consequently prevents the starting capacitor from being switched in again should the motor be overloaded.

⚠ Standard single-phase motors should not run at no-load for a long period as the losses will be higher than that of a full load due to generated overvoltage which in turn will cause a fairly high temperature rise and also a reduction in the lifetime of capacitors.

Frames, end-shields and flanges

Frame size 63...112, the frames, end-shields and the flanges are made of aluminium alloy which is pressure die-casting and resistible to corrosion. B14/FT165 flanges on frame size 112 motors are cast iron.

Enclosure degrees of protection

GAMAK motors are manufactured as totally enclosed in conformity with the protection degree IP 55 which permits them to work in the ambient of dirty and humidity conditions. Upon request, any production can be made according to protection class IP 56, as well.

Terminal box

All the terminal boxes comply with degree of protection IP 65, and are placed to the front and on top of motor frames allowing an easy cable entry from both sides. Electronic start relay, start and the permanent capacitors are located in the motor terminal box and a connecting diagram is provided in the cover of terminal box.

Cable entry

Frame size	63	71	80	90	100	112
Dimensions of compression glands	Pg 11	Pg 16				
Number of compression glands	1					
Maximum cable outer dimeter mm	11	16				
Maximum conductor cross section total mm^2	1.5	2.5				

Shaft Extension

The motors of standard design are built with one cylindrical shaft extension with shaft-key fitted in accordance with IEC 60 072-1. The free shaft-ends have threaded center-bore to DIN 332-2 form D. Motors with double shaft extension may be delivered on special orders.

The run-out of the shaft, concentricity of mounting spigot and the perpendicularity of the face flange are within the permissible limits (normal class) according to IEC 60 072-1. Motors with increased accuracy (Precision class) may be supplied on request.

Vibration

Shaft/rotor assemblies of all standard range motors are dynamically balanced with Half Shaft Key to the limits of grade N (normal) mechanical vibration class specified in DIN EN 60 034-14. Shaft fitments such as couplings, pulleys, gears and fans must also be balanced likewise to prevent undue vibration and adverse effects on bearing life.

Painting

The motors are painted in grey according to RAL 7031 (DIN 1843) with a protective paint. Special external coatings for protection against excessive corrosive atmospheres, chemicals and microorganism are available on request.

Storage

Motors must be kept in a dry and vibration free place if they have to be stored for a long period. The insulation resistance must be dried if necessary, before the motors are taken into operation.

Bearings

The motors are fitted with high quality noise tested single-row deep-groove radial ball bearings (DIN 625) which are both side closed (ZZ) and greased by the manufacture for life.

Standard design with single row deep groove ball bearings

Frame size	No. of pole	D.End	N.D. End	Fig. No.
63	2 & 4	6201 ZZ		1
71	2 & 4	6202 ZZ		
80	2 & 4	6204 ZZ		
90	2 & 4	6205 ZZ		
100	2 & 4	6206 ZZ		
112	2	6206 ZZ		

On request, the motors can be manufactured in fixed bearing design (Fig. 2) in order to avoid the movement of the shaft in axial direction.

Arrangement of bearings

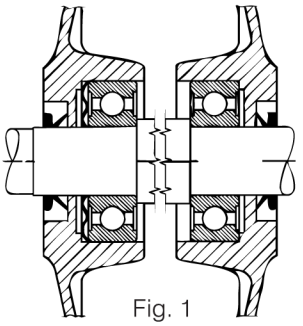


Fig. 1

D.End Floating Ball-Bearing (Spring loaded)

N.D.End Floating Ball-Bearing

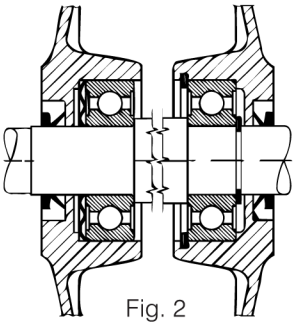


Fig. 2

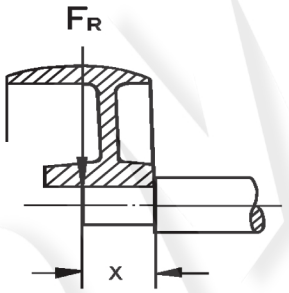
D.End Floating Ball-Bearing (Spring loaded)

N.D.End Fixed Ball-Bearing

Permissible radial loads

Standard design with single row deep groove ball bearing (Axial Force $F_a = 0$)

Frame size	3000 min^{-1}		1500 min^{-1}	
	Fx_0 (N)	$Fx_{max.}$ (N)	Fx_0 (N)	$Fx_{max.}$ (N)
63	350	300	450	390
71	400	340	500	420
80	660	540	840	680
90	730	600	910	720
100	1030	820	1300	1050
112	1020	830	-	-



