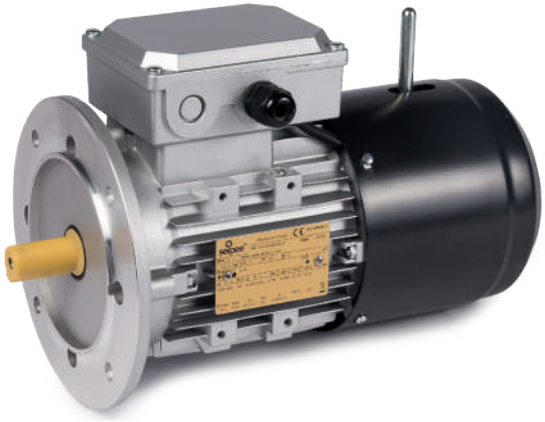
SELF-BRAKING MOTORS

JMK-GMK IE3-IE2

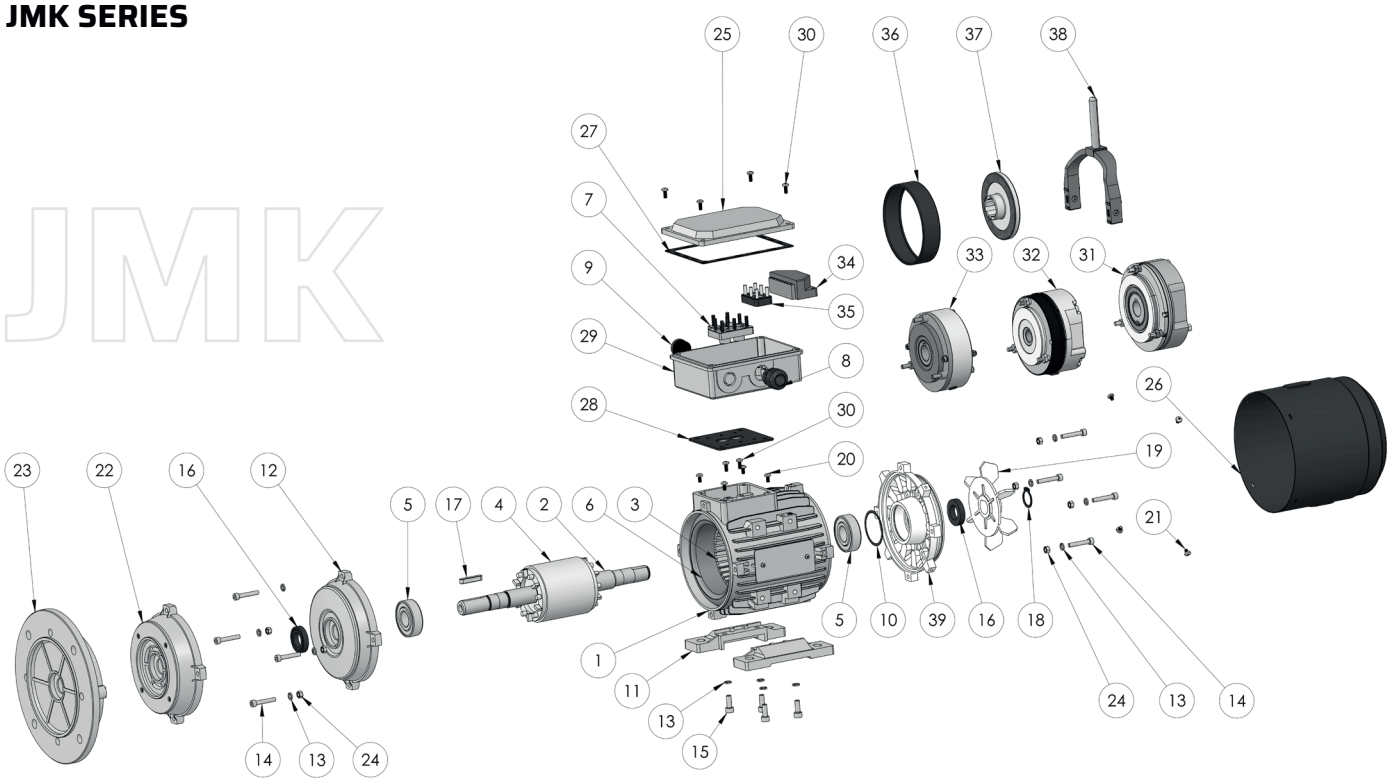
9 SELF-BRAKING MOTORS

• 9.1 COMPONENTS



JMK SERIES

JMK



1) Housing
2) Shaft
3) Stator
4) Rotor
5) Bearing
6) Winding
7) Terminal board
8) Cable gland
9) Plug
10) Preload spring
11) Foot for IMB3
12) Shield on control side for IMB3
13) Washer
14) Fastening screw for IMB3-IMB5-IMB14
15) Feet fastening screw for IMB3
16) Sealing ring
17) Key
18) Safety flexible ring
19) Fan
20) Terminal box locking screw
21) Fan cover locking screw
22) Flange IMB14
23) Flange IMB5
24) Nut
25) Terminal box cover
26) Fan cover
27) Terminal box gasket
28) Terminal box gasket
29) Terminal box
30) Terminal box cover screw
31) T.C. brake
32) T.A. brake
33) L.7. brake
34) Brake rectifier
35) Terminal board for brake A.C.
36) Brake protection with friction material
37) Brake pad with anti-sticking friction material
38) Release lever
39) Shield side opposite control

• 9.2 GENERAL CHARACTERISTICS

Standard asynchronous three-phase self-braking electric motor for general use in industrial applications, with cage rotor in short circuit, closed, self-ventilated externally (cooling method IC 411), thermal insulation class F/B suitable for inverter operation.

Designed to operate in continuous service (S1) at nominal voltage and frequency, working ambient air temperature: -15 ÷ +40 °C.
Maximum altitude: 1000 m above sea level.

JMK MOTORS SERIES

From an axis height of 63 to 160, power 0,12...18.5kW, 2-4-6-8-pole in die-cast aluminium light alloy.

Excellent thermal conductivity and excellent corrosion resistance.

Lifting ring starting with size 100.

Aluminium feet with the possibility of installation on the 3 sides of the motor in order to have the terminal box on the desired side: IM B3, IM B5, IM B14 and combined formats IM B35 (B3/B5) and IM B34 (B3/B14) / R, B, L, T. Standard on motor IM B3, it is supplied with a high terminal box (position T).

The motors can also be operated in the corresponding vertical-axis structural formats, however when requesting the motor specify its exact positioning.
The motor plate indicates the structural format with horizontal axis.

Terminal box and terminal cover in die-cast aluminium light alloy with bilateral cable input from size 63 ... 132. In size 160. standard two cable glands on the right hand side, on request on the left hand side. Ground terminal inside the terminal box, setup for a second ground clamp on the housing.

Terminal board to power a 6-terminal motor.

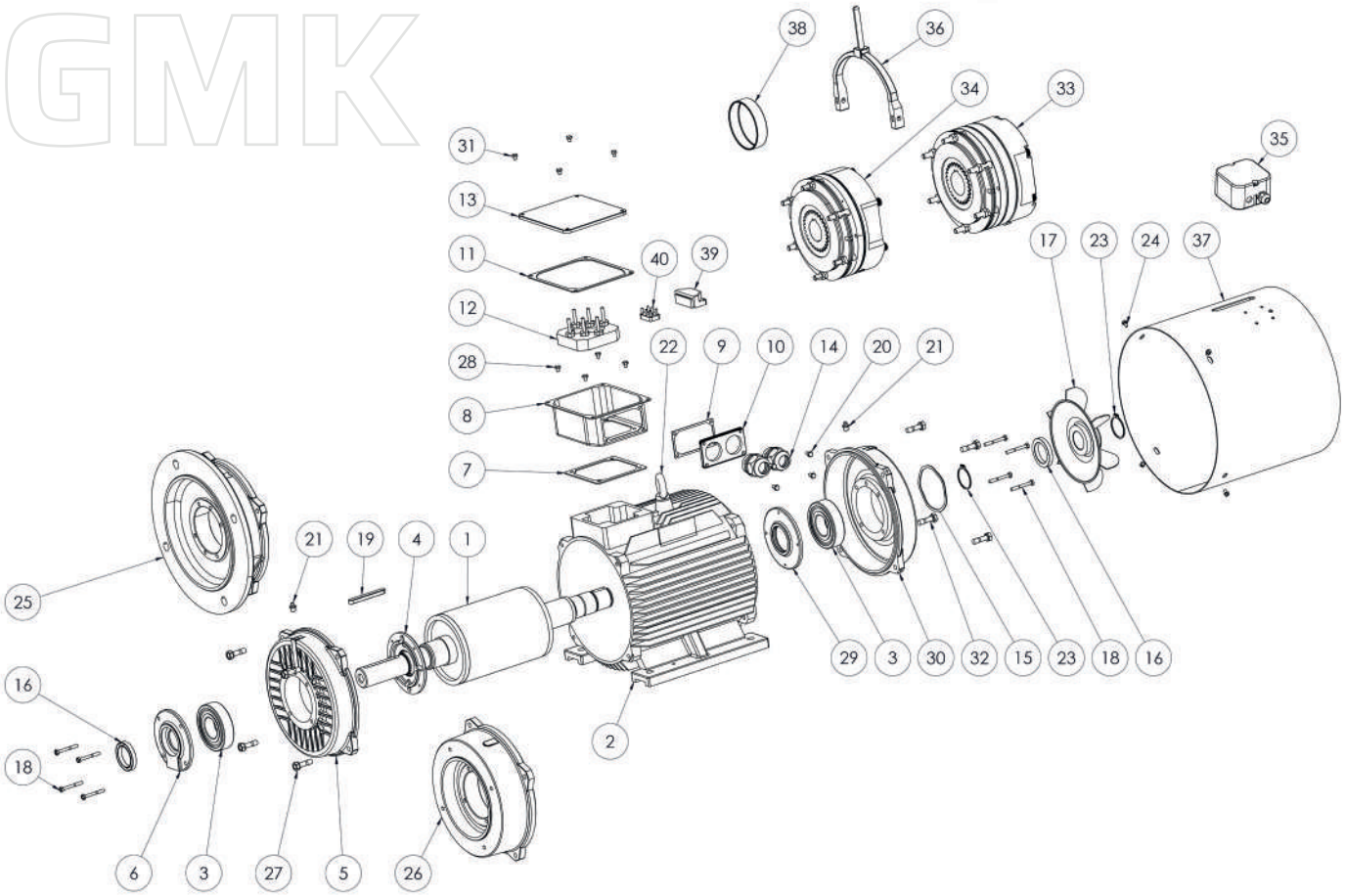
Shields and flanges all with tightening couplings “resting” and mounted on the housing with “tight” coupling. Shields and flanges on the shaft side made of die-cast aluminium light alloy, the bearing compartments are reinforced with steel sizes 80 ... 160. Shield on the side opposite coupling in cast iron.

