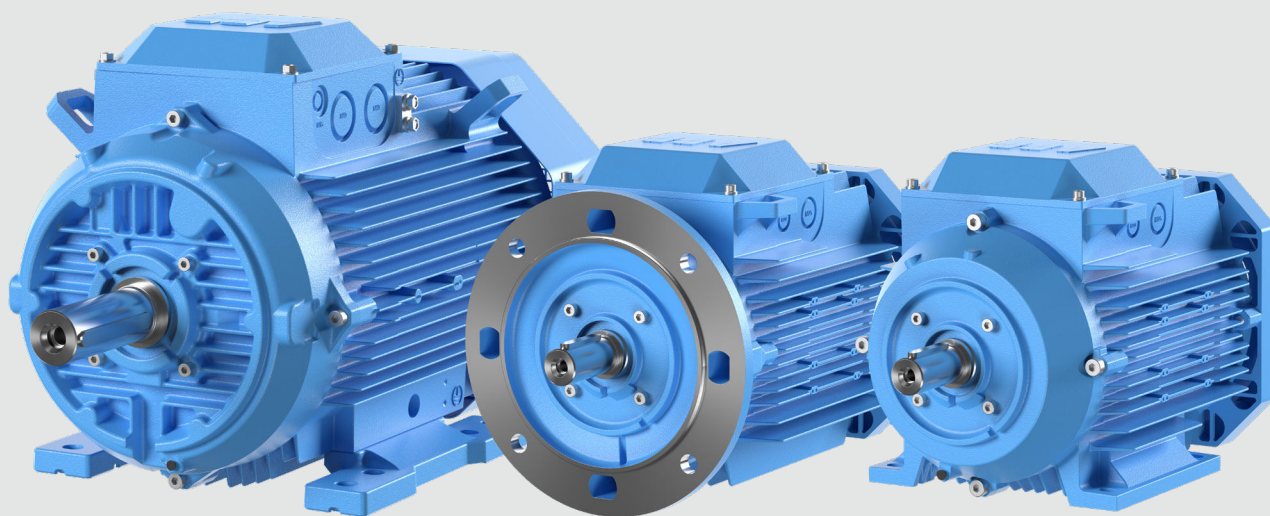

CATALOG | JANUARY 2025

Low voltage

Process performance aluminum
motors, 400 V 50 Hz, 460 V 60 Hz



—
With expertise, and a comprehensive portfolio of products and life-cycle services, we help value-minded industrial customers improve their energy efficiency and productivity.

Low voltage Brake aluminum motors

Sizes 71-132, 0.12 to 7.5 kW

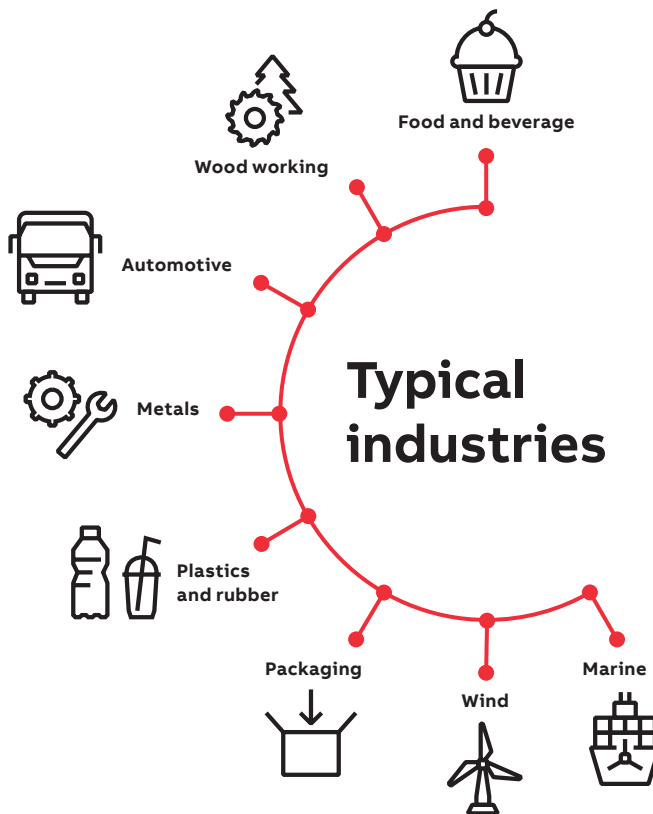
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Brake aluminum motors

Brake motors keep the rotor position fixed when power supply is shut-off and effectively enable to slow down and stop the driven equipment in a short time.

ABB brake aluminum motors are standard motors modified for braking duties, i.e. three phase induction motors with standard dimensions and output rating. The electro-magnetic disc brake is powered by DC current through a rectifier located in terminal box. When the brake coil is de-energized, the brake is actuated by spring pressure.

ABB brake motors are highly acclaimed in the market due to its high performance and ensuring a reliable service over the lifetime. The comprehensive range is offering full compliance to the global standards, high efficiency for energy and cost savings, as well as competitive delivery times.