Permissible external axial loads

Frame size	Horizontal Shaft				Vertical Shaft											
	Drawing	Push			Shaft down						Mil above					
					Power down			Power above			Power down			Power above		
	$F_r = 0$	max. F_r		$F_r = 0$	max. F_r		$F_r = 0$	max. F_r		$F_r = 0$	max. F_r		$F_r = 0$	max. F_r		$F_r = 0$
		X_0	X_{max}		X_0	X_{max}		X_0	X_{max}		X_0	X_{max}		X_0	X_{max}	
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
2 pole (3000 min^{-1})																
63	80	170	150	220	70	70	70	180	150	230	160	140	210	90	90	90
71	100	180	160	230	90	90	90	190	170	250	170	140	220	110	110	110
80	140	320	270	400	120	120	120	340	290	430	300	240	390	160	160	160
90	160	350	290	430	130	130	130	370	320	470	310	250	400	190	190	190
100	220	490	400	590	170	170	170	520	440	650	420	330	540	270	270	270
112	220	490	410	590	160	160	160	530	450	660	410	330	530	280	280	280
4 pole (1500 min^{-1})																
63	80	260	230	330	70	70	70	270	240	340	250	230	320	90	90	90
71	100	280	250	350	90	90	90	290	260	370	260	220	340	120	120	120
80	140	490	420	610	120	120	120	510	440	640	460	390	590	170	170	170
90	160	530	440	650	120	120	120	570	480	700	480	400	610	200	200	200
100	220	740	630	880	150	150	150	790	670	960	650	540	830	290	290	290

Voltage and Frequency

Single phase motors are normally wound for the rated supply voltages of 230V and frequency 50/60 Hz. However, motors for a supply voltage of 110V may be supplied on request. Motors will operate satisfactorily within voltage band of ±%5 of the rated voltage and ±%2 of the rated frequency. In case of continuous operation at the extreme voltage limits specified above, the temperature rise limits permitted for various insulation classes may be exceeded by 10 K maximum.

Rated output

The rated output P_N is the mechanical power in Watts available at the shaft, and it is specified on the motor name-plate. The active power P_1, is the power in Watts transmitted from the supply to the motor and it is always bigger than the mechanical power due to losses.

P_1 (W) = U.I.Cos φ

Efficiency (η), is the ratio of the mechanical power to the active power. The efficiency values given in the catalog are calculated by the method of summation of losses according to IEC 60 034-2-1:2007.

The rated outputs tabulated in this catalogue expressed in kW, refer to the mechanical power where motor is running continuously (S1) at rated load, voltage, frequency, at ambient temperature not exceeding +40°C and an altitude of installation upto 1000 m above sea-level..

Rated Torque

The torque transmitted to the motor shaft is :

$$\text{Rated torque (Nm)} = 9550 \frac{\text{Rated output (kW)}}{\text{Rated speed (min}^{-1}\text{)}}$$

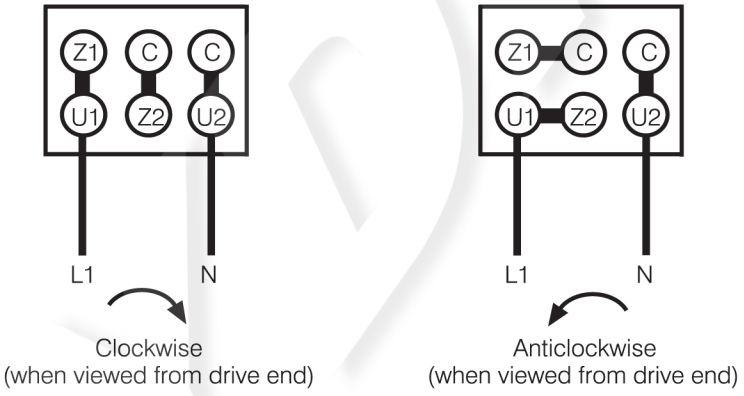
The load-torque of a motor during acceleration must always be bigger than the opposing torque of the driven machine.

⚠ Rotating magnetic field in single phase motors is formed with one phase of the A.C. supply which results with lower starting and/or nominal torque compared to three phase motors. In the event single phase motors are preferred instead of 3-phase motors, please consult GAMAK for detailed performance comparison.

Reversing direction of rotation

Single phase motors can rotate to both directions like 3-phase motors.

The direction of rotation of a split phase permanent capacitor motor can be reversed as per connection diagram below :



To change direction of rotation at Capacitor start/Capacitor run motors, swap main winding leads (black-brown) at U1 and U2 terminals on the electronic relay.