JMK motors are powder coated RAL 9006 aluminium grey on the housing and with powder coated steel sheet fan/brake cover both internally and externally RAL 9005 black.

• 9.3 COMPONENTS

GMK SERIES

GMK



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 flange fastening screw
19) Key
20) Terminal box tab screw
21) Greaser
22) Lifting eyebolts
23) Safety flexible ring
24) Fan cover locking screw
25) Flange IMB5
26) Flange IMB14 (size GM 160 only)
27) Shield locking screw IMB3 on control side
28) Terminal box locking screw
29) Side opposite control bearing locking internal flange
30) Shield on side opposite control IMB3
31) Terminal box cover locking screw
32) Shield locking screw IMB3 on side opposite control
33) T.A. brake
34) T.C. brake.
35) Brake auxiliary box
36) Release lever
37) Fan cover
38) Brake protection in rubber
39) Brake rectifier
40) Terminal board for brake A.C.

GMK SERIES MOTORS

From an axis height 180 to 225, power 11...45kW 2-4-6-8-pole with **cast iron** housing with motor lifting eyebolt, **feet in cast iron firmly on the casing and shields and flanges in cast iron**.

As standard, the IMB3 motor is supplied with a top terminal box, and a side one on request.

Terminal box and terminal cover in steel (terminal box adjustable in 90° steps). Power cable input on the right side.

Ground terminal inside the terminal box, setup for a second ground clamp on the housing.

Terminal board to power a 6-terminal motor.

GMK motors are painted with combined nitro paint, in RAL 5010 blue with powder painted steel sheet fan/brake cover both internally and externally the same RAL.

• 9.4 BEARINGS

Both the JMK and GMK series are equipped with rigid radial ball bearings with a crown, double-shield, lubricated for life, one of the best brands and selected for specific use on electric motors.

The shielded bearings ZZ, 2RS or DDU are lubricated for life with lithium grease for working temperature -15...+ 110 C, and therefore do not require maintenance.

Tab. 9.4.1

Motor		Horizontal IM B3, B35, B34, B5, B6, B7, B8, B14		Vertical IM V1, V15, V5, V18, V6		Dimensions Bearings
		Coupling side	Side opp. coup.	Coupling side	Side opp. coup.	[$Ø_i$ x $Ø_e$ x H]
JMK 63		6201-2RS/DDU	6202-2RS/DDU	6201-2RS/DDU	6202-2RS/DDU	12x32x10 / 15x35x11
JMK 71		6202-2RS/DDU	6203-2RS/DDU	6202-2RS/DDU	6203-2RS/DDU	15x35x11 / 17x40x1
JMK 80		6204-2RS/DDU		6204-2RS/DDU		20x47x14
JMK 90		6205-2RS/DDU		6205-2RS/DDU		25x52x1
JMK 100		6206-2RS/DDU		6206-2RS/DDU		30x62x16
JMK 112		6306-2RS/DDU	6207-2RS/DD	6306-2RS/DDU	6207-2RS/DDU	30x72x19 / 35x72x17
JMK 132		6308-2RS/DDU		6308-2RS/DDU		40x90x23
JMK 160		6309-2RS/DDU		6309-2RS/DDU		45x100x25
GMK 180		6311 ZZ C3	6311-2RS/DDU C3	6311 ZZ C3	6311-2RS/DDU C3	55x120x29
GMK 200		6312 ZZ C3	6312-2RS/DDU C3	6312 ZZ C3	6312-2RS/DDU C3	60x130x31
GMK 225		6313 ZZ C3	6313-2RS/DDU C	6313 ZZ C3	6313-2RS/DDU C3	65x140x33
GMK 250		6314 ZZ C3	6314-2RS/DDU C3	6314 ZZ C3	6314-2RS/DDU C3	70x150x35
GMK 280	2 2-4-6	6314 ZZ C3 6317 ZZ C3	6314-2RS/DDU C3 6317-2RS/DDU C3	6314 ZZ C3 6317 ZZ C3	6314-2RS/DDU C3 6317-2RS/DDU C3	70x150x35 85x180x41

9.5 SHAFT

Motor shaft in carbon steel with cylindrical ends, threaded hole in the head and key joined; motor shaft locked axially by two elastic rings: one on the shaft, the other on the rear shield.

Dynamic balance rotor with half key inserted in the end of the shaft.

On the opposite side, there is a threaded hole with the following dimensions:

JMK 63 = M4x12mm
JMK 71 = M5x15mm
JMK 80 = M6x15mm
JMK 90-100-112-132 = M8x25mm
JMK 160 = M10x25mm
GMK 180...280 = M10x25mm

9.6 MOTOR CONNECTIONS

Motor power supply voltage:

Size 63 ... 112 -> standard voltage Δ 230 V / Y 400 V
Size 132 and 160 -> standard voltage Δ 400 V
Different voltages available on request.

SELF-BRAKING MOTORS
IE3

Size	JMK
80 ~ 160	

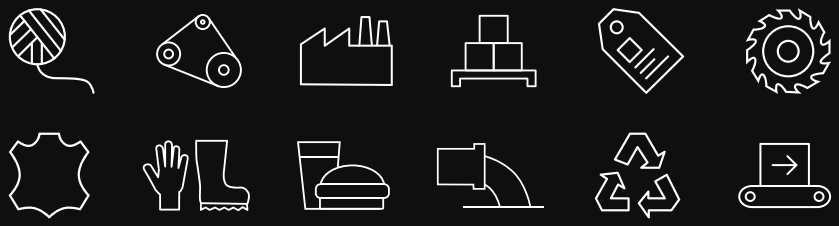
Size	GMK
180 ~ 225	

Power	JMK
0.75 ~ 18.5 kW	

Power	GMK
15 ~ 90 kW	

Polarity	JMK
2, 4, 6, 8 poles	

Polarity	GMK
2, 4, 6, 8 poles	



Sectors of use

• 9.7 JMK IE3 ELECTRICAL DATA

JMK 2 POLES IE3 SERIES

Tab. 9.7.1

IE3	JMK Motor	Poles	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%	100%	75%	50%				Kg m^2	Kg
Δ / Y - 230 / 400 V 50 Hz	**80 a**	**2**	**0,75**	2880	2,49	1,62	0,83	80,7	80,7	79,1	6,8	2,3	2,3	0,0014	13,3
	80 b	**2**	**1,1**	2880	3,65	2,31	0,83	82,7	82,7	81,0	7,3	2,3	2,3	0,0017	14,4
	80 c	**2**	**1,5**	2895	4,95	3,05	0,83	84,2	84,2	82,5	7,5	2,3	2,3	0,0018	15,5
	90 S	**2**	**1,5**	2895	4,95	3,10	0,83	84,2	84,2	82,5	7,6	2,3	2,3	0,0019	20,8
	90 La	**2**	**2,2**	2895	7,26	4,35	0,85	85,9	85,9	84,2	7,8	2,3	2,3	0,0025	22,8
	90 Lb*	**2**	**3**	2895	9,9	5,65	0,88	87,1	87,1	85,4	8,0	2,3	2,3	0,0030	27
	100 La	**2**	**3**	2895	9,9	5,65	0,88	87,1	87,1	85,4	8,1	2,3	2,3	0,0037	31,4
	100 Lb*	**2**	**4**	2900	13,2	7,45	0,88	88,1	88,1	86,3	8,1	2,3	2,3	0,0040	33,5
	112 Ma	**2**	**4**	2900	13,2	7,45	0,88	88,1	88,1	86,3	8,3	2,3	2,3	0,0085	42,5
	112 Mb*	**2**	**5,5**	2930	17,9	10,1	0,88	89,2	89,2	87,4	8	2,2	2,3	0,0095	47
Δ 400V 50Hz	**132 Sa**	**2**	**5,5**	2930	17,9	10,1	0,88	89,2	89,2	87,4	8,0	2,2	2,3	0,0195	59,5
	132 Sb	**2**	**7,5**	2930	24,4	13,7	0,88	90,1	90,1	88,3	7,8	2,2	2,3	0,0245	65
	132 Ma+	**2**	**9,25**	2940	30,0	16,8	0,88	90,1	90,1	88,3	7,8	2,2	2,3	0,0260	74
	132 Mb*	**2**	**11**	2945	35,7	19,3	0,90	91,2	91,2	89,4	7,9	2,2	2,3	0,0280	76,4
	132 Mc*	**2**	**15**	2945	48,6	25,9	0,91	91,9	91,9	90,1	8,0	2,2	2,3	0,0400	80,5
	160 Ma	**2**	**11**	2945	35,7	19,3	0,90	91,2	91,2	89,4	7,9	2,2	2,3	0,0450	108
	160 Mb	**2**	**15**	2945	48,6	25,9	0,91	91,9	91,9	90,1	8,0	2,2	2,3	0,0500	122
	160 La	**2**	**18,5**	2940	60,1	32,5	0,89	92,4	92,4	90,6	8,1	2,2	2,3	0,0650	133
	160 Lb*	**2**	**22**	2955	71,1	38,1	0,90	92,70	92,70	90,80	8,2	2,2	2,3	0,0940	144

