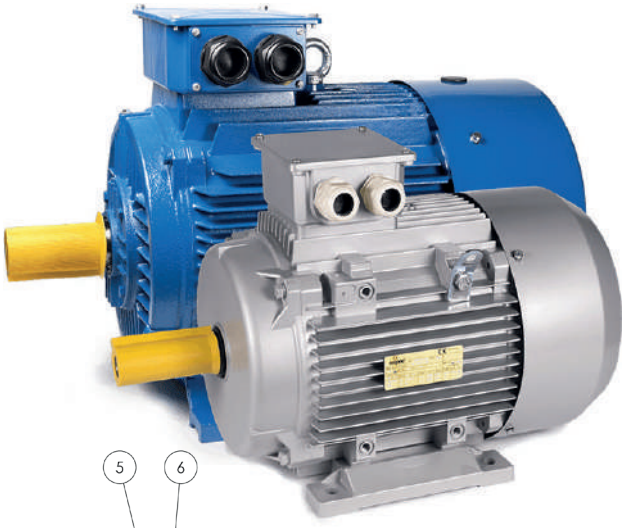
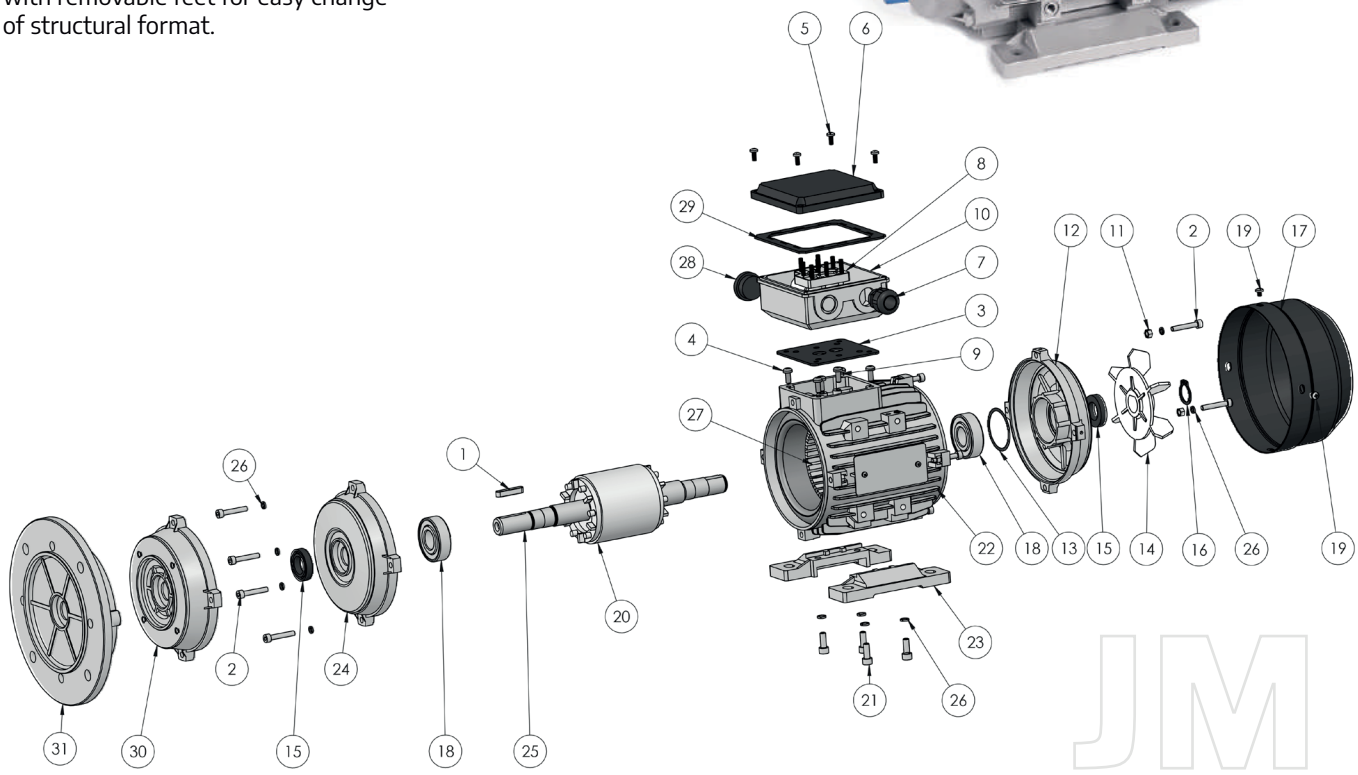
JM-GM
THREE-PHASE MOTORS
IE4

6 JM-GM THREE-PHASE MOTORS

6.1 COMPONENTS



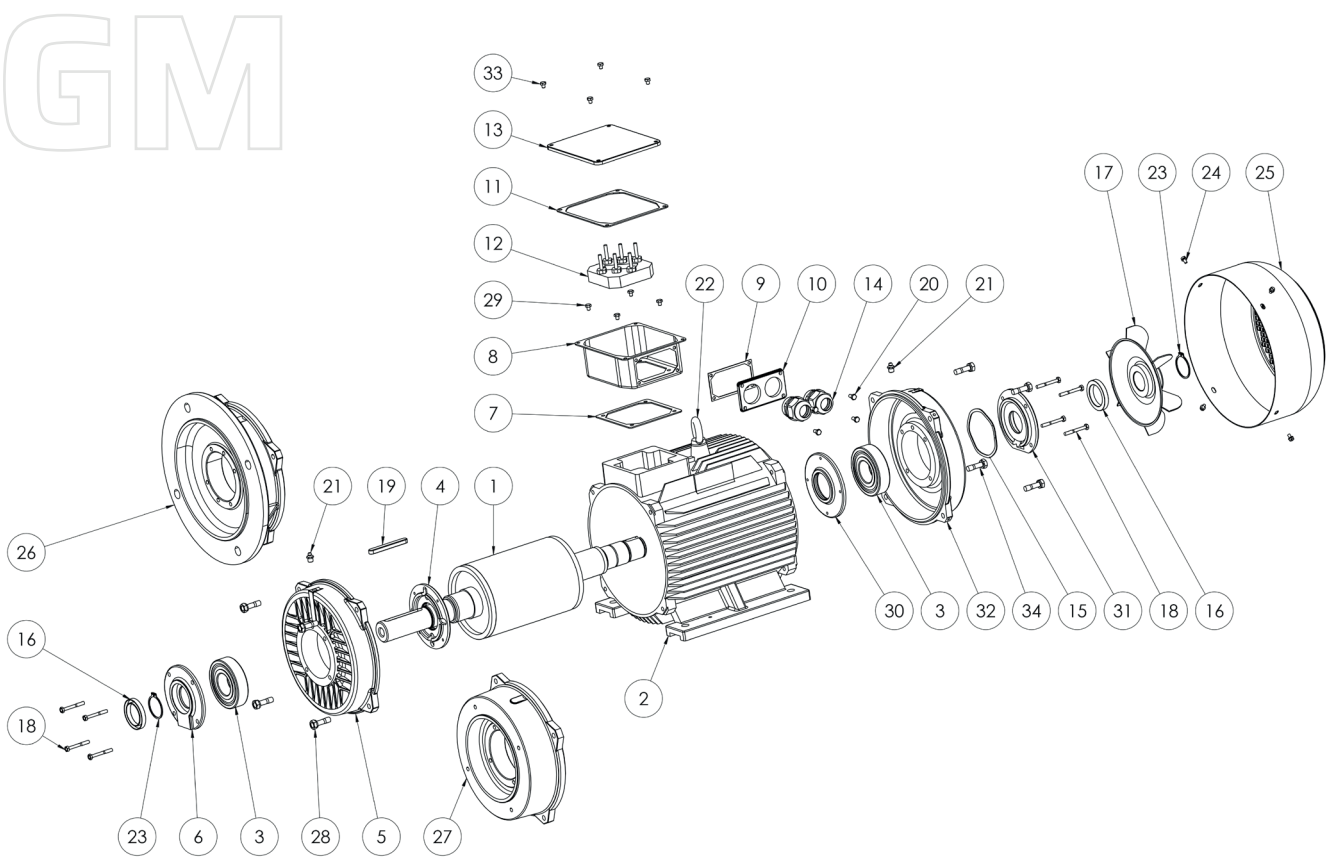
JM SERIES
JM Motors Series size 56 TO 160, in aluminium, with removable feet for easy change of structural format.