Key features

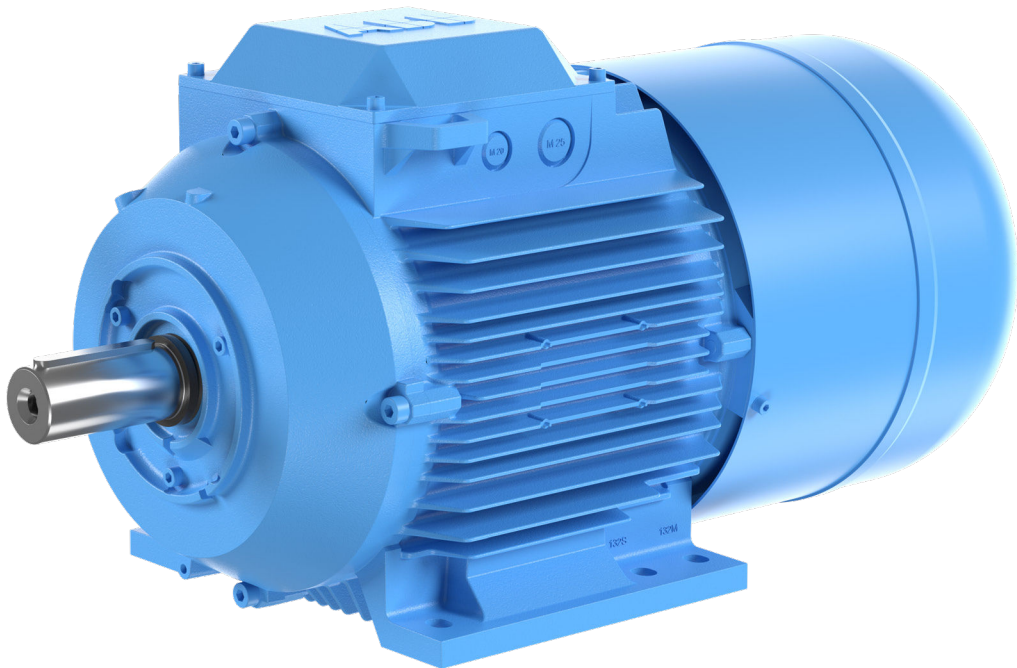
Motor features

- Easy installation with wide terminal box and brake rectifier included in the terminal box
- Standard connection of the rectifier, directly to motor terminals
- Mounting in any position
- Temperature rise B and insulation class F
- IP 55
- With standard motors' dimensions and output ratings
- Hand release fitted as an option
- Technical and application support
- Service and support

Brake features

The pre-assembled electromagnetic brake is in conformity with relevant EU harmonized legislations. It is suitable for parking and emergency stop braking industrial applications.

- Compact design with torque from 4 to 800 Nm
- Brake disc highest security, lowest wear and maintenance
- Easy installation
- IP54 as standard
- Duty cycle: 100% energized is allowed
- Non-stick friction material
- UL certified



Ordering information

Explanation of the product code

Motor type	Motor size	Product code	Code for mounting arrangement, Voltage and frequency code, Generation code followed by variant codes
M3AA	112MB	3GAA 111	320 - ASK843, 003 etc.
		1 2 3 4 5 6 7 8 9 10 11 12 13 14...	

Positions 1 to 4

3GAA: Totally enclosed motor with aluminum stator frame

Positions 5 and 6

IEC size		IEC size	
07:	71	11:	112
08:	80	13:	132
09:	90		
10:	100		

Position 7

Pole pairs

1:	2 poles
2:	4 poles
3:	6 poles

Positions 8 to 10

Running number

Position 11

- (dash)

Position 12 (marked with black dot in data tables)

Mounting arrangement

A:	Foot-mounted motor
B:	Flange-mounted motor. Large flange with clearance holes. Frame sizes 71-100.
C:	Flange-mounted motor. Small flange with tapped holes.
E:	Flange-mounted motor. Large flange with clearance holes, cast iron endshield. Frame sizes 112-132
H:	Foot- and flange-mounted motor. Large flange with clearance holes.
J:	Foot- and flange-mounted motor. Small flange with tapped holes.

Position 13 (marked with black dot in data tables)

Voltage and frequency code

Single-speed motors

D:	400 VΔ, 415 VΔ, 690 VY 50 Hz
----	------------------------------

Position 13 (marked with black dot in data tables)

S: 230 VΔ, 400 VY, 415 VY 50 Hz

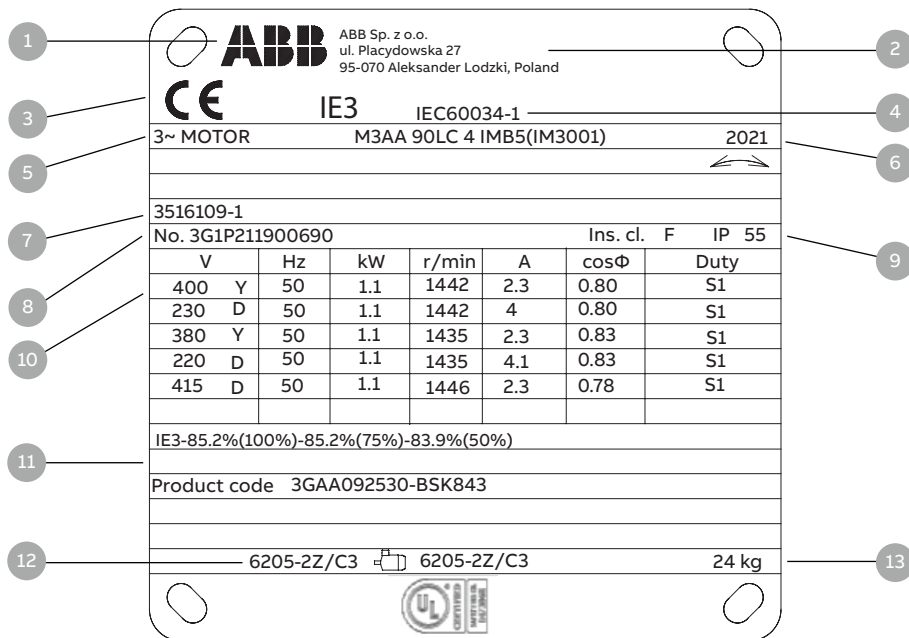
Position 14

Version

A, B, C...: Generation code followed by variant codes

Efficiency values are given according to IEC 60034-2-1; 2014

Rating plates



- 1 ABB logo
- 2 Manufacturing place
- 3 CE mark on Ecodesign approved motors UKCA mark on UK approved motors
- 4 Manufacturing standard
- 5 Product description
- 6 Manufacturing year
- 7 Factory order reference number
- 8 Serial number
- 9 Insulation class, IP protection class
- 10 Voltage, Frequency, output, speed, current, power factory, duty
- 11 Product code
- 12 Bearing type
- 13 Weight

Technical data

IE3 Aluminum brake motors

IP 55 - IC 411 - Insulation class F, temperature rise class B - Brake IP54
IE3 efficiency class according to IEC 60034-30-1; 2014