JMK 4 POLES IE3 SERIES

Tab. 9.7.2

IE3	JMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m²	Weight Kg
Δ / Y - 230 / 400 V 50 Hz	80 b	4	0,75	1420	5,04	1,77	0,74	82,5	82,5	80,9	6,3	2,3	2,3	0,0023	15,5
	80 c*	4	1,1	1445	7,27	2,55	0,74	84,1	84,1	82,4	6,5	2,3	2,3	0,0025	17,7
	90 S	4	1,1	1435	7,32	2,52	0,75	84,1	84,1	82,4	6,5	2,3	2,3	0,0027	20,6
	90 La	4	1,5	1435	9,98	3,38	0,75	85,3	85,3	83,6	6,6	2,3	2,3	0,0037	25
	90 Lb*	4	1,85	1435	12,3	3,95	0,78	86,7	86,7	85,0	6,7	2,3	2,3	0,0043	25,5
	90 Lc*	4	2,2	1435	14,6	4,68	0,78	86,7	86,7	85,0	6,9	2,3	2,3	0,0051	26
	100 La	4	2,2	1445	14,5	4,52	0,81	86,7	86,7	85,0	6,9	2,3	2,3	0,0069	33,5
	100 Lb	4	3	1445	19,8	6,02	0,82	87,7	87,7	85,9	7,5	2,3	2,3	0,0084	39
	112 Ma	4	4	1450	26,3	7,95	0,82	88,6	88,6	86,8	7,6	2,3	2,3	0,0140	49,3
	112 Mc*	4	5,5	1460	36,0	11,1	0,80	89,6	89,6	87,8	7,7	2,0	2,3	0,0170	52,6
Δ 400V 50Hz	132 S	4	5,5	1465	35,9	10,8	0,82	89,6	89,6	87,8	7,7	2,0	2,3	0,0310	66
	132 Ma	4	7,5	1465	48,9	14,4	0,83	90,4	90,4	88,6	7,5	2,0	2,3	0,0370	77
	132 Mb*	4	9,25	1460	60,5	18,0	0,82	90,4	90,4	88,6	7,5	2,0	2,3	0,0500	79,5
	132 Mc*	4	11	1465	71,7	21,2	0,82	91,4	91,4	89,6	7,4	2,2	2,3	0,0530	91,5
	160 M	4	11	1475	71,2	20,4	0,85	91,4	91,4	89,6	7,4	2,2	2,3	0,0800	117
	160 L	4	15	1475	97,1	27,3	0,86	92,1	92,1	90,3	7,5	2,2	2,3	0,0980	133,5

JMK 6 POLES IE3 SERIES

Tab. 9.7.3

IE3	JMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m²	Weight Kg
Δ / Y - 230 / 400V 50 Hz	90 S	6	0,75	935	7,66	2,25	0,61	78,9	78,9	77,3	5,8	2,1	2,1	0,0036	19,5
	90 La	6	1,1	945	11,1	2,84	0,69	81,0	81,0	79,4	5,9	2,1	2,1	0,0041	23,5
	100 L	6	1,5	945	15,2	3,80	0,69	82,5	82,5	80,9	6,0	2,1	2,1	0,0080	32,5
	100 M	6	2,2	955	22,0	5,31	0,71	84,3	84,3	82,6	6,0	2,1	2,1	0,0190	41,5
Δ 400V 50Hz	132 S	6	3	965	29,7	7,12	0,71	85,6	85,6	83,9	6,2	2,0	2,1	0,0340	62
	132 Ma	6	4	965	39,6	9,37	0,71	86,8	86,8	85,1	6,8	2,0	2,1	0,0400	69
	132 Mb	6	5,5	965	54,4	12,0	0,75	88,0	88,0	86,2	7,1	2,0	2,1	0,0500	78,5
	160 M	6	7,5	970	73,8	15,8	0,77	89,1	89,1	87,3	6,7	2,1	2,1	0,1100	107
	160 L	6	11	970	108,3	22,3	0,79	90,3	90,3	88,5	6,9	2,1	2,1	0,1300	142

JMK 8 POLES IE3 SERIES

Tab. 9.7.4

IE3	JMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m²	Weight Kg
Δ / Y - 230 / 400 V 50 Hz	100 La	8	0,75	710	10,1	2,29	0,63	75,0	75,3	72,0	3,5	1,7	2,1	0,0099	29,5
	100 Lb	8	1,1	710	14,8	3,19	0,64	77,7	78,0	74,5	3,5	1,7	2,1	0,0115	31
	112 Ma	8	1,5	710	20,2	4,18	0,65	79,7	80,1	76,6	4,2	1,8	2,1	0,0260	41,5
Δ 400V 50Hz	132 Sa	8	2,2	720	29,2	5,88	0,66	81,9	82,3	77,8	5,5	2,0	2,0	0,0385	57
	132 Ma	8	3	720	39,8	7,74	0,67	83,5	83,8	79,8	5,5	2,0	2,0	0,0510	60
	160 Ma	8	4	720	53,0	10,0	0,68	84,8	85,2	81,2	6,0	1,9	2,1	0,1100	98
	160 Mb	8	5,5	720	72,9	13,5	0,68	86,2	86,6	81,8	6,0	2,0	2,2	0,1200	105
	160 L	8	7,5	720	99,5	18,0	0,69	87,3	87,7	83,2	6,0	1,9	2,2	0,1390	115

* Power or power/size not standardized

• 9.8 GMK IE3 ELECTRICAL DATA

GMK 2 POLES IE3 SERIES

Tab. 9.8.1

IE3	GMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m^2	Weight Kg
Δ 400V 50Hz	180 M	2	22	2955	71,1	38,1	0,90	92,7	92,7	90,8	8,2	2,2	2,3	0,1150	205
	200 La	2	30	2960	96,8	52,1	0,89	93,3	93,3	91,4	7,5	2,2	2,3	0,1700	285
	200 Lb	2	37	2960	119,4	62,6	0,91	93,7	93,7	91,8	7,5	2,2	2,3	0,2000	295
	225 M	2	45	2965	144,9	78,5	0,88	94,0	94,0	92,1	7,6	2,2	2,3	0,3000	360
	250 M	2	55	2970	176,8	94,6	0,89	94,3	94,3	92,4	7,6	2,2	2,3	0,4400	455
	280 S	2	75	2975	240,7	127	0,90	94,7	94,7	92,8	6,9	2,0	2,3	0,6900	585
	280 M	2	90	2975	288,9	154	0,89	95,0	95,0	93,1	7,0	2,0	2,3	0,8000	665

GMK 4 POLES IE3 SERIES

Tab. 9.8.2

IE3	GMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m^2	Weight Kg
Δ 400V 50Hz	180 M	4	18,5	1470	120,2	34,3	0,84	92,6	92,6	90,7	7,5	2,2	2,3	0,1470	195
	180 L	4	22	1470	142,9	40,2	0,85	93,0	93,0	91,1	7,7	2,2	2,3	0,1700	228
	200 L	4	30	1475	194,2	53,8	0,86	93,6	93,6	91,7	7,8	2,2	2,3	0,2750	310
	225 S	4	37	1485	237,9	66,1	0,86	93,9	93,9	92,0	7,2	2,2	2,3	0,4300	352
	225 M	4	45	1485	289,4	79,3	0,87	94,2	94,2	92,3	7,3	2,2	2,3	0,4900	387
	250 M	4	55	1485	353,7	96,5	0,87	94,6	94,6	92,7	7,4	2,2	2,3	0,7000	475
	280 S	4	75	1485	482,3	129	0,88	95,0	95,0	93,1	7,4	2,2	2,3	1,1800	618
	280 M	4	90	1485	578,7	157	0,87	95,2	95,2	93,3	6,7	2,2	2,3	1,5300	700

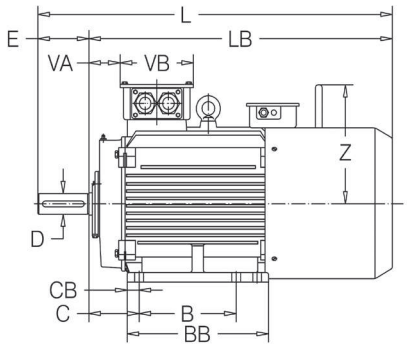
GMK 6 POLES IE3 SERIES

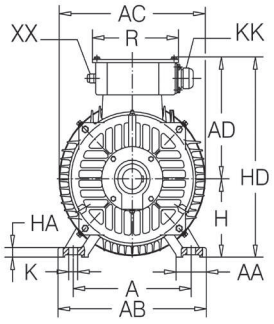
Tab. 9.8.3

IE3	GMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m^2	Weight Kg
Δ 400V 50Hz	180 L	6	15	980	146,2	29,3	0,81	91,2	91,2	89,4	7,2	2,0	2,1	0,2100	213
	200 La	6	18,5	980	180,3	35,9	0,81	91,7	91,7	89,9	7,2	2,1	2,1	0,3200	275
	200 Lb	6	22	980	214,4	41,5	0,83	92,2	92,2	90,4	7,3	2,1	2,1	0,3650	293
	225 M	6	30	980	292,3	55,5	0,84	92,9	92,9	91,0	7,1	2,0	2,1	0,5500	344
	250 M	6	37	985	358,7	68,1	0,84	93,3	93,3	91,4	7,1	2,1	2,1	0,8500	450
	280 S	6	45	985	436,3	81,6	0,85	93,7	93,7	91,8	7,2	2,1	2,0	1,4500	555
	280 M	6	55	985	533,2	99,3	0,85	94,1	94,1	92,2	7,2	2,1	2,0	1,7500	620