1) Key
2) Tie-rod
3) Terminal box gasket
4) Terminal box locking screw
5) Terminal board cover locking screw
6) Terminal board cover
7) Cable gland
8) Terminal board
9) Terminal board locking screw
10) Terminal box
11) Nut
12) Shield B3 side opposite control
13) Preload spring
14) Fan
15) Sealing ring
16) Safety flexible ring
17) Fan cover
18) Bearings
19) Fan cover locking screw
20) Rotor
21) Feet fastening screw for IMB3
22) Housing
23) Foot for IMB3
24) Shield on control side for IMB3
25) Shaft
26) Washer
27) Stator
28) Plug
29) Terminal box cover gasket
30) Flange IMB14
31) Flange IMB5

GM SERIES

GM series motors size 160 to 450, in cast iron, with fused feet.



1) Shaft with rotor
2) Housing
3) Bearing
4) Control side bearing locking internal flange
5) Shield on control side
6) Control side bearing locking external flange
7) Terminal box gasket
8) Terminal box
9) Terminal box tab gasket
10) Terminal box tab
11) Terminal box cover gasket
12) Terminal board
13) Terminal box cover
14) Cable gland
15) Preload spring
16) Sealing ring
17) Fan
18) Bearing locking external flange fastening screw
19) Key
20) Terminal box tab screw
21) Greaser
22) Lifting eyebolts
23) Safety flexible ring
24) Locking screw
25) Fan cover
26) Flange IMB5
27) Flange IMB14 (size Gm 160 only)
28) Shield locking screw IMB3 on control side
29) Terminal box locking screw
30) Side opposite control bearing locking internal flange
31) Side opposite control bearing locking external flange
32) Shield on side opposite control IMB3
33) Terminal box cover locking screw
34) Shield locking screw IMB3 on side opposite control

• 6.2 ELECTRICAL CONNECTIONS

Single-speed three-phase motor windings can be connected star or delta.

The delta connection is obtained by connecting the end of a phase with the beginning of the next phase.
The phase current I_{ph} and the phase voltage U_{ph} are respectively:
$I_{ph} = I_n / \sqrt{3}$; $U_{ph} = U_n$

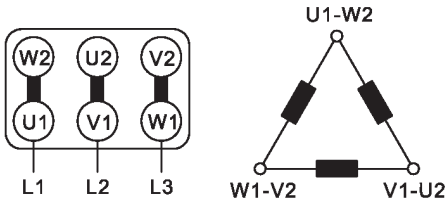
Where I_n is the line current and U_n the voltage relating to the delta connection.

The star connection is obtained by connecting W2, U2 and V2 and powering U1, V1, W1.
The phase current I_{ph} and the phase voltage U_{ph} are respectively:
$I_{ph} = I_n$; $U_{ph} = Un / \sqrt{3}$

Where I_n e U_n refers to the star connection.

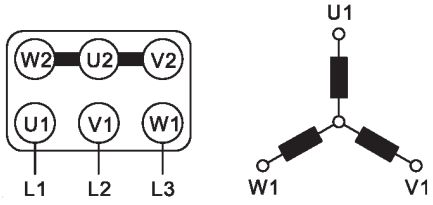
■ **MINIMUM VOLTAGE**
DELTA CONNECTION

Δ



■ **MAXIMUM VOLTAGE**
STAR CONNECTION

Y



Starting of the star-triangle motor allows reduced inrush current by reducing the starting torque, and can therefore only be implemented if the obtained starting torque is higher than the resistant torque.

The inrush current of an asynchronous motor is directly proportional to the square of the voltage, therefore the motors whose nominal delta voltage corresponds to the mains voltage can be started with the star-triangle method

THREE-PHASE ASYNCHRONOUS
IE4 JM-GM MOTORS

Size	JM
80 ~ 160	

Size	GM
160 ~ 355	

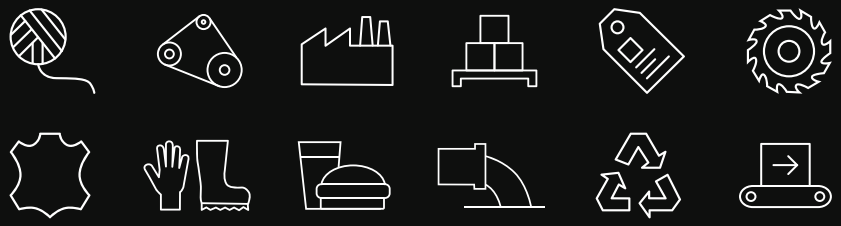
Power	JM
0.75 ~ 18.5 kW	

Power	GM
11 ~ 315 kW	

Polarity	JM
2, 4, 6 poles	

Polarity	GM
2, 4, 6 poles	

Sectors of use



• 6.3 JM IE4 ELECTRICAL DATA

JM 2 POLES IE4 SERIES

Tab. 6.3.1

IE4	JM Motor	P_N	n_N	T_N	$I_{N\,(400\,V)}$	COSφ	η			$\frac{I_s}{I_N}$	$\frac{T_s}{T_N}$	$\frac{T_{max}}{T_N}$	J	Weight
		kW	min⁻¹	Nm	A		100%	75%	50%				Kg m²	Kg
Δ/Y 230/400V 50Hz	80 a	0,75	2910	2,46	1,58	0,82	83,5	83,5	81,8	7,0	2,3	2,3	0,0013	11
	80 b	1,1	2920	3,60	2,25	0,83	85,2	85,2	83,5	7,3	2,2	2,3	0,0016	11,6
	90 S	1,5	2930	4,89	2,98	0,84	86,5	86,5	84,8	7,6	2,2	2,3	0,0018	16
	90 La	2,2	2930	7,17	4,25	0,85	88,0	88,0	86,2	7,6	2,2	2,3	0,0024	20,6
	100 La	3	2935	9,8	5,59	0,87	89,1	89,1	87,3	7,8	2,2	2,3	0,0040	24,5
	112 Ma	4	2940	13,0	7,29	0,88	90,0	90,0	88,2	8,3	2,2	2,3	0,0080	42
Δ 400V 50Hz	132 Sa	5,5	2945	17,8	9,92	0,88	90,9	90,9	89,1	8,3	2,0	2,3	0,0180	46
	132 Sb	7,5	2950	24,3	13,40	0,88	91,7	91,7	89,9	7,9	2,0	2,3	0,0240	52
	160 Ma	11	2960	35,5	19,30	0,89	92,6	92,6	90,7	8,1	2,0	2,3	0,0480	95
	160Mb	15	2960	48,4	26,10	0,89	93,3	93,3	91,4	8,1	2,0	2,3	0,0600	103
	160 La	18,5	2960	59,7	32,00	0,89	93,7	93,7	91,8	8,2	2,0	2,3	0,0708	115