Out-put kW	Motor type designation	Product code ¹⁾	Speed r/min	Efficiency IEC 60034-30-1; 2014			Power factor Cosφ	Current		Torque					Moment of inertia J = 1/4 GD ² kgm ²	Weight kg	Sound pressure Level L _{PA} dB
				Full load 100%	3/4 load 75%	1/2 load 50%		I _N A	I _s /I _N	T _N Nm	T _v /T _N	T _b /T _N	T _L /T _{Nm}	K ²			
3000 r/min = 2 poles			400 V 50 Hz														
0.75	M3AA 80MB 2	3GAA081320-...K	2894	80.7	80.4	77.2	0.74	1.74	7.9	2.4	3.7	4.2	8	3.3	0.0008	12.5	57
1.1	M3AA 80MC 2	3GAA081330-...K	2883	82.7	82.4	80.6	0.81	2.3	7.9	3.6	3.7	4.2	8	2.2	0.001	13.5	56
1.5	M3AA 90LB 2	3GAA091520-...K	2906	84.2	84.8	84.7	0.89	2.8	7.9	4.9	2.3	3.3	16	3.3	0.0027	23	60
2.2	M3AA 90LC 2	3GAA091530-...K	2900	85.9	87.4	87.5	0.89	4.0	8.3	7.2	2.9	3.5	16	2.2	0.0032	26	60
3	M3AA 100LC 2	3GAA101530-...K	2896	87.1	88.2	88.0	0.90	5.4	8.4	9.8	3.2	3.9	32	3.3	0.0057	36	62
4	M3AA 112MB 2	3GAA111320-...K	2888	88.1	89.4	89.6	0.91	7.1	8.4	13.2	3.2	4.0	40	3.0	0.0104	48	68
5.5	M3AA 132SB 2	3GAA131120-...K	2901	89.2	89.9	90.1	0.91	9.7	7.9	18.1	2.3	3.4	80	4.4	0.0154	73	68
7.5	M3AA 132SC 2	3GAA131130-...K	2909	90.1	91.2	91.4	0.90	13.1	8.3	24.6	3.0	3.9	80	3.3	0.0173	78	70
1500 r/min = 4 poles			400 V 50 Hz														
0.75	M3AA 80ME 4	3GAA082350-...K	1440	82.5	82.4	80.2	0.76	1.7	7.9	4.9	3.3	3.7	8	1.6	0.0027	16.5	54
1.1	M3AA 90LC 4	3GAA092530-...K	1442	84.1	83.5	81.7	0.80	2.3	7.9	7.2	3.3	3.9	16	2.2	0.0055	25	56
1.5	M3AA 90LD 4	3GAA092540-...K	1439	85.3	84.7	82.8	0.78	3.2	8.2	9.9	3.5	4.0	16	1.6	0.0055	25	51
2.2	M3AA 100LE 4	3GAA102550-...K	1454	86.7	87.1	86.0	0.83	4.3	8.9	14.5	3.1	4.1	32	2.2	0.0144	44	54
3	M3AA 100LF 4	3GAA102560-...K	1452	87.7	88.1	87.1	0.83	5.9	9.0	19.7	3.5	4.2	32	1.6	0.0144	44	54
4	M3AA 112MB 4	3GAA112320-...K	1451	88.6	89.4	89.0	0.77	8.6	7.6	26.3	3.1	4.1	40	1.5	0.018	58	59
5.5	M3AA 132MB 4	3GAA132320-...K	1464	89.6	90.2	89.5	0.78	11.4	7.0	35.9	2.8	3.9	80	2.2	0.0295	83	70
7.5	M3AA 132MC 4	3GAA132330-...K	1464	90.4	90.8	90.7	0.81	14.7	7.7	48.9	2.5	3.6	80	1.6	0.0414	83	64
1000 r/min = 6 poles			400 V 50 Hz														
0.75	M3AA 90LD 6	3GAA093540-...K	937	78.9	79.6	77.3	0.76	1.8	4.6	7.6	2.1	2.3	16	2.1	0.0055	25	55
1.1	M3AA 100LE 6	3GAA103550-...K	963	81.0	82.2	81.0	0.69	2.6	5.6	10.9	2.3	3.1	32	2.9	0.0138	43	49
1.5	M3AA 100LF 6	3GAA103560-...K	969	82.5	81.4	77.5	0.65	3.7	7	14.7	3.3	4.1	32	2.2	0.0138	43	49
2.2	M3AA 112MC 6	3GAA113330-...K	967	84.3	85.2	84.1	0.69	5.2	6.5	21.7	2.4	3.5	40	1.8	0.0187	53	68
3	M3AA 132MC 6	3GAA133330-...K	978	85.6	86.0	84.5	0.69	7.0	6.2	29.2	2.0	3.0	80	2.7	0.0402	81	61
4	M3AA 132MD 6	3GAA133340-...K	973	86.8	87.7	87.5	0.72	9.1	5.6	39.2	1.9	2.7	80	2.0	0.0402	82	61
5.5	M3AA 132ME 6	3GAA133350-...K	973	88.0	88.8	88.2	0.74	12	5.8	53.9	2	2.9	80	1.5	0.039	78	61

¹⁾ Note: Mandatory variant code 843 for DC brake.

²⁾ K-braking torque ratio

Technical data

IE2 Aluminum brake motors

IP 55 - IC 411 - Insulation class F, temperature rise class B - Brake IP54

IE2 efficiency class according to IEC 60034-30-1; 2014

Out-put kW	Motor type designation	Product code ¹⁾	Speed r/min	Efficiency IEC 60034-30-1; 2014			Power factor Cosφ	Current		Torque, motor				Torque, brake		Moment of inertia J = 1/4 GD ² kgm ²	Weight kg	Sound pressure Level L _{PA} dB
				Full load 100%	3/4 load 75%	1/2 load 50%		I _N A	I _s /I _N	T _N Nm	T _v / T _N	T _v / T _N	T _b / T _{Nm}	K ²				
3000 r/min = 2 poles				400 V 50 Hz														
0.37	M3AA 71A 2	3GAA071311-**-E	2785	69.5	70.8	67.8	0.79	0.91	4.6	1.26	2.5	2.8	4	3.2	0.0004	7.5	58	
0.55	M3AA 71B 2	3GAA071312-**-E	2790	74.1	75.4	73.4	0.79	1.29	5.1	1.88	3.1	3.1	4	2.1	0.0005	7.5	58	
1500 r/min = 4 poles				400 V 50 Hz														
0.25	M3AA 71A 4	3GAA072311-**-E	1430	68.5	66.8	59.5	0.67	0.76	4.7	1.67	2.2	3.0	4	2.4	0.0006	7.5	45	
0.37	M3AA 71B 4	3GAA072312-**-E	1411	72.7	73.3	69.9	0.74	0.96	5.2	2.5	2.6	2.9	4	1.6	0.001	8.5	45	
0.55	M3AA 80A 4	3GAA082311-**-E	1406	77.1	78.6	78.6	0.78	1.29	5.4	3.73	2.8	2.6	8	2.1	0.0022	11.5	50	
1000 r/min = 6 poles				400 V 50 Hz														
0.18	M3AA 71A 6	3GAA073311-**-E	870	56.6	58.7	54.8	0.71	0.61	2.8	1.97	1.9	2.0	4	2.0	0.0009	8	42	
0.25	M3AA 71B 6	3GAA073312-**-E	890	61.6	61.8	56.7	0.68	0.84	3.1	2.68	2.3	2.4	4	1.5	0.0012	9	42	
0.55	M3AA 80C 6	3GAA083313-**-E	905	73.1	75.9	75.1	0.76	1.42	4.4	5.8	2.7	2.55	8	1.4	0.0034	18	50	