9.10 GMK DIMENSIONAL DATA

B3





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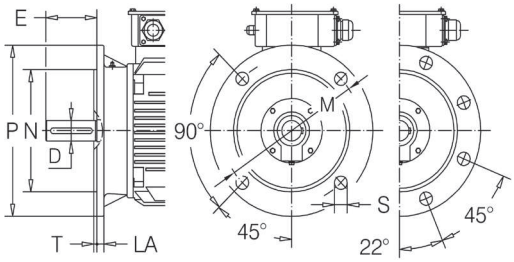

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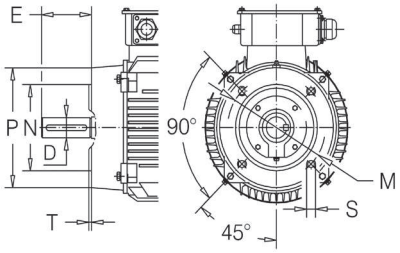
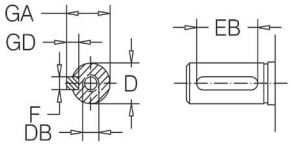




Shaft end

GMK IE3 SERIES

Tab. 9.10.1

GMK Motor			Main Overall Dimension							Feet									Flange						
			AC	AD	H	HD	Z	LB	L	A	B	C	AB	BB	AA	CB	HA	K	IM	M	NJ6	P	LA	T	S
180	M	2-4	355	267	180	447	260	690	800	279	241	121	350	311	70	35	22	15	B5	300	250	350	15	5	N°4 19
	L	4-6-8						730	840		279			349											
200	L	2...8	397	299	200	499	260	800	910	318	305	133	390	370	70	32	25	18	B5	350	300	400	17	5	N°4 19
225	S	4...8	446	322	225	547	260	805	945	356	286	149	432	370	75	46	28	19	B5	400	350	450	20	5	N°8 19
225	M	2...8	446	322	225	547	260	830	940	356	311	149	433	395	75	46	28	19	B5	400	350	450	20	5	N°8 19
250	M	2...8	485	358	250	608	260	920	1060	406	349	168	486	445	80	55	30	24	B5	500	450	550	22	5	N°8 19
280	S	2...8	547	387	280	667	320	1100	1240	457	368	190	545	485	85	69	35	24	B5	500	450	550	22	5	N°8 19
	M							1150	1290		419			536											

GMK IE3 SERIES

Tab. 9.10.2

GMK Motor			Shaft - End							Shaft - Seals						Shaft - Seals					
							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
180		2-4-6-8	48	M16	110	51,5	14	9	100	55	75	8/12	55	90	8/10	6-M6	2-M40x1,5	1-M16x1,5	82	158	185
200		2-4-6-8	55	M20	110	59	16	10	100	60	80	8/12	60	90	8/10	6-M8	2-M50x1,5	1-M16x1,5	92	187	224
225	S	4-8	60	M20	140	64	18	11	125	65	90	10/12	65	90	8/10	6-M8	2-M50x1,5	1-M16x1,5	95	187	224
225	M	2	55	M20	110	59	16	10	100	60	80	8/12	65	90	8/10	6-M8	2-M50x1,5	1-M16x1,5	95	187	224
		4-6-8	60		140	64	18	11	125	65	90	10/12	65	90	8/10						
250		2	60	M20	140	64	18	11	125	65	90	10/12	70	90	8/10	6-M10	2-M63x1,5	1-M16x1,5	88	238	283
		4-6-8	65			69				70	90	10/12	70	90	8/10						
280		2	65	M20	140	69	18	11	125	70	90	10/12	70	90	8/10	6-M10	2-M63x1,5	1-M16x1,5	96	238	283
		4-6-8	75			79,5	20	12		85	110	10/12	70	90	8/10						

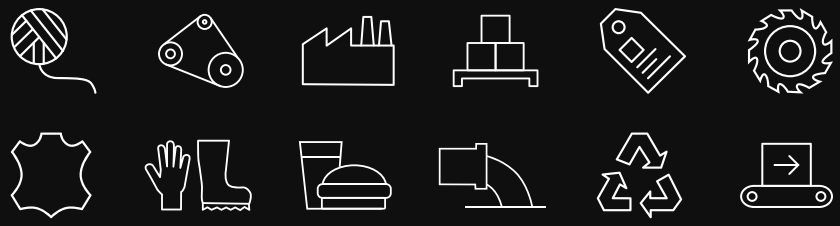
SELF-BRAKING MOTORS
IE2

Size	JMK
63 ~ 80	

Power	JMK
0.12 ~ 0.55 kW	

Polarity	JMK
2, 4, 6, 8 poli	

Sectors of use



• 9.11 JMK 2-4-6-8 POLES IE2 ELECTRICAL DATA

JMK 2 POLES IE2 SERIES

Tab. 9.11.1

IE2	JMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m^2	Weight Kg
Δ / Y - 230 / 400 V - 50 Hz	63 a	2	0,18	2710	0,63	0,57	0,75	60,4	61,2	57,5	4,4	3,1	3,2	0,00024	6,0
	63 b	2	0,25	2710	0,88	0,71	0,78	64,8	65,5	62,3	4,5	2,8	3,0	0,00031	6,4
	63 c	2	0,37	2730	1,29	0,97	0,79	69,5	70,3	66,8	4,4	3,0	3,1	0,00036	6,9
	71 a	2	0,37	2730	1,29	0,97	0,79	69,5	70,3	66,8	5,6	2,4	3,1	0,00049	8,2
	71 b	2	0,55	2760	1,90	1,36	0,79	74,1	74,8	72,1	5,5	2,8	3,2	0,00057	8,8
	71 c	2	0,75	2760	2,59	1,71	0,82	77,4	77,9	74,3	5,6	2,8	2,9	0,00068	9,5

JMK 4 POLES IE2 SERIES

Tab. 9.11.2

IE2	JMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m^2	Weight Kg
Δ / Y - 230 / 400 V - 50 Hz	63 a	4	0,12	1350	0,85	0,46	0,64	59,1	59,8	56,4	3,1	2,4	2,8	0,00028	6,4
	63 b	4	0,18	1350	1,27	0,62	0,65	64,7	65,3	62,5	3,3	2,5	2,6	0,00035	6,8
	63 c	4	0,25	1350	1,77	0,80	0,66	68,5	69,5	66,2	3,4	2,5	2,5	0,00042	7,3
	71aa	4	0,25	1350	1,77	0,73	0,72	68,5	69,3	65,6	4,4	2,6	2,7	0,00057	8,6
	71 b	4	0,37	1370	2,58	0,99	0,74	72,7	73,3	69,3	4,6	3,0	3,0	0,00073	9,0
	71 c	4	0,55	1380	3,81	1,37	0,75	77,1	77,8	74,3	4,5	2,8	2,9	0,00094	10,8
	80 a	4	0,55	1370	3,83	1,37	0,75	77,1	77,8	74,3	5,4	2,3	2,6	0,00190	12,5

JMK 6 POLES IE2 SERIES

Tab. 9.11.3

IE2	JMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m^2	Weight Kg
Δ 400V 50Hz	63 a	6	0,12	850	1,35	0,55	0,62	50,6	51,6	48,5	2,2	2,0	2,1	0,00053	7,0
	71 a	6	0,18	880	1,95	0,70	0,66	56,6	57,4	53,2	2,8	2,0	2,4	0,00110	8,5
	71 b	6	0,25	900	2,65	0,84	0,70	61,6	62,4	58,3	3,0	2,1	2,3	0,00120	9,0
	71 c	6	0,37	900	3,93	1,13	0,70	67,6	68,6	64,3	3,1	2,2	2,4	0,00130	9,7
	80 a	6	0,37	900	3,93	1,13	0,70	67,6	68,6	64,3	4,1	2,1	2,5	0,00165	14
	80 b	6	0,55	900	5,84	1,51	0,72	73,1	73,9	70,1	4,2	2,1	2,4	0,00210	15

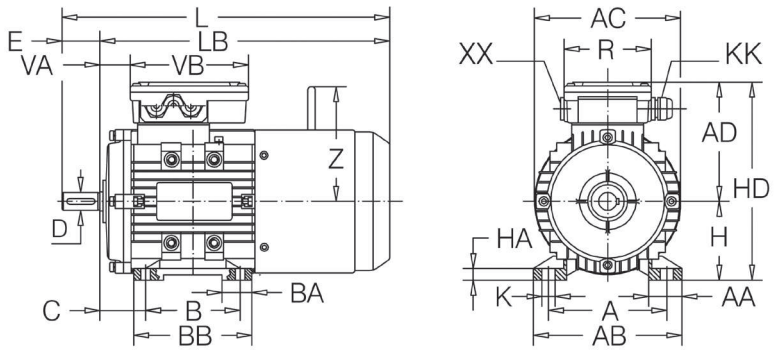
JMK 8 POLES IE2 SERIES

Tab. 9.11.4

IE2	JMK Motor	Poles	P_N kW	n_N min^{-1}	T_N Nm	$I_{N\,(400\,V)}$ A	COSφ 100%	η 100%	η 75%	η 50%	I_s/I_N	T_s/T_N	T_{max}/T_N	J Kg m^2	Weight Kg
Δ 400V 50Hz	71 b	8	0,12	690	1,66	0,74	0,59	39,8	40,6	36,5	2,0	1,9	1,9	0,00140	9,4
	80 a	8	0,18	680	2,53	0,93	0,61	45,9	46,7	42,1	3,1	2,0	2,5	0,00250	14,5
	80 b	8	0,25	680	3,51	1,17	0,61	50,6	51,6	47,5	3,3	2,2	2,5	0,00270	15
	90 S	8	0,37	680	5,20	1,51	0,63	56,1	56,8	53,4	2,9	1,6	1,9	0,00390	19
	90 La	8	0,55	680	7,72	1,98	0,65	61,7	62,3	58,4	3,0	1,8	1,9	0,00470	22

