

E.M.G.

ELETTROMECCANICA S.R.L.



**MOTORI ASINCRONI
SINGLE PHASE - MONOFASE**



E.M.G single speed asynchronous single-phase motors of standard construction have a lower starting torque and are suitable for many applications including fan drives and centrifugal pumps. E.M.G. single speed asynchronous single-phase motors of standard design have high reliability and strength the frame and end shields are constructed of Aluminium. The motors are manufactured according to EN 60072-1, standardised powers from 0.06kW (0.08HP) 56 MEC size to 3kW (4HP) 100 MEC size are available.

Reference table for technical specifications of the motors.

Symbol	Meaning	Symbol	Meaning
P_N	Rated power (kW) and (HP)	C_N/C_S	Torque ratio
n_N	Rated speed of rotation (rpm)	$\cos\Phi$	Rated power factor
I_N	Rated current (A)	η	Full load efficiency
I_s	Starting current (A)	CP	Permanent capacitor (μF)
I_s/I_N	Current ratio	J_z	Moment of inertia of the system shaft + rotor ($kgcm^2$)
C_N	Nominal torque (Nm)	G	Weight of the motor B3 (kg)
C_s	Starting torque (Nm)		

Series EMBP - 2 Pole Permanent Capacitor Single Phase Motors 230 volts													Terminal Box Type
Type	P_N		n (rpm)	η (%)	I_N (230V) (A)	$\cos\Phi$	C_N (Nm)	C_S/C_N	I_s / I_N	CA (μF)	J_z ($kgcm^2$)	G (kg)	
	kW	HP											
EMBP 56-2A	0,09	0,12	2730	40,0	1,40	0,70	0,32	2,06	1,81	6,3	0,72	3	Small
EMBP 56-2B	0,12	0,17	2700	47,0	1,42	0,78	0,43	1,53	1,79	6,3	0,72	3	
EMBP 63-2A	0,18	0,25	2870	50,0	1,65	0,96	0,60	1,20	3,49	12,5	1,67	4,5	Small
EMBP 63-2B	0,25	0,33	2830	58,0	1,90	0,97	0,84	0,86	3,00	12,5	1,67	4,5	
EMBP 71-2A	0,37	0,5	2830	72,0	2,30	0,97	1,25	0,70	3,65	14	3,43	6	Small
EMBP 71-2B	0,55	0,75	2800	70,0	3,20	0,97	1,87	0,49	3,47	14	4,60	7	
EMBP 80-2A	0,75	1	2810	69,0	5,10	0,93	2,55	0,90	3,50	25	6,72	9,8	Small
EMBP 80-2B	1,1	1,5	2780	75,0	6,80	0,94	3,73	0,64	3,62	30	8,09	10,9	
EMBP 90L-2A	1,5	2	2800	74,0	9,40	0,93	5,07	0,75	3,80	40	12,23	15	Large
EMBP 90L-2B	2,2	3	2800	75,0	14,00	0,93			40	40		16	
EMBP 100L-2A	2,2	3	2790	75,0	13,80	0,92	7,49	0,70	3,22	40+20	18,54	18,6	Large
EMBP 100L-2B	3	4	2770	76,0	18,70	0,92				40+20		20	