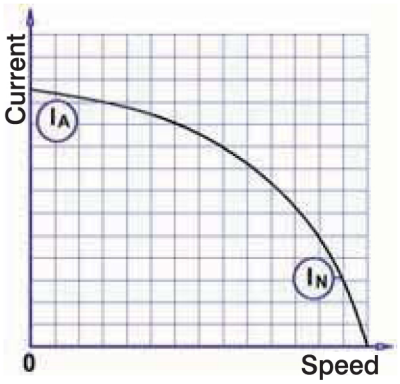
Direction of rotation must be checked by instant on/off before the motor is coupled to the driven machine.

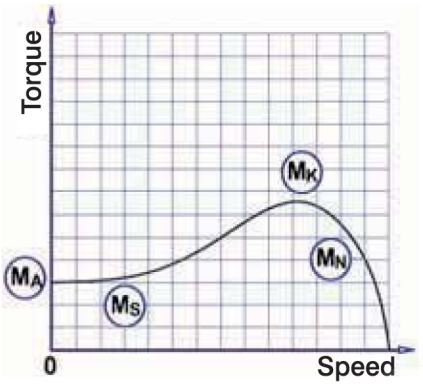
No-load operation

The voltage induced at the capacitors of single phase motors reaches to its maximum value when run at no load which results in reduction of capacitor life. Furthermore, single phase motors must not run at no load for long periods as losses at no load running is higher than that it is at full load running. Please consult GAMAK if long period of no-load running is required for the application as special winding may be necessary.

RATINGS AND PERFORMANCE

Permanent Split Capacitor Motors



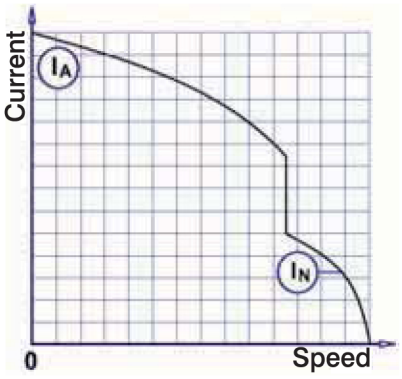


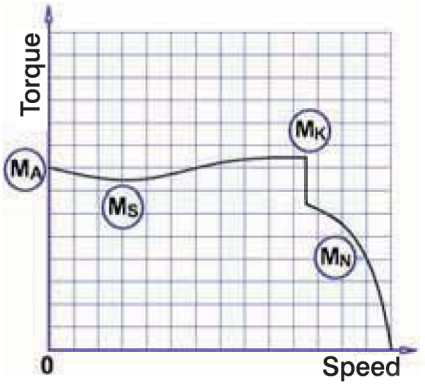
Single Phase, 230 V, 50 Hz
Duty Type : S1 (continuous)
Degree of protection : IP 55
Insulation Class : F (155 ºC)
Temp. Rise : B (80 K)

Rated output	Type	Full - load data					Starting data		Breakdown torque ratio	Permanent capacitor	Moment of inertia	Weight approx.
		Speed	Current I_N	Torque M_N	Power factor	Efficiency η	Current ratio	Torque ratio			J	B3
kW		min^{-1}	A	Nm	Cos φ	%	I_A/I_N	M_A/M_N	M_K/M_N	µF	kgm^2	kg
2 pole (3000 min^{-1})												
0,18	MD 63 2a	2860	1,3	0,60	0,94	64	4,2	0,85	2,4	8	0,00012	4,2
0,25	MD 63 2b	2870	1,6	0,83	0,98	69	4,0	0,75	2,2	10	0,00014	4,6
0,37	MD 71 2a	2885	2,5	1,22	0,96	67	4,0	0,65	2,2	15	0,00028	5,9
0,55	MD 71 2b	2865	3,5	1,83	0,98	70	3,9	0,72	2,3	20	0,00035	6,8
0,75	MD 80 2a	2770	5,0	2,59	0,96	68	3,3	0,88	1,9	30	0,00056	9,0
1,1	MD 80 2b	2770	7,0	3,79	0,95	72	3,8	0,93	2,0	35	0,00070	10,4
1,5	MD 90 S 2	2820	9,8	5,08	0,91	73	4,2	0,60	2,0	40	0,00113	13,3
2,2	MD 90 L 2	2800	13,5	7,50	0,95	75	3,4	0,50	1,7	50	0,00141	15,6
3	MD 100 L 2	2850	17,7	10,05	0,97	76	4,7	0,49	2,2	60	0,00260	20,1
4 pole (1500 min^{-1})												
0,12	MD 63 4a	1430	1,1	0,80	0,91	52	2,6	0,69	2,1	8	0,00019	4,1
0,18	MD 63 4b	1390	1,5	1,24	0,93	56	2,3	0,84	1,8	10	0,00023	4,6
0,25	MD 71 4a	1425	1,8	1,68	0,93	65	3,2	0,73	2,1	10	0,00048	6,1
0,37	MD 71 4b	1435	2,6	2,46	0,91	68	2,8	0,65	1,9	15	0,00056	6,6
0,55	MD 80 4a	1410	3,3	3,73	0,97	75	3,4	0,51	1,7	20	0,00092	8,7
0,75	MD 80 4b	1405	4,6	5,10	0,98	72	3,5	0,55	1,8	30	0,00123	10,3
1,1	MD 90 S 4	1410	7,1	7,45	0,96	70	3,5	0,63	1,9	35	0,00209	13,3
1,5	MD 90 L 4	1410	9,3	10,16	0,96	72	3,3	0,57	1,8	50	0,00265	15,8
2,2	MD 100 L 4a	1425	13,4	14,74	0,93	77	4,1	0,40	1,8	60	0,0044	21,0
3	MD 100 L 4b	1425	19,0	20,11	0,86	80	3,6	0,30	1,7	60	0,0051	23,2