¹⁾ Note: Mandatory variant code 843 for DC brake.

²⁾ K-braking torque ratio

Variant codes

Variant codes specify additional options and features to the standard motor. The desired features are listed as three-digit variant codes in the motor order. Note also that there are variants that cannot be used together.

Most of the variant codes apply to IE2 and IE3 motors. For details please contact your ABB sales office before making an order.

Code/Variant	Frame size					
	71	80	90	100	112	132
Administration						
531 Sea freight packing.	•	•	•	•	•	•
Balancing						
052 Vibration acc. to Grade A (IEC 60034-14).	○	○	○	○	○	○
426 Half key balancing	○	○	○	○	○	○
Bearings and Lubrication						
039 Cold-resistant grease	○	○	○	○	○	○
040 Heat-resistant grease	○	○	○	○	○	○
041 Bearings regreasable via grease nipples.	-	-	•	•	•	•
042 Locked D-end	○	○	○	○	○	○
057 2RS bearings at both ends.	•	•	•	•	•	•
188 63-series bearing in D-end	-	-	•	○	○	•
194 2Z bearings greased for life at both ends.	○	○	○	○	○	○
195 Bearings greased for life.	○	○	○	○	○	○
Branch standard designs						
178 Stainless steel / acid proof bolts.	•	•	•	•	•	•
217 Cast iron D-end shield (on aluminum motor).	•	•	•	•	•	○
232 Cast iron N-end shield (on aluminium motor).	○	○	○	○	○	○
425 Corrosion protected stator and rotor core.	•	•	•	•	•	•
Brakes						
086 Reconnection of brake for separate ac supply.	•	•	•	•	•	•
088 Brake with mechanical release.	•	•	•	•	•	•
288 Brake motor with voltage code S for the motor and separate supply of the brake for voltage corresponding to code D.	•	•	•	•	•	•
289 Brake motor with voltage code D for the motor and separate supply of the brake for voltage corresponding to code S.	•	•	•	•	•	•
298 Brake motor for 460V with voltage code S and D	•	•	•	•	•	•
843 DC Brake. (Sizes 71-132 available as premodified motors with 843)	○	○	○	○	○	○
Cooling system						
046 Two-directional fan.	○	○	○	○	○	○
053 Metal fan cover.	○	○	○	○	○	○
068 Light alloy metal fan	•	•	•	•	•	•
183 Separate motor cooling (fan axial, N-end).	•	•	•	•	•	•
205 Non metallic fan	○	○	○	○	○	○
792 Metal fasteners for fan cover	○	○	○	○	○	○
Documentation						
141 Binding 2D main dimension drawing.	•	•	•	•	•	•
Earthing Bolt						
067 External earthing bolt.	•	•	•	•	•	•
Heating elements						
450 Heating element, 100-120 V	•	•	•	•	•	•
451 Heating element, 200 - 240 V	•	•	•	•	•	•

○ = Included as standard | • = Available as option | - = Not applicable

Code/Variant	Frame size					
	71	80	90	100	112	132
Marine						
496	Fulfilling Bureau Veritas (BV) requirements, without certificate(non-essential duty only)					
Mounting arrangements						
008	IM 2101 foot/flange mounted, IEC flange, from IM 1001 (B34 from B3).					
009	IM 2001 foot/flange mounted, IEC flange, from IM 1001 (B35 from B3).					
047	IM 3601 flange mounted, IEC flange, from IM 3001 (B14 from B5).					
048	IM 3001 flange mounted, IEC flange, from IM 3601 (B5 from B14).					
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)					
200	Flange ring holder.					
223	Flange ring FF 115.					
224	Flange ring FT 115.					
226	Flange ring FF 130.					
227	Flange ring FT 130.					
233	Flange ring FF 165.					
234	Flange ring FT 165.					
243	Flange ring FF 215.					
253	Flange ring FF 265.					
255	Flange FF 265.					
260	Flange FT 115.					
Painting						
114	Special paint color, standard grade					
Protection						
005	Protective roof					
072	Radial seal at D-end. Not possible for 2-pole , 280 and 315 frames					
074	Degree of protection IP55.					
784	Gamma-seal at D-end.					
Rating & instruction plates						
002	Restamping voltage, frequency and output, continuous duty.					
003	Individual serial number.					
004	Additional text on std rating plate (max 12 digits on free text line).					
095	Restamping output (maintained voltage, frequency), intermittent duty.					
098	Stainless rating plate.					
126	Tag plate					
135	Mounting of additional identification plate, stainless.					
138	Mounting of additional identification plate, aluminium.					
159	Additional plate with text "Made in"					
160	Additional rating plate affixed.					
161	Additional rating plate delivered loose.					
162	Rating plate fixed to stator.					
163	Frequency converter rating plate. Rating data according to quotation.					
198	Aluminum rating plate					
Standards and Regulations						
208	Fulfilling Underwriters Laboratories (UL), listed requirements					
331	Motor not for sale for use in EU or UK.					
538	CE mark					
586	Fulfilling UK Conformity Assessment (UKCA) requirements.					
687	Fulfilling energy efficiency requirements for Canada					
Stator winding temperature sensors						
122	Bimetal detectors, break type (NCC), (3 in series), 150 °C, in stator winding.					
436	PTC - thermistors (3 in series), 150 °C, in stator winding					
445	Pt100 2-wire in stator winding, 1 per phase					
Terminal box						
230	Standard metal cable gland.					
375	Standard plastic cable gland					
465	Terminal box on top					
738	Prepared for metric cable glands.					
Testing						
145	Type test report from a catalogue motor, 400V 50Hz.					
148	Routine test report.					
Y/D starting						
023	6 terminals (for Y/D start, single speed), in terminal box.					