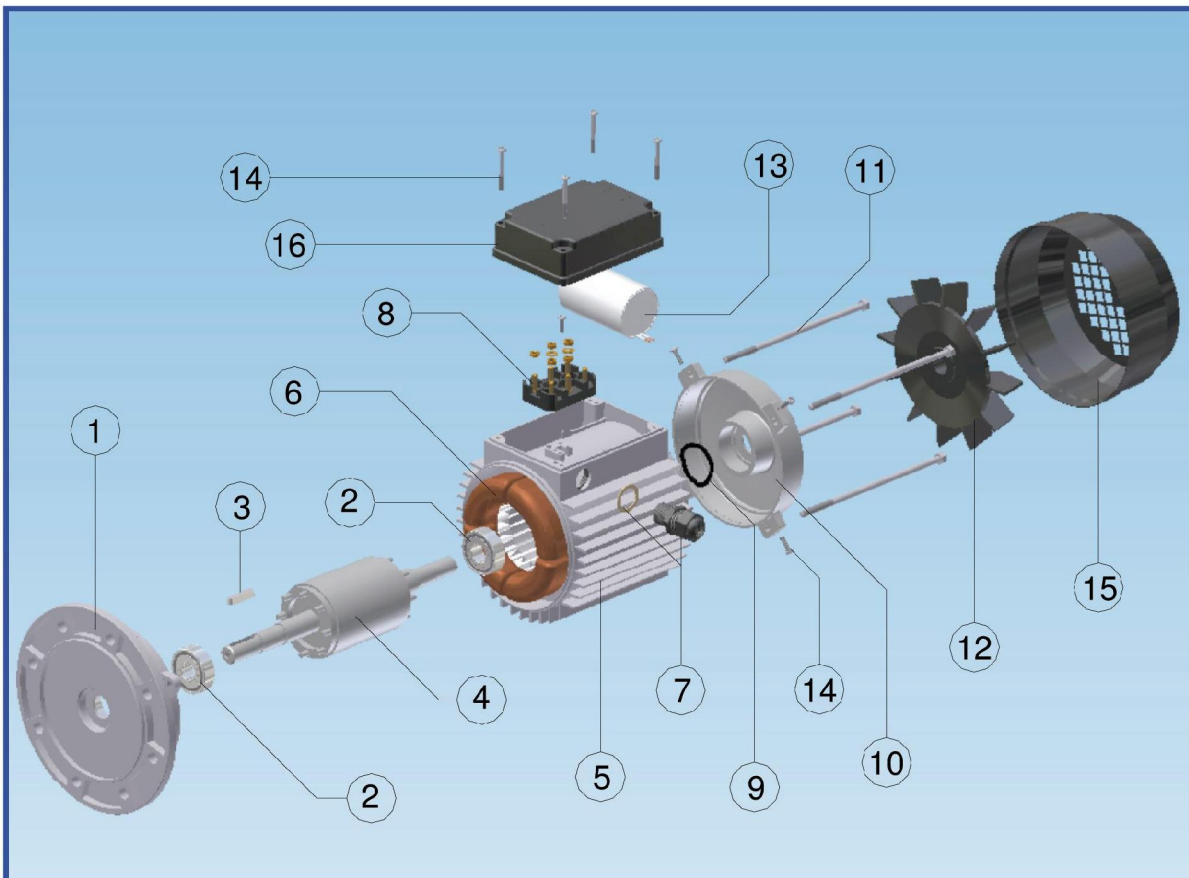
Series EMBP - 4 Pole Permanent Capacitor Single Phase Motors 230 volts													Terminal Box Type
Type	P_N		n (rpm)	η (%)	I_N (230V) (A)	$\cos\Phi$	C_N (Nm)	C_S/C_N	I_s / I_N	CA (μF)	J_z ($kgcm^2$)	G (kg)	
	kW	HP											
EMBP 56-4A	0,06	0,08	1350	36,0	0,75	0,96	0,42	1,86	1,69	6,3	1,17	3	Small
EMBP 56-4B	0,09	0,12	1300	44,0	0,84	0,98	0,62	1,29	1,51	6,3	1,17	3	
EMBP 63-4A	0,12	0,17	1400	44,0	1,40	0,85	0,87	1,49	1,88	8	2,60	4	Small
EMBP 63-4B	0,18	0,25	1380	56,0	1,50	0,93	1,25	1,10	2,57	10	2,60	4	
EMBP 71-4A	0,25	0,33	1350	57,0	2,10	0,90	1,77	0,93	2,26	14	6,76	6	Small
EMBP 71-4B	0,37	0,5	1350	62,0	2,90	0,89	2,60	0,57	2,44	16	7,82	6	
EMBP 80-4A	0,55	0,75	1360	66,0	4,10	0,88	3,84	0,46	2,61	16	14,23	8,5	Small
EMBP 80-4B	0,75	1	1380	67,0	5,70	0,85	5,14	0,57	2,74	20	18,45	9,4	
EMBP 90S-4	1,1	1,5	1370	70,0	7,80	0,88	7,53	0,55	3,00	25	19,65	12,3	Small
EMBP 90L-4A	1,5	2	1370	75,0	9,60	0,91	10,24	0,53	3,20	36	23,40	14,7	
EMBP 90L-4B	1,8	2,5	1340	68,0	12,50	0,90	12,90	0,50	2,30	36	25,53	15,5	Large
EMBP 100L-4A	2,2	3	1380	73,0	12,70	0,95	15,1	0,53	3,26	60	41,54	17,5	