• 9.12 JMK DIMENSIONAL DATA

B3



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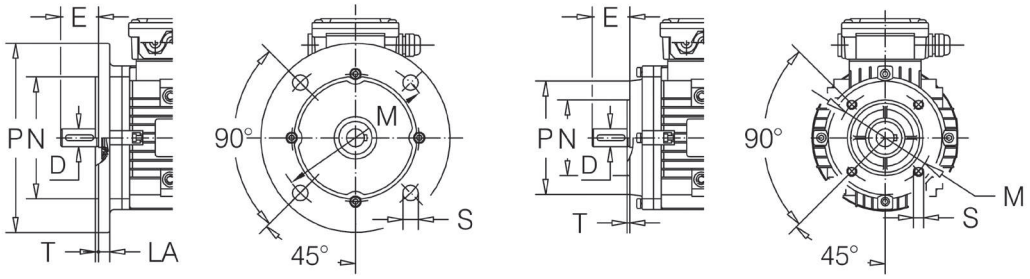

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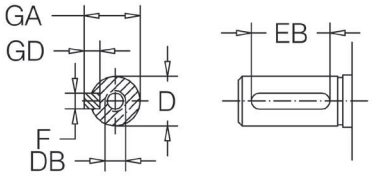


Shaft end

JMK A30-33 IE2 SERIES

Tab. 9.12.1

JMK Motor			Main Overall Dimension							Feet									Flange						
			AC	AD	H	HD	Z	LB	L	A	B	C	AB	BB	AA	BA	HA	K	IM	M	NJ6	P	LA	T	S
63		2...6	122	113	63	176	107	250	273	100	80	40	121	103	28	26	9	7	B5	115	95	140	9	3	N°4 9
																			B14	75	60	90	--	2,5	N°4 M5
71		2...8	140	118	71	189	116	290	320	112	90	45	133	106	28	23	10	7	B5	130	110	160	9	3,5	N°4 10
																			B14	85	70	105	--	2,5	N°4 M6
80		2...8	156	139	80	219	136	335	375	125	100	50	161	130	35	35	11	9	B5	165	130	200	10	3,5	N°4 12
																			B14	100	80	120	--	3	N°4 M6
90	S	2...8	174	145	90	235	164	325	375	140	100	56	174	130	35	33	12	10	B5	165	130	200	12	3,5	N°4 12
	L							375	425		125			155					B14	115	95	140	--	3	N°4 M8

JMK A31 IE2 SERIES

Tab. 9.12.2

JMK Motor			Shaft - End							Shaft - Seals						Terminal - Box					
							Key			Flange-End			Drive End DE Non drive end NDE			Term.	Cable gland	Plug			
			D	DB	E	GA	F	GD	EB	Øi	Øe	H	Øi	Øe	H	N°-Ø	N°-KK	N°-XX	VA	VB	R
63	M	2...6	11	M4	23	12,5	4	4	16	12	24	7	15	26	7	6-M4	1-M20x1,5	1-M20x1,5	15	119	94
71	M	2...8	14	M5	30	16	5	5	22	15	25	7	17	32	5	6-M4	1-M20x1,5	1-M20x1,5	23	119	94
80	M		19	M6	40	21,5	6	6	32	20	35	7	20	35	7	6-M4	1-M20x1,5	1-M20x1,5	28	140	105
90	S	2...8	24	M8	50	27	8	7	40	25	37	7	25	40	7	6-M4	2-M25x1,5	2-M25x1,5	32	140	105
	L																				

BRAKES TABLES AND **RELEVANT CONNECTION DIAGRAMS**

9.17 BRAKES TABLES AND RELEVANT CONNECTION DIAGRAMS

The brake acts in the absence of power supply due to the force exerted by the springs.
By removing the power supply to the electromagnet, the mobile anchor, by acting on the springs, presses the brake pad keyed onto the motor shaft against the rear shield, generating the braking torque.

By powering the brake, the electromagnet, overcoming the force of the springs, attracts the mobile anchor and releases the brake pad and the motor shaft.
The construction with multiple springs and the braking in the absence of the power supply make the equipment safe.

The JMK and GMK self-braking motors can be fitted with 3 types of brake:

1. Alternating current brake: series **TA**... , **GA**...
2. Direct current brake: series **TC**... , **GC**...
3. Direct current brake Intorq: series **L7**... , **L8**...

CHOICE OF BRAKE

To define the type of brake to use, you must **know the braking torque MF [Nm]** you need, this torque is based on the type of application required.

Data necessary for brake determination:

1) Total Overall Inertia of the rotating parts brought to the shaft of the electric motor ITOT [Kgm2]
2) no. rotations of the electric motor [rpm]
3) Braking time required t_F
4) The resistant load attributable to a resistant torque MR (e.g. load to keep suspended). . . etc.)
5) The number of activations made by the brake over time, typically no. of activations in an hour m [1/h].

Other data to take into account are ambient temperature, environmental conditions (e.g. the brake is installed in dusty or damp areas or both, brackish etc...) and the mounting position of the motor, horizontal, vertical with the drive shaft up or down, etc...).

DETERMINING THE BRAKING TORQUE
(simplified formula)

Notes:

P: nominal power of the motor [W]
n: N° of rotations [1/min]
s: function safety coefficient of the application (typically 2÷3).

You obtain:
The Braking Torque, known via the formula

$$M_F = \frac{P}{(2\pi \cdot \eta)/60} \cdot s$$

The MR Resistant Torque obtainable from one of the 4 notable cases outlined below that cover most real applications:

CASE 1 : Lifting of a weight Q [N] having, compared to the rotation axis, a moment MR [Nm]

The necessary braking torque is calculated using the formulas outlined below. Multiplying the result of these formulas by the safety coefficient s, generally equal to 2, the desired braking torque is obtained.

$$M_{Fs} = \frac{\frac{2\pi \cdot \eta}{60} \cdot I_{TOT}}{tf \cdot ct} - M_R$$

M_F $M_F = M_{Fs} \cdot s$

Where ct = 0.995 reduction coefficient of the intervention time

CASE 2 : Lowering of a weight Q [N] having, compared to the rotation axis, a moment MR [Nm]

The necessary braking torque is calculated using the formulas outlined below. Multiplying the result of these formulas by the safety coefficient s, generally equal to 2, the desired braking torque is obtained.

$$M_{Fs} = \frac{\frac{2\pi \cdot \eta}{60} \cdot I_{TOT}}{tf \cdot ct} + M_R$$

$$M_F = M_{Fs} \cdot S$$

Where ct = 0.995 reduction coefficient of the intervention time

CASE 3 : : Resistant constant torque M_R [Nm] which opposes rotation of the motor

The necessary braking torque is calculated using the formulas outlined below. Multiplying the result of these formulas by the safety coefficient s, generally equal to 2, the desired braking torque is obtained.

$$M_{Fs} = \frac{\frac{2\pi \cdot \eta}{60} \cdot I_{TOT}}{tf \cdot ct} - M_R$$

$$M_F = M_{Fs} \cdot S$$

Where ct = 0.995 reduction coefficient of the intervention time

CASE 4 : Resistant constant torque M_R [Nm] which promotes rotation of the motor

$$M_{Fs} = \frac{\frac{2\pi \cdot \eta}{60} \cdot I_{TOT}}{tf \cdot ct} + M_R$$

$$M_F = M_{Fs} \cdot S$$

Where ct = 0.995 reduction coefficient of the intervention time

CHECKING THERMAL DISSIPATION OF THE BRAKE

During the braking phase, a certain amount of heat develops and it must be verified if the brake is able to dispose of it.

It is necessary to check that this amount of heat is compatible with the number of brake applications/hour that the brake has to perform.

CASE 1

$$L = I_{TOT} \cdot \frac{\left(\frac{2\pi \cdot \eta}{60}\right)^2}{2} \cdot \left(\frac{M_F}{M_F + M_R}\right)$$

CASE 2

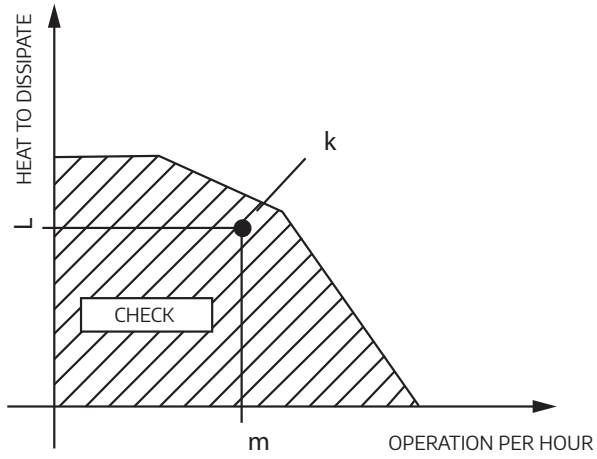
$$L = I_{TOT} \cdot \frac{\left(\frac{2\pi \cdot \eta}{60}\right)^2}{2} \cdot \left(\frac{M_F}{M_F - M_R}\right)$$

CASE 3 and 4

$$L = I_{TOT} \cdot \frac{\left(\frac{2\pi \cdot \eta}{60}\right)^2}{2}$$

I notice the number of manoeuvres/hour to be carried out using "Graphic 1" verifies the point K is under the curve limit of the selected type of brake.

GRAPHIC 1



If point K remains below the curve, the selected brake size meets the assumed load conditions.