RATINGS AND PERFORMANCE

Capacitor Start / Capacitor Run Motors

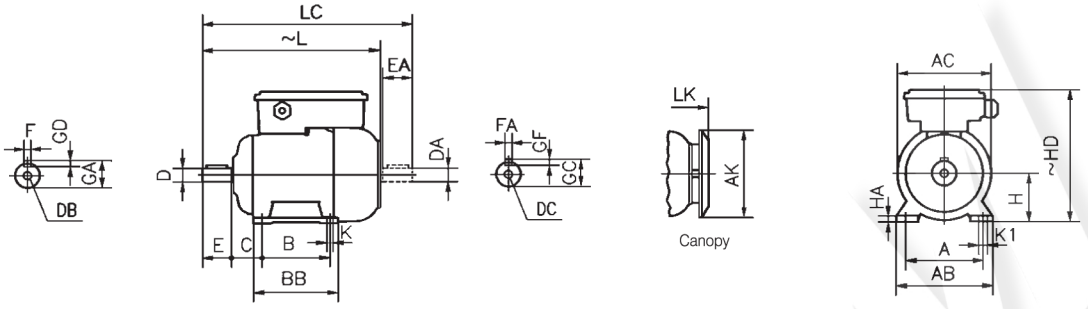




Single Phase, 230 V, 50 Hz
Duty Type : S1 (continuous)
Degree of protection : IP 55
Insulation Class : F (155 °C)
Temp. Rise : B (80 K)

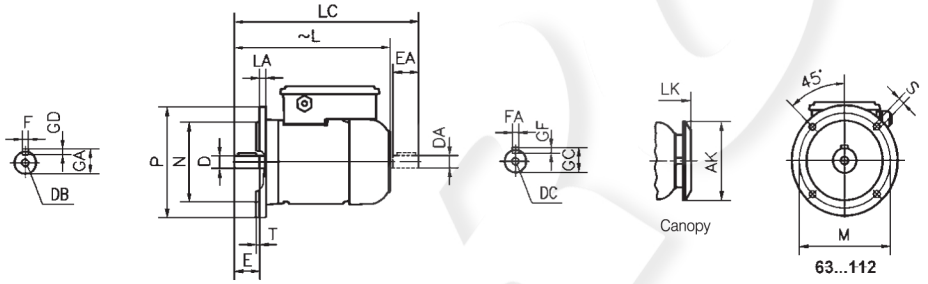
Rated output	Type	Full - load data					Starting data		Breakdown torque ratio	Starting capacitor	Permanent capacitor	Moment of inertia	Weight approx.
		Speed	Current I_N	Torque M_N	Power factor	Eff. η	Current ratio	Torque ratio		330 V	400 V	J	B3
kW		min^{-1}	A	Nm	Cos φ	%	I_A/I_N	M_A/M_N	M_K/M_N	µF	µF	kgm^2	kg
2 pole (3000 min^{-1})													
0,18	MSD 63 2a	2860	1,3	0,60	0,94	64	5,1	2,3	2,4	21-25	8	0,00012	4,5
0,25	MSD 63 2b	2870	1,6	0,83	0,98	70	4,9	2,1	2,2	30-36	10	0,00014	4,9
0,37	MSD 71 2a	2885	2,5	1,22	0,96	67	4,7	2,1	2,2	53-64	15	0,00028	6,2
0,55	MSD 71 2b	2865	3,5	1,83	0,98	70	4,7	2,2	2,3	88-106	20	0,00035	7,2
0,75	MSD 80 2a	2770	5,0	2,59	0,96	68	4,3	1,8	1,9	88-106	30	0,00056	9,4
1,1	MSD 80 2b	2770	7,0	3,79	0,95	72	4,6	1,9	2,0	130-156	35	0,00070	10,9
1,5	MSD 90 S 2	2820	9,8	5,08	0,91	73	5,4	2,0	2,0	233-280/250V	40	0,00113	13,8
2,2	MSD 90 L 2	2800	13,5	7,50	0,95	75	4,6	1,7	1,7	233-280/250V	50	0,00141	16,1
3	MSD 100 L 2	2850	17,7	10,05	0,97	76	5,3	2,1	2,2	233-280/250V	60	0,00260	20,6
4	MSD 112 M 2	2885	22,0	13,24	0,93	85	5,1	2,1	2,2	233-280/250V	60	0,00410	26,9
4 pole (1500 min^{-1})													
0,12	MSD 63 4a	1430	1,1	0,80	0,91	52	4,0	1,9	2,1	21-25	8	0,00019	4,4
0,18	MSD 63 4b	1390	1,5	1,24	0,93	56	3,6	1,8	1,8	30-36	10	0,00023	4,9
0,25	MSD 71 4a	1425	1,8	1,68	0,93	65	4,5	2,3	2,1	36-43	10	0,00048	6,4
0,37	MSD 71 4b	1435	2,6	2,46	0,91	68	3,8	2,0	1,9	36-43	15	0,00056	6,9
0,55	MSD 80 4a	1410	3,3	3,73	0,97	75	4,5	2,2	1,7	88-106	20	0,00092	9,1
0,75	MSD 80 4b	1405	4,6	5,10	0,98	72	4,5	2,5	1,8	108-130	30	0,00123	10,8
1,1	MSD 90 S 4	1410	7,1	7,45	0,96	70	4,8	2,4	1,9	145-174	35	0,00209	13,8
1,5	MSD 90 L 4	1410	9,3	10,16	0,96	73	4,7	2,7	1,8	161-193	50	0,00265	16,3
2,2	MSD 100 L 4a	1425	13,4	14,74	0,93	77	4,6	2,3	1,8	233-280/250V	60	0,00440	21,5
3	MSD 100 L 4b	1425	19,0	20,11	0,86	80	4,0	1,7	1,7	233-280/250V	60	0,00510	23,7