○ = Included as standard | ● = Available as option | - = Not applicable

Mechanical design

Degrees of protection

The degree of protection, as per 60034-5, is IP55 for the terminal box, electrical components of the brake and other motor parts.

Mechanical components of the brake IP54.

Mounting arrangements of brake motors

The design of the brake motor enables it to operate in any mounting position. Nevertheless, the position of the drain holes should be taken into account.

Vertically mounted motors with the shaft end downwards, intended for outdoor operation, should be provided with a protective roof to avoid water ingress and the possibility of ice forming on the brake.

Operation

ABB's brake motor is a standard motor modified for braking duties, i.e. a three phase induction motor with standard dimensions and output rating.

The electro-magnetic disc brake is powered, by DC current through a rectifier located in terminal box.

When the brake coil is de-energised, the brake is actuated by spring pressure.

The axial movement of the brake disc performs a dual braking action against the moving electromagnet and the motor shield, without pressure or impact being transmitted to the bearings.

Lubrication and bearings

The bearings incorporate two Z-type non-friction sealing plates. The amount of grease is sufficient for the life of the bearing.

Standard design: deep groove ball bearings as listed below:

Motor size	D-end	N-end
71	6203-2Z/C3	6203-2Z/C3
80	6204-2Z/C3	6204-2Z/C3
90	6205-2Z/C3	6205-2Z/C3
100	6306-2Z/C3	6206-2Z/C3
112	6306-2Z/C3	6206-2Z/C3
132	6308-2Z/C3	6208-2Z/C3

Brake design

—
01 Brake disc for frame sizes 71-112 (ERX-35)

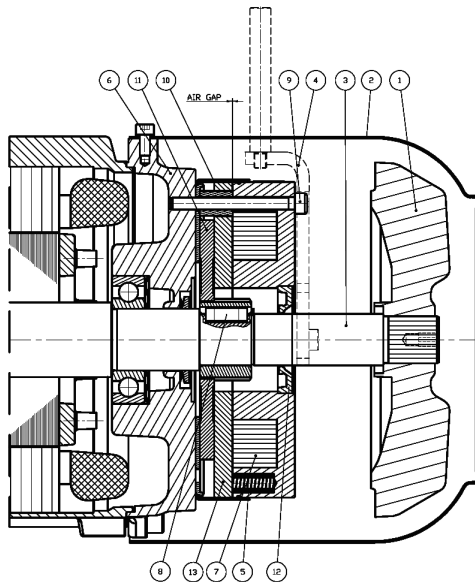
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02 Brake disc for frame size 132 (ERX-60)

General

Electromagnetic disc brakes work by the action of a set of springs and are released when applying voltage to the brake coil.

This means that the motor will brake automatically in case of any voltage failure, as a significant safety feature. The brake is always functional, irrespective of the mounting position of the brake motor.

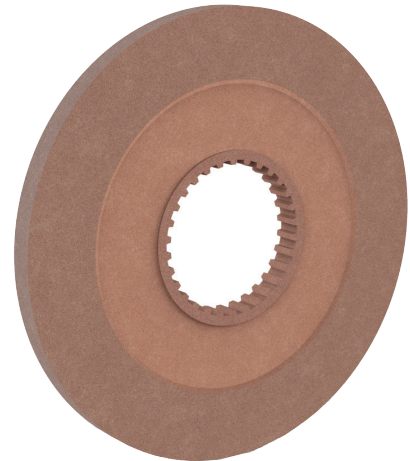
Detailed view



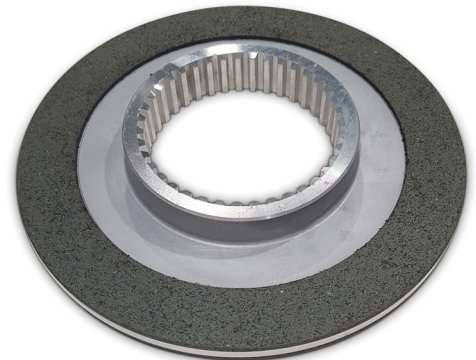
- 1 Fan
- 2 Fan cover
- 3 Shaft
- 4 Hand release lever (option 088)
- 5 Pressure spring
- 6 Motor N-end shield
- 7 Brake magnet
- 8 Brake key
- 9 Mounting screw
- 10 Dust cover
- 11 Brake disc
- 12 Lip seal
- 13 Armature plate

Brake disc

The friction discs have been designed to provide consistent and reliable braking performance in a wide range of conditions.



—
01



—
02

From the first principle, the friction material has been designed to deliver static and dynamic braking functions with high torque stability. Furthermore, it offers consistent performance across varying rotational speeds and a wide range of environmental conditions. The material is non-sticking with a high friction coefficient.

The friction material was put through a rigorous battery of in-house testing to ensure that it's best-in-class performance.

Replacing the brake disc

The brake disc must be replaced when reaching the maximum airgap stated in Table 1.

Rectifier

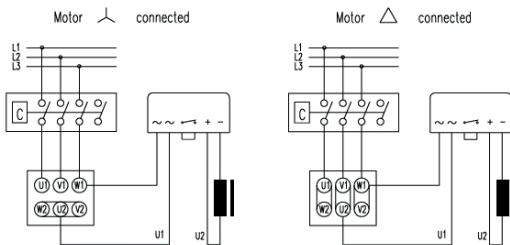
The rectifier is a device for DC brake applications. It is highly resistant to temperature as well as to voltage peaks. Its compact design enables it to be placed in the motor terminal box.

Connection for DC brake¹⁾

The brake is fed via a rectifier. The voltage stated on the brake rating plate is that of the brake coil on the DC side of the rectifier.

