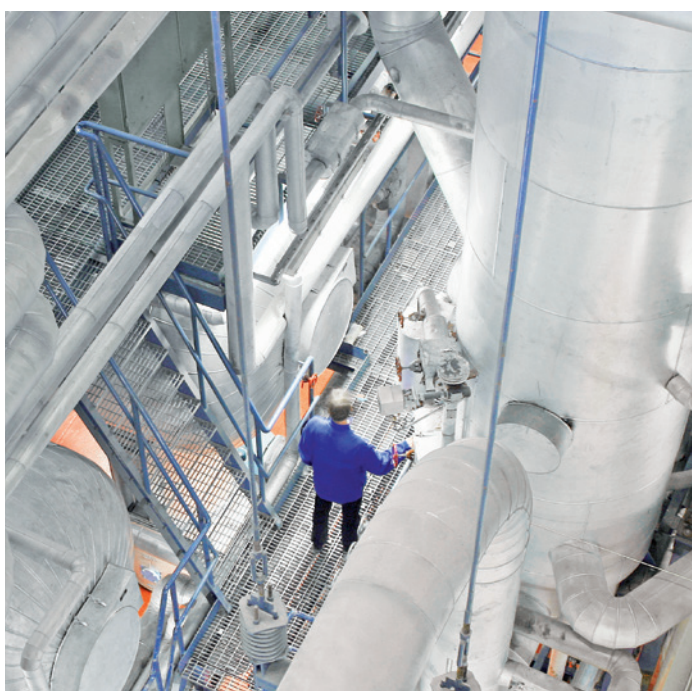




Catalog | November 2016

Low voltage Brake motors

We provide motors, generators and mechanical power transmission products, services and expertise to save energy and improve customers' processes over the total life cycle of our products, and beyond.



Low voltage Brake Motors

Totally enclosed squirrel cage three phase low voltage motors,
Sizes 63 - 132, 0.12 to 11 kW

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Mechanical design

Degrees of protection

The degrees of protection, as per IEC standards 60034-5, are: terminal box and electrical components of the brake – IP 55; other motor parts – IP 55.

Mechanical components of the brake – IP 23 S.
Mechanical parts of the brake, protected with a rubber ring and V-ring – IP 55 (optional: variant code 213).

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 either DC current through a rectifier located in terminal box or three phase AC current.

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.

The brake linings withstand high temperatures, have great wear resistance and give long life. Because of the very low wear of the braking disc, the brakes of the ABB motor usually require only one-third of the maintenance required by other common brake types in the market.

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.

The motors are fitted with the bearings listed in the table.

Motor size		D-end	N-end
M3VRF/S	63 A, B, BB	6202-2Z/C3	6202-2Z/C3
	71	6203-2Z/C3	6203-2Z/C3
	80	6204-2Z/C3	6204-2Z/C3
M3AR	90	6205-2Z/C3	6205-2Z/C3
	100	6306-2Z/C3	6206-2Z/C3
	112	6206-2Z/C3	6206-2Z/C3
	132	6208-2Z/C3	6208-2Z/C3

Brake design

General

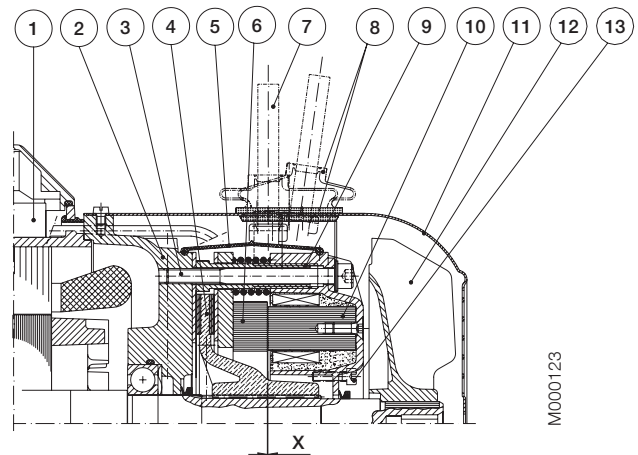
Electromagnetic disc brakes work by the action of a set of springs and are released when applying voltage to the brake coil.

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. The external dimensions for both the DC and the three phase AC brake are identical.

Detailed view

- 1 Rectifier (DC brake only)
- 2 Motor N-end shield
- 3 Screw
- 4 Brake disc
- 5 Dust protection (optional)
- 6 Armature
- 7 Hand release
- 8 Hand release bellows
- 9 Air gap regulation screw
- 10 Magnet
- 11 Fan cover
- 12 Fan
- 13 Torque regulation screw

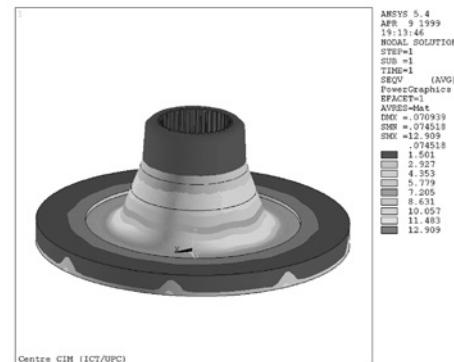


M000123

Brake disc

The brake lining is made from asbestos-free material. It is highly resistant to wear and has excellent thermal conductivity, thus giving consistent performance even at high temperatures.

The brake disc withstands a large number of braking operations and is insensitive to dust and moisture. The core of the brake disc is grooved and made of special polyamide that absorbs impacts, enabling it to work with high vibration applications.



M000124

Readjusting the air gap

The brakes are supplied with the air gap adjusted to its nominal value.

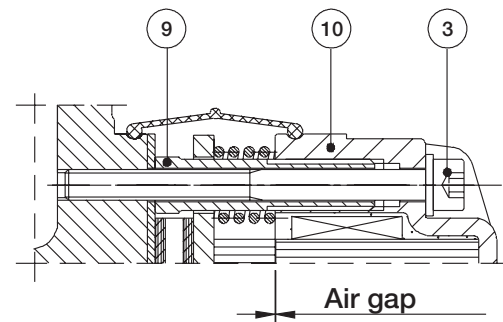
The air gap has to be readjusted to its nominal value when the wear of the lining reaches the readjustment value (X_n) stated in table 1.

For this operation, work on the bushings (9) after releasing the bolts (3).

Tighten up the bushings in the magnet support (10) as required to reach the rated air gap value stated in table 1.

Tighten the bolts (3) to the specific torque, C (see table 1).

At the end of the operation, check that the air gap complies with the specified value and is uniform across the whole surface.



M000125

Replacing the brake disc

The brake disc must be replaced when reaching the minimum permissible lining thickness stated in Table 1.

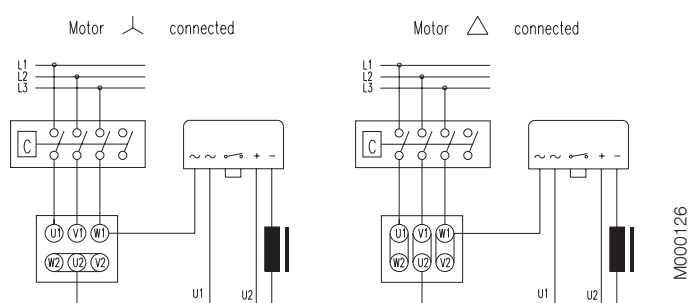
Rectifier

The rectifier is a device for DC brake applications. It is highly resistant to temperature as well as to voltage peaks, and it includes an additional protection of the auxiliary contact of contactor. 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.

Standard connection (t'21~)



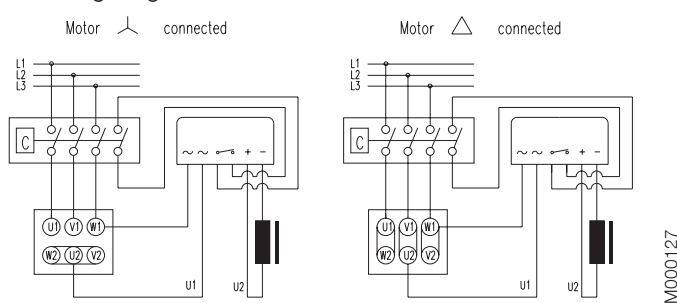
Reconnection (t21~)

When it is necessary to reduce the 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.

The coil can operate reliably between of 90 % and 110 % of the rated voltage. For voltages outside these limits, please consult ABB.

Reconnection (t21=)

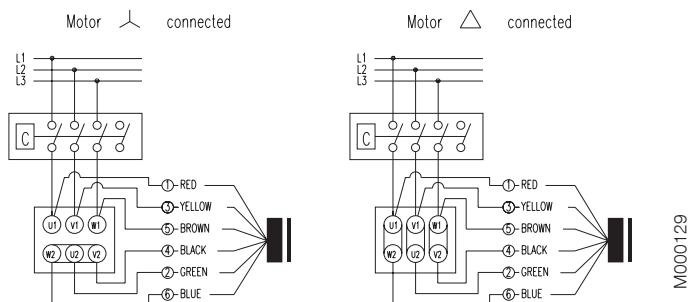
To obtain instant braking, please see table 2 (t21=), use the following diagram.



Connection of AC brake¹⁾

The coil should only be used between 90 % – 110 % of its rated voltage.

Standard connection (t21)



¹⁾ Remark:

Regardless of whether a DC or AC brake is used, the brake is usually connected to the motor terminals of single-speed motors. It can, however, also be delivered with a separate

Reconnection (t21f)

To obtain instant braking, the coil must be fed separately from the motor terminals.

brake supply (variant code 086). In case of two-speed motors, the brake is always connected separately. Separate brake connection is compulsory when the motor is driven by a frequency converter.

Hand release

The device is a lever used to override the action of the brake springs for as long as it is applied.

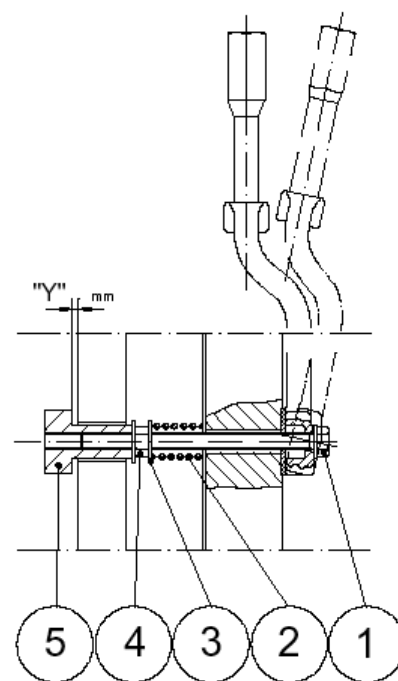
Hand release is included as standard, except for frame size 63, where it is available as option, see variant code 088.

When installing the release lever, please proceed as follows:

Remove the rubber protection, if fitted. Insert the screw (1) with its washer, position the spring (2) and washer (3) and tighten the nut (4) firmly. Fit the other washer and the square-head nut (5); adjust the position of the nut in relation to the moving magnet (Y value) with the central screw (1). When the required value is reached, tighten the inner nut (4) while holding nut (5) fixed.

Important: The use of the release lever needs periodic checking of the Y value and the air gap. The air gap should never exceed the maximum values stated in brake data table 1. Failure to check could result in malfunction due to mechanical locking of the armature.

Size	Y
FM 075.6	1
FM 088.6	1
FM 100.6	1
FM 120.6	1
FM 140.6	1.5
FM 155.6	1.5
FM 170.6	1.5
FM 206.6	1.5



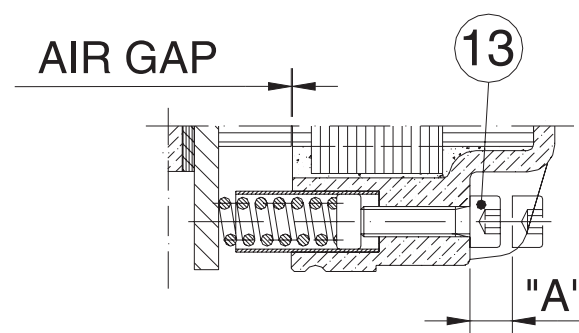
M000130

Torque adjustment

In brake motors from frame size 71 up to 180, the braking torque can be adjusted from 100 % up to 55 % of the nominal torque as standard.

Instructions for how to regulate torque are delivered with the brake motor. These instructions describe how to loosen the torque regulation screw (13), as well as the relation between dimension A and torque.

Reduced braking torque, from 60 % up to 33 %, is available by using variant code 087 (applies for frame sizes 71 - 180).



M000131

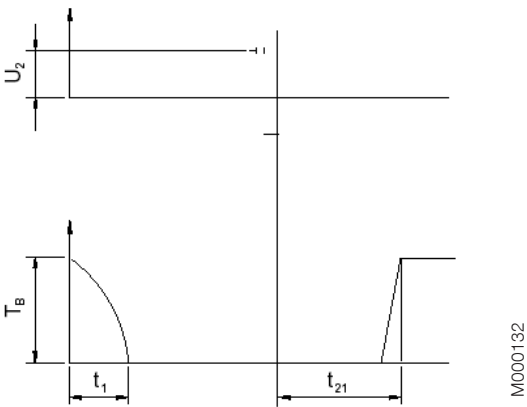
Brake operating times

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.