DIMENSIONS



FOOT MOUNTED MOTORS - B3, B6, B7, B8, B15, V5, V6

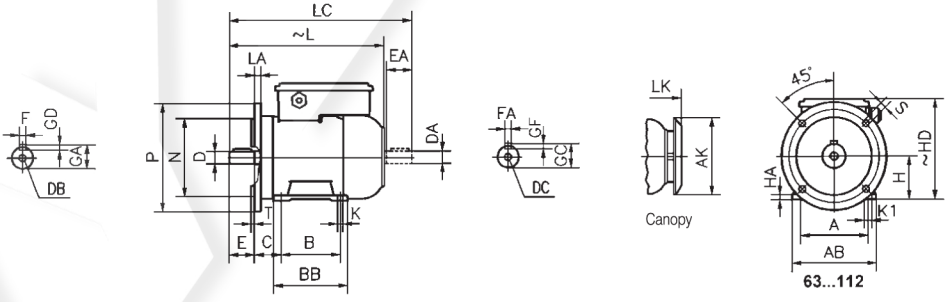
Frame size		Number of pole	H	HD [1] ~	HD [2] ~	HA	A	AB	Ø AC	ØAK	K	K1	B	BB	L ~	LC	LK ~	C	E EA	DB [3] DC	ØD ØDA	GA GC	FXGD FAXGF
63		2-4	63	201	189	10	100	125	121	116	7	11	80	103	215	242	245	40	23	M4	11	12.5	4X4
71		2-4	71	208	196	10	112	140	138	116	7	11	90	108	247	282	277	45	30	M5	14	16	5X5
80		2-4	80	224	212	10	125	160	156	150	10	15	100	125	278	323	308	50	40	M6	19	21.5	6X6
90	S	2-4	90	242	230	12	140	180	176	150	10	15	100	130	308	363	338	56	50	M8	24	27	8X7
	L												125	155	333	388	363						
100	L	2-4	100	271	259	13	160	200	194	188	12	18	140	175	375	441	410	63	60	M10	28	31	8X7
112	M	2	112	294	-	13	190	230	218	188	12	18	140	175	392	458	432	70	60	M10	28	31	8X7
Tolerances			-0.5																		j6		



FLANGED MOTORS (FORM "A" - DIN EN 50 347) - B5, V1, V3

Note: The seating face of the flanges lies in the same plane as the shoulder on the shaft.