Series EMBP - 6 Pole Permanent Capacitor Single Phase Motors 230 volts													Terminal Box Type
Type	P_N		n (rpm)	η (%)	I_N (230V) (A)	$\cos\Phi$	C_N (Nm)	C_S/C_N	I_s / I_N	CA (μF)	J_z ($kgcm^2$)	G (kg)	
	kW	HP											
EMBP 71-6A	0,15	0,20	880		1,7				2,60	10		7	Small
EMBP 80-6A	0,25	0,33			1,9				2,68	14		8,5	
EMBP 80-6B	0,37	0,5	930		2,8	0,90			2,10	16		9	Small
EMBP 90S-6A	0,55	0,75	850		4,0				2,30	16		12,5	
EMBP 90S-6B	0,75	1	940		5,4				2,70	20		15	Small
EMBP 100L-6A	1,1	1,5			7,7				2,30	25		19,5	
EMBP 100L-6B	1,5	2	900		10,0	0,91			2,90	30			Large

Series EMBP - 2 Pole Permanent Capacitor Single Phase Motors 110 volts												Terminal Box Type	
Type	P _N		n (rpm)	η (%)	I _N (110v) (A)	CosΦ	C _N (Nm)	C _S /C _N	I _S / I _N	CA (μF)	J _Z (kgcm ²)		G (kg)
	kW	HP											
EMBP 71-2A EMBP 71-2B	0,37 0,55	0,5 0,75										6 7	Small
EMBP 80-2A EMBP 80-2B	0,75 1,1	1 1,5										9,8 10,9	
EMBP 90L-2A EMBP 90L-2B	1,5 2,2	2 3										15 16	Large
EMBP 100L-2A EMBP 100L-2B	2,2 3	3 4										18,6 20	

Series EMBP - 4 Pole Permanent Capacitor Single Phase Motors 110 volts												Terminal Box Type	
Type	P _N		n (rpm)	η (%)	I _N (110v) (A)	CosΦ	C _N (Nm)	C _S /C _N	I _S / I _N	CA (μF)	J _Z (kgcm ²)		G (kg)
	kW	HP											
EMBP 71-4A EMBP 71-4B	0,25 0,37	0,33 0,5										6 6	Small
EMBP 80-4A EMBP 80-4B	0,55 0,75	0,75 1										8,5 9,4	
EMBP 90S-4 EMBP 90L-4A EMBP 90L-4B	1,1 1,5 1,8	1,5 2 2,5										12,3 14,7 15,5	Small Large Large
EMBP 100L-4A	2,2	3										17,5	

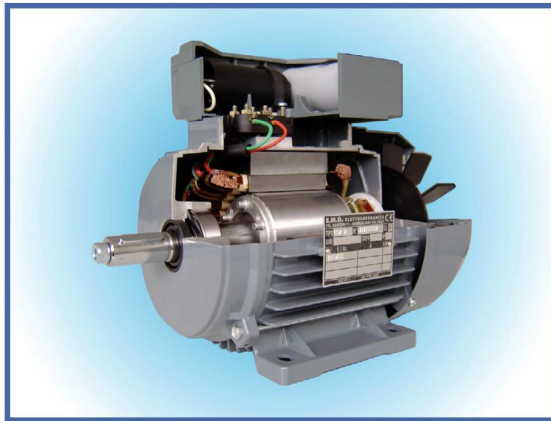
Low starting torque Single-Phase series EMBP Exploded View



1. B5 Flange	7. Cable gland	13. Capacitor
2. Bearings	8. Terminal box and	14. Terminal box screws
3. Key	9. Bearing loading washer	15. Fan Cover
4. Shaft + Rotor	10. Shield	16. Terminal box with gasket
5. B5 Frame	11. Tie Rods	
6. Wound stator	12. Fan	



Series EMB-High Starting Torque Single-Phase Motors 230Volt with Centrifugal Switch (Capacitor Start Capacitor Run)



Standard asynchronous single-phase motors have a low starting torque and therefore can be difficult to start with loads or voltages lower than the nominal one. The use of a centrifugal switch is a good solution to solve this problem. The aim of this switch is the connection of a starting capacitor to the asynchronous single-phase motor in order to get a higher starting torque and to disconnect it in the running condition. E.M.G. has single speed asynchronous single-phase motors with centrifugal switch with high reliability and strength. According to EN 60072-1, standardised powers from 0.25kW (0.33HP) 71 MEC size to 3kW (4HP) 100 MEC size are available.