Special brakes (with DC brake)

Two-speed motors with one or two windings, motors with 9 or 12 terminals, and motors that have to be started with star-delta connection, with brake coil for DC, are supplied with the rectifier fitted in the motor terminal box, without the two wires that normally connect it to the motor terminal. The AC supply to the rectifier is independent to the motor supply and should be fed by the main contactor.

The standard brake coil connection voltages for 50 and 60 Hz will be those stated in the following table, unless stated otherwise in the order:

- ¹⁾ H.W. = Half-wave rectifier, F.W. = Full-wave rectifier
- ²⁾ Special coil on request
- ³⁾ Available using variant code 285

Rectifier input voltage (V_{AC})	Rectifier type ¹⁾	D.C. coil brake voltage (V)
110	F.W.	102 ²⁾
220	F.W.	205
230	F.W.	205
240	F.W.	205
250	F.W.	223 ²⁾
254	F.W.	223 ²⁾
380	H.W.	178
400	H.W.	178
415	H.W.	178
420	H.W.	178
440	H.W.	205
500	H.W.	223 ²⁾
24 V _{DC}	None	24 ³⁾

Brake data tables

Table 1.

Brake motor size		63	71	80	90	100	112	132	160/180	
		A/B							2 p	4-8 p
Brake type		75.5	88.6	100.6	120.6	140.6	155.6	170.6	206.6	
Rated torque ¹⁾	T _{Bnom} (Nm)	7.5	10	24	35	44	86	130	200	230
Delivered torque ²⁾	T _{Bdel} (Nm)	4	8	21	30	38	72	120	130	200
Nominal air gap	X (mm)	0.2	0.2	0.25	0.35	0.4	0.4	0.4	0.4	
Minimum permissible brake disc thickness	(mm)	3.5	3.5	5	5.5	6	6	7.5	8.5	
Recommended air gap readjustment	X _n (mm)	0.5	0.5	0.6	0.7	0.8	0.8	0.8	0.9	
Thickness of new brake disc	E _m (mm)	5.5	6	7.5	8.5	9.5	9.5	11	13	
Tightening torque: bolt	C _s (Nm)	6	6	12	12	30	30	30	50	
Input coil:										
- AC brake motor	(VA)	60	110	160	250	500	700	990	2000	
- DC brake motor	(W)	30	32	45	72	91	100	120	170	
Friction work per operation	WR _{max} (J)	1x10 ³	1.5x10 ³	2x10 ³	3.5x10 ³	6.6x10 ³	8x10 ³	1.1x10 ⁴	2x10 ⁴	
Friction work	PR _{max} (J/h)	3x10 ⁵	3.5x10 ⁵	4.5x10 ⁵	7x10 ⁵	9x10 ⁵	9.5x10 ⁵	1x10 ⁶	1.2x10 ⁶	
Operation for thickness wear of 0.1 mm	WR _{0.1} (J)	7x10 ⁶	10x10 ⁶	15x10 ⁶	17x10 ⁶	31x10 ⁶	31.5x10 ⁶	48x10 ⁶	80x10 ⁶	
Moment of inertia	J (kgm ²)	1.5x10 ⁻⁵	3.7x10 ⁻⁵	7.5x10 ⁻⁵	2x10 ⁻⁴	3.7x10 ⁻⁴	6.2x10 ⁻⁴	10.4x10 ⁻⁴	26.4x10 ⁻⁴	
Weight	(kg)	0.8	1	1.6	2.7	4	5.2	9	16.2	

¹⁾ Braking torque after performing 10.000–15.000 operations.

²⁾ Delivered torque: Torque value marked on rating plate corresponding to the braking torque when the brake motor leaves the ABB factory. Tolerance of +/-10% of this value is accepted. Ambient conditions, temperature on friction surfaces, brake motor positioning and transport applied on the product can affect this value.

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. This allows adjustment to the required value by using the torque regulation facility.

Table 2.

Braking (t₂₁) and release (t₁) times

Brake motor sizes		63	71	80	90	100	112	132	160/180
		A/B							
Brake type		75.5	88.6	100.6	120.6	140.6	155.6	170.6	206.6
AC brake coil									
- release time	t ₁ (ms)	5	6.6	5	5.1	5.5	5	5	5.5
- standard braking time	t ₂₁ (ms)	25	25	30	40	50	50	65	105
- fast braking time	t _{21f} (ms)	10	10	10	10	10	10	10	10
DC brake coil									
- release time	t ₁ (ms)	20	20	25	35	40	50	60	100
- std connection time	t' ₂₁ (ms)	150	170	210	330	420	720	850	930
- reconnection time	t ₂₁ (ms)	30	35	45	70	90	155	190	150
- fast reconnection time	t ₂₁ = (ms)	10	10	15	20	35	45	55	

When fast braking in AC brake is used, the contactor that is operating the coil of the brake has to be over dimensioned taking in consideration a high inductive load.

Calculations

Maximum number of connections 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.

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

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.

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

Braking time

The total braking time from the disconnecting of brake until the machine is stopped is calculated as follows:

$$t = 104.6 \times \frac{J \times n_m}{T_B} + t_{21}$$

t and t_{21} are in ms

Maximum number of operations until wear of 0.1 mm

The service life, expressed in switching operations, can be calculated with the aid of the values $WR_{0.1}$ given in brake data table 1.

$$L_{0.1} = \frac{WR_{0.1}}{WR}$$

Number of operations before readjusting the air gap

With the X_n values in table 1 we can calculate the number of required operations until the readjustment of air gap becomes necessary.

$$L_n = \frac{X_n - X}{0.1} \times L_{0.1}$$

Options

Separate brake supply

For brakes which need an independent supply, please note the variant code 086 and the voltage for feeding the brake. When the motor is supplied via a frequency converter, both in the case of DC and AC, the brake should be supplied separately at rated voltage (constant). The separate brake supply can be connected directly, no separate terminal box is needed.

Dust protection

To protect the brake disc against dust, the brake can be supplied with a rubber protection ring and V-ring.

Variant code 213 should be stated in the order.

Braking torque reduction

Reduced braking torque range, from 60 % up to 33 %, is available by using variant code 087.

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.

Ordering information

When placing an order, please state the following minimum data in the order, as in the example.

The product code of the motor is composed in accordance with the following example.

Motor type	M3AR 112M
Pole number	4
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	5,5 kW
Product code	3GAR112360-ADE
Brake information	

A	B	C	D	E	F	G	
M3AR 112 MF 3GAR 11 2 360 - ADE 283 etc.							A = Motor type M3VRF/M3ARF (DC brake) M3VRS/M3ARS (AC brake)
		1 2 3 4	5 6	7	8 9 10	11	B = Motor size
					12 13 14		C = Product code
							D = Mounting arrangement code
							E = Voltage/frequency code
							F = Generation code
							G = Mandatory variant codes for frame sizes 90-132: Variant code 283 for DC brake Variant code 284 for AC brake

Positions 1 to 4

3GAA = Totally enclosed motor, aluminum frame

3GVA = Totally enclosed motor, aluminum frame, alternative design

Position 4

R = Brake motor

Positions 5 and 6

IEC-size

06 = 63 12 = 112

07 = 71 13 = 132

08 = 80

09 = 90

10 = 100

Position 7

Speed (Pole pairs)

1 = 2 poles 6 = 12 poles

2 = 4 poles 7 = > 12 poles

3 = 6 poles 8 = Two-speed motors

4 = 8 poles 9 = Multi-speed motors

5 = 10 poles

Position 8 to 10

Serial number

Position 11

- (dash)

Position 12

Mounting arrangement

A = Foot-mounted.

B = Flange-mounted. Large aluminum flange with clearance holes, sizes 63-100.

C = Flange-mounted. Small aluminum flange with tapped holes, sizes 63-100.

E = Flange-mounted. Large cast iron flange with clearance holes, sizes 112-132.

H = Foot- and flange-mounted. Large aluminum flange with clearance holes, sizes 63-100.

J = Foot- and flange-mounted. Small aluminum flange with tapped holes, sizes 63-100.

K = Foot- and flange-mounted. Large cast iron flange with clearance holes, sizes 112-132.

N = Flange mounted. Two piece cast iron flange (IEC-1) with clearance holes, sizes 90-132.

P = Foot- and flange-mounted. Two piece cast iron flange (IEC) with clearance holes, sizes 90-132.

Position 13

Voltage and frequency code

See table below

Position 14

Generation code = C (size 63), E (sizes 71-132)

The product code must be, if needed, followed by variant codes.

Technical data

Single-speed motors with three-phase DC brake

IP 55 – IC 411 – Insulation class F, temperature rise class B – Brake IP 23 S

Out-put kW	Motor type	Product code	Torque					Efficiency			Current			Moment of inertia J=1/4GD² kgm²	Weight foot mounted kg			
			rated		braking			Speed r/min	T _N Nm	T _s / T _N	T _B Nm	K ¹⁾	Power factor cos φ			I _N A	I _s /I _N	c/h ²⁾
3000 r/min = 2 pole			400 V 50 Hz					100 %			75 %	Basic design						
0.37	M3VRF	71 A	3GVR	071 401-CSE	2840	1.25	3.8	10	7.6	77.1	76.5	0.72	1	5.5	2600	0.00051	7	
0.55	M3VRF	71 B	3GVR	071 402-ASE	2830	1.86	3.6	10	5.26	79.2	78.2	0.76	1.35	5.7	2600	0.0006	8	
0.75	M3VRF	80 A	3GVR	081 401-BSE	2870	2.49	2.9	24	9.6	81.2	79.3	0.75	1.8	6.2	2000	0.00074	11	
1.5	³⁾ M3AR	90S 2	3GAR	091100-••E	2895	4.9	2.3	35	7	78.5	77.2	0.75	3.6	6.4	1300	0.0019	19	
2.2	³⁾ M3AR	90L 2	3GAR	091500-••E	2890	7.2	2.5	35	4.7	82.6	84.4	0.84	4.5	7.0	1200	0.0024	22	
3	³⁾ M3AR	100L 2	3GAR	101500-••E	2905	9.8	2.5	44	4.4	84.5	84.9	0.84	6.1	7.5	1000	0.0041	32	
4	³⁾ M3AR	112M 2	3GAR	111300-••E	2885	13.2	2.6	86	6.41	85.7	86.7	0.85	7.9	7.4	500	0.0061	38	
5.5	³⁾ M3AR	132SA 2	3GAR	131110-••E	2845	18.4	2.8	130	7.06	85.8	86.4	0.87	10.6	6.8	600	0.014	57	
7.5	³⁾ M3AR	132SB 2	3GAR	131120-••E	2860	25.0	3.4	130	5.17	88.0	86.2	0.89	13.8	8.5	500	0.0186	62	
3000 r/min = 2 pole			400 V 50 Hz									High-output design						
0.75	M3VRF	71 BC	3GVR	071 404-CSE	2800	2.57	3.1	10	3.84	78.5	77.9	0.85	1.7	5.1	2400	0.0006	8	
2.7	³⁾ M3AR	90LF 2	3GAR	091560-••E	2840	9.0	2.4	35	3.88	81.0	83.2	0.86	5.5	6.4	1200	0.0027	24	
4	³⁾ M3AR	100LF 2	3GAR	101560-••E	2880	13.2	3.0	44	3.38	84.3	86.1	0.86	7.9	8.0	1000	0.005	36	
5.5	³⁾ M3AR	112MF 2	3GAR	111360-••E	2855	18.3	2.7	86	4.67	86.5	87.1	0.93	9.8	7.3	500	0.0127	66	
9.2	³⁾ M3AR	132SF 2	3GAR	131160-••E	2825	31.0	3.2	130	4.18	86.0	88.2	0.93	16.6	7.3	500	0.0246	77	
11	³⁾ M3AR	132SG 2	3GAR	131170-••E	2835	37.0	3.2	130	3.51	87.0	87.4	0.93	19.6	8.0	500	0.0238	77	

¹⁾ Braking-torque ratio

²⁾ No-load (shaft-free) operations/hour

³⁾ Frame sizes 90-132: mandatory variant code 283 for DC brake

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

Motor size	S			D			X
	Motor	Brake (input rectifier voltage/brake voltage)		Motor	Brake (input rectifier voltage/brake voltage)		
	50 Hz	60 Hz		50 Hz	60 Hz		
63-132	220-240 VΔ	250-280 VΔ	220-240 V/205 V d.c.	380-420 VΔ	440-480 VΔ	380-420 V/178 V d.c.	Any other rated voltage or frequency, 690 V maximum connection for motor and 500 V for brake (input rectifier)
	380-420 VY			660-690 VY	–		
Motor size	E			F			
	Motor	Brake (input rectifier voltage/brake voltage)		Motor	Brake (input rectifier voltage/brake voltage)		
	50 Hz			50 Hz			
63-80	–	–		500 VY	500 V/223 V d.c.		
90-132	500 VΔ	500 V/223 V d.c.		500 VY	500 V/223 V d.c.		