Frame size		Number of pole	Flange No.	ØM	ØN	ØP	Clearance hole No.	Clearance hole ØS	T	LA	AD [1] ~	AD [2] ~	ØAK	L ~	LC	LK ~	E EA	DB [3] DC	ØD ØDA	GA GC	FXGD FAXGF
63		2-4	FF115	115	95	140	4	10	3	10	138	126	116	215	242	245	23	M4	11	12.5	4X4
71		2-4	FF130	130	110	160	4	10	3.5	10	137	125	116	247	282	277	30	M5	14	16	5X5
80		2-4	FF165	165	130	200	4	12	3.5	12	144	132	150	278	323	308	40	M6	19	21.5	6X6
90	S	2-4	FF165	165	130	200	4	12	3.5	12	152	140	150	308	363	338	50	M8	24	27	8X7
	L													333	388	363					
100	L	2-4	FF215	215	180	250	4	14.5	4	15	171	159	188	375	441	410	60	M10	28	31	8X7
112	M	2	FF215	215	180	250	4	14.5	4	15	182	-	188	392	458	432	60	M10	28	31	8X7
Tolerances					j6														j6		



FOOT AND FLANGED MOTORS (FORM "A" - DIN EN 50 347) - B35

Note: The seating face of the flange lies in the same plane as the shoulder on the shaft.

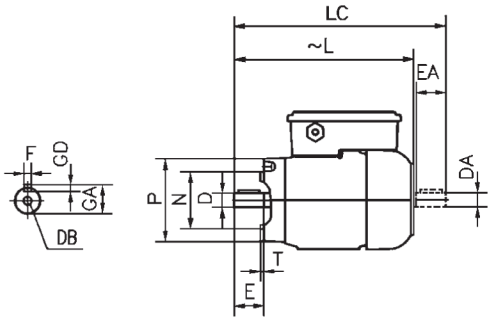
Frame size		Number of pole	H	HD [1] ~	HD [2] ~	HA	A	AB	ØAK	K	K1	B	BB	Flange	ØM	ØN	ØN	No	ØS	T	LA	L ~	LC	LK ~	C	E EA	DB [3] DC	ØD ØDA	GA GC	FXGD FAXGF
63		2-4	63	201	189	10	100	125	116	7	11	80	103	FF115	115	95	140	4	10	3	10	215	242	245	40	23	M4	11	12.5	4X4
71		2-4	71	208	196	10	112	140	116	7	11	90	108	FF130	130	110	160	4	10	3.5	10	247	282	277	45	30	M5	14	16	5X5
80		2-4	80	224	212	10	125	160	150	10	15	100	125	FF165	165	130	200	4	12	3.5	12	278	323	308	50	40	M6	19	21.5	6X6
90	S	2-4	90	242	230	12	140	180	150	10	15	100	130	FF165	165	130	200	4	12	3.5	12	308	363	338	56	50	M8	24	27	8X7
	L																					333	388	363						
100	L	2-4	100	271	259	13	160	200	188	12	18	140	175	FF215	215	180	250	4	14.5	4	15	375	441	410	63	60	M10	28	31	8X7
112	M	2	112	294	-	13	190	230	188	12	18	140	175	FF215	215	180	250	4	14.5	4	15	392	458	432	70	60	M10	28	31	8X7
Tolerances			-0.5													j6											j6		

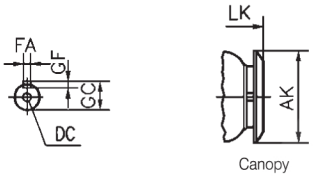
[1] Capacitor start / capacitor run motors

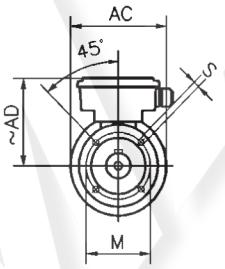
[2] Permanent split capacitor motors

[3] DIN 332-2 form D

All dimensions in mm



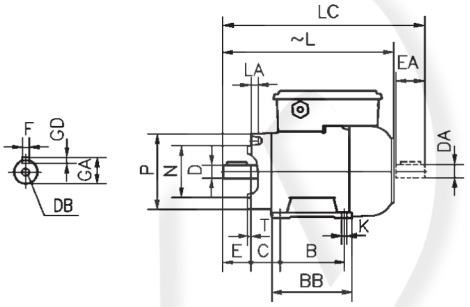


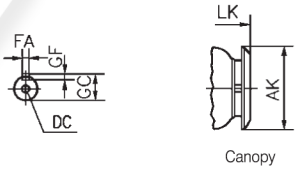


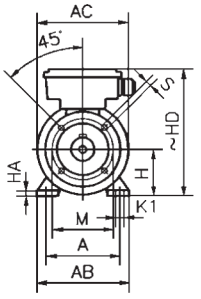
FLANGED MOTORS (FORM "C" - DIN EN 50 347) - B14, V18, V19

Note: The seating face of the flange lies in the same plane as the shoulder on the shaft.