Table for an easy reference of the technical specifications of the motors.

Symbol	Meaning
P_N	Rated power (kW) and (HP)
n_N	Rated speed of rotation (rpm)
I_N	Rated current (A)
I_s	Starting current (A)
I_s/I_N	Current ratio
C_N	Nominal torque (Nm)
C_s	Starting torque (Nm)
C_N/C_s	Torque ratio
$\cos\Phi$	Rated power factor
η	Full load efficiency
CP	Permanent capacitor (μF)
CA	Starting capacitor (μF)
J_z	Polar moment of inertia of the system shaft + rotor ($kgcm^2$)
G	Weight of the motor B3 (kg)

Series EMB - 2 Pole Capacitor Start Capacitor Run Single Phase Motors 230 volts														Terminal Box Type
Type	P_N		n (rpm)	η (%)	I_N (230v) (A)	$\cos\Phi$	C_N (Nm)	C_s/C_N	I_s / I_N	CP (μF)	CA (μF)	J_z ($kgcm^2$)	G (kg)	
	kW	HP												
EMB 71-2A	0,37	0,5	2830	72,0	2,30	0,97	1,25	3,00	5,48	14	71±10%	3,7	6	Small
EMB 71-2B	0,55	0,75	2800	70,0	3,20	0,97	1,87	2,69	4,75	14	71±10%	4,65	7	
EMB 80-2A	0,75	1	2870	75,0	4,70	0,93	2,47	3,38	6,11	25	98±10%	6,77	9,8	Large
EMB 80-2B	1,1	1,5	2850	76,0	6,60	0,96	3,69	2,88	5,19	31,5	120±10%	7,95	10,9	
EMB 90L-2A	1,5	2	2920	78,0	8,80	0,95	4,89	2,66	7,32	36	140±10%	12,43	15	Large
EMB 90L-2B	2,2	3	2850	79,5	12,90	0,93				40	160±10%		15,6	
EMB 100L-2A	2,2	3	2910	78,5	12,70	0,96	7,20	1,99	5,35	40+20	160±10%	19,75	18,6	Large
EMB 100L-2B	3	4	2900	81,0	15,30	0,99				40+40	160±10%		20	

Series EMB - 4 Pole Capacitor Start Capacitor Run Single Phase Motors 230 volts														Terminal Box Type
Type	P_N		n (rpm)	η (%)	I_N (230v) (A)	$\cos\Phi$	C_N (Nm)	C_s/C_N	I_s / I_N	CP (μF)	CA (μF)	J_z ($kgcm^2$)	G (kg)	
	kW	HP												
EMB 71-4A	0,25	0,33	1440	62,0	1,90	0,93	1,66	3,21	6,39	14	71±10%	6,88	6	Small
EMB 71-4B	0,37	0,5	1410	67,0	2,50	0,96	2,46	2,13	4,86	14	71±10%	6,88	6	
EMB 80-4A	0,55	0,75	1430	72,0	3,70	0,91	3,65	2,25	4,92	16	71±10%	14,38	8,5	Large
EMB 80-4B	0,75	1	1430	70,0	5,30	0,88	4,96	2,07	4,83	20	98±10%	18,68	9,4	
EMB 90S-4	1,1	1,5	1430	73,5	6,80	0,95	7,29	1,91	4,94	25	120±10%	18,20	12,3	Large
EMB 90L-4A	1,5	2	1420	73,0	9,50	0,93	10,00	1,37	4,12	31,5	120±10%	22,15	14,7	
EMB 90L-4B	1,8	2,5	1420	74,0	11,50	0,92	12,30	1,41	3,80	36	120±10%	25,95	15,5	
EMB 100L-4A	2,2	3	1440	80,0	13,40	0,90	14,54	1,35	3,73	40	140±10%	33,64	17,5	Large