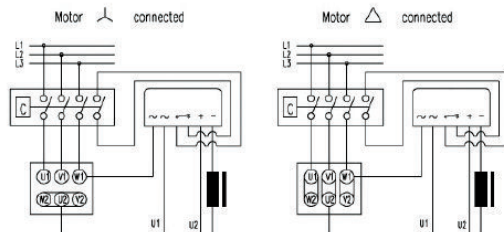
The coil can operate reliably between of 85 % and 110 % of the rated voltage. For voltages outside these limits, please consult ABB.

Standard brake release time



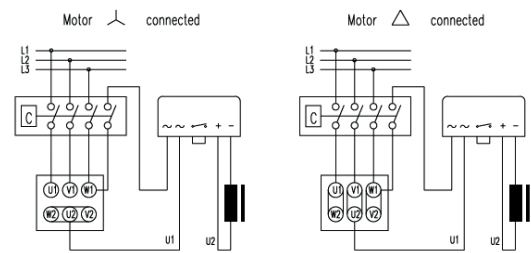
Reconnection (t21=)

To obtain fast braking time, please see table 2 (t21=), use the following diagram.



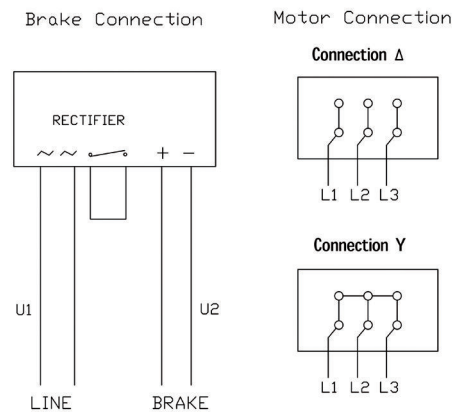
Reconnection (t21~)

When it is necessary to reduce the fast braking time, the connections should be modified according to the following diagram. The breaking of the circuit on the AC side is controlled by using an auxiliary contact of the contactor.



Reconnection of brake for separate ac supply

To obtain separate AC supply, please use following diagram.



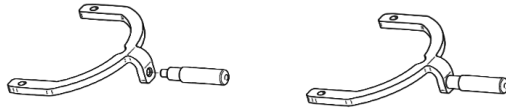
Hand release

The device is a lever used to override the action of the brake springs for as long as it is applied. Hand release is available as an option, see variant code 088.

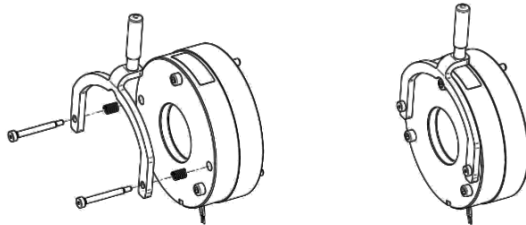
When installing the release lever, please proceed as follows:

ERX5 to ERX60

- 1 Tighten lever handle on lever until to have it blocked.



- 2 Insert lever springs into the brake.
- 3 Put lever screws through the lever and tighten the screws into the brake until to have them blocked.



Torque adjustment

In brake motors from frame size 71 up to 132, the braking torque is set to the nominal torque as standard.

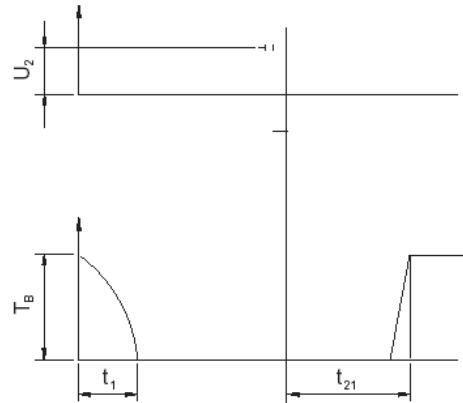
Brake operating times

The operating times stated in brake data table 2 are valid for the nominal air gap and warmed-up brake coil.

- t_1 = Brake release time
- t_{21} = Braking time
- U_2 = Rated voltage
- T_B = Nominal braking torque

Brake release time = the time from when voltage is applied to the brake coil up to the ceasing of braking action.

Braking time = the time from when the current is switched off up to the starting of braking action.



Brake voltages

The standard brake coil connection voltages for 50 Hz will be those stated in the following table, unless stated otherwise in the order:

Rectifier input voltage (V_{Ac})	Rectifier type ¹⁾	D.C. coil brake voltage (V)
220	H.W	103
230	H.W	103
240	H.W	103
380	H.W	180
400	H.W	180
415	H.W	180
500	H.W	225 ²⁾

¹⁾ H.W. = Half-wave rectifier

²⁾ Special coil on request

Brake design

Data tables

Table 1.

Brake motor size		71	80	90	100	112	132
Brake type		ERX 5	ERX 10	ERX 20	ERX 35	ERX 35	ERX 60
Rated torque ¹⁾	T_{Bnom} (Nm)	4	8	16	32	40	80
Nominal air gap	X (mm)	0.25	0.25	0.25	0.25	0.25	0.25
Maximum air gap	Xn (mm)	0.6	0.6	0.6	0.6	0.6	0.6
Thickness of new brake disc	E_m (mm)	6.5	8.1	7	7	7	7.9
Tightening torque: bolt	C_s (Nm)	2.7	5.2	9	9	9	22
Max. Input coil:							
- DC brake motor	(W)	19-23	20-25	36-39	42-47	42-47	36-59
Moment of inertia	J (kgm ²)	4.5x10 ⁻³	1.2x10 ⁻²	3.2x10 ⁻²	1x10 ⁻¹	1x10 ⁻¹	1.7x10 ⁻¹
Weight	(kg)	1.3	1.6	3.8	5	5	6.6

¹⁾ Rated torque is guaranteed for the brand new brakes (no running or burnishing required)

In general, all the variables mentioned above can affect the braking torque values, so if an accurate value is needed, ABB recommends it is measured in the real application.

Graph 1.