JM 4 POLES IE4 SERIES

Tab. 6.3.2

IE4	JM Motor	P_N	n_N	T_N	$I_{N\,(400\,V)}$	COSφ	η			$\frac{I_s}{I_N}$	$\frac{T_s}{T_N}$	$\frac{T_{max}}{T_N}$	J	Weight
		kW	min⁻¹	Nm	A		100%	75%	50%				Kg m²	Kg
Δ/Y 230/400V 50Hz	80 b	0,75	1430	5,01	1,68	0,75	85,7	85,7	84,0	6,6	2,3	2,3	0,0031	12,9
	90 S	1,1	1445	7,27	2,40	0,76	87,2	87,2	85,5	6,8	2,3	2,3	0,0037	16,8
	90 La	1,5	1450	9,88	3,19	0,77	88,2	88,2	86,4	7,0	2,3	2,3	0,0044	20
	100 La	2,2	1455	14,4	4,38	0,81	89,5	89,5	87,7	7,6	2,3	2,3	0,0076	26
	100 Lb	3	1455	19,7	5,84	0,82	90,4	90,4	88,6	7,6	2,3	2,3	0,0095	31,3
	112 Ma	4	1460	26,2	7,73	0,82	91,1	91,1	89,3	7,8	2,2	2,3	0,0134	39,2
Δ 400V 50Hz	132 Sa	5,5	1470	35,7	10,40	0,83	91,9	91,9	90,1	7,9	2,0	2,3	0,0305	51,2
	132 Ma	7,5	1470	48,7	13,90	0,84	92,6	92,6	90,7	7,5	2,0	2,3	0,0415	65
	160 Ma	11	1475	71,2	20,00	0,85	93,3	93,3	91,4	7,7	2,2	2,3	0,0988	97,3
	160 La	15	1475	97,1	26,80	0,86	93,9	93,9	92,0	7,8	2,2	2,3	0,1160	109

JM 6 POLES IE4 SERIES

Tab. 6.3.3

IE4	JM Motor	P_N	n_N	T_N	$I_{N\,(400\,V)}$	COSφ	η			$\frac{I_s}{I_N}$	$\frac{T_s}{T_N}$	$\frac{T_{max}}{T_N}$	J	Weight
		kW	min⁻¹	Nm	A		100%	75%	50%				Kg m²	Kg
Δ/Y 230/400V 50Hz	90 S	0,75	950	7,54	1,84	0,71	82,7	82,7	81,0	6,0	2,0	2,1	0,0042	17,2
	90 La	1,1	955	11,0	2,57	0,73	84,5	84,5	82,8	6,0	2,0	2,1	0,0047	22,4
	100 La	1,5	960	14,9	3,45	0,73	85,9	85,9	84,2	6,5	2,0	2,1	0,0090	33,5
	112 Ma	2,2	965	21,8	4,91	0,74	87,4	87,4	85,7	6,6	2,0	2,1	0,0170	38,6
Δ 400V 50Hz	132 Sa	3	970	29,5	6,60	0,74	88,6	88,6	86,8	6,8	2,0	2,1	0,0310	46
	132 Ma	4	975	39,2	8,72	0,74	89,5	89,5	87,7	6,8	2,0	2,1	0,0380	54
	132 Mb	5,5	975	53,9	11,70	0,75	90,5	90,5	88,7	7,0	2,0	2,1	0,0480	61,8
	160 Ma	7,5	980	73,1	15,00	0,79	91,3	91,3	89,5	7,0	2,0	2,1	0,0950	88,3
	160 La	11	980	107,2	21,50	0,80	92,3	92,3	90,5	7,2	2,0	2,1	0,1200	125

• 6.4 GM IE4 ELECTRICAL DATA

GM 2 POLES IE4 SERIES

Tab. 6.4.1

IE4	GM Motor	P_N	n_N	T_N	$I_{N\,(400\,V)}$	COSφ	η			$\frac{I_s}{I_N}$	$\frac{T_s}{T_N}$	$\frac{T_{max}}{T_N}$	J	Weight
		kW	min^{-1}	Nm	A		100%	75%	50%				$Kg\,m^2$	Kg
Δ 400V 50Hz	160 Ma	11	2960	35,49	19,3	0,89	92,6	92,6	90,7	8,1	2,0	2,3	0,0480	133
	160 Mb	15	2960	48,39	26,1	0,89	93,3	93,3	91,4	8,1	2,0	2,3	0,0600	146
	160 La	18,5	2960	59,68	32,0	0,89	93,7	93,7	91,8	8,2	2,0	2,3	0,0708	160
	180 M	22	2965	70,85	38,0	0,89	94,0	94,0	92,1	8,2	2,0	2,3	0,1116	221
	200 La	30	2970	96,46	51,5	0,89	94,5	94,5	92,6	7,6	2,0	2,3	0,1680	260
	200 Lb	37	2970	118,96	63,3	0,89	94,8	94,8	92,9	7,6	2,0	2,3	0,1956	309
	225 M	45	2975	144,44	76,0	0,90	95,0	95,0	93,1	7,7	2,0	2,3	0,2940	370
	250 M	55	2975	176,54	92,6	0,90	95,3	95,3	93,4	7,7	2,0	2,3	0,4000	520
	280 S	75	2980	240,33	126	0,90	95,6	95,6	93,7	7,1	1,8	2,3	0,7800	570
	280 M	90	2982	288,21	151	0,90	95,8	95,8	93,9	7,1	1,8	2,3	0,8520	630
	315 S	110	2980	352,49	184	0,90	96,0	96,0	94,1	7,1	1,8	2,3	1,5600	985
	315 M	132	2980	422,99	220	0,90	96,2	96,2	94,3	7,1	1,8	2,3	2,4000	1050
	315 Mb	160	2980	512,71	264	0,91	96,3	96,3	94,4	7,2	1,8	2,3	2,8200	1160
	315 Lb	200	2980	640,89	329	0,91	96,5	96,5	94,6	7,2	1,8	2,2	3,2400	1200
	355 M	250	2985	799,77	411	0,91	96,5	96,5	94,6	7,2	1,6	2,2	4,0800	2050
	355 L	315	2985	1007,71	518	0,91	96,5	96,5	94,6	7,2	1,6	2,2	4,6800	2380

