


ABB Motors and Generators		Technical Data Sheet				
Department/Author		Project	Location		Item name	
Our ref.		Rev/Changed by	Date of issue	Saving ident	Pages	
		A	1/16/2019	untitled.xls	1.00001 1(3)	
No.	Definition	Data	Unit	Remarks		
1	Product	<b>TEFC, 3-phase, squirrel cage induction motor</b>				
2	Product code	<b>3GBA 161 410-BDCIN</b>			Calc. ref.	3GZH021016-1
3	Type/Frame	<b>M2BAX 160MLA 2</b>				
4	Mounting	<b>IM3001, B5(flange)</b>				
5	Rated output P <sub>N</sub>	11	kW			
6	Service factor	<b>1</b>				
7	Type of duty	<b>S1 100%</b>				
8	Rated voltage U <sub>N</sub>	415	VD	+10, -10 %		
9	Rated frequency f <sub>N</sub>	50	Hz	+5, -5 %		
10	Rated speed n <sub>N</sub>	2925	r/min			
11	Rated current I <sub>N</sub>	19.6	A			
12						
13	Starting current I <sub>s</sub> /I <sub>N</sub>	<b>7</b>				
14	Nominal torque T <sub>N</sub>	36	Nm			
15	Locked rotor torque T <sub>S</sub> /T <sub>N</sub>	<b>2.4</b>				
16	Maximum torque T <sub>max</sub> /T <sub>N</sub>	<b>3</b>				
17						
18						
Load characteristics		Load %	Current A	Efficiency %	Power factor	
19	PLL determined from residual loss	100	19.6	89.4 / IE2	0.88	
20		75	15.1	89.7	0.85	
21		50	11.1	88.2	0.78	
22						
23	Thermal withstand time hot	20	s			
24	Thermal withstand time cold	32	s			
25	Insulation class / Temperature class	<b>F / B</b>				
26	Ambient temperature	50	°C			
27	Altitude	<b>1000</b> m.a.s.l.				
28	Degree of protection	<b>IP55</b>				
29	Cooling system	<b>IC411 self ventilated</b>				
30	Bearing DE/NDE	<b>6209-2Z/C3 - 6209-2Z/C3</b>				
31	Sound pressure level (LP dB(A) 1m)	79	dB(A)	at no-load		
32	Moment of inertia J = ¼ GD2	0.0415	kg·m2			
33	Position of terminal box	<b>Top</b>				
34	Direction of rotation	<b>Bi-directional</b>				
35	Weight of rotor	22	kg			
36	Total weight of motor	105	kg			
37						
38						
39						
40						
41						
42						
43						
44						
45						
Ex-motors						
46						
47						
48						
Option Variant Codes / Definition						
49						
50						
51						
52						
Remarks:						
Data based on situation 9/19/2015						