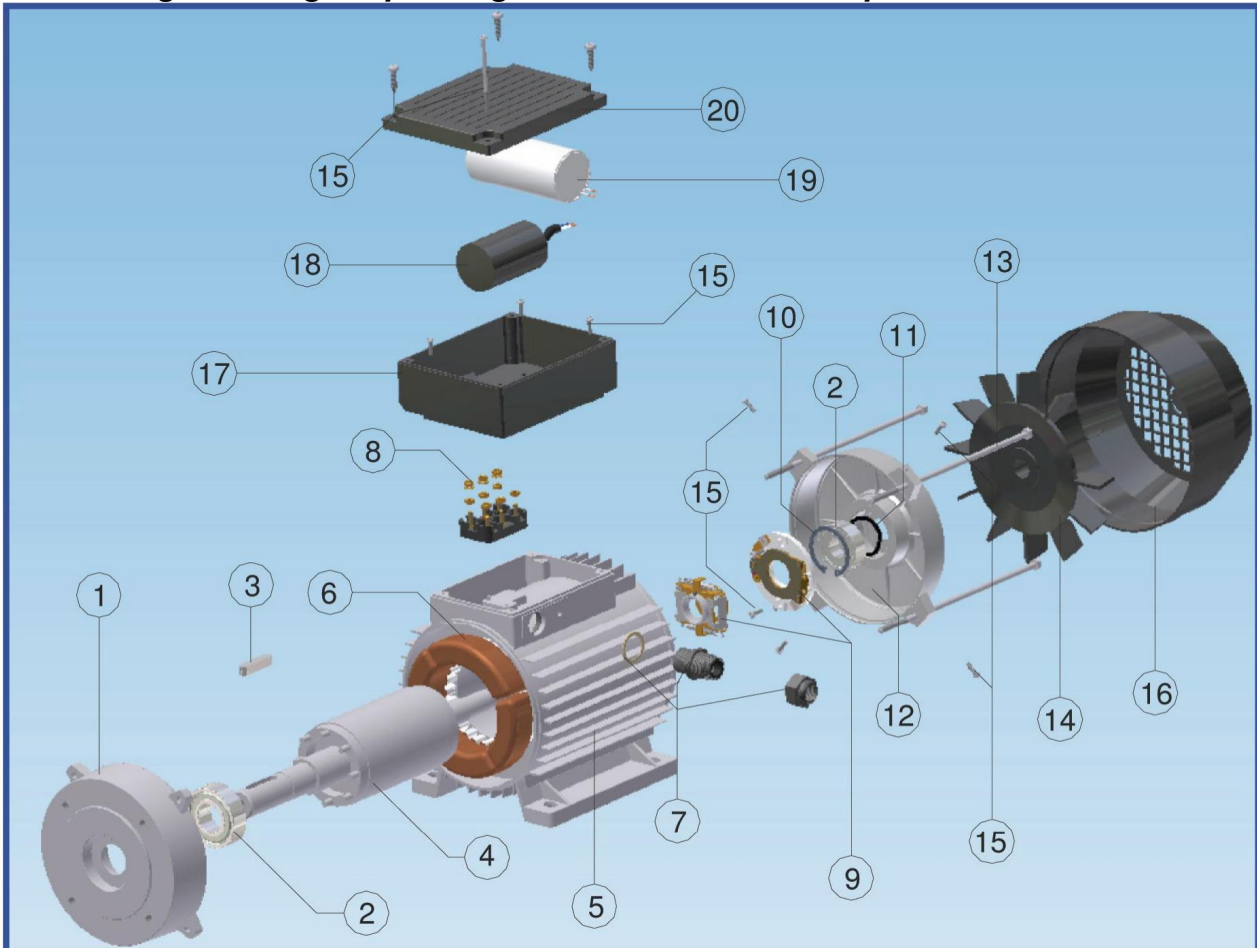


Series EMB-High Starting Torque Single-Phase Motors 110Volt with Centrifugal Switch (Capacitor Start Capacitor Run)