GM 4 POLES IE4 SERIES

Tab. 6.4.2

IE4	GM Motor	P_N	n_N	T_N	$I_{N\,(400\,V)}$	COSφ	η			$\frac{I_s}{I_N}$	$\frac{T_s}{T_N}$	$\frac{T_{max}}{T_N}$	J	Weight
		kW	min^{-1}	Nm	A		100%	75%	50%				$Kg\,m^2$	Kg
Δ 400V 50Hz	160 Ma	11	1475	71,22	20,0	0,85	93,3	93,3	91,4	7,7	2,2	2,3	0,0988	146
	160 La	15	1475	97,11	26,8	0,86	93,9	93,9	92,0	7,8	2,2	2,3	0,1160	156
	180 M	18,5	1480	119,37	33,0	0,86	94,2	94,2	92,3	7,8	2,0	2,3	0,1720	181
	180 L	22	1480	141,95	39,1	0,86	94,5	94,5	92,6	7,8	2,0	2,3	0,2050	210
	200 La	30	1480	193,57	53,1	0,86	94,9	94,9	93,0	7,3	2,0	2,3	0,3360	280
	225 S	37	1485	237,93	65,2	0,86	95,2	95,2	93,3	7,4	2,0	2,3	0,5250	373
	225 M	45	1485	289,37	79,2	0,86	95,4	95,4	93,5	7,4	2,0	2,3	0,5980	390
	250 M	55	1485	353,68	96,5	0,86	95,7	95,7	93,8	7,4	2,2	2,3	0,8420	553
	280 S	75	1490	480,67	128	0,88	96,0	96,0	94,1	6,9	2,0	2,3	1,4760	655
	280 M	90	1490	576,80	154	0,88	96,1	96,1	94,2	6,9	2,0	2,3	1,8060	730
	315 S	110	1490	704,98	185	0,89	96,3	96,3	94,4	7,0	2,0	2,2	4,2460	980
	315 M	132	1490	845,98	222	0,89	96,4	96,4	94,5	7,0	2,0	2,2	4,4530	1031
	315 Mb	160	1490	1025,43	269	0,89	96,6	96,6	94,7	7,1	2,0	2,2	5,1240	1093
	315 Lb	200	1490	1281,78	332	0,90	96,7	96,7	94,8	7,1	2,0	2,2	6,1000	1240
	355 M	250	1490	1602,23	415	0,90	96,7	96,7	94,8	7,1	2,0	2,2	8,4180	1754
	355 L	315	1490	2018,81	522	0,90	96,7	96,7	94,8	7,1	2,0	2,2	10,6140	1960

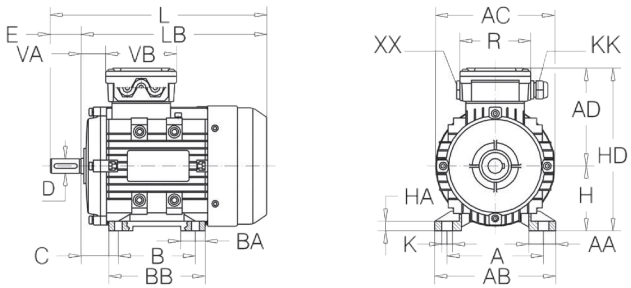
GM 6 POLES IE4 SERIES

Tab. 6.4.3

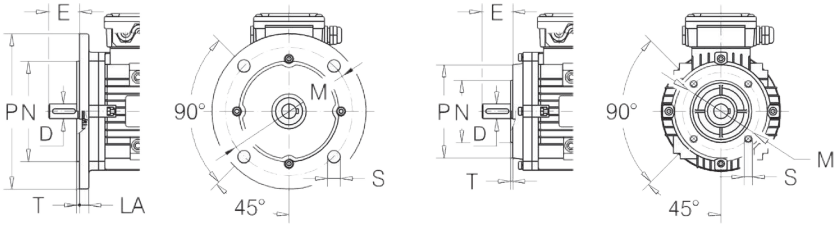
IE4	GM Motor	P_N	n_N	T_N	$I_{N\,(400\,V)}$	COSφ	η			$\frac{I_s}{I_N}$	$\frac{T_s}{T_N}$	$\frac{T_{max}}{T_N}$	J	Weight
		kW	min^{-1}	Nm	A		100%	75%	50%				Kg m^2	Kg
Δ 400V 50Hz	**160 Ma**	**7,5**	980	73,08	15,0	0,79	91,3	91,3	89,5	7,0	2,0	2,1	0,0950	140
	160 La	**11**	980	107,19	21,5	0,80	92,3	92,3	90,5	7,2	2,0	2,1	0,1200	160
	180 L	**15**	985	145,42	28,8	0,81	92,9	92,9	91,0	7,3	2,0	2,1	0,2200	245
	200 La	**18,5**	985	179,35	35,3	0,81	93,4	93,4	91,5	7,3	2,0	2,1	0,3700	265
	200 Lb	**22**	985	213,28	41,8	0,81	93,7	93,7	91,8	7,4	2,0	2,1	0,4200	285
	225 M	**30**	990	289,37	55,4	0,83	94,2	94,2	92,3	6,9	2,0	2,1	0,5500	335
	250 M	**37**	990	356,89	67,3	0,84	94,5	94,5	92,6	7,1	2,0	2,1	0,8500	471
	280 S	**45**	990	434,06	80,6	0,85	94,8	94,8	92,9	7,3	2,0	2,0	1,4200	530
	280 M	**55**	990	530,52	97,1	0,86	95,1	95,1	93,2	7,3	2,0	2,0	1,7000	670
	315 S	**75**	990	723,43	135,0	0,84	95,4	95,4	93,5	6,6	2,0	2,0	4,2000	960
	315 M	**90**	990	868,12	160,0	0,85	95,6	95,6	93,7	6,7	2,0	2,0	4,9000	1070
	315 La	**110**	990	1061,03	195,0	0,85	95,8	95,8	93,9	6,7	2,0	2,0	5,5000	1160
	315 Lb	**132**	990	1273,24	231,0	0,86	96,0	96,0	94,1	6,8	2,0	2,0	6,5000	1250
	355 Ma	**160**	990	1543,32	279,0	0,86	96,2	96,2	94,3	6,8	1,8	2,0	10,1000	1780
	355 Mb	**200**	990	1929,15	345,0	0,87	96,3	96,3	94,4	6,8	1,8	2,0	11,2000	1900
	355 L	**250**	990	2411,44	430,0	0,87	96,5	96,5	94,6	6,8	1,8	2,0	13,0000	2100