Technical data

Single-speed motors with three-phase DC brake

IP 55 – IC 411 – Insulation class F, temperature rise class B – Brake IP 23 S

Out-put kW					Torque					Efficiency			Current			Moment of inertia J=1/4GD ² kgm ²	Weight foot mounted kg	
					rated		braking			Power factor cos φ		I _N A	I _S /I _N	c/h ²⁾				
					Speed r/min	T _N Nm	T _S / T _N	T _B Nm	K ¹⁾									
Product code										100 %	75 %		Basic design					
1500 r/min = 4 pole					400 V 50 Hz													
0.18	M3VRF	63 B	3GVR	062 402-BSC	1380	1.25	2.5	7.5	5.76	65.6	62.1	0.64	0.63	3.1	7100	0.00036	5.5	
0.25	M3VRF	71 A	3GVR	072 401-CSE	1410	1.71	2.7	10	5.88	70.4	69.1	0.71	0.74	4.3	6500	0.00081	7	
0.37	M3VRF	71 B	3GVR	072 402-ASE	1420	2.51	2.6	10	4	74.6	72.1	0.69	1.05	4.4	6500	0.00104	8	
0.37	M3VRF	71 B	3GVR	072 402-BSE	1420	2.51	2.6	10	4	74.6	72.1	0.69	1.05	4.4	6500	0.00104	8	
0.37	M3VRF	71 B	3GVR	072 402-CSE	1420	2.51	2.6	10	4	74.6	72.1	0.69	1.05	4.4	6500	0.00104	8	
0.55	M3VRF	80 A	3GVR	082 401-ASE	1390	3.75	2.6	24	6.31	75.3	73.1	0.76	1.4	4.6	5000	0.00128	11	
0.55	M3VRF	80 A	3GVR	082 401-BSE	1390	3.75	2.6	24	6.31	75.3	73.1	0.76	1.4	4.6	5000	0.00128	11	
0.75	M3VRF	80 B	3GVR	082 402-ASE	1410	5.08	3.5	24	4.7	78.2	75.6	0.74	1.9	4.7	5000	0.00159	12	
0.75	M3VRF	80 B	3GVR	082 402-BSE	1410	5.08	3.5	24	4.7	78.2	75.6	0.74	1.9	4.7	5000	0.00159	12	
0.75	M3VRF	80 B	3GVR	082 402-CSE	1410	5.08	3.5	24	4.7	78.2	75.6	0.74	1.9	4.7	5000	0.00159	12	
0.75	M3VRF	80 B	3GVR	082 402-CFE	1410	5.08	3.5	24	4.7	78.2	75.6	0.74	1.9	4.7	5000	0.00159	12	
1.1	³⁾ M3AR	90S 4	3GAR	092100-••E	1420	7.3	2.0	35	4.66	77.20	78.10	0.77	2.6	4.8	3200	0.0032	19	
1.5	³⁾ M3AR	90L 4	3GAR	092500-••E	1420	10.0	2.8	35	3.5	81.30	81.90	0.75	3.5	5.8	3200	0.0043	22	
2.2	³⁾ M3AR	100LA 4	3GAR	102510-••E	1430	14.6	2.2	44	2.93	82.30	83.40	0.78	4.9	5.6	2700	0.0069	32	
3	³⁾ M3AR	100LB 4	3GAR	102520-••E	1430	20.0	2.5	44	2.2	84.60	85.70	0.78	6.5	6.4	2700	0.0082	35	
4	³⁾ M3AR	112M 4	3GAR	112300-••E	1435	26.6	2.9	86	3.23	84.50	83.90	0.80	8.5	7.0	2500	0.0158	40	
5.5	³⁾ M3AR	132S 4	3GAR	132100-••E	1450	36.2	2.2	130	3.59	87.00	87.70	0.83	10.9	7.3	1800	0.0336	60	
7.5	³⁾ M3AR	132M 4	3GAR	132300-••E	1450	49.3	2.5	130	2.63	88.00	88.60	0.83	14.8	7.9	1400	0.0406	68	
1500 r/min = 4 pole					400 V 50 Hz					High-output design								
0.55	M3VRF	71 C	3GVR	072 404-BSE	1410	3.74	2.7	10	2.7	77.3	76.9	0.73	1.45	4.8	6500	0.00125	9	
1.85	³⁾ M3AR	90LE 4	3GAR	092550-••E	1410	12.5	2.6	35	2.69	79.70	82.00	0.76	4.4	5.3	3200	0.0043	22	
2.2	³⁾ M3AR	90LF 4	3GAR	092560-••E	1390	15.1	2.3	35	2.33	80.00	83.10	0.83	4.7	5.3	3200	0.0048	23	
4	³⁾ M3AR	100LG 4	3GAR	102570-••E	1415	26.9	2.1	44	1.62	83.20	85.80	0.76	9.1	5.5	2700	0.009	36	
5.5	³⁾ M3AR	112MF 4	3GAR	112360-••E	1425	36.8	2.8	86	2.33	84.50	83.50	0.83	11.3	7.1	2500	0.018	47	
9.2	³⁾ M3AR	132MF 4	3GAR	132360-••E	1450	60.5	2.0	130	2.14	88.00	88.60	0.85	17.7	7.3	1400	0.05	83	
11	³⁾ M3AR	132MG 4	3GAR	132370-••E	1450	72.4	2.5	130	1.79	88.00	89.40	0.86	20.9	8.3	500	0.05	83	

¹⁾ Braking-torque ratio

²⁾ No-load (shaft-free) operations/hour

³⁾ Frame sizes 90-132: mandatory variant code 283 for DC brake

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

	S			D			X
Motor size	Motor		Brake (input rectifier voltage/brake voltage)	Motor		Brake (input rectifier voltage/brake voltage)	
	50 Hz	60 Hz		50 Hz	60 Hz		
63-132	220-240 VΔ 380-420 VY	250-280 VΔ	220-240 V/205 V d.c.	380-420 VΔ 660-690 VY	440-480 VΔ –	380-420 V/178 V d.c.	Any other rated voltage or frequency, 690 V maximum connection for motor and 500 V for brake (input rectifier)
	E			F			
Motor size	Motor		Brake (input rectifier voltage/brake voltage)	Motor		Brake (input rectifier voltage/brake voltage)	
	50 Hz			50 Hz			
63-80	–		–	500 VY		500 V/223 V d.c.	
90-132	500 VΔ		500 V/223 V d.c.	500 VY		500 V/223 V d.c.	

Technical data

Single-speed motors with three-phase DC brake

IP 55 – IC 411 – Insulation class F, temperature rise class B – Brake IP 23 S

Out-put kW	Motor type	Product code	Torque					Efficiency			Current			Moment of inertia J=1/4GD² kgm²	Weight foot mounted kg			
			rated		braking			Speed r/min	T _N Nm	T _S / T _N	T _B Nm	K ¹⁾	Power factor cos φ			I _N A	I _S /I _N	c/h ²⁾
			Speed r/min	T _N Nm	T _S / T _N	T _B Nm	K ¹⁾											
1000 r/min = 6 pole			400 V 50 Hz								Basic design							
0.25	M3VRF	71 B	3GVR	073 402-BSE	920	2.61	2.5	10	3.84	64.9	62.3	0.65	0.86	3.2	7500	0.00096	8	
0.37	M3VRF	80 A	3GVR	083 401-CSE	925	3.82	3.1	24	6.28	72.9	70.8	0.72	1.04	3.8	7000	0.00186	11	
0.55	M3VRF	80 B	3GVR	083 402-BSE	925	5.68	2.9	24	4.22	73.3	71.9	0.71	1.55	3.4	7000	0.0022	12	
0.75	³⁾ M3AR	90S 6	3GAR	093100-••E	925	7.7	2.1	35	4.66	71.5	70.9	0.64	2.3	3.6	3800	0.0032	19	
1.1	³⁾ M3AR	90L 6	3GAR	093500-••E	915	11.4	1.9	35	3.18	73.0	73.4	0.63	3.4	3.2	3900	0.0043	22	
1.5	³⁾ M3AR	100L 6	3GAR	103500-••E	950	15.0	2.0	44	2.93	79.6	79.9	0.69	3.9	4.2	3300	0.0082	34	
2.2	³⁾ M3AR	112M 6	3GAR	113300-••E	940	22.3	2.1	86	3.85	80.5	79.3	0.74	5.3	5.6	3200	0.015	40	
3	³⁾ M3AR	132S 6	3GAR	133100-••E	960	29.8	2.0	130	4.36	84.5	82.7	0.75	6.8	6.1	2400	0.033	59	
4	³⁾ M3AR	132MA 6	3GAR	133310-••E	960	39.7	2.0	130	3.27	85.5	83.1	0.78	8.6	7.1	1900	0.04	66	
5.5	³⁾ M3AR	132MB 6	3GAR	133320-••E	960	54.7	2.0	130	2.36	83.8	84.3	0.71	13.3	5.3	1000	0.045	74	
1000 r/min = 6 pole			400 V 50 Hz								High-output design							
1.3	³⁾ M3AR	90LF 6	3GAR	093560-••E	910	13.6	1.90	35	2.59	74.4	76.8	0.69	3.6	3.6	3800	0.0048	24	
2.2	³⁾ M3AR	100LG 6	3GAR	103570-••E	940	22.3	1.90	44	2	79.8	81.5	0.69	5.7	4.3	3300	0.009	37	
3	³⁾ M3AR	112MF 6	3GAR	113360-••E	935	30.6	2.0	86	2.81	80.0	79.9	0.76	7.1	5.5	3200	0.018	46	
6.5	³⁾ M3AR	132MG 6	3GAR	133370-••E	960	64.6	2.0	130	2.01	85.0	84.5	0.75	14.7	6.6	2400	0.051	79	

¹⁾ Braking-torque ratio

²⁾ No-load (shaft-free) operations/hour

³⁾ Frame sizes 90-132: mandatory variant code 283 for DC brake

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

	S			D			X
	Motor	Brake	(input rectifier voltage/brake voltage)	Motor	Brake	(input rectifier voltage/brake voltage)	
Motor size	50 Hz 60 Hz			50 Hz 60 Hz			
63-132	220-240 VΔ 250-280 VΔ	220-240 V/205 V d.c.		380-420 VΔ 440-480 VΔ	380-420 V/178 V d.c.		Any other rated voltage or frequency, 690 V maximum connection for motor and 500 V for brake (input rectifier)
	380-420 VY			660-690 VY –			
	E			F			
	Motor	Brake	(input rectifier voltage/brake voltage)	Motor	Brake	(input rectifier voltage/brake voltage)	
Motor size	50 Hz			50 Hz			
63-80	–	–		500 VY	500 V/223 V d.c.		
90-132	500 VΔ	500 V/223 V d.c.		500 VY	500 V/223 V d.c.		

Technical data

Single-speed motors with three-phase DC brake

IP 55 – IC 411 – Insulation class F, temperature rise class B – Brake IP 23 S

Out-put kW					Torque					Efficiency			Current			Moment of inertia J=1/4GD ² kgm ²	Weight foot mounted kg	
					rated		braking			Power factor cos φ		I _N A			I _S /I _N			c/h ²⁾
					Speed r/min	T _N Nm	T _S / T _N	T _B Nm	K ¹⁾									
Motor type	Product code	750 r/min = 8 pole	400 V 50 Hz					100 %	75 %	Basic design								
0.37 ³⁾	M3AR	90S 8	3GAR	094100-••E	695	5	1.7	35	7	59.4	55.9	0.54	1.6	2.7	4100	0.0032	19	
0.55 ³⁾	M3AR	90L 8	3GAR	094500-••E	660	7.6	1.5	35	4.66	61.7	59.5	0.58	2.3	2.5	4100	0.0043	22	
0.75 ³⁾	M3AR	90LF 8	3GAR	094560-••E	635	10.5	1.7	44	-	58.5	57.8	0.6	3.1	2.7	-	0.0048	22	
0.75 ³⁾	M3AR	100LA 8	3GAR	104510-••E	720	9.9	2.5		4.4	70.7	67.1	0.47	3.2	3.9	3600	0.0069	31	
1.1 ³⁾	M3AR	100LB 8	3GAR	104520-••E	695	15.1	1.7	44	2.93	76	74.9	0.66	3.1	3.4	3700	0.0082	34	
1.5 ³⁾	M3AR	100LG 8	3GAR	104570-••E	685	20.9	1.9	86	-	70.7	70.9	0.64	4.7	3.1	-	0.009	34	
1.5 ³⁾	M3AR	112M 8	3GAR	114300-••E	695	20.6	1.9		4.17	74.5	75.9	0.65	4.4	4.1	3600	0.016	41	
2.2 ³⁾	M3AR	132S 8	3GAR	134100-••E	720	29.1	1.6	130	4.45	80.5	77.8	0.67	5.8	5.3	3000	0.04	66	
3 ³⁾	M3AR	132M 8	3GAR	134300-••E	720	39.7	1.8	130	3.26	82	79.2	0.68	7.7	5.5	2600	0.047	73	

¹⁾ Braking-torque ratio

²⁾ No-load (shaft-free) operations/hour

³⁾ Frame sizes 90-132: mandatory variant code 283 for DC brake

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

	S			D			X
	Motor	Brake (input rectifier voltage/brake voltage)		Motor	Brake (input rectifier voltage/brake voltage)		
Motor size	50 Hz 60 Hz			50 Hz 60 Hz			
63-132	220-240 VΔ 250-280 VΔ	220-240 V/205 V d.c.		380-420 VΔ 440-480 VΔ	380-420 V/178 V d.c.		Any other rated voltage or frequency, 690 V maximum connection for motor and 500 V for brake (input rectifier)
	380-420 VY			660-690 VY –			
	E			F			
	Motor	Brake (input rectifier voltage/brake voltage)		Motor	Brake (input rectifier voltage/brake voltage)		
Motor size	50 Hz			50 Hz			
63-80	–	–		500 VY	500 V/223 V d.c.		
90-132	500 VΔ	500 V/223 V d.c.		500 VY	500 V/223 V d.c.		