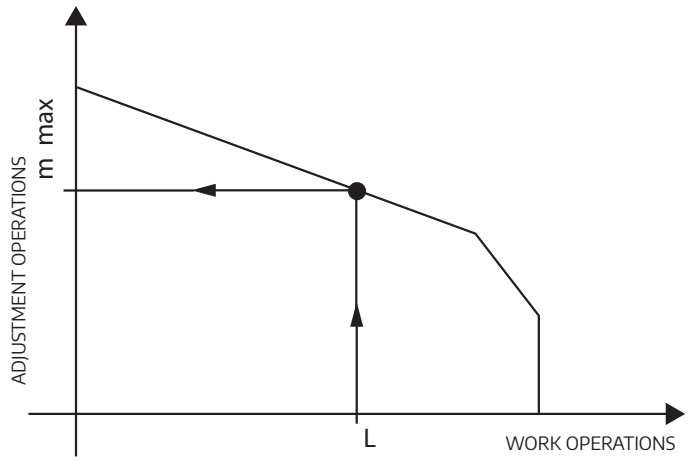
If this is not the case, change to a larger size and repeat the operation.

ADJUSTMENT OF THE AIR GAP

The maximum number of possible mmax manoeuvres before adjusting the air gap is obtained with "Graphic 2".

Enter on the x axis with the work L to dissipate and read the number of overall manoeuvres on the ordinates of the selected brake curve. In terms of time (hours), the adjustment is obtained with the following formula:

GRAPHIC 2



Hreg = mmaxm

The formula above allows calculation of consumption equal to a 0.1 mm air gap. The functionality of the brake is guaranteed by a maximum air gap value of 0.7 mm (consumption 0.5mm).

BRAKE OVERALL CHARACTERISTICS

Spring electromagnetic brakes, designed for service S1 *, IP54 with insulation class F, overtemperature class B

OF SERIES

- Brake pad in aluminium, series TA,TC size 1,2,3,4,5 and series L7 and L8. In steel: series TA, TC size 6,7,8 and series GA and GC.
- Double friction gasket, silent, without asbestos
- Toothed driving hub with anti-vibration o-ring (excluding brake L7, L8).
- No axial load on motor shaft during braking.
- High braking moment.
- Possibility of adjusting the braking moment continuously according to the type of use (excluding the L7 brake) as indicated in the tables of brake characteristics.
- Motors supplied as standard with a brake calibrated to 80% of the rated brake moment value (15%), used (excluding brake L7) as indicated in the brake characteristics tables.
- The minimum and nominal value of the braking moment (for brake L7 only the nominal value) are outlined on the motor plate.
- Brake connected to an auxiliary terminal board inside the terminal box. The power supply of the motor is always separate from that of the brake. In the TA and GA series brakes with auxiliary terminal board, while the TC, GC, L7, L8 series, both with rectifier. For brake connection, see “Brakes installation and maintenance”.

SUPPLIED ON REQUEST

- **Manual release lever** with automatic return (rod on the release lever corresponding to the terminal box, and is removable).
- Set up for manual rotation of the motor shaft using a hex male key on the side opposite control.
- The degree of protection IP55 (not possible for execution with a release lever and on series TC, L7, L8).
- Vast availability of special executions: servo-ventilator, encoder, release lever... (for the complete list, see the special executions chapter on page 145).

** For brakes in the TA and GA series, service S1 can only be guaranteed with motor ventilation.*

If the work cycle involves operating periods with excited coil (activated brake) and motor stopped or with a low number of rotations, it is indispensable to equip the self-braking motor with servo-ventilation.

ALTERNATING CURRENT BRAKE CHARACTERISTICS SERIES TA AND GA

- High insertion and disconnection speed to permit:
  - completely free start-up of the motor
  - a high braking frequency
- High number of brakes.
  - Good heat dissipation using the structure in die-cast aluminium.
- Mobile anchor with laminated magnetic core for faster and less electrical losses.
- The coil of the electromagnet is completely cemented with epoxy resin.
- Possibility of adjusting the braking moment.

Brake recommended for use where powerful and very fast braking is required.

AC BRAKES TA SERIES

Tab. 9.17.1

Motor		Brake	Static braking moment M_f Minimum [Nm]	Static braking moment M_f Nominal [Nm]	Power [W]	Δ 230V 50Hz [A]	Y 400V 50H [A]	Air gap [mm]	Release lever tie-rods clearance [mm]	Minimum thickness of brake pad [mm]
JMK	63	**TA1**	2	4,5	17	0,13	0,07	0,15÷0,50	0,8	5
	71	**TA2**	3	10	22	0,16	0,09	0,20÷0,60	0,9	5,5
	80	**TA3**	5	16	27	0,26	0,15	0,20÷0,60	0,9	6
	90	**TA4**	8	20	29	0,30	0,17	0,25÷0,70	1	6,5
	90	**GA5**	15	40	49	0,68	0,39	0,25÷0,70	1	6,5
	100	**TA5**	15	40	49	0,68	0,39	0,25÷0,70	1	6,5
	112	**TA6**	20	60	60	0,90	0,52	0,25÷0,70	1	6,5
	132	**TA7**	30	90	69	1,18	0,68	0,30÷0,70	1	7
	132	**GA7**	60	150	78	1,51	0,86	0,35÷0,70	1,2	7
	160	**TA8**	60	200	130	1,40	0,80	0,30÷0,70	1	7,5
GMK	180	**TA8D**	130	400	130	1,40	0,80	0,35÷0,70	1	7,5
	200	**TA8D**	130	400	130	1,40	0,80	0,35÷0,70	1	7,5
	225	**TA8D**	130	400	130	1,40	0,80	0,35÷0,70	1	7,5

1. The braking moment can be reduced (see “brakes installation and maintenance”). You are not advised for safety reasons to calibrate the braking moment at values under the plate minimum.

2. The motor is supplied with a braking moment calibrated at 80 % (± 15%) of its nominal value, or with a braking moment equal to the nominal value.

3. ATTENTION: : Periodically adjust the air gap. Its value must always be between the table values.See “Installation and Maintenance” paragraph.

4. Clearance “g” for the minimum value of the air gap with optional release lever). Clearance “g” is reduced to decrease the thickness of the brake pad. Adjusting the air gap, the clearance “g” is automatically reset.

DIRECT CURRENT BRAKE CHARACTERISTICS

- Highly progressive intervention, both on starting the motor and in braking, due to less rapid direct current braking
- Maximum silence in interventions and operation.
- The electromagnet coil is completely cemented with epoxy resin and the mechanical parts are protected by a galvanising treatment.
- Possibility of adjusting the braking moment (excluding brake L7).

Brakes recommended for use where regular and silent braking is required

DC BRAKES TC and GC SERIES

Tab. 9.17.2

Motor		Brake	Static braking moment		Values detected inbound of the rectifier					
			M_f Minimum [Nm]	M_f Nominal [Nm]	Power [W]	Δ 230V 50Hz [A]	Y 400V 50H [A]	Air gap [mm]	Release lever tie-rods clearance [mm]	Minimum thickness of the brake disk [mm]
JMK	63	TC1	2	5	17	0,08	0,05	0,15÷0,50	0,8	5
	71	TC2	7	12	22	0,10	0,06	0,20÷0,60	0,9	5,5
	80	TC3	8	16	27	0,13	0,08	0,20÷0,60	0,9	6
	90	TC4	8	20	32	0,15	0,09	0,25÷0,70	1	6,5
	90	GC5	18	40	40	0,17	0,10	0,25÷0,60	1	6,5
	100	TC5	16	40	50	0,24	0,14	0,25÷0,70	1	6,5
	112	TC6	25	60	60	0,29	0,17	0,25÷0,70	1	6,5
	132	TC7	40	90	65	0,32	0,19	0,30÷0,70	1	7
	132	GC7	40	150	65	0,32	0,19	0,35÷0,80	1,2	7
	160	TC8	80	200	85	0,40	0,23	0,30÷0,70	1	7,5
GMK	180	TC8D	180	400	90	0,43	0,25	0,35÷0,70	1	8
	200	TC9D	300	600	140	0,66	0,38	0,35÷0,70	1	8
	225	TC9D	300	600	140	0,66	0,38	0,35÷0,70	1	8
	250	TC10*	500	800	160	0,73	0,42	0,35÷0,70	1	12
	280	TC10**	500	800	160	0,73	0,42	0,35÷0,70	1	12

* The TC9D reduced brake 300÷600Nm can also be assembled on request
** The TC10D increased brake 1000÷1500Nm can also be assembled on request

DC BRAKE INOTQ L7 L8 SERIES

Tab. 9.17.3

Motor		Brake	Static braking moment M_f Minimum [Nm]	Static braking moment M_f Nominal [Nm]	Values detected inbound of the rectifier Power [W]	Δ 230V 50Hz [A]	Y 400V 50H [A]	Air gap [mm]	Release lever tie-rods clearance [mm]	Minimum thickness of the brake disk [mm]
JMK	63	**L7.06**	--	4	20	0,09	0,06	0,20÷0,50	1	5,5
		L8.06	2	4						4,5
	71	**L7.08**	--	8	25	0,12	0,07	0,20÷0,50	1	4,5
		L8.08	4	8						5,5
	80	**L7.X8**	--	12	25	0,12	0,07	0,20÷0,50	1	4,5
		L8.X8	6	12						5,5
	90	**L7.10**	--	16	30	0,14	0,08	0,20÷0,50	1	8,5
		L8.10	8	16						7,5
	100	**L7.12**	--	32	40	0,20	0,12	0,30÷0,75	1,5	9,2
		L8.12	14	32						8
	112	**L7.14**	--	60	50	0,24	0,14	0,30÷0,75	1,5	9,2
		L8.14	25	60						7,5
	132	**L7.16**	--	80	55	0,27	0,16	0,30÷0,75	1,5	10,7
		L8.16	35	80						8
	160	**L8.18**	65	150	85	0,40	0,23	0,40÷0,90	2	10
GMK	180	**L8.20**	115	260	100	0,46	0,27	0,40÷0,90	2	12
	200	**L8.25**	175	400	110	0,50	0,30	0,40÷1,0	2	15,5

* Values reported on the motor nameplate.

** Recommended for heavy duty (on request).

1. The braking moment can be reduced (see "brakes installation and maintenance") (with the exception of the L7 series). You are not advised for safety reasons to calibrate the braking moment at values under the plate minimum.