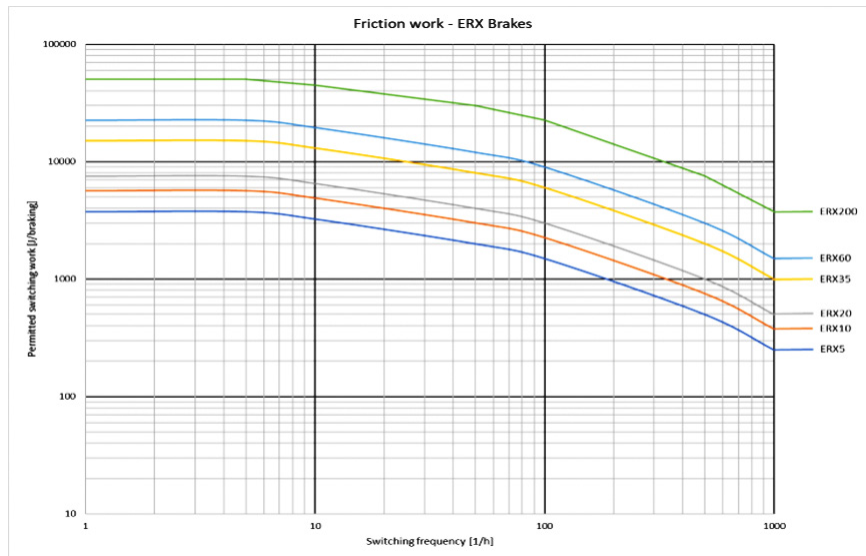


Table 2.

Brake motor sizes		71	80	90	100/112	132
DC Brake size		ERX 5	ERX 10	ERX 20	ERX 35	ERX 60
Brake release time t_1	ms	70	90	110	130	180
Standard braking time t_{21} (AC)	ms	250	250	500	700	750
Fast braking time t_{21f} (DC)	ms	30	30	50	80	160

Brake design

Calculations

Maximum number of connection per hour

The connection frequency that may be achieved with the motors is limited by the temperature rise that they undergo both in the coil and in the rotor. The brakes are designed so that they may withstand the kinds of duty for which these motors are intended.

The maximum number of connections per hour depends on:

- the power P_2 required after reaching the rated speed, i.e. the relative load P with regard to the rated power P_n

$$P = \frac{P_2}{P_n} \times 100 \%$$

- the total inertia J in kgm^2 of the mass to be accelerated (inertia of the rotor J_m as per catalogue, plus the additional inertia J_b of the driven machine) in relation to the motor shaft, that is, J_b multiplied by the square of the coefficient of the load speed divided by the motor speed.

$$J = J_m + J_b \times \left[\frac{n_b}{n_m} \right]^2$$

- the relative duration factor for service S4.

$$S4 = \frac{\text{connection time}}{\text{connection time} + \text{downtime}} \times 100 \text{ in } \%$$

For calculations of the maximum number of connections/hour, please consult ABB.

Required data:

- Type of brake motor
- Load inertia reduced at motor shaft
- Required power P_2
- Type of service

Permitted friction work per operation

Friction work per operation must not exceed the WR_{\max} values stated in brake data table 1.

$$WR = \frac{1}{2} \times J \left[\frac{\pi \times n_m}{30} \right]^2 \text{ in joules}$$

Friction work per hour

The friction work can be calculated if the number of operations per hour is known.

This value must be equal to or less than the PR_{\max} stated in brake data table 1.

$$PR = WR \times c/h$$

Brake design

Options

When the motor is supplied via a frequency converter, the brake should be supplied separately at rated voltage (constant). The separate brake supply can be connected directly, no separate terminal box is needed.

Protective roof

To protect motors from accumulation of water, ice or snow when installed outdoors in the vertical position and with the shaft downwards, the assembly should be fitted with a protective roof.

Variant code 005 should in this case be stated in the order.

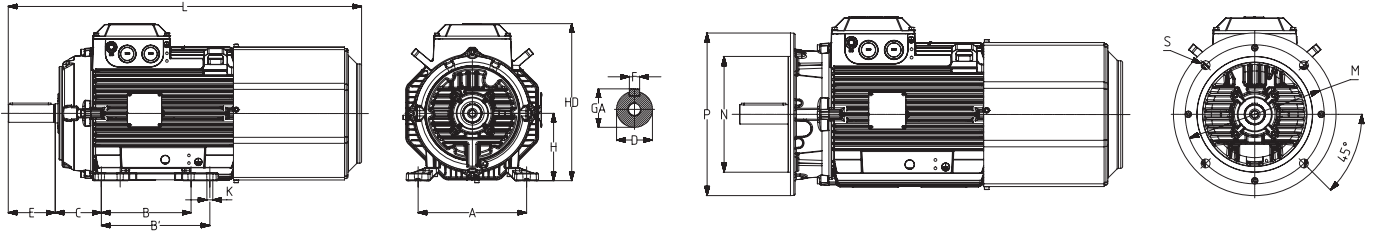
Brake VCs for different supplies

Motor voltage code	Motor voltage	Motor frequency	Connection	Brake supply AC before rectifier	Rectifier	Suitable Brake coil	VC to be selected	Separate supply
D	380 Vac	50	Δ	196-250* Vac	half wave rectifier	103.5 Vdc	VC289	Yes
D	380 Vac	50	Δ	380 Vac	half wave rectifier	180 Vdc	No VC	No
D	400 Vac	50	Δ	196-251* Vac	half wave rectifier	103.5 Vdc	VC289	Yes
D	400 Vac	50	Δ	400 Vac	half wave rectifier	180 Vdc	No VC	No
D	415 Vac	50	Δ	196-251* Vac	half wave rectifier	103.5 Vdc	VC289	Yes
D	415 Vac	50	Δ	415 Vac	half wave rectifier	180 Vdc	No VC	No
D	660 Vac	50	Y	196-251* Vac	half wave rectifier	103.5 Vdc	VC289	Yes
D	660 Vac	50	Y	380 Vac	half wave rectifier	180 Vdc	No VC	No
D	690 Vac	50	Y	196-251* Vac	half wave rectifier	103.5 Vdc	VC289	Yes
D	690 Vac	50	Y	400 Vac	half wave rectifier	180 Vdc	No VC	No
D	460 Vac	60	Δ	460 Vac	half wave rectifier	207 Vdc	VC298	No
S	220 Vac	50	Δ	220 Vac	half wave rectifier	103.5 Vdc	No VC	No
S	220 Vac	50	Δ	340-440* Vac	half wave rectifier	180 Vdc	VC288	Yes
S	230 Vac	50	Δ	230 Vac	half wave rectifier	103.5 Vdc	No VC	No
S	230 Vac	50	Δ	340-440* Vac	half wave rectifier	180 Vdc	VC288	Yes
S	380 Vac	50	Y	220 Vac	half wave rectifier	103.5 Vdc	No VC	No
S	380 Vac	50	Y	340-440* Vac	half wave rectifier	180 Vdc	VC288	Yes
S	400 Vac	50	Y	230 Vac	half wave rectifier	103.5 Vdc	No VC	No
S	400 Vac	50	Y	340-440* Vac	half wave rectifier	180 Vdc	VC288	Yes
S	415 Vac	50	Y	240 Vac	half wave rectifier	103.5 Vdc	No VC	No
S	415 Vac	50	Y	340-440* Vac	half wave rectifier	180 Vdc	VC288	Yes
S	460 Vac	60	Y	98-125 Vac	full wave rectifier, separate supply (120 Vac) Stock modification	103.5 Vdc	VC298 + VC086	Yes
S	460 Vac	60	Y	265 Vac	full wave rectifier	225 Vdc	VC298	No