Frame size	Number of pole	Foot mounted motor dimensions : Mounting arrangements B3, B6, B7, B8, B15, V5, V6																		
		Flange No.	ØM	ØN	ØP	S	T	LS	ØAC	ØAK	AD 1) ~	AD 2) ~	L ~	LC	LK ~	E EA	DB 3) DC	ØD ØDA	GA GC	FXGD FAXGF
63	2-4	FT 75	75	60	90	M 5	2.5	10	121	116	138	126	215	242	245	23	M 4	11	12.5	4x4
		FT100	100	80	120	M 6	3	12												
71	2-4	FT 85	85	70	105	M 6	2.5	12	138	116	137	125	247	282	277	30	M 5	14	16	5x5
		FT115	115	95	140	M 8	3	16	-											
80	2-4	FT100	100	80	120	M 6	3	12	156	150	144	132	278	323	308	40	M 6	19	21.5	6x6
		FT130	130	110	160	M 8	3.5	16	-											
90 S	2-4	FT115	115	95	140	M 8	3	16	176	150	152	140	308	363	338	50	M 8	24	27	8x7
		FT130	130	110	160		3.5													
90 L	2-4	FT115	115	95	140		3						333	415	363					
		FT130	130	110	160		3.5													
100 L	2-4	FT130	130	110	160	M 8	3.5	16	194	188	171	159	375	441	415	60	M10	28	31	8x7
		FT165	165	130	200	M10		20	-											
112 M	2-4	FT130	130	110	160	M 8	3.5	16	218	188	182	-	392	458	432	60	M10	28	31	8x7
		FT165	165	130	200	M10		12												
Tolerances				j6														j6		







FOOT AND FLANGED MOTORS (FORM "C" - DIN EN 50 347) - B34

Note: The seating face of the flange lies in the same plane as the shoulder on the shaft.

Frame size	Number of pole	Foot mounted motor dimensions : Mounting arrangements B3, B6, B7, B8, B15, V5, V6																										
		H	HD 1) ~	HD 2) ~	HA	A	AB	ØAC	ØAK	ØK	K1	B	BB	Flange No.	LS	MØ	ØN	ØP	S	T	L ~	LC	LK ~	C	E EA	DB 3) DC	ØD ØDA	GA GC	FXGD FAXGF
63	2-4	63	201	189	10	100	125	121	116	7	11	80	103	FT 75	10	75	60	90	M 5	2.5	215	245	245	40	23	M 4	11	12.5	4x4
														FT100	12	100	80	120	M 6	3									
71	2-4	71	208	196	10	112	140	138	116	7	11	90	108	FT 85	12	85	70	105	M 6	2.5	247	277	277	45	30	M 5	14	16	5x5
								-						FT115	16	115	95	140	M 8	3									
80	2-4	80	224	212	10	125	160	156	150	10	15	100	125	FT100	12	100	80	120	M 6	3	278	308	308	50	40	M 6	19	21.5	6x6
								-						FT130	16	130	110	160	M 8	3.5									
90 S	2-4	90	242	230	12	140	180	176	150	10	15	100	130	FT115	16	115	95	140	M 8	3	308	338	338	56	50	M 8	24	27	8x7
														FT130		130	110	160		3.5									
90 L	2-4											125	155	FT115		115	95	140		3	333	363	363						
														FT130		130	110	160		3.5									
100 L	2-4	100	271	259	13	160	200	194	188	12	18	140	175	FT130	16	130	110	160	M 8	3.5	375	415	415	63	60	M10	28	31	8x7
								-						FT165	20	165	130	200	M10										
112 M	2-4	112	294	-	13	190	230	218	188	12	18	140	175	FT130	16	130	110	160	M 8	3.5	392	432	432	70	60	M10	28	31	8x7
														FT165	12	165	130	200	M10										
Tolerances		-0.5															j6									j6			