• 6.5 JM IE4 DIMENSIONAL DATA

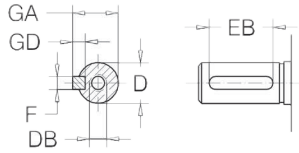
B3



B5



B14



Shaft end

JM SERIES

Tab. 6.5.1

JM Motor			Main Overall Dimension						Feet									Flange						
			AC	AD	H	HD	LB	L	A	B	C	AB	BB	AA	BA	HA	K	IM	M	NJ6	P	LA	T	S
80		**2-4**	158	129	80	209	250	290	125	100	50	157	125	35	31	8	10	**B5**	165	130	200	12	3,5	N°4 12
																		B14	100	80	120	--	3	N°4 M6
90	**S**	**2-4-6**	175	140	90	230	275	325	140	100	56	173	125	37	32	10	10	**B5**	165	130	200	12	3,5	N°4 12
	L						300	350		125			150					**B14**	115	95	140	--	3	N°4 M8
100	**L**	**2-4-6**	198	156	100	256	338	398	160	140	63	196	172	40	39	11	12	**B5**	215	180	250	13	4	N°4 15
																		B14	130	110	160	--	3,5	N°4 M8
112	**M**	**2-4-6**	219	166	112	278	387	447	190	140	70	227	180	41	43	12	12	**B5**	215	180	250	14	4	N°4 15
																		B14	130	110	160	--	3,5	N°4 M8
132	**S**	**2-4-6**	258	188	132	320	395	475	216	140	89	262	186	51	46	15	12	**B5**	265	230	300	14	4	N°4 15
	M						433	513		178			224					**B14**	165	130	200	--	3,5	N°4 M10
160	**M**	**2-4-6**	315	242	160	402	499	609	254	210	108	304	260	55	50	18	15	**B5**	300	250	350	15	5	N°4 19
	L						543	653		254			304					**B14**	215	180	250	--	4	N°4 M12

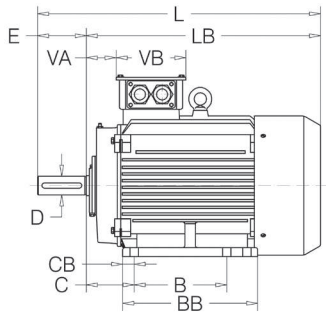
JM SERIES

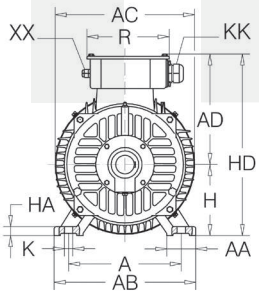
Tab. 6.5.2

JM Motor		Shaft - End							Shaft - Seals						Terminal - Box					
						Key			Flange-End			Drive End DE Non drive end NDE			Term.	Cable gland				
		D	DB	E	GA	F	GD	EB	Øi	Øe	H	Øi	Øe	H	N°-Ø	N°-KK	N°-XX	VA	VB	R
80	**2-4**	19	M6	40	21,5	6	6	30	20	35	7	20	35	7	6-M4	1- M20X1,5	1-plug	24,5	101	101
90	**2-4-6**	24	M8	50	27	8	7	40	25	40	7	25	40	7	6-M4	1- M25X1,5	1-plug	40,5	109	109
100	**2-4-6**	28	M10	60	31	8	7	50	30	47	7	30	47	7	6-M4	1- M25X1,5	1-plug	34	109	109
112	**2-4-6**	28	M10	60	31	8	7	50	30	47	7	30	47	7	6-M5	2-M25X1,5	--	33,2	117,5	117,5
132	**2-4-6**	38	M12	80	41	10	8	65	40	62	7	40	62	7	6-M5	2-M32X1,5	--	41,2	117,5	117,5
160	**2-4-6**	42	M16	110	45	12	8	90	45	62	12	45	62	12	6-M6	2-M40x1,5	1-M16x1,5	75	167	167

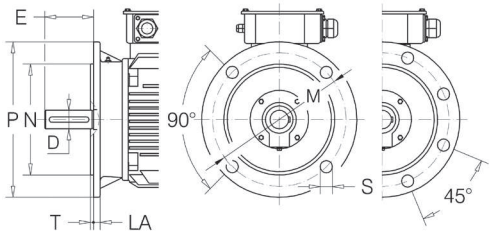
• 6.6 GM IE4 DIMENSIONAL DATA

B3

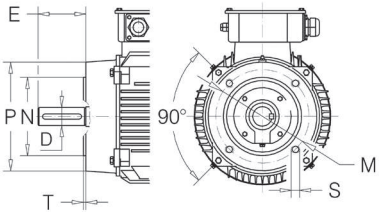


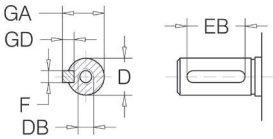


B5



B14





Shaft end

GM SERIES

Tab. 6.6.1

GM Motor			Main Overall Dimension						Feet									Flange						
			AC	AD	H	HD	LB	L	A	B	C	AB	BB	AA	CB	HA	K	IM	M	NJ6	P	LA	T	S
160	M	2-4-6	335	256	160	416	523	633	254	210	108	320	260	65	26	20	15	B5	300	250	350	15	5	N°4 19
	L						593	703		254			304					B14	215	180	250	--	4	N°4 M12
180	M	2-4	363	271	180	451	616	726	279	241	121	350	311	70	35	22	15	B5	300	250	350	15	5	N°4 19
	L	4-6					651	761		279			349											
200	L	2-4-6	418	312	200	512	752	862	318	305	133	390	370	70	32	25	18	B5	350	300	400	17	5	N°4 19
225	S	4	465	334	225	559	740	880	356	286	149	432	370	75	46	28	19	B5	400	350	450	20	5	N° 8 19
225	M	2	465	334	225	559	775	885	356	311	149	433	395	75	46	28	19	B5	400	350	450	20	5	N° 8 19
		4-6						915																
250	M	2-4-6	525	379	250	629	840	980	406	349	168	486	445	80	55	30	24	B5	500	450	550	22	5	N° 8 19
280	S	2	588	412	280	692	840	980	457	368	190	545	485	85	69	35	24	B5	500	450	550	22	5	N° 8 19
		4-6																						
280	M	2 4-6	588	412	280	692	880	1020	457	419	190	545	536	85	69	35	24	B5	500	450	550	22	5	N° 8 19
315	S	2	620	530	315	845	1060	1200	508	406	216	630	570	120	84	45	28	B5	600	550	660	22	6	N° 8 24
		4-6						1230																
315	M	2	620	530	315	845	1170	1310	508	457	216	630	680	120	84	45	28	B5	600	550	660	22	6	N° 8 24
		4-6					1164	1340																
315	L	2	620	530	315	845	1170	1310	508	508	216	630	680	120	84	45	28	B5	600	550	660	22	6	N° 8 24
		4-6					1164	1340																
355	M	2	698	645	355	1000	1360	1500	610	560	254	730	750	120	68	52	28	B5	740	680	800	25	6	N° 8 24
		4-6						1570																
355	L	2	698	645	355	1000	1360	1500	610	630	254	730	750	120	68	52	28	B5	740	680	800	25	6	N° 8 24
		4-6						1570																