Technical data

Two-speed motors with three-phase DC brake

IP 55 – IC 411 – Insulation class F, temperature rise class F – Brake IP 23 S

Out-put kW	Motor type	Product code	Speed r/min	Torque rated		braking		Effi- ciency %	Power factor cos φ	Current		Moment of inertia J=1/4GD ² kgm ²	Weight IM 1001 kg
				T _N Nm	T _S / T _N	T _B Nm	K ¹⁾			I _N	I _S /I _N A		
3000/1500 r/min = 2/4 poles				400 V 50 Hz				Constant torque, two separate windings					
1.1/0.55 ²⁾	M3ARF 90 S	3GAR 099101-••E	2900/1450	3.6/3.6	1.4/1.5	35	9.7/9.7	74/62	0.85/0.64	2.5/2	5.1/3.6	0.0019	20
1.5/0.75 ²⁾	M3ARF 90 L	3GAR 099501-••E	2900/1450	4.9/4.9	1.5/1.5	35	7.1/7.1	77/70	0.87/0.67	3.3/2.4	5.7/4.1	0.0024	23
2.0/1.0 ²⁾	M3ARF 100 L	3GAR 109501-••E	2900/1460	6.5/6.5	1.9/1.4	44	7.7/7.7	76/67	0.89/0.66	4.3/3.3	6.2/4	0.0041	32
2.6/1.3 ²⁾	M3ARF 112 M	3GAR 119301-••E	2900/1460	8.6/8.5	1.6/1.6	86	10/9.9	80/75	0.92/0.72	5.1/3.5	6.4/5	0.012	45
4.4/2.2 ²⁾	M3ARF 132 SB	3GAR 139121-••E	2925/1450	14.4/14.5	2/1.3	130	10.4/10	81/74	0.86/0.73	9.1/5.9	7.3/4.5	0.016	55
5.6/2.8 ²⁾	M3ARF 132 M	3GAR 139301-••E	2885/1440	18.5/18.6	1.8/1.4	130	8.1/8.1	82/77	0.93/0.75	10.6/7	6.7/5	0.022	76
3000/1500 r/min = 2-4 poles				400 V 50 Hz				Constant torque, Dahlander connection					
1.3/1 ²⁾	M3ARF 90 S	3GAR 099108-••E	2730/1400	4.5/6.8	2/1.5	35	7.8/5.1	71/71	0.88/0.8	3.1/2.6	3.9/3.8	0.0032	20
1.9/1.5 ²⁾	M3ARF 90 L	3GAR 099508-••E	2820/1420	6.4/10	2.8/2	35	5.5/3.5	74/75	0.82/0.76	4.4/3.9	5.1/4.4	0.0043	23
2.5/2.1 ²⁾	M3ARF 100 LA	3GAR 109518-••E	2800/1430	8.5/14	2.2/1.6	44	5.9/3.6	68/76	0.88/0.81	6/5	4.8/4.4	0.0069	32
3.4/2.5 ²⁾	M3ARF 100 LB	3GAR 109528-••E	2810/1430	11.5/18	2.2/1.9	44	4.3/2.7	78/80	0.88/0.85	7.2/5.9	5.3/5.4	0.0082	35
4/2.6 ²⁾	M3ARF 112 M	3GAR 119308-••E	2865/1430	13.3/17.4	1.8/2.3	86	10/9.9	82/77	0.93/0.76	7.6/6.5	6.3/6.2	0.012	45
4.7/3.1 ²⁾	M3ARF 132 SB	3GAR 139128-••E	2820/1420	15.9/20.8	1.8/2.2	130	10.4/10	79/77	0.92/0.76	9.2/7.7	5.5/5.7	0.016	55
6.3/4.4 ²⁾	M3ARF 132 SA	3GAR 139118-••E	2895/1445	20.8/29	1.7/1.6	130	7.2/5.2	85/84	0.94/0.8	11.4/9.5	6.5/5.7	0.0155	58
7.2/4.8 ²⁾	M3ARF 132 M	3GAR 139308-••E	2870/1435	24/31.9	2.4/2.5	130	6.3/4.7	84/81	0.92/0.76	13.3/11.5	7.1/6.2	0.022	76
8/6.2 ²⁾	M3ARF 132 SC	3GAR 139138-••E	2910/1440	26.2/41.1	1.9/1.6	130	6.9/3.6	87/85	0.95/0.83	14/12.7	7.8/5.6	0.0215	78
9.6/7 ²⁾	M3ARF 132 MD	3GAR 139348-••E	2900/1440	31.6/46.4	1.8/1.7	130	4.7/3.2	87/85	0.95/0.85	16.8/14.1	7.6/5.9	0.026	85
1500/1000 r/min = 4/6 poles				400 V 50 Hz				Constant torque, two separate windings					
0.8/0.5 ²⁾	M3ARF 90 S	3GAR 099104-••E	1430/940	5.3/5	1.5/1.4	35	7/6.6	68/57	0.8/0.66	2.2/2	3.9/2.8	0.0032	20
1.2/0.75 ²⁾	M3ARF 90 L	3GAR 099504-••E	1430/940	8/7.6	1.7/1.5	35	4.6/4.4	73/63	0.81/0.67	3/2.6	4.4/3.1	0.0043	23
1.5/0.9 ²⁾	M3ARF 100 LA	3GAR 109514-••E	1440/960	9.9/8.9	1.5/1.5	44	5.6/5.1	75/69	0.84/0.65	3.5/3	4.7/3.8	0.0069	32
1.8/1.1 ²⁾	M3ARF 100 LB	3GAR 109524-••E	1460/960	11/11	2.1/1.6	44	4.5/4.5	77/70	0.78/0.64	4.4/3.6	5.8/3.9	0.0082	35
2.6/1.7 ²⁾	M3ARF 112 M	3GAR 119304-••E	1445/960	17.2/16.9	1.5/1.5	86	5/4.9	80/70	0.85/0.76	5.5/4.4	5.9/5.2	0.018	45
3.3/2.2 ²⁾	M3ARF 132 S	3GAR 139104-••E	1470/980	21.4/21.4	1.4/1.2	130	7/7	82/76	0.8/0.65	7.1/6.4	6.8/4.6	0.038	61
4.5/3 ²⁾	M3ARF 132 M	3GAR 139304-••E	1470/980	29.2/29.2	1.4/1.5	130	5.1/5.1	82/77	0.81/0.7	9.8/8	7.2/5.6	0.048	79
5.5/3.7 ²⁾	M3ARF 132 MD	3GAR 139344-••E	1460/960	36/36.8	1.9/1.8	130	4.2/4.2	85/81	0.88/0.8	10.7/8.3	8/6.3	0.036	84

¹⁾ Braking-torque ratio

²⁾ Frame sizes 90-132: mandatory variant code 283 for DC brake

Technical data

Two-speed motors with three-phase DC brake

IP 55 – IC 411 – Insulation class F, temperature rise class F – Brake IP 23 S

Out-put kW	Motor type	Product code	Torque					Effi- ciency %	Power factor cos φ	Current		Moment of inertia J=1/4GD ² kgm ²	Weight IM 1001 kg
			Speed r/min	T _N	T _S / T _N	T _B	K ¹⁾			I _N	I _S /I _N A		
				Nm		Nm							
3000/750 r/min = 2/8 poles			400 V 50 Hz					Constant torque, two separate windings					
0.75/0.18 ²⁾	M3ARF 90 LA	3GAR 099510-••E	2875/720	2.5/2.4	2.3/1.3	35	14/14	71.2/46.3	0.8/0.51	1.9/1.1	5.7/2.4	0.0043	23
1.3/0.33 ²⁾	M3ARF 90 LB	3GAR 099520-••E	2780/690	4.4/4.5	1.8/1.2	35	8/8	71/52	0.92/0.62	2.9/1.5	4.5/2.3	0.0043	23
1.8/0.5 ²⁾	M3ARF 100 LB	3GAR 109520-••E	2860/705	6.6/6.7	1.7/1.3	44	8.3/7.4	80/54	0.93/0.64	3.5/2.1	5.3/2.6	0.0082	35
2.2/0.59 ²⁾	M3ARF 112 MC	3GAR 119330-••E	2900/720	7.2/7.8	2.4/1.6	86	11.8/11	78/62	0.87/0.55	4.9/2.5	7/3.5	0.015	42
3.3/0.95 ²⁾	M3ARF 132 SA	3GAR 139110-••E	2940/730	10.7/12.4	2.6/1.2	130	14/12	81/72	0.95/0.52	6.2/3.7	9.5/4.3	0.0215	65
4.4/1.3 ²⁾	M3ARF 132 MC	3GAR 139330-••E	2920/725	14.4/17.1	2.2/1.3	130	10.7/8.8	82/74	0.94/0.62	8.3/4.1	8.6/4	0.03	77
1500/750 r/min = 4/8 poles			400 V 50 Hz					Constant torque, two separate windings					
0.55/0.25 ²⁾	M3ARF 90 S	3GAR 099102-••E	1450/700	3.6/3.4	1.3/1.4	35	10.3/9.7	62/51	0.78/0.59	1.9/1.2	4.2/2.3	0.0032	20
0.75/0.37 ²⁾	M3ARF 90 L	3GAR 099502-••E	1450/700	4.9/5	1.4/1.5	35	7.1/7	66/57	0.75/0.57	2.2/1.7	4.1/2.5	0.0043	23
1.1/0.55 ²⁾	M3ARF 100 LA	3GAR 109512-••E	1460/710	7.2/7.4	1.2/1.2	44	6.9/6.8	68/62	0.77/0.61	3.1/2.2	4.2/2.6	0.0069	32
1.5/0.75 ²⁾	M3ARF 100 LB	3GAR 109522-••E	1440/700	9.8/10	1.3/1.2	44	5.1/5	72/60	0.82/0.6	3.7/2.9	4.6/2.7	0.0082	35
1.8/0.9 ²⁾	M3ARF 112 M	3GAR 119302-••E	1460/715	11.7/12	1.2/1.6	86	7.3/7.1	77/65	0.76/0.66	4.4/3	6.5/4	0.018	45
2.5/1.3 ²⁾	M3ARF 132 S	3GAR 139102-••E	1480/735	16.2/17	1.6/1.4	130	9.3/8.8	80/67	0.79/0.56	5.8/6	6/3.7	0.038	61
3.3/1.7 ²⁾	M3ARF 132 M	3GAR 139302-••E	1470/725	21.4/22.4	1.6/1.4	130	7/6.7	81/71	0.79/0.58	7.5/6	7/4.2	0.048	79
1500/750 r/min = 4-8 poles			400 V 50 Hz					Constant torque, Dahlander connection					
0.7/0.37 ²⁾	M3ARF 90 S	3GAR 099109-••E	1420/700	4.7/5.1	1.6/1.6	35	7.4/6.9	72/50	0.8/0.57	1.8/1.9	4.4/2.3	0.0032	20
1.1/0.55 ²⁾	M3ARF 90 L	3GAR 099509-••E	1390/685	7.4/7.5	1.4/1.5	35	4.7/4.7	70/55	0.84/0.58	2.6/2.6	4.1/2.3	0.0043	23
1.5/0.75 ²⁾	M3ARF 100 LA	3GAR 109519-••E	1440/710	10/10	1.4/1.5	44	5/5	76/62	0.85/0.57	3.4/3.2	4.6/2.8	0.0069	32
2/0.95 ²⁾	M3ARF 100 LB	3GAR 109529-••E	1440/710	13/12	1.4/1.6	44	4.2/3.8	78/64	0.86/0.55	4.4/4	4.8/2.9	0.0082	35
2.5/1.5 ²⁾	M3ARF 112 M	3GAR 119309-••E	1410/705	16.9/20.3	1.4/1.5	86	5/4.2	78/67	0.9/0.66	5.1/4.9	5.5/4.1	0.018	45
3.8/1.9 ²⁾	M3ARF 132 S	3GAR 139109-••E	1450/730	25/24.9	1.4/1.3	130	6/6	82/70	0.84/0.52	7.7/7.6	5.6/3.7	0.038	61
5/2.5 ²⁾	M3ARF 132 M	3GAR 139309-••E	1455/730	32.8/32.7	1.7/2	130	4.6/4.6	85/73	0.88/0.52	9.6/9.6	6.9/4.8	0.048	79

¹⁾ Braking-torque ratio

²⁾ Frame sizes 90-132: mandatory variant code 283 for DC brake

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

Motor size	A		B		S	
	Motor	Brake (input rectifier 50 Hz voltage/brake voltage)	Motor	Brake (input rectifier 50 Hz voltage/brake voltage)	Motor	Brake (input rectifier 50 Hz voltage/brake voltage)
63-132	–		–		220-230 V	220-230 V/205 V d.c.
Motor size	D		E		X	
	Motor	Brake (input rectifier 50 Hz voltage/brake voltage)	Motor	Brake (input rectifier 50 Hz voltage/brake voltage)	Any other rated voltage or frequency, 690 V maximum connection for motor and 500 V for brake (input rectifier)	
63-132	380-400 V	380-400 V/178 V d.c.	500 V	500 V/223 V d.c.		