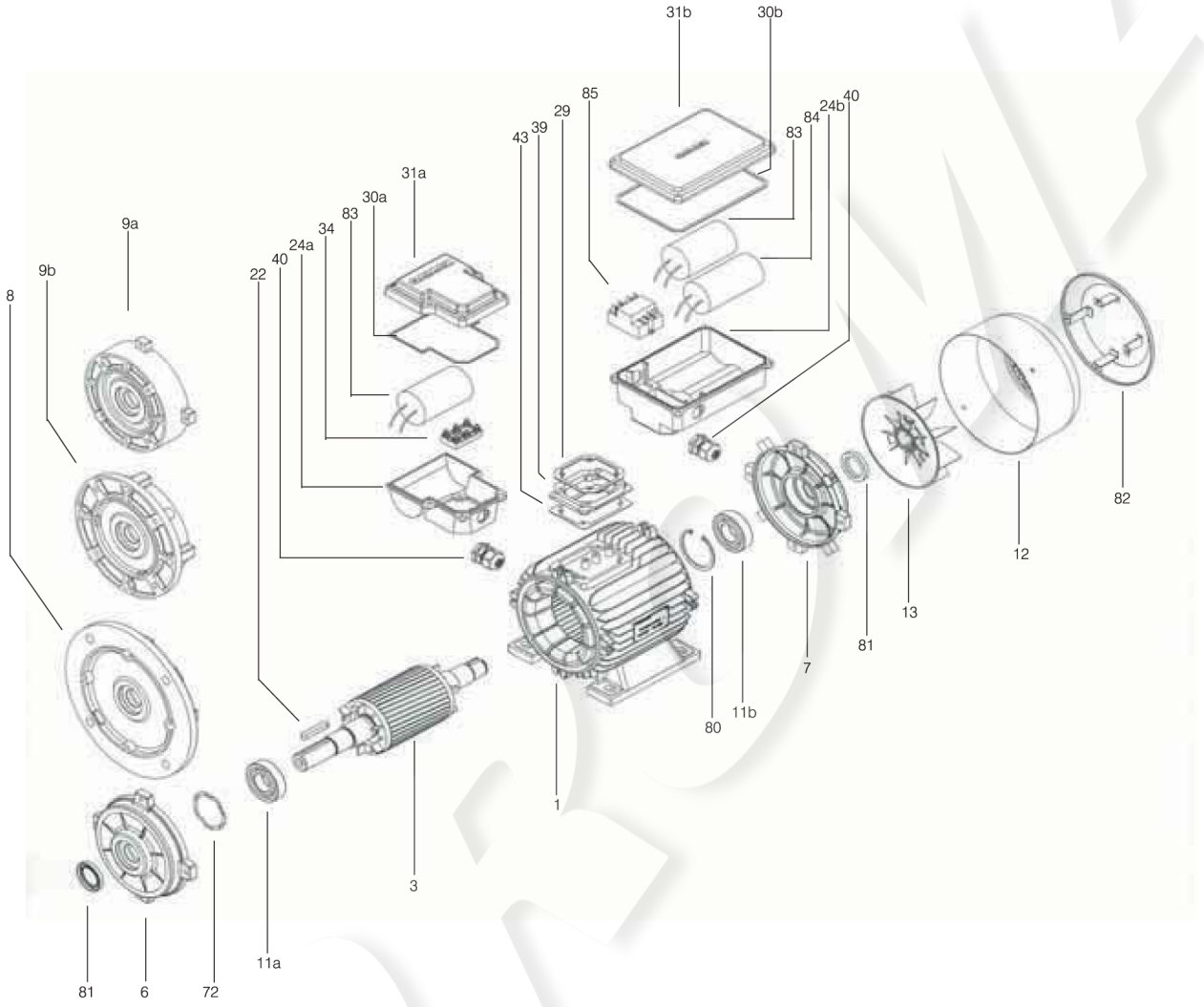
1) Start capacitor motors

2) Permanent split capacitor motors

3) DIN 332-2 form D

All dimensions in mm

SPARES



1 Stator complete with winding, varnished and fitted in the frame
3 Rotor complete with shaft, finish machined and balanced (Excluding keys)
6 End Shield Drive-end B3 mounting
7 End Shield Non drive end
8 D-Flange (Form A-"FF") - Plase state flange number
9a C-Face Flange (Form C-"FT") - Please state flange number
9b C-Face Flange (Form C-"FT", big type) - Please state flange number
11a Drive end bearing
11b Non Drive end bearing
12 Fan cover
13 Fan
22 Shaft key
30a Terminal box to lid gasket - Permanent split capacitor design
31a Terminal box lid - Permanent sylit capacitor design
24a Terminal box - Permanent split capacitor design
34 Terminal board complete with terminal links, nuts and washers
30b Terminal box to lid gasket - Capacitor start / capacitor run design
31b Terminal box lid - Capacitor start / capacitor run design
24b Terminal box - Capacitor start / capacitor run design
29 Adaptor plate to terminal box gasket (63 and 100-112)
39 Adaptor plate (63 and 100-112)
40 Cable gland
43 Terminal box / Adaptor plate to frame gasket (63...112)
72 Corrugated disc spring for preloading ball-bearing
80 Internal circlip for retaining ball bearing at Non-Drive end shield (special arrangement on request)
81 V-Ring (Oil seal)
82 Canopy
83 Permanent capacitor
84 Starting capacitor
85 Electronic start relay - Capacitor start / capacitor run design