*Separate supply. Input voltage indicated is the allowed range.

Dimension drawings

Brake motors, sizes 71-132



	IM B3 (IM 1001), IM 1002										IM B5 (IM3001), IM 3002				IMB14 (IM3601)				
Motor size	D	GA	F	E	L max	A	B	B'	C	HD	K	M	N	P	S	M	N	P	S
71	14	12.5	5	30	312	112	90		45	180	7	130	110	160	10	85	70	105	6
80	19	21.5	6	40	379	125	100		50	193.5	10	165	130	200	12	100	80	120	6
90	24	27	8	50	418	140	125		56	217	10	165	130	200	12	115	95	140	8
100	28	31	8	60	533.5	160	140		63	237	12	215	180	250	15	130	110	160	8
112	28	31	8	60	556.5	190	140		70	260	12	215	180	250	15	130	110	160	8
132	38	41	10	80	611.5	216	140	178	89	298	12	265	230	300	14.5	165	130	200	10

Tolerances		Tolerances	
A, B	±0,8	F	ISO h9
D	ISO j6 ≤ Ø 28 mm	H	-0,5
	ISO k6 < Ø 38 mm	N	ISO js6
	ISO m6 ≥ Ø 55 mm	C	±0,8

Motors in brief

Brake motors

Motor size		71	80	90	100	112	132
Stator and end shields	Material stator	Die-cast aluminum alloy					
	Material D-end	Die-cast aluminum alloy					
	Material N-end	Cast iron					
	Paint colour shade	Munsell blue 8B 4.5/3.25					
	Corrosion class	C3 according to IEO/EN 12944-5					
Feet	Material	Integrated aluminum feet					
Bearings	D-end	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6306-2Z/C3	6306-2Z/C3	6208-2Z/C3
	N-end	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C3	6208-2Z/C3
Axially locked bearings	Inner bearing cover	Locked at D-end					
Bearing seal	D-end	V-ring					
	V-ring	V-ring					
Lubrication		Permanently lubricated bearings. Grease for bearing temperatures -40...+160 °C					
Measuring nipples for condition monitoring of the bearings		Not included					
Rating plates	Material	Aluminum					
	Material	Die-cast aluminum alloy, integrated to stator					
Terminal box	Cover screw materials	Zinc-electroplated steel					
Connections	Openings	2 x (M20 + M20)		2 x (M20 + M25)		2 x (M25 + M25) ¹⁾ 2 x (M40 + M32 + M12) ²⁾	
	Terminals	6 terminals for connecton with cable lugs (not included)					
	Cable glands	Optional					
Fan	Material	Glass-fiber enforces polypropylene					
Fan cover	Material	Steel					
	Paint color shade	Munsell blue 8B 4.5/3.25					
	Corrosion class	C3					
Stator winding	Material	Copper					
	Insulation	Insulation class F					
	Winding protection	Optional					
Rotor winding	Material	Die-cast aluminum					
Balancing		Half key balancing					
Key ways		Closed key way					
Drain holes		Drain holes with closable plastic plugs, open on delivery					
External earthing bolt		Optional					
Enclosure		Motor, terminal box and brake electrical components: IP 55					
		Brake mechanical components: IP54					
Cooling method		IC 411					

¹⁾ S, SB, M, MA

²⁾ SC, MC, SMA, SME

Total product offering

Motors, generators and mechanical power transmission products with a complete portfolio of services



IEC motors

- Low voltage motors
- High voltage induction and synchronous motors
- Marine motors
- Motors for explosive atmospheres
- Motors for food and beverage
- Motors for variable speed drives
- Permanent magnet motors
- Synchronous reluctance motors
- Traction motors

NEMA motors

- Low voltage motors
- High voltage induction and synchronous motors
- Marine motors
- Motors for explosive atmospheres
- Motors for variable speed drives
- Permanent magnet motors
- Servomotors
- Washdown motors

Generators

- Generators for wind turbines
- Generators for diesel and gas engine power plants
- Generators for steam and gas turbine power plants
- Generators for marine applications
- Generators for industrial applications
- Generators for traction applications
- Synchronous condensers for reactive power compensation

Mechanical power transmission components, bearings, gearings

- Mounted bearings
- Enclosed gearing
- Mechanical drive components
- Couplings
- Sheaves and bushings
- Conveyor components
- Geared motor units

Life cycle services

ABB's portfolio of drives

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Being able to rely on the continuous high performance and efficiency of your operations is something you want to take for granted. ABB variable-frequency drives are made with all this in mind, established upon more than 40 years of experience and backed by a broad range of life cycle services.

ABB drives help you to optimize your processes and systems with state-of-the-art motor control technology, resulting in increased energy efficiency, better product quality, and reduced operating costs with higher output, less downtime, and reduced need for maintenance. All ABB drives are designed for easy selection, ordering, installation and use, and they offer integrated safety features, giving you more time to focus on what matters for you and your business.

Our portfolio offers low-voltage AC and DC drives, medium-voltage AC drives, and motion control drives spanning the fractional-kilowatt to multi-megawatt power level. There is a drive available for essentially every industry and application and for all types of motors, in environments ranging from water utility facilities to clean electrical rooms, and to harsh coal mines and windy offshore platforms to food and beverage production. This wide product range allows you to select the best-fitting drive solution, providing maximum reliability and efficiency for every need.