Series EMB - 2 Pole Capacitor Start Capacitor Run Single Phase Motors 110 volts													Terminal Box Type	
Type	P _N		n (rpm)	η (%)	I _N (110V) (A)	Cos Φ	C _N (Nm)	C _S /C _N	I _S / I _N	CP (μF)	CA (μF)	J _Z (kgcm ²)		G (kg)
	kW	HP												
EMB 71-2A	0,37	0,5	2830								71±10%		6	Small
EMB 71-2B	0,55	0,75	2800								71±10%		7	
EMB 80-2A	0,75	1	2870								98±10%		9,8	Large
EMB 80-2B	1,1	1,5	2820	77	14,9	0,92			3,8	31,5	120±10%		10,9	
EMB 90L-2A	1,5	2	2870								140±10%		15	Large
EMB 90L-2B	2,2	3	2970	78	23,0	0,91			5,2	40	160±10%		15,6	

Series EMB - 4 Pole Capacitor Start Capacitor Run Single Phase Motors 110 volts													Terminal Box Type	
Type	P _N		n (rpm)	η (%)	I _N (230V) (A)	Cos Φ	C _N (Nm)	C _S /C _N	I _S / I _N	CP (μF)	CA (μF)	J _Z (kgcm ²)		G (kg)
	kW	HP												
EMB 71-4A	0,25	0,33	1440								71±10%		6	Small
EMB 71-4B	0,37	0,5	1430	62	3,2	0,80			3,2	20	71±10%		7	
EMB 80-4A	0,55	0,75	1430								71±10%		8,5	Large
EMB 80-4B	0,75	1	1420	69	10,4	0,90			4,7	20	90±10%		9,4	
EMB 90S-4	1,1	1,5	1430								110±10%		12,3	Large
EMB 90L-4A	1,5	2	1420						5,2	30	120±10%		14,7	
EMB 100L-4A	2,2	3	1410								160±10%		17,5	Large