Technical data

Single-speed motors with three phase AC brake

IP 55 – IC 411 – Insulation class F, temperature rise class B – Brake IP 23 S

Out-put kW	Motor type	Product code	Torque					Efficiency			Current			Moment of inertia J=1/4GD ² kgm ²	Weight foot mounted kg	
			Speed r/min	rated		braking		100 %	75 %	Power factor cos φ	I _N A	I _s /I _N	c/h ²⁾			
				T _N Nm	T _s / T _N	T _B Nm	K ¹⁾									
3000 r/min = 2 pole			400 V 50 Hz								Basic design					
0.55	M3VRS 71 B	3GVR 071 452-CSE	2830	1.86	3.6	10	5.26	79.2	78.2	0.76	1.35	5.7	2600	0.0006	8	
0.75	M3VRS 80 A	3GVR 081 451-BSE	2870	2.49	2.9	24	9.6	81.2	79.3	0.75	1.8	6.2	2000	0.00074	11	
1.1	M3VRS 80 B	3GVR 081 452-ASE	2850	3.69	2.3	24	6.48	81.4	79.5	0.78	2.5	6.1	2000	0.00078	12	
1.1	M3VRS 80 B	3GVR 081 452-BSE	2850	3.69	2.3	24	6.48	81.4	79.5	0.78	2.5	6.1	2000	0.00078	12	
1.5 ³⁾	M3AR 90S 2	3GAR 091100-••E	2895	4.9	2.3	35	7	78.5	77.2	0.75	3.6	6.4	1300	0.0019	19	
2.2 ³⁾	M3AR 90L 2	3GAR 091500-••E	2890	7.2	2.5	35	4.7	82.6	84.4	0.84	4.5	7.0	1200	0.0024	22	
3 ³⁾	M3AR 100L 2	3GAR 101500-••E	2905	9.8	2.5	44	4.4	84.5	84.9	0.84	6.1	7.5	1000	0.0041	32	
4 ³⁾	M3AR 112M 2	3GAR 111300-••E	2885	13.2	2.6	86	6.41	85.7	86.7	0.85	7.9	7.4	500	0.0061	38	
5.5 ³⁾	M3AR 132SA 2	3GAR 131110-••E	2845	18.4	2.8	130	7.06	85.8	86.4	0.87	10.6	6.8	600	0.014	57	
7.5 ³⁾	M3AR 132SB 2	3GAR 131120-••E	2860	25.0	3.4	130	5.17	88.0	86.2	0.89	13.8	8.5	500	0.0186	62	
3000 r/min = 2 pole			400 V 50 Hz								High-output design					
2.7 ³⁾	M3AR 90LF 2	3GAR 091560-••E	2840	9.0	2.4	35	3.88	81.0	83.2	0.86	5.5	6.4	1200	0.0027	24	
4 ³⁾	M3AR 100LF 2	3GAR 101560-••E	2880	13.2	3.0	44	3.38	84.3	86.1	0.86	7.9	8.0	1000	0.005	36	
5.5 ³⁾	M3AR 112MF 2	3GAR 111360-••E	2855	18.3	2.7	86	4.67	86.5	87.1	0.93	9.8	7.3	500	0.0127	66	
9.2 ³⁾	M3AR 132SF 2	3GAR 131160-••E	2825	31.0	3.2	130	4.18	86.0	88.2	0.93	16.6	7.3	500	0.0246	77	
11 ³⁾	M3AR 132SG 2	3GAR 131170-••E	2835	37.0	3.2	130	3.51	87.0	87.4	0.93	19.6	8.0	500	0.0238	77	

¹⁾ Braking-torque ratio

²⁾ No-load (shaft-free) operations/hour

³⁾ Frame sizes 90-132: mandatory variant code 283 for DC brake

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

Motor size	S				D				G		H		X
	Motor 50 Hz	Motor 60 Hz	Brake 50 Hz	Brake 60 Hz	Motor 50 Hz	Motor 60 Hz	Brake 50 Hz	Brake 60 Hz	Motor 50 Hz	Brake 50 Hz	Motor 50 Hz	Brake 50 Hz	
63-132	220-240 VΔ	250-280 VΔ	230 VΔ	265 VΔ	380-420 VΔ	440-480 VΔ	400 VΔ	460 VΔ	–	–	–	–	Any other rated voltage or frequency, 690V maximum
	380-420 VY	440-480 VY	400 VY	460 VY	660-690 VY	–	690 VY	–					

Technical data

Single-speed motors with three phase AC brake

IP 55 – IC 411 – Insulation class F, temperature rise class B – Brake IP 23 S

Out-put kW					Torque					Efficiency			Current			Moment of inertia J=1/4GD ² kgm ²	Weight foot mounted kg	
					Speed r/min	rated		braking		K ¹⁾	100 %	75 %	Power factor cos φ	I _N A	I _s /I _N			c/h ²⁾
						T _N Nm	T _s / T _N	T _B Nm										
Motor type	Product code				400 V 50 Hz								Basic design					
1500 r/min = 4 pole																		
0.12	M3VRS	63 A	3GVR	062 451-BSC	1400	0.82	2.6	7.5	9.37	63.7	58.4	0.59	0.46	3.1	7100	0.00029	5	
0.12	M3VRS	63 A	3GVR	062 451-CSC	1400	0.82	2.6	7.5	9.37	63.7	58.4	0.59	0.46	3.1	7100	0.00029	5	
0.18	M3VRS	63 B	3GVR	062 452-BSC	1380	1.25	2.5	7.5	5.76	65.6	62.1	0.64	0.63	3.1	7100	0.00036	5.5	
0.18	M3VRS	63 B	3GVR	062 452-CSC	1380	1.25	2.5	7.5	5.76	65.6	62.1	0.64	0.63	3.1	7100	0.00036	5.5	
0.25	M3VRS	71 A	3GVR	072 451-BSE	1410	1.71	2.7	10	5.88	70.4	69.1	0.71	0.74	4.3	6500	0.00081	7	
0.25	M3VRS	71 A	3GVR	072 451-CSE	1410	1.71	2.7	10	5.88	70.4	69.1	0.71	0.74	4.3	6500	0.00081	7	
0.37	M3VRS	71 B	3GVR	072 452-ASE	1420	2.51	2.6	10	4	74.6	72.1	0.69	1.05	4.4	6500	0.00104	8	
0.37	M3VRS	71 B	3GVR	072 452-BSE	1420	2.51	2.6	10	4	74.6	72.1	0.69	1.05	4.4	6500	0.00104	8	
0.37	M3VRS	71 B	3GVR	072 452-CSE	1420	2.51	2.6	10	4	74.6	72.1	0.69	1.05	4.4	6500	0.00104	8	
0.55	M3VRS	80 A	3GVR	082 451-ASE	1390	3.75	2.6	24	6.31	75.3	73.1	0.76	1.4	4.6	5000	0.00128	11	
0.55	M3VRS	80 A	3GVR	082 451-BSE	1390	3.75	2.6	24	6.31	75.3	73.1	0.76	1.4	4.6	5000	0.00128	11	
0.55	M3VRS	80 A	3GVR	082 451-CSE	1390	3.75	2.6	24	6.31	75.3	73.1	0.76	1.4	4.6	5000	0.00128	11	
0.75	M3VRS	80 B	3GVR	082 452-ASE	1410	5.08	3.5	24	4.7	78.2	75.6	0.74	1.9	4.7	5000	0.00159	12	
0.75	M3VRS	80 B	3GVR	082 452-BSE	1410	5.08	3.5	24	4.7	78.2	75.6	0.74	1.9	4.7	5000	0.00159	12	
0.75	M3VRS	80 B	3GVR	082 452-CSE	1410	5.08	3.5	24	4.7	78.2	75.6	0.74	1.9	4.7	5000	0.00159	12	
0.75	M3VRS	80 B	3GVR	082 452-BFE	1410	5.08	3.5	24	4.7	78.2	75.6	0.74	1.9	4.7	5000	0.00159	12	
1.1	³⁾ M3AR	90S 4	3GAR	092100-••E	1420	7.3	2.0	35	4.66	77.20	78.10	0.77	2.6	4.8	3200	0.0032	19	
1.5	³⁾ M3AR	90L 4	3GAR	092500-••E	1420	10.0	2.8	35	3.5	81.30	81.90	0.75	3.5	5.8	3200	0.0043	22	
2.2	³⁾ M3AR	100LA 4	3GAR	102510-••E	1430	14.6	2.2	44	2.93	82.30	83.40	0.78	4.9	5.6	2700	0.0069	32	
3	³⁾ M3AR	100LB 4	3GAR	102520-••E	1430	20.0	2.5	44	2.2	84.60	85.70	0.78	6.5	6.4	2700	0.0082	35	
4	³⁾ M3AR	112M 4	3GAR	112300-••E	1435	26.6	2.9	86	3.23	84.50	83.90	0.80	8.5	7.0	2500	0.0158	40	
5.5	³⁾ M3AR	132S 4	3GAR	132100-••E	1450	36.2	2.2	130	3.59	87.00	87.70	0.83	10.9	7.3	1800	0.0336	60	
7.5	³⁾ M3AR	132M 4	3GAR	132300-••E	1450	49.3	2.5	130	2.63	88.00	88.60	0.83	14.8	7.9	1400	0.0406	68	
1500 r/min = 4 pole					400 V 50 Hz								High-output design					
0.25	M3VRS	63 BB	3GVR	062 453-BSC	1370	1.75	2.5	7.5	4.28	70.3	67.4	0.67	0.78	3.2	7100	0.0004	6	
0.55	M3VRS	71 C	3GVR	072 454-BSE	1410	3.74	2.7	10	2.7	77.3	76.9	0.73	1.45	4.8	6500	0.00125	9	
0.95	M3VRS	80 C	3GVR	082 453-BSE	1410	6.44	2.9	24	3.75	78.9	77.9	0.75	2.35	4.3	500	0.00197	13	
1.85	³⁾ M3AR	90LE 4	3GAR	092550-••E	1410	12.5	2.6	35	2.69	79.70	82.00	0.76	4.4	5.3	3200	0.0043	22	
2.2	³⁾ M3AR	90LF 4	3GAR	092560-••E	1390	15.1	2.3	35	2.33	80.00	83.10	0.83	4.7	5.3	3200	0.0048	23	
4	³⁾ M3AR	100LG 4	3GAR	102570-••E	1415	26.9	2.1	44	1.62	83.20	85.80	0.76	9.1	5.5	2700	0.009	36	
5.5	³⁾ M3AR	112MF 4	3GAR	112360-••E	1425	36.8	2.8	86	2.33	84.50	83.50	0.83	11.3	7.1	2500	0.018	47	
9.2	³⁾ M3AR	132MF 4	3GAR	132360-••E	1450	60.5	2.0	130	2.14	88.00	88.60	0.85	17.7	7.3	1400	0.05	83	
11	³⁾ M3AR	132MG 4	3GAR	132370-••E	1450	72.4	2.5	130	1.79	88.00	89.40	0.86	20.9	8.3	500	0.05	83	

¹⁾ Braking-torque ratio

²⁾ No-load (shaft-free) operations/hour

³⁾ Frame sizes 90-132: mandatory variant code 284 for AC brake

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

Motor size	S				D				G		H		X
	Motor	Brake	Motor	Brake	Motor	Brake	Motor	Brake	Motor	Brake	Motor	Brake	
	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	50 Hz	50 Hz	50 Hz	
63-132	220-240 VΔ	250-280 VΔ	230 VΔ	265 VΔ	380-420 VΔ	440-480 VΔ	400 VΔ	460 VΔ	–	–	–	–	Any other rated voltage or frequency, 690V maximum
	380-420 VY	440-480 VY	400 VY	460 VY	660-690 VY	–	690 VY	–					