GM SERIES

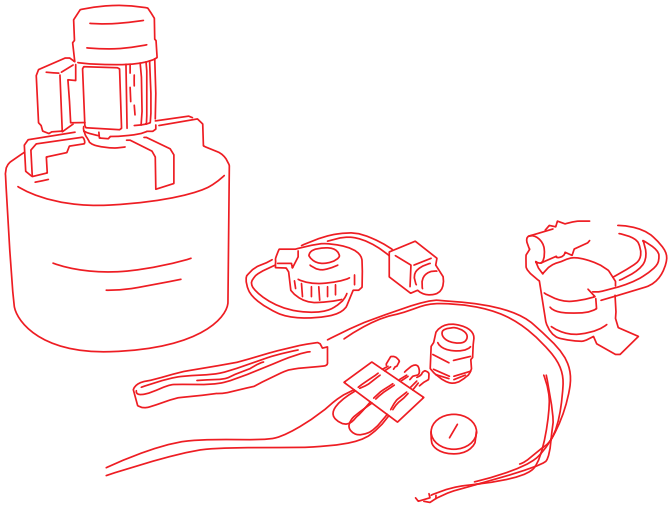
Tab. 6.6.2

GM Motor			Shaft - End							Shaft - Seals						Terminal - Box					
							Key			Flange-End			Drive End DE Non drive end NDE			Term.	Cable gland				
			D	DB	E	GA	F	GD	EB	Øi	Øe	H	Øi	Øe	H	N°-Ø	N°-KK	N°-XX	VA	VB	R
160	**M**	**2-4-6**	42	M16	110	45	12	8	90	45	62	8/12	45	62	8/12	6-M6	2-M40x1,5	1-M16x1,5	67	152	185
	L																				
180	**M**	**2-4**	48	M16	110	51,5	14	9	100	55	75	8/12	55	75	8/12	6-M6	2-M40x1,5	1-M16x1,5	82	152	185
	L	**4-6**																			
200	**L**	**2-4-6**	55	M20	110	59	16	10	100	60	80	8/12	60	80	8/12	6-M8	2-M50x1,5	1-M16x1,5	92	190	224
225	**S**	**4**	60	M20	140	64	18	11	125	65	90	10/12	65	90	10/12	6-M8	2-M50x1,5	1-M16x1,5	95	190	224
225	**M**	**2**	55	M20	110	59	16	10	100	60	80	8/12	60	80	8/12	6-M8	2-M50x1,5	1-M16x1,5	95	190	224
		4-6	60		140	64	18	11	125	65	90	10/12	65	90	10/12						
250	**M**	**2**	60	M20	140	64	18	11	125	65	90	10/12	65	90	10/12	6-M10	2-M63x1,5	1-M16x1,5	88	220	283
		4-6	65			69				70	90	10/12	70	90	10/12						
280	**S**	**2**	65	M20	140	69	18	11	125	70	90	10/12	70	90	10/12	6-M10	2-M63x1,5	1-M16x1,5	96	220	283
		4-6	75			79,5	20	12		85	110	10/12	85	100	10/12						
280	**M**	**2**	65	M20	140	69	18	11	125	70	90	10/12	70	90	10/12	6-M10	2-M63x1,5	1-M16x1,5	96	220	283
		4-6	75			79,5	20	12		85	110	10/12	85	100	10/12						
315	**S**	**2**	65	M20	140	69	18	11	125	85	110	10/12	85	110	10/12	6-M12/16	2-M63x1,5	1-M16x1,5	117	280	320
		4-6	80		170	85	22	14	140	95	120	10/12	95	120	10/12						
315	**M**	**2**	65	M20	140	69	18	11	125	85	110	10/12	85	110	10/12	6-M12/16	2-M63x1,5	1-M16x1,5	117	280	320
		4-6	80		170	85	22	14	140	95	120	10/12	95	120	10/12						
315	**L**	**2**	65	M20	140	69	18	11	125	85	110	10/12	85	110	10/12	6-M12/16	2-M63x1,5	1-M16x1,5	117	280	320
		4-6	80		170	85	22	14	140	95	120	10/12	95	120	10/12						
355	**M**	**2**	75	M20	140	79,5	20	12	125	95	120	10/12	95	120	10/12	6-M20	2-M63x1,5	1-M16x1,5	117	330	380
		4-6	100	M24	210	106	28	16	180	110	140	10/12	110	140	10/12						
355	**L**	**2**	75	M20	140	79,5	20	12	125	95	120	10/12	95	120	10/12	6-M20	2-M63x1,5	1-M16x1,5	117	330	380
		4-6	100	M24	210	106	28	16	180	110	140	10/12	110	140	10/12						

EXECUTIONS

NON-STANDARD

10 SPECIAL EXECUTIONS



1) WINDING

Non-standard voltages and/or frequencies
Seipee electric motors with three-phase power supply are designed for use on the European mains
230/400V ± 10% 50Hz.
This means that the same motor can also be connected to the following electrical mains:

- 220/380V ±5%
- 230/400V ±10%
- 240/415V ±5%

Special windings can be created on request with different voltages and/or frequencies.

Tropicalization
Tropicalization of winding consists in cold painting a product of remarkable hygroscopic qualities that ensures a certain refractory capacity against penetration of condensation in materials that must maintain optimal insulation.
It is indicated in situations where the motor is installed in environments where moisture content is particularly high.

Additional wrapping impregnation
It consists of a second impregnation cycle, recommended for:

- humid and corrosive environments (mildew);
- environments with strong mechanical and electromagnetic stress induced by inverters;
- in the presence of strong electrical agents (voltage peaks);
- in the presence of strong mechanical agents (induced mechanical or electromagnetic vibrations);

2) TERMINAL BOX

Side terminal box
As standard, the terminal box is in position T, i.e. on the top control side.
For motors with feet IM B3 and deriving structural formats, it is possible to place the terminal box R (right) or L (left), on request.
In self-braking motors, any release lever follows the position of the terminal box.

NDE terminal box
On request, the terminal box can be positioned on the NDE side (fan side) instead of the DE side (control side) as is standard.

Cables input
As standard, the cable glands are positioned on the right side of the terminal box. The position of the cables input can be rotated by 90° or 180° on request.

Cable gland type
The standard cable glands are made of polyamide, and the relative dimensions for each motor size are outlined in the tables of the dimensional data of the various series of motors.
On request, cable glands and metal plugs can be supplied, especially suitable for applications with temperatures outside the range -15/+40 C.

Cylindrical connector for quick motor cabling

Auxiliary capacitor (JMM series)
Auxiliary capacitor with built-in electronic circuit breaker for high starting point (MS/MN=approximately 1..1÷1.4).
It automatically enters at the start of the motor only for a time of 1.5 s (not suitable for applications with starting times > 1.5 s).

Warning: The time between starting and the next start must be > 6 s, to avoid causing damage to the circuit breaker.

3) MOTOR PROTECTION

Bimetal thermal probes (PTO)
Three probes connected in series with normally closed contact inserted in the motor winding. The contact is opened when the winding temperature reaches and exceeds the intervention value (150 C for motor in class F). VN,max. 250 [V], IN,max. 1.6 [A]
The terminals are placed inside the motor terminal box.

Standard on motors with axle height 160 to 450.

Thermistor thermal probes (PTC)
Three thermistors connected in series inserted in the winding conforming to DIN 44081/44082, to be connected to specific release equipment (the purchase of this equipment is charged to the buyer of the motor).