High starting torque Single-Phase series EMB Exploded View

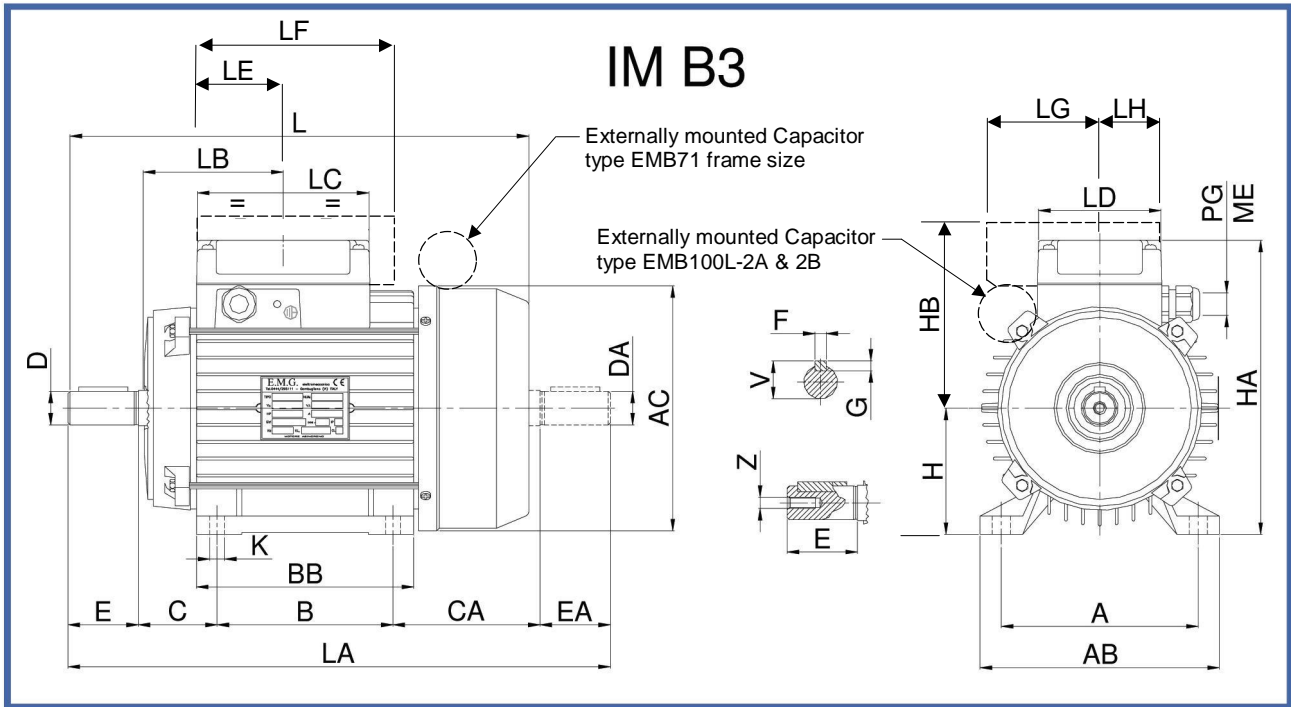


1. B14 Flange	8. Terminal box and components	15. Mounting screws
2. Bearings	9. Centrifugal switch	16. Fan Cover
3. Key	10. Snap Ring	17. Terminal box with gasket
4. Shaft + Rotor	11. Bearing loading washer	18. Electrolytic Capacitor
5. B3 Frame	12. Shield	19. Capacitor
6. Wound stator	13. Tie Rods	20. Terminal Box Cover
7. Cable gland	14. Fan	



Series EMBP- Permanent Capacitor
Series EMB- Capacitor start Capacitor Run
Single Phase Motor Single and Double Shaft IM B3 Dimensions

(Applies to mounting types B6, B7, B8, V5 and V6 also)



Size	Overall (mm)							Feet (mm)					Shaft (mm)				Small Terminal Box (mm)				
	H	HA	L	LA	C	AC	CA	AB	BB	A	B	K	D/DA	E/EA	V	Z	LB	LC	LD	ME	PG
56	56	144	188	208	35	112	61	107	90	90	71	6	9	20	10,2	M4	70	90	79	M16	9
63	63	158	207	230	38	127	65	120	100	100	80	7	11	23	12,5	M4	78	101	79	M16	-
71	71	175	243	273	45	145	78	135	109	112	90	7	14	30	16	M5	90	111	79	M16	-
80	80	195	280	326	51	159	95	152	125	125	100	9	19	40	21,5	M6	101	123	88	M20	-
90S	90	210	305	360	56	177	105	170	131	140	100	10	24	50	27	M8	102	123	88	M20	-
90L	90	210	330	386	56	177	105	170	155	140	125	10	24	50	27	M8	104	123	88	M20	-
100L	100	234	363	432	61	193	111	192	171	160	140	12	28	60	31	M10	92	90	90	M25	16

	Large Terminal Box (mm)				
	HB	LE	LF	LG	LH
71 ⁽¹⁾	73	60	111	44	44
80	140	60	140	68	44
90S	145	60	140	68	44
90L	145	60	140	68	44
100L ⁽²⁾	160	60	140	68	44

Shaft Tolerances		
	DA Ø11 - Ø28mm	J6
	38mm	h5

⁽¹⁾ Note - 71 frame size EMB series Capacitor start Capacitor run motor has small type terminal box and external capacitor diameter Ø 42mm x 90mm long mounted to top of fan cowl