Technical data

Single-speed motors with three phase AC brake

IP 55 – IC 411 – Insulation class F, temperature rise class B – Brake IP 23 S

Out-put kW	Motor type	Product code	Torque					Efficiency			Current			Moment of inertia J=1/4GD ² kgm ²	Weight foot mounted kg
			Speed r/min	rated		braking		K ¹⁾	100 %	75 %	Power factor cos φ				
				T _N Nm	T _S / T _N	T _B Nm	I _N A					I _S /I _N	c/h ²⁾		
1000 r/min = 6 pole			400 V 50 Hz								Basic design				
0.25	M3VRS 71 B	3GVR 073 452-ASE	920	2.61	2.5	10	3.84	64.9	62.3	0.65	0.86	3.2	7500	0.00096	8
0.25	M3VRS 71 B	3GVR 073 452-BSE	920	2.61	2.5	10	3.84	64.9	62.3	0.65	0.86	3.2	7500	0.00096	8
0.37	M3VRS 80 A	3GVR 083 451-BSE	925	3.82	3.1	24	6.15	72.9	70.8	0.72	1.04	3.8	7000	0.00186	11
0.55	M3VRS 80 B	3GVR 083 452-ASE	925	5.68	2.9	24	4.06	73.3	71.9	0.71	1.55	3.4	7000	0.0022	12
0.55	M3VRS 80 B	3GVR 083 452-BSE	925	5.68	2.9	24	4.06	73.3	71.9	0.71	1.55	3.4	7000	0.0022	12
0.75	³⁾ M3AR 90S 6	3GAR 093100-••E	925	7.7	2.1	35	4.66	71.5	70.9	0.64	2.3	3.6	3800	0.0032	19
1.1	³⁾ M3AR 90L 6	3GAR 093500-••E	915	11.4	1.9	35	3.18	73.0	73.4	0.63	3.4	3.2	3900	0.0043	22
1.5	³⁾ M3AR 100L 6	3GAR 103500-••E	950	15.0	2.0	44	2.93	79.6	79.9	0.69	3.9	4.2	3300	0.0082	34
2.2	³⁾ M3AR 112M 6	3GAR 113300-••E	940	22.3	2.1	86	3.85	80.5	79.3	0.74	5.3	5.6	3200	0.015	40
3	³⁾ M3AR 132S 6	3GAR 133100-••E	960	29.8	2.0	130	4.36	84.5	82.7	0.75	6.8	6.1	2400	0.033	59
4	³⁾ M3AR 132MA 6	3GAR 133310-••E	960	39.7	2.0	130	3.27	85.5	83.1	0.78	8.6	7.1	1900	0.04	66
5.5	³⁾ M3AR 132MB 6	3GAR 133320-••E	960	54.7	2.0	130	2.36	83.8	84.3	0.71	13.3	5.3	1000	0.045	74
1000 r/min = 6 pole			400 V 50 Hz								High-output design				
1.3	³⁾ M3AR 90LF 6	3GAR 093560-••E	910	13.6	1.90	35	2.59	74.4	76.8	0.69	3.6	3.6	3800	0.0048	24
2.2	³⁾ M3AR 100LG 6	3GAR 103570-••E	940	22.3	1.90	44	2	79.8	81.5	0.69	5.7	4.3	3300	0.009	37
3	³⁾ M3AR 112MF 6	3GAR 113360-••E	935	30.6	2.0	86	2.81	80.0	79.9	0.76	7.1	5.5	3200	0.018	46
6.5	³⁾ M3AR 132MG 6	3GAR 133370-••E	960	64.6	2.0	130	2.01	85.0	84.5	0.75	14.7	6.6	2400	0.051	79

¹⁾ Braking-torque ratio

²⁾ No-load (shaft-free) operations/hour

³⁾ Frame sizes 90-132: mandatory variant code 284 for AC brake

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

Motor size	S				D				G		H		X
	Motor		Brake		Motor		Brake		Motor	Brake	Motor	Brake	
	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	50 Hz	50 Hz	50 Hz	
63-132	220-240 VΔ	250-280 VΔ	230 VΔ	265 VΔ	380-420 VΔ	440-480 VΔ	400 VΔ	460 VΔ	–	–	–	–	Any other rated voltage or frequency, 690V maximum
	380-420 VY	440-480 VY	400 VY	460 VY	660-690 VY	–	690 VY	–					

Technical data

Single-speed motors with three phase AC brake

IP 55 – IC 411 – Insulation class F, temperature rise class B – Brake IP 23 S

Out-put kW					Torque					Efficiency			Current			Moment of inertia J=1/4GD ² kgm ²	Weight foot mounted kg
					rated		braking			Power factor cos φ	I _N A	I _S /I _N	c/h ²⁾				
					Speed r/min	T _N Nm	T _S / T _N	T _B Nm	K ¹⁾					100 %	75 %		
Motor type	Product code	400 V 50 Hz								Basic design							
750 r/min = 8 pole																	
0.25	M3VRS	80 B	3GVR	084 452-ASE	700	24	2.9	3.52	6.85	70.7	67.4	0.62	0.85	3.1	7500	0.00245	12
0.37	³⁾ M3AR	90S 8	3GAR	094100-••E	695	5	1.7	5	7	59.4	55.9	0.54	1.6	2.7	4100	0.0032	19
0.55	³⁾ M3AR	90L 8	3GAR	094500-••E	660	7.6	1.5	7.5	4.66	61.7	59.5	0.58	2.3	2.5	4100	0.0043	22
0.75	³⁾ M3AR	90LF 8	3GAR	094560-••E	635	10.5	1.7	10	-	58.5	57.8	0.6	3.1	2.7	-	0.0048	22
0.75	³⁾ M3AR	100LA 8	3GAR	104510-••E	720	9.9	2.5		4.4	70.7	67.1	0.47	3.2	3.9	3600	0.0069	31
1.1	³⁾ M3AR	100LB 8	3GAR	104520-••E	695	15.1	1.7	15	2.93	76	74.9	0.66	3.1	3.4	3700	0.0082	34
1.5	³⁾ M3AR	100LG 8	3GAR	104570-••E	685	20.9	1.9	20.6	-	70.7	70.9	0.64	4.7	3.1	-	0.009	34
1.5	³⁾ M3AR	112M 8	3GAR	114300-••E	695	20.6	1.9		4.17	74.5	75.9	0.65	4.4	4.1	3600	0.016	41
2.2	³⁾ M3AR	132S 8	3GAR	134100-••E	720	29.1	1.6	29.2	4.45	80.5	77.8	0.67	5.8	5.3	3000	0.04	66
3	³⁾ M3AR	132M 8	3GAR	134300-••E	720	39.7	1.8	39.8	3.26	82	79.2	0.68	7.7	5.5	2600	0.047	73

¹⁾ Braking-torque ratio

²⁾ No-load (shaft-free) operations/hour

³⁾ Frame sizes 90-132: mandatory variant code 284 for AC brake

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

Motor size	S				D				G		H		X
	Motor		Brake		Motor		Brake		Motor	Brake	Motor	Brake	
	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	50 Hz	50 Hz	50 Hz	
63-132	220-240 VΔ	250-280 VΔ	230 VΔ	265 VΔ	380-420 VΔ	440-480 VΔ	400 VΔ	460 VΔ	-	-	-	-	Any other rated voltage or frequency, 690V maximum
	380-420 VY	440-480 VY	400 VY	460 VY	660-690 VY	-	690 VY	-					

Technical data

Two-speed motors with three phase AC brake

IP 55 – IC 411 – Insulation class F, temperature rise class F – Brake IP 23 S

Out-put kW	Motor type	Product code	Speed r/min	Torque				Effi- ciency %	Power factor cos φ	Current		Moment of inertia J=1/4GD ² kgm ²	Weight IM 1001 kg
				T _N Nm	T _S / T _N	braking				I _N	I _S /I _N A		
3000/1500 r/min = 2-4 poles				400 V 50 Hz				Constant torque, two separate windings					
1.1/0.55	M3ARS 90 S	3GAR 099101-●●E	2900/1450	3.6/3.6	1.4/1.5	35	9.7/9.7	74/62	0.85/0.64	2.5/2	5.1/3.6	0,0019	20
1.5/0.75	M3ARS 90 L	3GAR 099501-●●E	2900/1450	4.9/4.9	1.5/1.5	35	7.1/7.1	77/70	0.87/0.67	3.3/2.4	5.7/4.1	0,0024	23
2/1	M3ARS 100 L	3GAR 109501-●●E	2900/1460	6.5/6.5	1.9/1.4	44	7.7/7.7	76/67	0.89/0.66	4.3/3.3	6.2/4	0,0041	32
2.6/1.3	M3ARS 112 M	3GAR 119301-●●E	2900/1460	8.6/8.5	1.6/1.6	86	10/9.9	80/75	0.92/0.72	5.1/3.5	6.4/5	0,012	45
4.4/2.2	M3ARS 132 SB	3GAR 139121-●●E	2925/1450	14.4/14.5	2/1.3	130	8.1/8.1	81/74	0.86/0.73	9.1/5.9	7.3/4.5	0,016	55
5.6/2.8	M3ARS 132 M	3GAR 139301-●●E	2885/1440	18.5/18.6	1.8/1.4	130	10.4/10	82/77	0.93/0.75	10.6/7	6.7/5	0,022	76
3000/1500 r/min = 2-4 poles				400 V 50 Hz				Constant torque, Dahlander connection					
1.3/1	M3ARS 90 S	3GAR 099108-●●E	2730/1400	4.5/6.8	2/1.5	35	7.8/5.1	71/71	0.88/0.8	3.1/2.6	3.9/3.8	0.0032	20
1.9/1.5	M3ARS 90 L	3GAR 099508-●●E	2820/1420	6.4/10	2.8/2	35	5.4/3.5	74/75	0.82/0.76	4.4/3.9	5.1/4.4	0.0043	23
2.5/2.1	M3ARS 100 LA	3GAR 109518-●●E	2800/1430	8.5/14	2.2/1.6	44	5.9/3.6	68/76	0.88/0.81	6/5	4.8/4.4	0.0069	32
3.4/2.5	M3ARS 100 LB	3GAR 109528-●●E	2810/1430	11.5/18	2.2/1.9	44	4.3/2.7	78/80	0.88/0.85	7.2/5.9	5.3/5.4	0.0082	35
4.26	M3ARS 112 M	3GAR 119308-●●E	2865/1430	13.3/17.4	1.8/2.3	86	10/9.9	82/77	0.93/0.76	7.6/6.5	6.3/6.2	0.012	45
6.3/4.4	M3ARS 132 SA	3GAR 139118-●●E	2895/1445	20.8/29	1.7/1.6	130	7.2/5.2	85/84	0.94/0.8	11.4/9.5	6.5/5.7	0.0155	58
4.7/3.1	M3ARS 132 SB	3GAR 139128-●●E	2820/1420	15.9/20.8	1.8/2.2	130	10.4/10	79/77	0.92/0.76	9.2/7.7	5.5/5.7	0.016	55
8/6.2	M3ARS 132 SC	3GAR 139138-●●E	2910/1440	26.2/41.1	1.9/1.6	130	6.9/3.6	87/85	0.95/0.83	14/12.7	7.8/5.6	0.0215	78
7.2/4.8	M3ARS 132 M	3GAR 139308-●●E	2870/1435	24/31.9	2.4/2.5	130	6.3/4.7	84/81	0.92/0.76	13.3/11.5	7.1/6.2	0.022	76
9.6/7	M3ARS 132 MD	3GAR 139348-●●E	2900/1440	31.6/46.4	1.8/1.7	130	4.7/3.2	87/85	0.95/0.85	16.8/14.1	7.6/5.9	0.026	85
1500/1000 r/min = 4/6 poles				400 V 50 Hz				Constant torque, two separate windings					
0.8/0.5	M3ARS 90 S	3GAR 099104-●●E	1430/940	5.3/5	1.5/1.4	35	7/6.6	68/57	0.8/0.66	2.2/2	3.9/2.8	0.0032	20
1.2/0.75	M3ARS 90 L	3GAR 099504-●●E	1430/940	8/7.6	1.7/1.5	35	4.6/4.4	73/63	0.81/0.67	3/2.6	4.4/3.1	0.0043	23
1.5/0.9	M3ARS 100 LA	3GAR 109514-●●E	1440/960	9.9/8.9	1.5/1.5	44	5.6/5.1	75/69	0.84/0.65	3.5/3	4.7/3.8	0.0069	32
1.8/1.1	M3ARS 100 LB	3GAR 109524-●●E	1460/960	11/11	2.1/1.6	44	4.5/4.5	77/70	0.78/0.64	4.4/3.6	5.8/3.9	0.0082	35
2.6/1.7	M3ARS 112 M	3GAR 119304-●●E	1445/960	17.2/16.9	1.5/1.5	86	5/4.9	80/70	0.85/0.76	5.5/4.4	5.9/5.2	0.018	45
3.3/2.2	M3ARS 132 S	3GAR 139104-●●E	1470/980	21.4/21.4	1.4/1.2	130	4.5/3.0	82/76	0.8/0.65	7.1/6.4	6.8/4.6	0,038	61
3.3/2.2	M3ARS 132 M	3GAR 139304-●●E	1470/980	29.2/29.2	1.4/1.5	130	5.1/5.1	82/77	0.81/0.7	9.8/8	7.2/5.6	0,048	79
5.5/3.7	M3ARS 132 MD	3GAR 139344-●●E	1460/960	36/36.8	1.9/1.8	130	4.2/4.2	85/81	0.88/0.8	10.7/8.3	8/6.3	0,036	84