All performance values are subject to IS/IEC tolerances


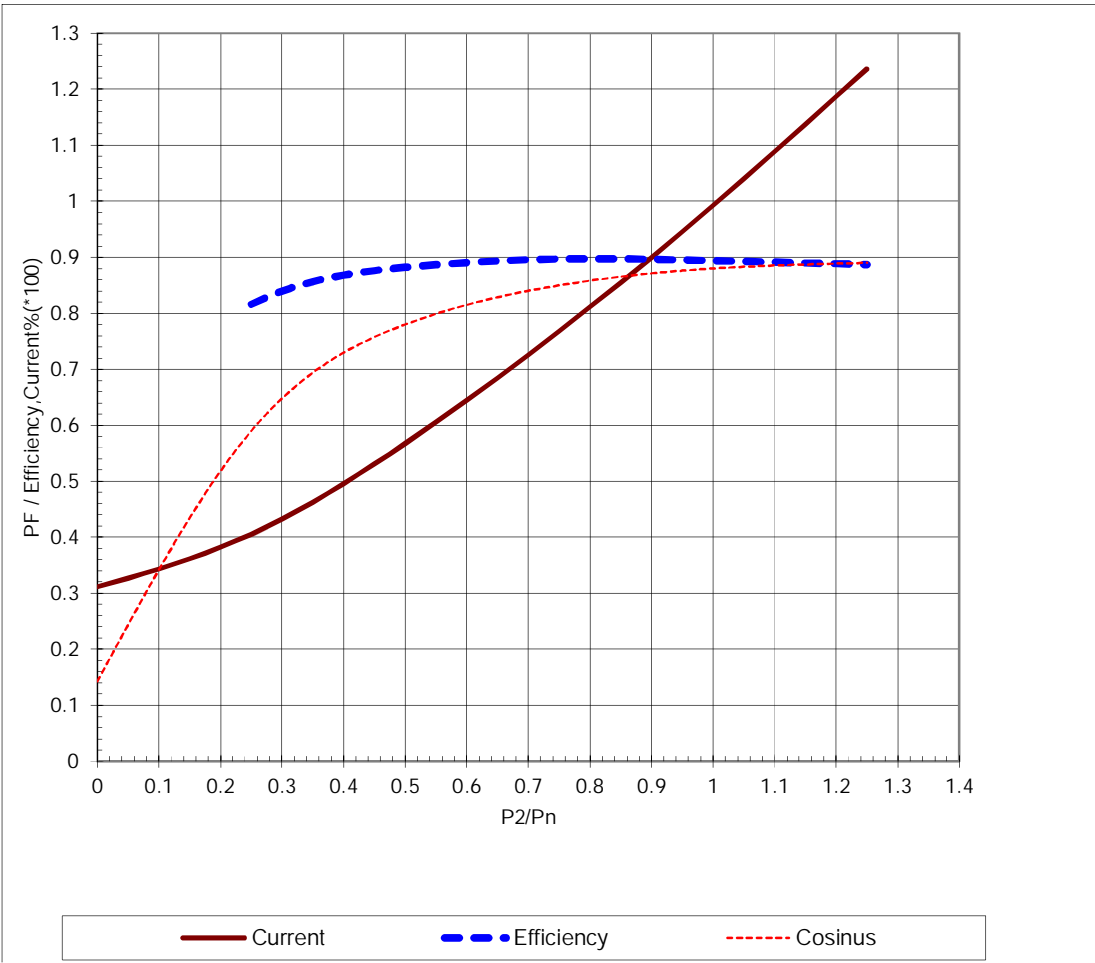

<b>ABB Motors and Generators</b>	<b>Load Curves</b>		
	Project	Location	
Department/Author	Customer name	Customer ref.	Item name <b>1.00001</b>
Our ref.	Rev/Changed by <b>A</b>	Date of issue <b>1/16/2019</b>	Saving ident <b>untitled.xls</b>
Pages <b>2(3)</b>	Product <b>TEFC, 3-phase, squirrel cage induction motor</b>		
Type/Frame	<b>M2BAX 160MLA 2</b>	Calc. ref.	<b>3GZH021016-1</b>
Product code	<b>3GBA 161 410-BDCIN</b>		
Rated output P <sub>N</sub>	<b>11 kW</b>		
Type of duty	<b>S1 100%</b>		
Voltage (V)	<b>415</b>	Current I <sub>N</sub> (A)	<b>19.6</b>
Frequency (Hz)	<b>50</b>	Speed (r/min)	<b>2925</b>
		Power factor at P <sub>N</sub>	<b>0.88</b>
		Efficiency (%) at P <sub>N</sub>	<b>89.4</b>
			
<p>Data based on situation 9/19/2015</p> <p style="text-align: center;">All data subject to tolerances in accordance with IS/IEC 60034-1 : 2004</p>			


ABB Motors and Generators	Starting Curves			
	Project	Location		
Department/Author	Customer name	Customer ref.		Item name <b>1.00001</b>
Our ref.	Rev/Changed by <b>A</b>	Date of issue <b>1/16/2019</b>	Saving ident <b>untitled.xls</b>	Pages <b>3(3)</b>
Type of product	<b>TEFC, 3-phase, squirrel cage induction motor</b>			
Type/Frame	<b>M2BAX 160MLA 2</b>	Calc. ref.	<b>3GZH021016-1</b>	
Product code	<b>3GBA 161 410-BDCIN</b>	Frequency (Hz)	<b>50</b>	
Rated output P <sub>N</sub>	<b>11 kW</b>	Rated current I <sub>N</sub>	<b>19.6</b>	<b>A</b>
Type of duty	<b>S1 100%</b>			
J <sub>motor</sub> (kgm <sup>2</sup> )	<b>0.0415</b>	Voltage (V) 100%	<b>415</b>	Voltage (V) <b>415V(100%)</b>
J <sub>load</sub> (kgm <sup>2</sup> )		T <sub>start</sub> /T <sub>N</sub>	<b>2.4</b>	T <sub>start</sub> /T <sub>N</sub> <b>2.4</b>
Speed (r/min)	<b>2925</b>	Starting time (s)	<b>0.2</b>	Starting time (s)
T <sub>N</sub> (Nm)	<b>36</b>	Speed (r/min)		Speed (r/min)
T <sub>load</sub> (Nm)		I <sub>s</sub> /I <sub>N</sub>	<b>7</b>	I <sub>s</sub> /I <sub>N</sub> <b>7</b>
		T <sub>max</sub> /T <sub>n</sub>	<b>3</b>	T <sub>max</sub> /T <sub>n</sub> <b>3</b>

The graph plots torque ratio (Ts/Tn) and current ratio (Is/In) against speed (r/min). The x-axis ranges from 0 to 3250 r/min. The left y-axis (Ts/Tn) ranges from 0 to 4.5, and the right y-axis (Is/In) ranges from 0 to 9. Two sets of curves are shown: solid lines for 415V and dashed lines for 415V(100%). The torque curves (Ts/Tn) show a peak around 2500-2750 r/min, while the current curves (Is/In) show a peak around 2500-2750 r/min and a sharp drop to zero at 3000 r/min.