2. The motor is supplied with a braking moment calibrated 80% (± 15%) of its nominal value, or with a braking moment equal to the nominal value.

3. ATTENTION: Periodically adjust the air gap (with the exception of the L7 series). Its value must always be between the table values.

4. Clearance "g" for the minimum value of the air gap with optional release lever). Clearance "g" is reduced to decrease the thickness of the brake pad. Adjusting the air gap, the clearance "g" is automatically reset.

5. The standard version motor is supplied with series L7 brake: on request, L8 series brake.

AC BRAKE POWER SUPPLY TA AND GA SERIES

Before powering the brake, ensure the supply voltage corresponds to the brake plate value.

Power supply voltages :
- Motors power supply at **Δ 230 V / Y 400 V – 50 Hz** and motors at **Δ 400 V – 50 Hz**:

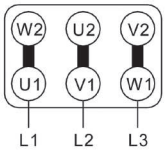
Brake coil at **Δ 230 V / Y 400 V – 50 Hz**, standard with brake connected to **Y for power supply at 400 V c.a. – 50 Hz**
- connection at Δ for power supply at 230 V c.a. and different power supply voltages on request.

Power supply voltages and frequency different from those available on request.

THREE-PHASE MOTOR TERMINAL BOARD CONNECTION DIAGRAM 2,4,6,8 poli

Δ

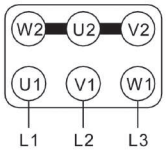
Minimum voltage



63 ~ 225

Y

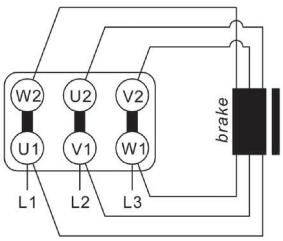
Maximum voltage



TA SERIES ALTERNATING CURRENT BRAKE CONNECTION DIAGRAM

Brake Δ

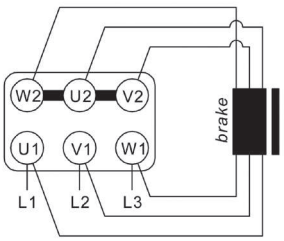
Minimum voltage
230V 50Hz
on request



63 ~ 225

Brake Y

Maximum voltage
400V 50Hz
standard



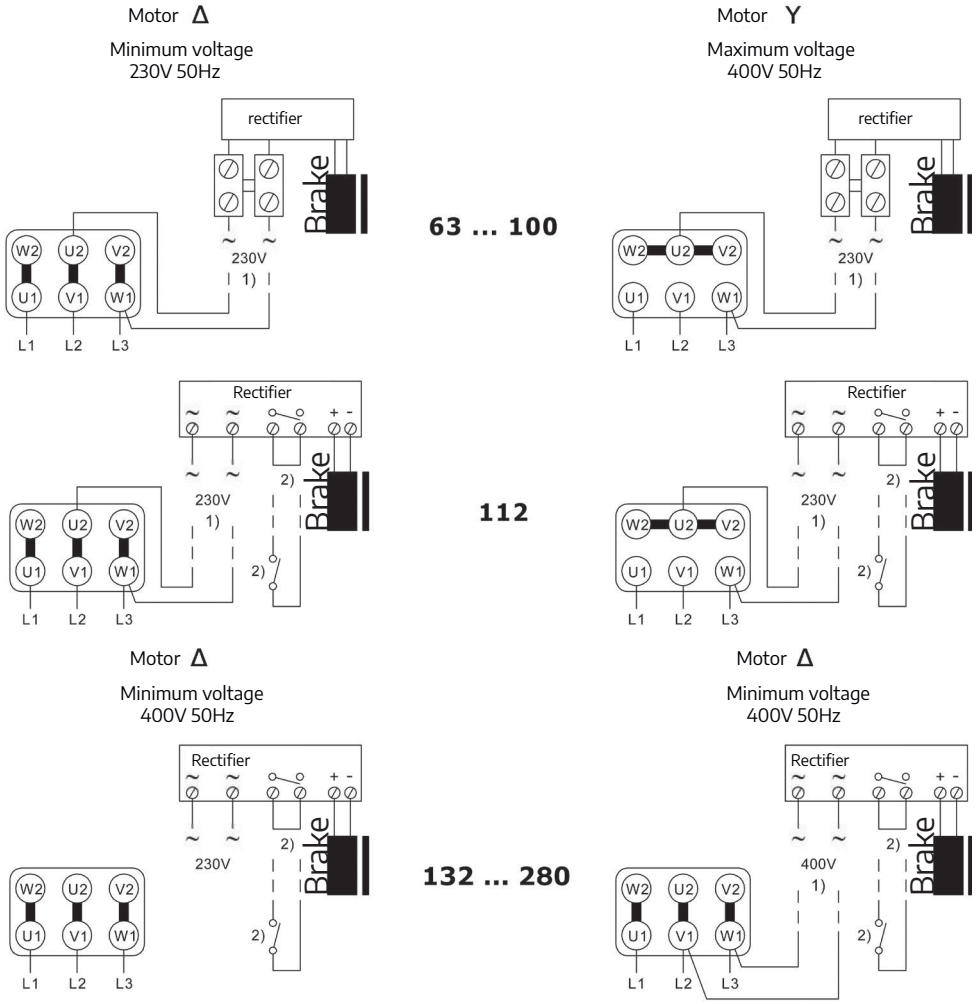
DIRECT CURRENT BRAKE POWER SUPPLY, TC, GC, L7, L8 SERIES

Before powering the brake, ensure the power supply voltage corresponds to the plate value of the brake.
Power supply voltage:

- Motors at Δ 230 V / Y 400 V – 50 Hz: standard power supply of rectifier at 230 V a.c. - 50/60 Hz (on request, rectifier power supply at 400 V a.c. - 50/60 Hz);
- Motors at Δ 400 V – 50 Hz: standard power supply of rectifier at 400 V a.c. 50/60 Hz. (on request, rectifier power supply equal to 230 V a.c. - 50/60 Hz.);
- Different power supply voltages available on request.

1) I motors are supplied with the rectifier connected to the auxiliary terminal board (size 112 to 160 with terminal board integrated in rectifier). On request, rectifier connection to the motor terminal board.
2) Rapid braking (the installation technician's responsibility). Motor size 90, 100 on request. The counter must work parallel to the motor power supply counter; the counters must be suitable for inductive load opening.

DIRECT CURRENT BRAKE CONNECTION, TC, L7, L8 SERIES



Available on request:
> manual release lever with automatic return (release lever rod in correspondence with the terminal box and removable).
> provision for manual rotation of the motor shaft by means of a hexagonal key on the side opposite the command.
> Degree of protection IP55 (not possible for execution with release lever and on TC, L7, L8 series).
> Wide availability of special executions: servo fan, encoder, release lever... (for completeness see the special executions chapter).

ADJUSTMENT OF BRAKING MOMENT

(With the exception of series L7 and L8)
The braking moment is directly proportional to compression of the brake spring.
The JM/GMK motor is supplied with the braking moment calibrated to 80 % ± 15% of its nominal value (series L7 at 100%). For a correct use of the self-braking motor, it is

advisable to adjust the braking moment according to load, rotation speed and braking time. For general use, it is good practice to calibrate the braking moment to about 1.5 times the nominal torque of the motor. In any case, the value shall be within the limits given on the plate.

IT IS NOT RECOMMENDED:

a) to calibrate the braking moment at a value over the maximum plate value of series GA, GC, L8 since the brake can only partially lock, resulting in vibrations and overheating.

b) calibrate the braking moment to a value under the minimum plate value since variable braking can occur.

TA, GA, GC SERIES:

1) Turn the screws (3) (drawing page 145) regulating the braking moment uniformly, with a male hex key. With hourly rotation, the braking moment increases, with anti-clockwise rotation decreasing.
2) Check the calibration value of the braking moment using a torque wrench coupled to the end of the motor shaft.

In TA series, you can approximately know the value of the braking moment obtained after adjustment, measuring the distance (highlighted with the letter "A" [mm] see the following table and (drawing page 145) between the adjustment screw and the electric magnet.

BRAKES TA SERIES

Value of the braking moment [Nm] on varying the distance "A"									
	Brake size								
"A" [mm]	TA1	TA2	TA3	TA4	TA5	TA6	TA7	TA8	TA8D
0	4,5	10	16	20	40	60	90	200	400
1	3,8	8,3	13,3	16	35	53	77	128	256
2	3,1	6,6	10,5	12	30	46	64	107	214
3	2,4	5	8	8	25	39	51	86	172
4	1,7	3,6	5,3	4	20	32	38	64	128
5	1	1,7	2,6	-	15	25	26	43	86
6	0,3	-	-	-	10	18	13	23	46
7	-	-	-	-	5	11	-	-	-

The zone highlighted restricts the safety value

Serie TC, L8:

1) Turn the ring nut (3) (drawing page 145) adjusting the braking moment. With hourly rotation, the braking moment increases, with anti-clockwise rotation decreasing.

2) Check the calibration value of the braking moment using a torque wrench coupled to the end of the motor shaft. For values under the minimum number plate, the number of threads in the socket of the ring adjustment is insufficient; the ring could come off.

It is possible to approximate the value of the braking moment obtained after adjustment:
TC Series: the distance is measured (highlighted with the letter "B" [mm] see the following table and drawing on page 145) between the adjustment ring nut and the electric magnet.

BRAKES TC SERIES

Value of the braking moment [Nm] on varying the distance"B"											
	Brake size										
"B" [mm]	TC1	TC2	TC3	TC4	TC5	TC6	TC7	TC8	TC8D	TC9D	TC10
0	5	12	16	20	40	60	90	200	400	600	800
1	4,3	10	13,2	16	36	53	77	180	360	520	675
2	3,5	7	10,6	12	32	46	64	160	330	480	600
3	2,8	4,5	8	8	28	39	51	140	200	420	525
4	2,1	2	5,3	4	24	32	38	120	180	360	450
5	1,4	-	2,6	-	20	25	25	100	150	300	375
6	0,7	-	-	-	16	18	13	80	130	240	300
7	-	-	-	-	12	11	-	60	110	180	225

The zone highlighted restricts the safety value

L8 SERIES:

Count the rotation clicks of the ring nut (the ring can be loosened click after click, in anti-clockwise rotation, up to the maximum size C max. (see following table and drawing on page 145.)