There is a sudden change in resistance (which causes the release) when the temperature of the winding reaches and exceeds the intervention value (150 C for motor in class F).
The terminals are placed inside the motor terminal box.

Standard on all motors with power over 0.75kw.

Temperature sensor PT 100 (resistance thermometer)
It is a temperature sensor that takes advantage of the variation in the resistivity of certain materials as temperature changes, in accordance with DIN-IEC 751.
Three PT 100 are inserted inside the winding, one for each phase. Terminals placed inside the motor terminal box must be connected to appropriate equipment (purchase of this equipment is charged to the buyer of the motor).

Temperature probe KTY84-130
Temperature sensor in silicon depending on the change in resistance with positive temperature coefficient.

Anti-condensation heater
It is recommended for motors operating in environments:
- with high humidity;
- with strong thermal excursions;
- with low temperature (possible ice formation);

It is a resistor fixed on coil heads that allows heating the winding of the stopped electric motor and then eliminates condensate inside the housing.

Structure: Glass fibre tape, in which a multi-wire resistor is inserted in nickel-chrome, covered with polyester adhesive tape reinforced with glass fibre filaments and an additional external glass fibre sleeve

Single-phase power supply 230V ac ±10% 50 / 60 Hz, absorbed power:
- 25 W for size 63 ... 90;
- 26 W for size 100 ... 112;
- 40 W for size 132 ... 160;
- 26 W for size 180 ... 200;
- 42 W for size 225 ... 250;
- 65 W for size 280;
- 99 W for size 315 ... 450;

The heater must not be powered during while the motor is running.
Terminals located inside the motor terminal box.

The anti-condensate heater is compulsory combined with the condensation drainage holes execution.
As standard on the GM 160...450 motors, on the side opposite the terminal box.
On placing the order, always specify the working position of the motor.
If, on installation, the plugs on the holes of the condensate exhaust located on the lower side of the electric motor have not been removed, they must be opened approximately every 5 months to allow leakage of the condensate created.

4) COLOURS AND PAINTING

Seipee motors are powder painted or painted with combined nitro paint to resist normal industrial environments and allow further finishing with monocomponent synthetic paint.

- JMM 56...100: RAL 9006 (White aluminium);
- JM 56...160: RAL 9006 (White aluminium);
- GM 160...450: RAL 5010 (blue);
- JMD 80...160: RAL 9006 (White aluminium);
- GMD 180...250: RAL 5010 (blue);
- JMK 63....160 RAL 9006 (White aluminium); Copriventola RAL 9005 (Black)
- GMK 180...280 RAL 5010 (blue);

The choice of painting treatment is a critical phase as it depends on the durability of the electric motor according to the environment in which it is to be placed.

According to standard UNI EN ISO 12944-1 the durability of the paint can be classified according to 3 classes:
Low (L) from 2 to 5 years.
Medium (M) from 5 to 10 years.
High (H) over 15 years.
Durability is indicated next to the corrosion category of the installation environment to allow the definition of the protec

tion cycle able to operate in that environment and to ensure the required durability. The painting cycles that are carried out are fully compliant with the regulations.
ISO 12944 Classification:
C1 - C2 = Rural zones, low pollution. Heated buildings/neutral atmosphere.
C3 = Urban and industrial atmosphere. Moderate levels of sulphur dioxide. Production areas with high humidity.
C4 = Industrial and coastal. Chemical processing plants.
C5L = Industrial areas with high humidity and aggressive atmospheres.
C5M = Sea areas, offshore, estuaries, coastal areas with high salinity.

- Without paint: motor supplied with base primer only
- Painting in other hues: RAL to indicate on purchase order
- Special paint C3
- Special paint resistant to heavier environments C4 or C5.

5) EXECUTIONS ON BEARINGS

PT 100 on bearing
PT100 sensor inserted on the bearing support (control side, side opposite control). The terminals are placed inside a shunt box fastened to the motor housing. .

Electrically insulated bearing
The rolling bearings of electric motors are potentially subject to current passages that quickly damage the surfaces of runners and rolling bodies and degrade their grease.
The risk of damage increases in the increasingly popular electric motors equipped with frequency converters, especially in applications with sudden variations in frequency.
In bearings on such motors, there is an additional risk due to the presence of high frequency currents caused by the parasitic capacities existing within the motor. The electrically insulated bearing has the outer surface of the external ring coated with a layer of aluminium oxide 100 m thick, able to withstand voltages of 1,000 V d.c., practically eliminating issues caused by current passage.
It is usually installed on the NDE bearing.

For use in motors equipped with frequency converters: recommended starting from size 250.

• Bearing 2RS

• Locked bearing as standard on GM motors, on request on JM series

• Oblique contact bearing
For applications with important axial loads acting in one direction only (size 315 and higher)

• Cylindrical roller bearing
For applications with strong, constant radial loads (size 160 to 280).

• Automatic single point greaser for bearings
Automatic lubricators can be installed to ensure the correct amount of lubricant is delivered within a certain time using an inert gas cell.
This lubrication procedure allows more accurate control of the amount of lubricant supplied, compared to traditional manual re-lubrication techniques. It has a nominal delivery period that can vary between 1 month and 12 months and can also be temporarily deactivated if necessary.

Suitable for direct mounting in confined spaces and is particularly suitable for points requiring frequent lubrication, machine shutdown and safety implications. (only possible for motors with re-lubricating bearings, GM series size 160 and higher)

6) MECHANICAL EXECUTIONS AND DEGREES OF PROTECTION

- **Double output shaft** (on which radial loads are not permitted)
- **Shaft ends to drawing**
- **Standard shaft in stainless steel**
- **External screws in stainless steel**
- **Entire key balancing**
- **Balancing without key**
- **Flange tolerance in precise class**
- **Fan cover for textile environment**

Fan cover equipped with a special protective roof instead of the normal grate to avoid clogging with waste and dust from filaments in the textile environment.
The longitudinal dimensions of the motor increase by 30÷70mm according to size.

IP56 protection JM and GM series
Recommended for motors operating in very humid environments and/ or in the presence water sprays. The protection rating on the rating plate becomes IP56.
You should contact the technical office for vertical axis positioned motors.

IP65 protection JM and GM series
Recommended for motors working in dusty environments.
The protection rating on the rating plate becomes IP65.
You should contact the technical office for vertical axis positioned motors.

Condensate drain holes
As standard on the GM 160...450 motors, on the side opposite the terminal box.
On placing the order, always specify the working position of the motor.
If, on installation, the plugs on the holes of the condensate exhaust located on the lower side of the electric motor have not been removed, they must be opened approximately every 5 months to allow leakage of the condensate created.

Rain cover
Execution required for outdoor applications or in the presence of water splashes, with vertical shaft pointing downwards, type of construction (IM V5, IM V1, IM V18, IM V15, IM V17).
The LB dimension increases by:
• 35 mm size 56 ... 112;
• 45 mm size 132 ... 160;
• 65 mm size 180 ... 225;
• 85 mm size 250 ... 355;
• 120 mm size 355X ... 450

Execution for low temperatures
Standard motors can operate at room temperature up to -15°C with peaks up to -20°C.
For room temperature up to -30°C and above, special bearings and an anti-condensate heater are required. On request, we recommend the light alloy fan and the metal cable glands/plugs and in case of condensate formation the relative condensate drainage holes (in this case indicate the mounting position).