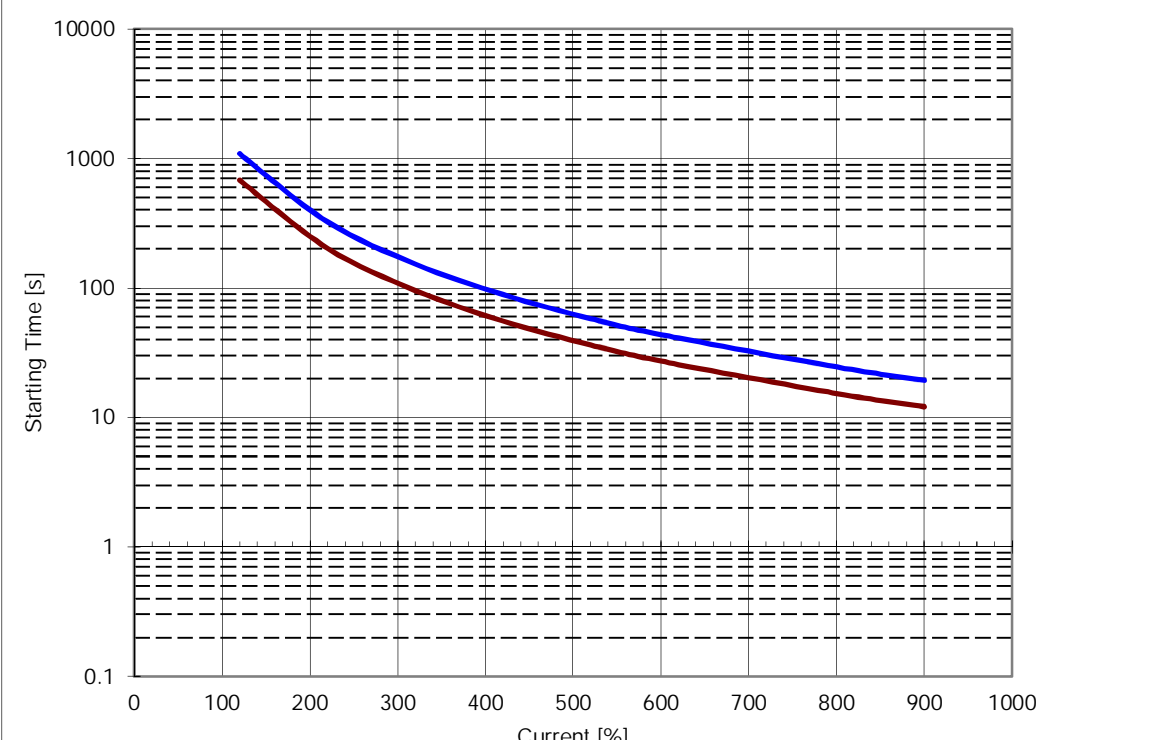
Speed (r/min)	Ts/Tn (415V)	Ts/Tn (415V(100%))	Is/In (415V)	Is/In (415V(100%))
0	2.4	2.4	7.0	7.0
500	2.0	2.0	6.5	6.5
1000	2.2	2.2	6.0	6.0
1500	2.5	2.5	5.5	5.5
2000	2.8	2.8	5.0	5.0
2500	3.0	3.0	4.5	4.5
2750	3.0	3.0	3.5	3.5
3000	0.0	0.0	0.0	0.0

Data based on situation 9/19/2015  
All data subject to tolerances in accordance with IS/IEC 60034-1 : 2004

<b>ABB Motors and Generators</b>	<b>Thermal Withstand Curve</b>		
	Project	Location	
Department/Author	Customer name	Customer ref.	Item name <b>1.00001</b>
Our ref.	Rev/Changed by <b>A</b>	Date of issue <b>1/16/2019</b>	Saving ident <b>untitled.xls</b>
Type of product	<b>TEFC, 3-phase, squirrel cage induction motor</b>		
Type/Frame	<b>M2BAX 160MLA 2</b>	Calc. ref.	<b>3GZH021016-1</b>
Product code	<b>3GBA 161 410-BDCIN</b>	Frequency (Hz)	<b>50</b>
Rated output P <sub>N</sub>	<b>11 kW</b>	Rated current I <sub>N</sub>	<b>19.6 A</b>
Type of duty	<b>S1 100%</b>		
J <sub>motor</sub> (kgm <sup>2</sup> )	<b>0.0415</b>	Voltage (V) 100%	<b>415</b>
J <sub>load</sub> (kgm <sup>2</sup> )		Voltage (V)	<b>415V(100%)</b>
Speed (r/min)	<b>2925</b>	T <sub>start</sub> /T <sub>N</sub>	<b>2.4</b>
T <sub>N</sub> (Nm)	<b>36</b>	Starting time (s)	<b>0.2</b>
T <sub>load</sub> (Nm)		Speed (r/min)	
		I <sub>s</sub> /I <sub>n</sub>	<b>7</b>
		T <sub>max</sub> /T <sub>n</sub>	<b>3</b>
		I <sub>s</sub> /I <sub>n</sub>	<b>7</b>
		T <sub>max</sub> /T <sub>n</sub>	<b>3</b>

Starting Time [s]



Running Hot
 Running Cold

Data based on situation 9/19/2015  
All data subject to tolerances in accordance with IS/IEC 60034-1 : 2004