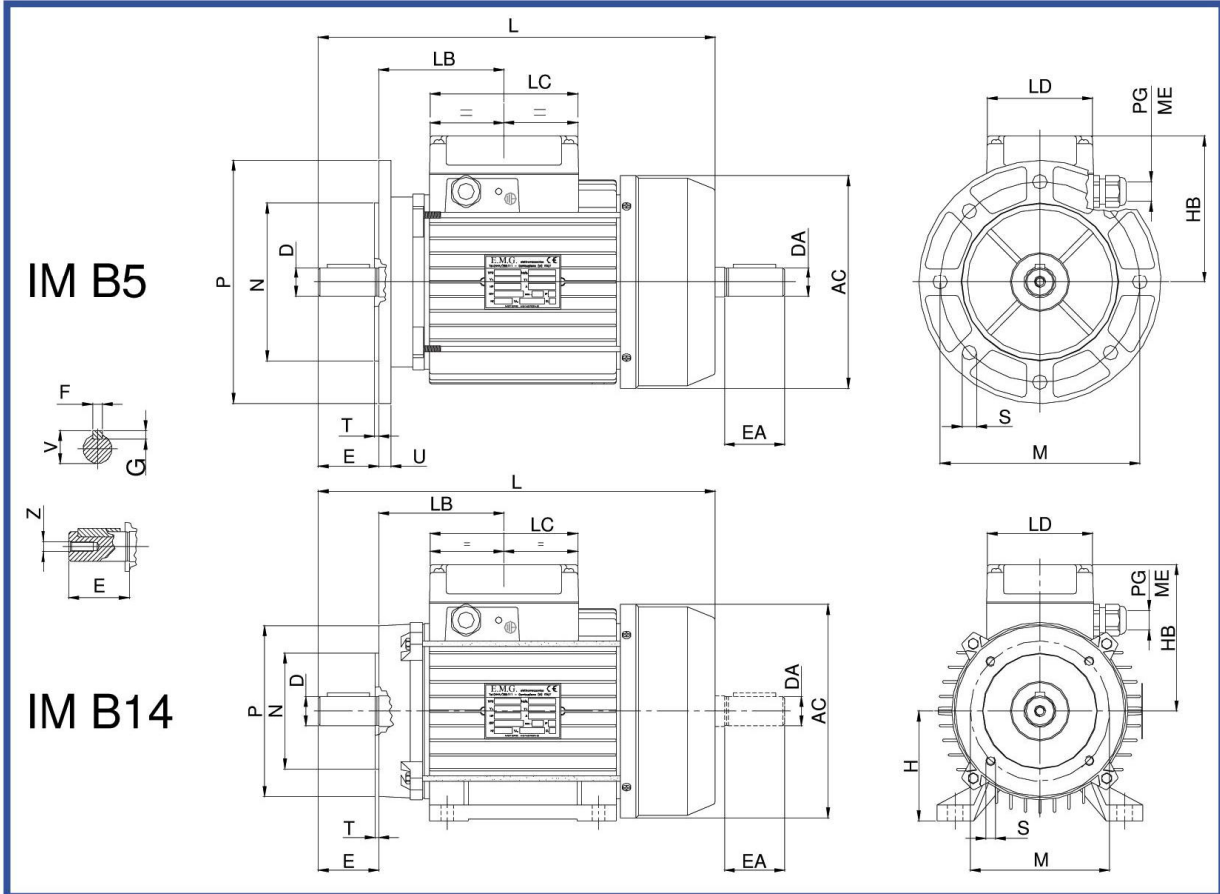
⁽²⁾ Note - 100L-2A & 2B EMB series Capacitor start Capacitor run motor has an external capacitor Ø 48mm x 100mm mounted at the side of the large type terminal box.



Series EMBP- Permanent Capacitor Single Phase Motors and Series EMB Capacitor start Capacitor run Single Phase Motors
For Large and small terminal box details see B3 drawing all other dimensions as below

Single and Double Shaft IM B5 and B14 Dimensions

Applies to mounting types V1 and V3 types for B5 flange. B5 Reduced flanges are also available B5R.
 Applies to mounting types V18 and V19 types for B14 flange.



MEC	Overall (mm)		Shaft (mm)				Small Terminal Box (mm)				Large Terminal Box
	HB	L	D/DA	E/EA	V	Z	LB	LC	LD	ME	PG
56	88	188	9	20	10,2	M4	70	90	79	M12	9
63	95	207	11	23	12,5	M4	78	101	79	M16	-
71	104	243	14	30	16	M5	90	111	79	M16	-
80	115	280	19	40	21,5	M6	101	123	88	M20	-
90S	120	305	24	50	27	M8	102	123	88	M20	-
90L	120	330	24	50	27	M8	104	123	88	M20	-
100L	134	363	28	60	31	M10	92	90	90	M25	16

See B3 drawing for dimensions of large type terminal box

MEC	B5 Standard flange (mm)						B5 Reduced flange B5R (mm)						B14 Flange (mm)				
	M	N	P	S	T	U	M	N	P	S	T	U	M	N	P	S	T
56	100	80	118	7	3	7,5	-	-	-	-	-	-	65	50	80	M5	2,5
63	115	95	140	9,5	3	9	-	-	-	-	-	-	75	60	90	M5	2,5
71	130	110	160	9,5	3,5	8	115	95	140	9	3,5	8	85	70	105	M6	2,5
80	165	130	200	12	3,5	9	130	110	160	9,5	3,5	9	100	80	120	M6	3
90S	165	130	200	13	3,5	10	130	110	160	9,5	3,5	9	115	95	140	M8	3
90L	165	130	200	13	3,5	10	130	110	160	9,5	3,5	9	115	95	140	M8	3
100L	215	180	250	14	4	10	165	130	200	12	3,5	10	130	110	160	M8	3,5



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