Execution for high temperatures
Standard three-phase motors can operate at room temperature up to 55°C with peaks up to 60°C, as long as the required power is lower than the plate power (as per General characteristics/Power yield based on ambient temperature Tab.....).
For an ambient temperature 60 ÷ 90°C, special bearings and sealing rings are necessary in fluorine rubber (viton). Wrapping in insulation class H, light alloy fan and metal cable glands/plugs are also recommended.

7) VENTILATION

IC418
Motor without fan and fan cover. Used in applications where cooling is ensured by the external environment.
IC416
Axial servo-fan IP54 indicated for:
- frequent start-ups and/or heavy start-up cycles
- with use of frequency or voltage variator

since, in the event of prolonged operation at low speed, the ventilation loses its effectiveness, it is therefore advisable to install a forced ventilation system with constant flow.
Vice versa, in the event of prolonged operation at high speeds, the noise emitted by the ventilation system can be annoying, and it is therefore recommended to opt for a forced ventilation system.
The characteristics of the servo-fan and the variation ΔL of the measurement LB (see "motor dimensions) are outlined on page 30 tab. 3.14.

The auxiliary ventilation power terminals are located inside an auxiliary terminal box attached to the fan cover. Before making the electrical connection make sure the power supply corresponds to the electrical data shown on the plate.

Important:
check the rotation direction of the three-phase fan. Corresponds to that indicated by the arrow placed on the fan cover, otherwise reverse two of the three phases of power supply

On request, the servo-fan can be created in special versions: voltages, frequencies, working temperature according to client specifications as well as the single-phase, multi-voltage and IP 66 protection versions.

8) SPEED TRANSDUCERS

Standard incremental encoder with hollow shaft and elastic fastening connection cable equipped with military type male connector fastened to the motor.
The female connector is also supplied with relevant diagram for the connection

Characteristics:
- incremental optical type
- two-directional with zero channel (channels A, B, Z and respective denied channels)
- degree of protection IP 54
- max speed 6000 RPM (4000 RPM in continuous service S1)
- operating temperature -10 C +85 C
- resolution from 200 to 2048 pul. /rev; 1024 standard
- max load current 20 mA per channel
- supply voltage 5 ÷ 28 Vdc
- electronic configuration line driver / push-pull (in push-pull configuration do not connect A,B,Z denied channels)
- absorption with no load 100 mA.

Available executions:
- servo-ventilated motor with encoder
- self-ventilated motor with encoder

Measurement LB in two executions is subject to the same variation ΔL outlined in table (Characteristics of the auxiliary fan page 32 no. table 3.14).

On request, the following can be supplied:
- Incremental encoder with high degree of protection
- Absolute encoder
- Resolver

Only for the JMK and GMK Series:

- **Brake protection in rubber**

It is used to prevent dust and/or water or other foreign bodies from entering the braking surfaces. Furthermore, consistently limit the dust from brake wear dispersing in the environment
It is applied around the brake in the appropriate slots provided.
This execution is necessary for IP55

- **IP55 protection (not possible in execution with release lever).**

TA and GA series brake: sealing ring on control side for IM B5 (V-ring for IM B3), dust-proof, water-proof rubber protection and V-ring on opposite side.

- **TC or L7 brake with IP66 protection (not possible in execution with release lever).**

- **Brake pad with anti-sticking friction material (TA, GA, TC, GC series)**

Eliminates danger of brake pad sticking. It is recommended for motors operating in environments:
- that are aggressive
- with high vapour concentrations
- near the sea (near saltwater)

Also recommended when the motor remains unused for long periods of time. (Attention: the nominal braking moment reduces by 10%)

- **Manual release lever**

It frees the motor from the unpowered brake and returns to its initial position after the manoeuvre (automatic return). Useful for manual rotations in case of power failure and/or during installation. The handle of the lever can be removed and is located in correspondence with the terminal box (standard

position). It is always advisable to remove the handle once the operations have been completed.

- **Manual rotation**

It allows you to turn the motor shaft from the opposite the control side. A hex male key is used by inserting it in the central hole of the fan cover.

- measurement 3 for size 63;
- measurement 4 for 71;
- measurement 5 for 80;
- measurement 6 for 90 ... 132;
- measurement 8 for 160;

NOT possible with executions with Rain protection roof, Encoder and axial servo-fan**.**

- **Braking moment calibrated different to standard value.**

- **Mechanical micrometer to signal wear or the brake Locked/Unlocked position**

- **Micro-switch to signal brake opening/closure.**

9) EXECUTIONS ACCORDING TO STANDARDS GUARDS

Execution according to standards

c UL us for the US and Canadian market, available on JM and GM series. Certificate No. E34813
The main variants are the insulation system of the winding class F certified UL, adaptation of air distances towards the ground and live parts.

Execution according to standards

EAC for the per Eurasian customs union (Russia, Belarus, Kazakhstan, Armenia and Kyrgyzstan) certified RU D-IT.AD53. B07480

for the People's Republic of China

UKCA for the UK

for applications in a naval or marine environment

ATEX

The JM and GM (≤600V) series motors are supplied for use in environments with potentially explosive atmospheres according to ATEX 94/9/EC directive group II category 3D for zone 22 / 3G zone 2.
As standard, PTC 130°C and certified cable glands are installed ATEX.
Marking plate:

ATEX II 3D Ex tc IIIC T125°C Dc IP65 zone 22
ATEX II 3G Ex ec IIC T3 Gc zone 2

On request, the execution is possible ATEX II 3G Ex ec IIC T4 Gc.

Legend:
II = Group of origin (use on surface);
3 = Protection category;
includes equipment designed to operate in accordance with the operating parameters established by the manufacturer and to ensure a normal level of protection; it may only be used in classified areas 2 or 22 non-conductive powders.
D = Powders per installation zone Dc (zona 22);
G = Gas per installation zone Gc (zona 2);
tc / ec = protection mode;
IIIC / IIC = equipment group of origin according to the nature of the explosive atmosphere;
T135°C = maximum surface temperature for atmospheres with presence of dust;
T3 / T4 = temperature class for atmospheres with presence of gas.

For inverter applications. it is always necessary to connect the supplied temperature probes to meet the thermal classes indicated in the marking.

The purchaser of the product will be responsible for taking appropriate technical and organisational measures and for assessing any possible risk of explosion to the health and safety of workers in potentially explosive areas (Directive 99/92/EC).
On receipt of the electric motor, make sure there is no damage or faults.
Before starting the motor, check the data on the plate, read the instruction manual carefully (supplied to the motor) and verify its suitability for the application requested

10) TECHNICAL DATA AND ADDITIONAL PLATES

- Double plate
- Sheet metal plate
- Additional instructions on the plate and the packaging label
- Test certificate
- Document with electrical data
- Document with dimensional drawing