¹⁾ Braking-torque ratio

Technical data

Two-speed motors with three phase AC brake

IP 55 – IC 411 – Insulation class F, temperature rise class F – Brake IP 23 S

Out-put kW	Motor type	Product code	Torque						Efficien- cy %	Power factor cos φ	Current		Moment of inertia J=1/4GD² kgm²	Weight IM 1001 kg
			Speed r/min	rated		braking		I _N			I _s /I _N A			
				T _N Nm	T _S / T _N	T _B Nm	K ⁽¹⁾							
3000/750 r/min = 2/8 poles			400 V 50 Hz						Constant torque, two separate windings					
0.75/0.18	M3ARS 90 LA	3GAR 099510-••E	2875/720	2.5/2.4	2.3/1.3	35	14/14	71.2/46.3	0.8/0.51	1.9/1.1	5.7/2.4	0,0043	23	
1.3/0.33	M3ARS 90 LB	3GAR 099520-••E	2780/690	4.4/4.5	1.8/1.2	35	8/8	71/52	0.92/0.62	2.9/1.5	4.5/2.3	0,0043	23	
1.8/0.5	M3ARS 100 LB	3GAR 109520-••E	2860/705	6.0/6.7	1.7/1.3	44	8.3/7.4	80/54	0.93/0.64	3.5/2.1	5.3/2.6	0,0082	35	
2.2/0.59	M3ARS 112 MC	3GAR 119330-••E	2900/720	7.2/7.8	2.4/1.6	86	11.8/11	78/62	0.87/0.55	4.9/2.5	7/3.5	0,015	42	
3.3/0.95	M3ARS 132 SA	3GAR 139110-••E	2940/730	10.7/12.4	2.6/1.2	130	14/12	81/72	0.95/0.52	6.2/3.7	9.5/4.3	0,0215	65	
4.4/1.3	M3ARS 132 MC	3GAR 139330-••E	2920/725	14.4/17.1	2.2/1.3	130	10.7/8.8	82/74	0.94/0.62	8.3/4.1	8.6/4	0,03	77	
1500/750 r/min = 4/8 poles			400 V 50 Hz						Constant torque, two separate windings					
0.55/0.25	M3ARS 90 S	3GAR 099102-••E	1450/700	3.6/3.4	1.3/1.4	35	10.3/9.7	62/51	0.78/0.59	1.9/1.2	4.2/2.3	0.0032	20	
0.75/0.37	M3ARS 90 L	3GAR 099502-••E	1450/700	4.9/5	1.4/1.5	35	7.1/7	66/57	0.75/0.57	2.2/1.7	4.1/2.5	0.0043	23	
1.1/0.55	M3ARS 100 LA	3GAR 109512-••E	1460/710	7.2/7.4	1.2/1.2	44	6.9/6.8	68/62	0.77/0.61	3.1/2.2	4.2/2.6	0.0069	32	
1.5/0.75	M3ARS 100 LB	3GAR 109522-••E	1440/700	9.8/10	1.3/1.2	44	5.1/5	72/60	0.82/0.6	3.7/2.9	4.6/2.7	0.0082	35	
1.8/0.9	M3ARS 112 M	3GAR 119302-••E	1460/715	11.7/12	1.2/1.6	86	7.3/7.1	77/65	0.76/0.66	4.4/3	6.5/4	0.018	45	
2.5/1.3	M3ARS 132 S	3GAR 139102-••E	1480/735	16.2/17	1.6/1.4	130	9.3/8.8	80/67	0.79/0.56	5.8/6	6/3.7	0.038	61	
3.3/1.7	M3ARS 132 M	3GAR 139302-••E	1470/725	21.4/22.4	1.6/1.4	130	7/6.7	81/71	0.79/0.58	7.5/6	7/4.2	0.048	79	
1500/750 r/min = 4-8 poles			400 V 50 Hz						Constant torque, Dahlander connection					
0.7/0.37	M3ARS 90 S	3GAR 099109-••E	1420/700	4.7/5.1	1.6/1.6	35	7.4/6.9	72/50	0.8/0.57	1.8/1.9	4.4/2.3	0.0032	20	
1.1/0.55	M3ARS 90 L	3GAR 099509-••E	1390/685	7.4/7.5	1.4/1.5	35	4.7/4.7	70/55	0.84/0.58	2.6/2.6	4.1/2.3	0.0043	23	
1.5/0.75	M3ARS 100 LA	3GAR 109519-••E	1440/710	10/10	1.4/1.5	44	5/5	76/62	0.85/0.57	3.4/3.2	4.6/2.8	0.0069	32	
2/0.95	M3ARS 100 LB	3GAR 109529-••E	1440/710	13/12	1.4/1.6	44	4.2/3.8	78/64	0.86/0.55	4.4/4	4.8/2.9	0.0082	35	
2.5/1.5	M3ARS 112 M	3GAR 119309-••E	1410/705	16.9/20.3	1.4/1.5	86	5/4.2	78/67	0.9/0.66	5.1/4.9	5.5/4.1	0.018	45	
3.8/1.9	M3ARS 132 S	3GAR 139109-••E	1450/730	25/24.9	1.4/1.3	130	6/6	82/70	0.84/0.52	7.7/7.6	5.6/3.7	0.038	61	
5/2.5	M3ARS 132 M	3GAR 139309-••E	1455/730	32.8/32.7	1.7/2	130	4.6/4.6	85/73	0.88/0.52	9.6/9.6	6.9/4.8	0.048	79	

¹⁾ Braking-torque ratio

The bullets in the product code indicate choice of mounting arrangement and voltage and frequency code, see below and ordering information page.

Code letters for supplementing product code for mounting arrangement:

Foot-mounted	A	
Flange-mounted, 1 flange	B for frame sizes 63-100	E for frame sizes 112-132.
Flange-mounted, 2 flanges	N for frame sizes 90-132	
Flange-mounted, small flange	C for frame sizes 63-100	

Code letters for supplementing product code for voltage and frequency (pos 13):

Motor size	A		B		S		D	
	Motor	Brake	Motor	Brake	Motor	Brake	Motor	Brake
50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
63-132	–	–	–	–	220-230 V	230 VΔ	380-400 V	400 VΔ
Motor size	E		H		X			
	Motor	Brake	Motor	Brake	Any other rated voltage or frequency, 690 V maximum			
63-132	500 V	500 VΔ	415 V	415 VΔ				

Variant codes

Brake motors

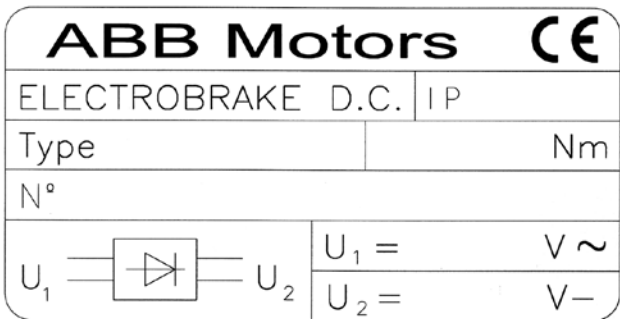
Code / Variant		Frame sizes						
		63	71	80	90	100	112	132
Brakes								
086	Reconnection of brake for separate ac supply.	•	•	•	•	•	•	•
087	Brake with reduced torque, 50% of nominal torque.	-	-	-	•	•	•	•
213	Brake with increased degree of protection.	•	•	•	•	•	•	•
283	DC brake	-	-	-	•	•	•	•
284	AC brake	-	-	-	•	•	•	•
285	Reconnection of brake for separate dc supply at 24V.	-	•	•	•	•	•	•
287	Brake with reduced torque, 25% of nominal torque.	-	-	-	•	•	•	•
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.	•	•	•	•	•	•	•
290	Brake motor with a.c. brake, change into d.c. brake keeping the voltage code.	•	•	•	•	•	•	•
291	Brake motor with d.c. brake, change into a.c. brake keeping the voltage code.	•	•	•	•	•	•	•
◦ = Included as standard • = Available as option - = Not applicable								

For other variant codes please see section for standard aluminum motors or consult ABB.

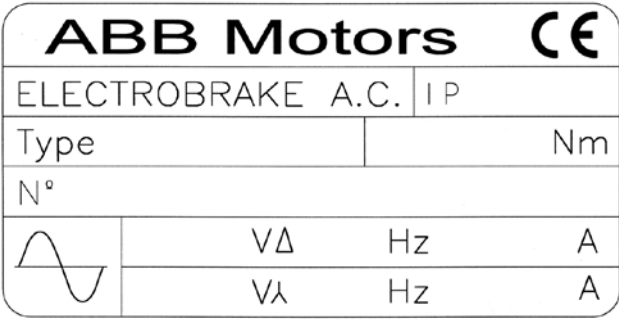
Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Brake rating plates

The brake rating plates have the following arrangement:



M000133

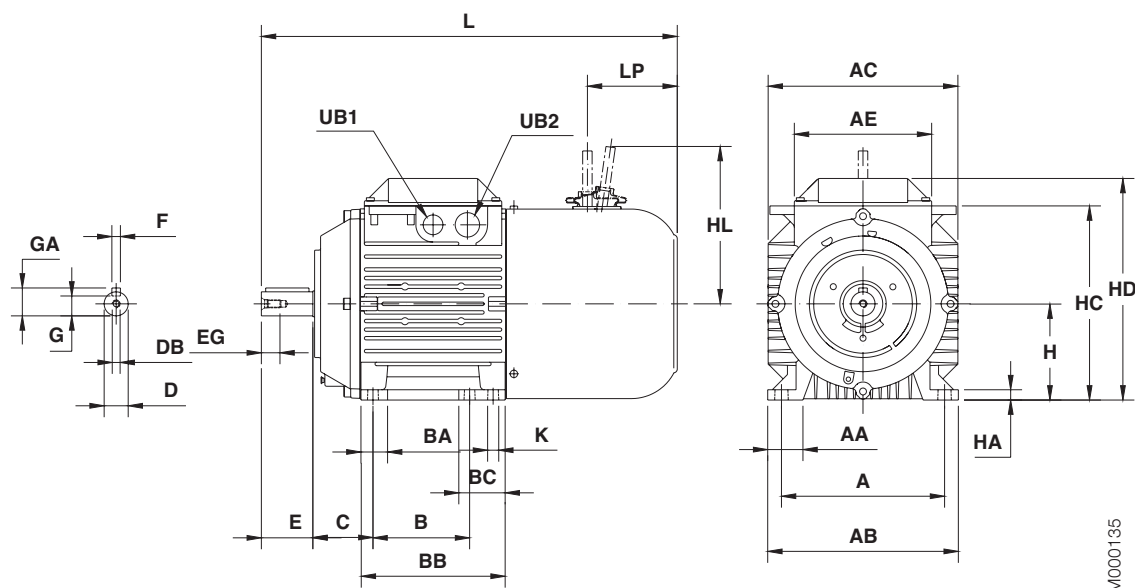


M000134

Dimension drawings

Brake motors, sizes 63 - 132

IM B3 (IM 1001)



Motor size	A	AA	AB	AC	AE	B	BA	BB	BC	C	D	DB	E	EG
63 A/B	100	26	120	123	85	80	21	96	21	40	11	M4	23	10
71	112	24	136	139	85	90	31	110	31	45	14	M5	30	13
80	125	28	154	156	97	100	34	125	34	50	19	M6	40	16
90S	140	27	170	177	110	100	30	125	30	56	24	M8	50	19
90 L	140	27	170	177	110	125	30	150	30	56	24	M8	50	19
100 L	160	32	197	197	110	140	34	172	34	63	28	M10	60	22
112 M	190	41	222	221	160	140	31	168	31	70	28	M10	60	22
132 S	216	47	262	261	160	140	40	212	76	89	38	M12	80	28
132 M	216	47	262	261	160	178	40	212	76	89	38	M12	80	28

Motor size	F	GA	H	HA	HC	HD	HL	K	L	LP	UB1	UB2
63 A/B	4	12.5	63	10	-	180	107	7	270	66	M16	Pg11
71	5	16	71	9	-	176	114	7	316	76	M20	Pg16
80	6	21.5	80	10	-	190	124	10	360	70	M20	Pg16
90S	8	27	90	10	177	217	161	10	370	70	M20	M25
90 L	8	27	90	10	177	217	161	10	395	70	M20	M25
100 L	8	31	100	12	197	237	173	12	453	105	M20	M25
112 M	8	31	112	12	226	258	184	12	487	105	M20	M25
132 S	10	41	132	14	264	296	225	12	606	119	M20	M25
132 M	10	41	132	14	264	296	225	12	606	119	M20	M25

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Tolerances:

D ISO j6 ($\leq 28 \text{ Ø}$)

D ISO k6 (38-42 Ø)

F ISO h9

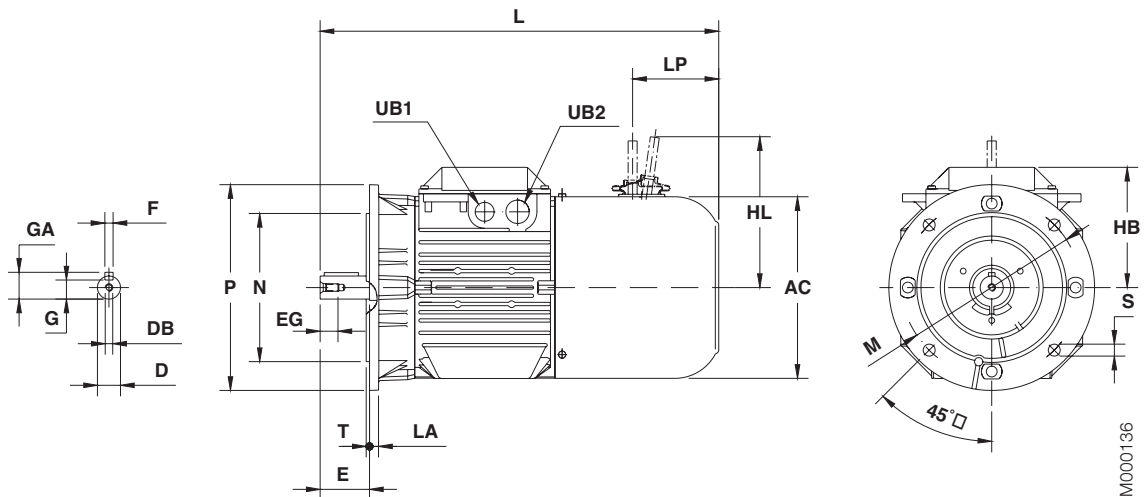
H + 0, - 0.5

Above table gives the main dimensions in mm. For detailed drawings please see our web-pages 'www.abb.com/motors&generators' or contact us.