L8 Series										
	Brake size									
Brake size	06	08	X8	10	12	14	16	18	20	25
[Nm][1)]	0,2	0,35	0,55	0,8	1,3	1,7	1,6	3,6	5,6	6,2
C max[mm]	7	7,5	7,5	7,5	11	11	13	14	17	21

SAFETY WARNINGS SELF-BRAKING MOTORS

Improper use of the motor, incorrect installation, removal of guards, elimination of safety devices, lack of maintenance, can cause serious damage to people and property.

Where there is a possibility that a brake malfunction may cause damage to people, property and production, use of the self-braking motor alone does **NOT** ensure an adequate level of safety and additional safety measures need to be put in place. Incorrect calibration of the braking moment and lack of regular maintenance may cause a brake malfunction.

Do not manually unlock the brake unless you are able to predict the consequences of this manoeuvre.

The release lever rod will not be left permanently installed on the brake during operation of the motor to avoid its inappropriate and hazardous use.

Therefore, the electric motor must be moved, installed, started up, maintained and repaired exclusively by qualified staff (according to IEC364).

Hazards: the electric motors have live parts, parts in motion and parts with temperatures over 50°C.

Use cables with a suitable section in order to avoid overheating and/or excessive voltage drop at the motor terminals.

Pay close attention to the terminal block connection (Δ ,Y) on the motor plate.

The minimum voltage refers to the Δ connection, the maximum Y voltage.

Star-delta start-up is only possible when the mains voltage corresponds to the delta value Δ.

Rotation direction: you are advised to check the rotation direction of the motor before coupling to the user machine, when an opposite rotation direction to the desired direction can cause damage to people and/or property (you are advised to cut the key at the end of the shaft to avoid its violent exit).

To modify the rotation direction of three-phase motors, simply invert two power supply phases of the line.

Ground: The metal parts of the motor that are not normally live must be connected to the ground using the appropriately marked terminal, placed inside the terminal box, always using a suitable section cable.

The installation technician and/or the user must ensure the brake is working properly.

Before the motor is started up, it is necessary to ensure the braking moment is suitable for the particular application and, if necessary, adjust it.

As standard, the motors are supplied with a separate brake supply from that of the motor.

It is possible to power the brake directly from the motor terminal board using special connection cables supplied to the motor, placed inside the terminal box.

For those operated with inverters, it is necessary to power the brake separately with cables especially prepared by the installation technician.

IMPORTANT:

Before starting the motor-brake unit, you must:

a) Before making the electrical connection make sure the power supply corresponds to the electrical data shown on the plate. Install the connection according to the diagrams shown in the sheet inside the terminal box.

b) verify the correct tightening of the electrical terminals and the ground terminal

c) close the terminal box by positioning the gasket correctly and screwing all the fixing screws on the cover to avoid altering the degree of protection declared on the plate

d) reassemble the fan cover and secure it with the appropriate screws

e) check the mechanical attachment of the coupled drive units and reassemble any guards (protective casing).

9.18 INSTALLATION AND MAINTENANCE OF SELF-BRAKING MOTORS

Receipt:
check the motor corresponds to the one ordered and that it was not damaged during transport.
Do not operate a damaged motor.

The eyebolts, if present, on the housing are used to lift the motor only.

For possible storage in the warehouse, the location must be covered, clean, dry, free of vibrations and corrosive agents.

After long storage periods in the warehouse or long periods of inactivity, **you are advised to check the insulation resistance between the windings and towards** the ground using a specific tool.

For operations with a temperature **different to -15 +40 °C and at altitudes over 1000 m, contact the Seipee technical office**. Use is not allowed in places with aggressive atmospheres, with danger of explosion.

In the installation, arrange the motor so there is a large air passage from the fan side; insufficient air circulation compromises heat exchange.

Avoid proximity to other heat sources that affect the temperature of both the cooling air and the motor by irradiation.

The foundation must be properly sized to ensure stability to the fixture.

Couplings
Check that the radial/axial load is within the values given in the table "Radial/axial forces" on page 26.

Tolerance H7 is recommended for the hole of the fitted units in the shaft ends.

Before coupling, clean and lubricate the contact surfaces to avoid seizure hazards.

Before coupling, clean and lubricate the contact surfaces to avoid seizure hazards.

It is advisable to heat any joints, pulleys up to 60-80 =C before mounting.

In direct coupling, align the motor with that of the driven machine.

In application of belt coupling, check: the centre line of the motor must always be parallel to the centre line of the machine being driven, the overhang of the pulley must be kept to a minimum, the tension of the straps must not be excessive in order not to impair the life of the bearings or cause the motor shaft to break.

The JMK series motors are balanced with **half key**;
to avoid vibrations and unbalancing, the transmission units are appropriately balanced before coupling.

The JMK series motors are balanced with half key;
to avoid vibrations and unbalancing, the transmission units are appropriately balanced before coupling.

PERIODIC MAINTENANCE OF BRAKES

Brake inspection operations must be performed with the brake electrically disconnected and after verifying the grounding connection.

Periodically check the air gap is within the values indicated in the respective tables (see "brake characteristics" section); an excessive gap makes the brake less silent and can prevent the release of the brake itself.

In addition, a gap above the maximum value can produce:

- a decrease in braking moment
- a total lack of braking due to the cancellation of clearance "g" of the tie rods on the release lever (for brakes with optional release lever); adjusting the air gap automatically restores clearance "g"
- partial release of the brake resulting in increased temperature and wear of the friction gasket.

ADJUSTMENT OF THE AIR GAP

TA, GA, TC, GC SERIES

- loosen the nuts (10) locking the brake screws (1) to the cast iron motor shield
- screw in the screws (1) holding the nuts (10) still until the minimum gap is reached (see the "brake characteristics" chapter)
- tighten the nuts (10) keeping the screws still (1)
- check the air gap near the columns using a feeler gauge.

L8 SERIES

- loosen the nuts (10) locking the brake to the cast iron motor shield
- turn the adjustment screws (10) regulating the air gap until the minimum air gap is reached (see the "brake characteristics"chapter)
- screw in the screws (1), keeping the adjustment screws (10) still
- check the air gap near the columns using a feeler gauge.

BRAKE PAD

Check the thickness of the friction gasket on both sides. This value must not be under 1 mm per part. As necessary, replace the brake pad.

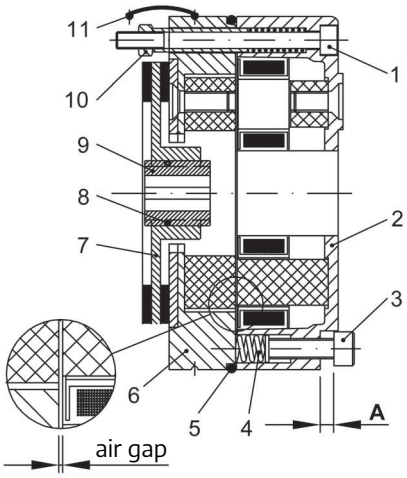
RELEASE LEVER

If the lever does not release the brake, reset clearance “g” indicated in the table (see “brake characteristics” chapter).

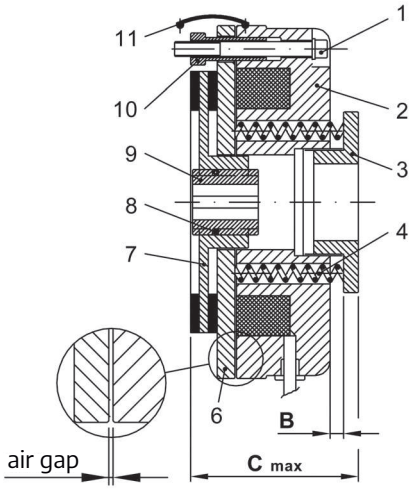
You are always advised to remove the handle once the operations are complete.

GA and GC

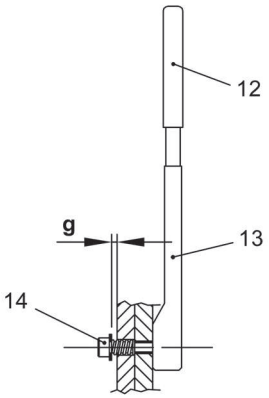
brake a.c. series
TA



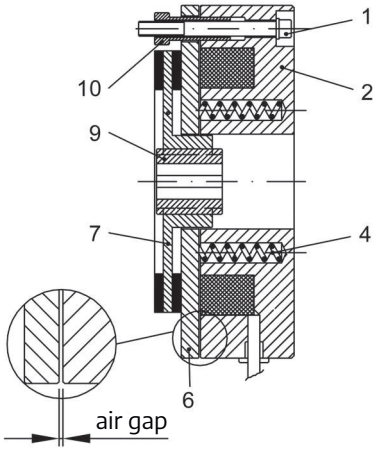
brake c.c. series
TC



release lever



brake c.c. series
L7



SPARE PARTS OF BRAKES

1) Locking screw
2) Electric magnet
3) Braking moment adjustment: cylindrical head screw with hexagon socket for TA series, grub screw with hexagon countersunk screw for GA and GC series, adjustment ring for TC and L8 series.
4) Braking spring
5) O-ring for IP 55 (TA and GA series)
6) Brake anchor
7) Brake pad
8) Anti-vibration o-ring
9) Driving hub
10) Air gap adjustment screw
11) Rubber protection
12) Handle (removable)
13) Body
14) Clearance “g” adjustment screw