Dimension drawings

Brake motors, sizes 63 - 132

IM B5 (IM 3001), IM V1 (IM 3011), IM B14 (IM 3601)



IM B5 (IM 3001)

Motor

size	AC	D	DB	E	EG	F	GA	HB	HL	L	LP	UB1	UB2
63 A/B	123	11	M4	23	10	4	12.5	117	107	270	66	M16	Pg 11
71	139	14	M5	30	13	5	16	105	114	316	76	M20	Pg 16
80	156	19	M6	40	16	6	21.5	110	124	360	70	M20	Pg16
90S	178	24	M8	50	19	8	27	127	161	370	70	M20	M25
90 L	178	24	M8	50	19	8	27	127	161	395	70	M20	M25
100 L	198	28	M10	60	22	8	31	137	173	453	105	M20	M25
112 M	223	28	M10	60	22	8	31	146	184	487	105	M20	M25
132 S,M	264	38	M12	80	28	10	41	164	225	606	119	M20	M25

IM B5 (IM 3001)

Motor	IEC						
size	flange	LA	M	N	P	S ¹⁾	T
63 A/B	FF115	10	115	95	140	M8	3
71	FF130	10	130	110	160	M8	3.5
80	FF165	12	165	130	200	M10	3.5
90	FF165	11	165	130	200	M10	3.5
100	FF215	11	215	180	250	M12	4
112	FF215	11	215	180	250	M12	4
132	FF265	12	265	230	300	M12	4

Tolerances:

- D ISO j6 ($\leq 28 \text{ } \varnothing$)
- D ISO k6 (38-42 $\varnothing$)
- F ISO h9

¹⁾ Clearance holes for bolt.

²⁾ Two pieces modular flange.

Modular flanges:

Brake motors sizes 71 - 132 can be supplied with several non standard modular flange dimensions

IM B14 (IM 3601)

Motor	IEC						
size	flange	LA	M	N	P	S	T
63 A/B	FT75	10	75	60	90	M5	2.5
71	FT85	10	85	70	105	M6	2.5
80	FT100	10	100	80	120	M6	3
90	FT115	14	115	95	140	M8	3
100	FT130	16	130	110	160	M8	3.5
112 ²⁾	FT130	9.5	130	110	160	M8	3.5
132	FT165	14.5	165	130	200	M8	3.5

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors with variant code 412.

Above table gives the main dimensions in mm. For detailed drawings please see our web-pages 'www.abb.com/motors&generators' or contact us.

Motors in brief

Brake motors

Motor size	63	71	80	90	100	112	132	
Stator and feet		Die-cast aluminum alloy.						
	Material	Detachable feet			Feet integrated with stator			
	Paint colour shade	Munsell blue 8B 4.5/3.25 / NCS 4822 BO5G / RAL 5014						
	Paint	Epoxy polyester powder paint, ≥ 30 µm.					2-pack polyurethane paint, ≥20µm.	
Bearing end shields	Material	Die-cast aluminum alloy.						
	Paint colour shade	Munsell blue 8B 4.5/3.25 / NCS 4822 BO5G						
	Paint	Epoxy polyester powder paint, ≥ 30 µm.					2-pack polyurethane paint, ≥20µm	
Flanges	Material	Die-cast aluminum alloy.					Cast iron	
	Paint colour shade	Munsell blue 8B 4.5/3.25 / NCS 4822 BO5G / RAL 5014						
	Paint	Epoxy polyester powder paint, ≥ 30 µm.					2-pack polyurethane paint, ≥20µm	
Bearings		6202-	6203-	6204-	6205-	6306-	6206-	6208-
	D-end	2Z/C3	2Z/C3	2Z/C3	2Z/C3	2Z/C3	2Z/C3	2Z/C3
	N-end	6202- 2Z/C3	6203- 2Z/C3	6204- 2Z/C3	6205- 2Z/C3	6206- 2Z/C3	6206- 2Z/C3	6208- 2Z/C3
Axially locked bearings		Inner bearing circlip, on request.			Inner bearing cover at D-end.			
	System	In sizes 71-80 mounting large flange.						
Bearing seals	D-end	V-ring						
	N-end	V-ring						
Lubrication		Permanently lubricated bearings. Grease for bearing temperatures -40...+160°C.						
Terminal box	Material	Die-cast aluminum alloy.						
	Surface treatment	Similar to stator.						
	Srews	Steel 5 G, chromated.						
Connections		1 x M16 +						
	Knock-out openings	Pg11	2xM20 + Pg16		2 x(M25 + M20)		2 x(M25 + M20)	
	Max Cu area, mm²	2.5	4		6		10	
	Terminal box	Screw terminal, 6 terminals.					Cable lugs, 6 terminals.	
Fan	Material	Polypropylene. Reinforced with 20% glass fibre.						
Fan cover	Material	Steel.						
Stator winding	Material	Copper.						
	Impregnation	Polyester varnish. Tropicallised.						
	Insulation class	Insulation class F. Temperature rise class B, unless otherwise stated.						
Stator winding temperature sensors		Optional.						
Rotor winding	Material	Die-cast aluminum.						
Balancing method		Half key balancing.						
Key ways		Closed key way.						
Enclosure		Motor, terminal box and brake electrical components: IP 55.						
		Brake mechanical components: IP23 S (IP 55 optional).						
Cooling method		IC 411						

Brake motors in frame sizes 160-180, please select from Low voltage Process performance motors catalog, aluminum motors.

For your notes:

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Total product offering

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

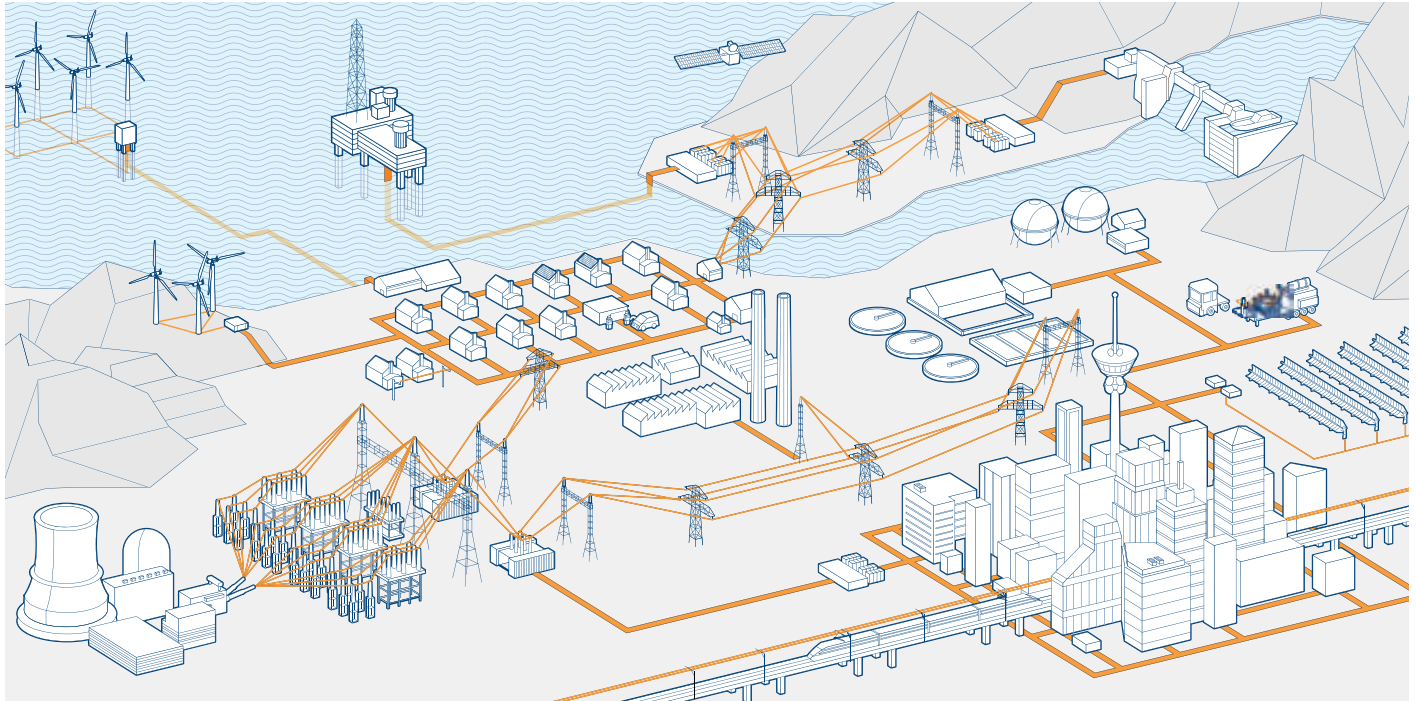


ABB is the leading manufacturer of low, medium and high voltage motors and generators, and mechanical power transmission products. ABB products are backed by a complete portfolio of services. Our in-depth knowledge of virtually every type of industrial process ensures we always specify the best solution for your needs.

> Low and high voltage IEC induction motors

- Process performance motors
- General performance motors
- High voltage cast iron motors
- Induction modular motors
- Slip-ring modular motors
- Synchronous reluctance motors

> Low and medium voltage NEMA motors

- Steel frame open drip proof (ODP) motors
- Weather protected, water cooled, fan ventilated
- Cast iron frame (TEFC)
- Air to air cooled (TEAAC) motors

> Motors and generators for explosive atmospheres

- IEC and NEMA motors and generators, for all protection types

> Synchronous motors

> Synchronous generators

- Synchronous generators for diesel and gas engines
- Synchronous generators for steam and gas turbines

> Wind power generators

> Generators for small hydro

> Other motors and generators

- Brake motors
- DC motors and generators
- Gear motors
- Marine motors and generators
- Single phase motors
- Motors for high ambient temperatures
- Permanent magnet motors and generators
- High speed motors
- Smoke extraction motors

- Wash down motors
- Water cooled motors
- Generator sets
- Roller table motors
- Low inertia motors
- Traction motors and generators

> Life cycle services

- Installation and commissioning
- Spares and consumables
- Preventive maintenance
- Predictive maintenance
- Condition monitoring
- On-site and workshop
- Remote troubleshooting
- Technical support
- Engineering and consulting
- Extensions, upgrades and retrofits
- Replacements
- Training
- Service agreements

> Mechanical power transmission components, bearings, gearings

Life cycle services and support

From pre-purchase to migration and upgrades



ABB offers a complete portfolio of services to ensure trouble-free operation and long product lifetimes. These services cover the entire life cycle. Local support is provided through a global network of ABB service centers and certified partners.

Pre-purchase

- ABB's front-end sales organization can help customers to quickly and efficiently select, configure and optimize the right motor or generator for their application.

Installation and commissioning

- Professional installation and commissioning by ABB's certified engineers represent an investment in availability and reliability over the entire life cycle.

Engineering and consulting

- ABB's experts provide energy efficiency and reliability appraisals, advanced condition and performance assessments and technical studies.

Condition monitoring and diagnosis

- Unique services collect and analyze data to provide early warnings of problems before failures can occur. All critical areas of the equipment are covered.

Maintenance and field services

- ABB offers life cycle management plans and preventive maintenance products. The recommended four-level maintenance program covers the entire product lifetime.

Spare parts

- Spare parts and support are offered throughout the life cycle of ABB products. In addition to individual spares, tailored spare part packages are also available.

Repair and refurbishment

- Support for all ABB motors and generators and other brands is provided by ABB's global service organization. Specialist teams can also deliver emergency support.

Migration and upgrades

- Life cycle audits determine the optimum upgrades and migration paths. Upgrades range from individual components to direct replacement motors and generators.

Training

- Product and service training courses take a practical approach. The training ranges from standard courses to specially tailored programs to suit customer requirements.

Specialized support

- Specialized support is offered through ABB's global service organization. Local units provide major and minor repairs as well as overhauls and reconditioning.

Service contracts

- Service contracts are tailored to the customer's needs. The contracts combine ABB's entire service portfolio and 120 years of experience to deploy the optimal service practices.

Contact us

www.abb.com/motors&generators

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