

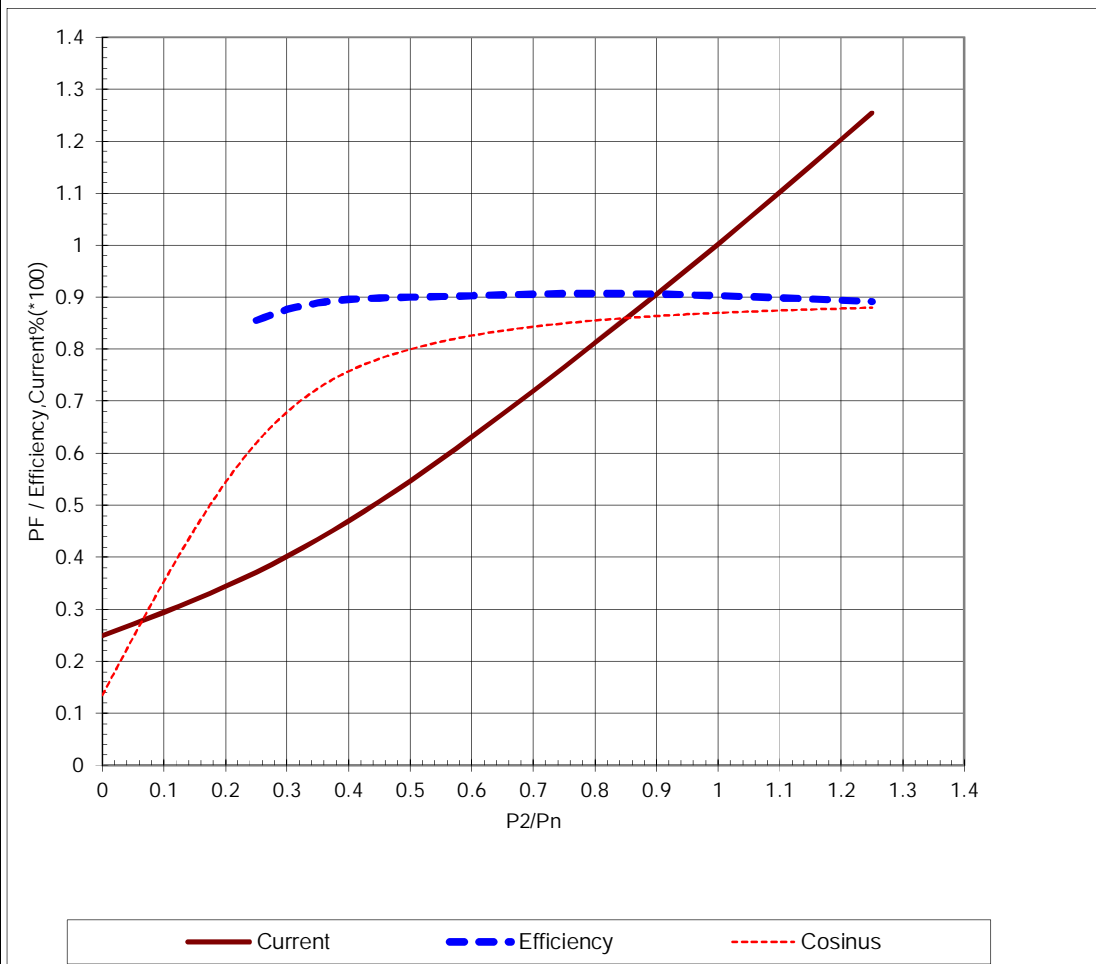


ABB Motors and Generators		Technical Data Sheet				
Department/Author		Project	Location		Item name	
Our ref.		Rev/Changed by	Date of issue	Saving ident	Pages	
		A	1/16/2019	untitled.xls	1.00001 1(3)	
No.	Definition	Data	Unit	Remarks		
1	Product	TEFC, 3-phase, squirrel cage induction motor				
2	Product code	3GBA 161 420-BDCIN		Calc. ref.	3GZH021016-2	
3	Type/Frame	M2BAX 160MLB 2				
4	Mounting	IM3001, B5(flange)				
5	Rated output P _N	15	kW			
6	Service factor	1				
7	Type of duty	S1 100%				
8	Rated voltage U _N	415	VD	+10, -10 %		
9	Rated frequency f _N	50	Hz	+5, -5 %		
10	Rated speed n _N	2928	r/min			
11	Rated current I _N	26.5	A			
12						
13	Starting current I _s /I _N	7				
14	Nominal torque T _N	49	Nm			
15	Locked rotor torque T _S /T _N	2.1				
16	Maximum torque T _{max} /T _N	3				
17						
18						
Load characteristics		Load %	Current A	Efficiency %	Power factor	
19	PLL determined from residual loss	100	26.5	90.3 / IE2	0.87	
20		75	20.3	90.7	0.85	
21		50	14.5	90	0.8	
22						
23	Thermal withstand time hot	18	s			
24	Thermal withstand time cold	29	s			
25	Insulation class / Temperature class	F / B				
26	Ambient temperature	50	°C			
27	Altitude	1000 m.a.s.l.				
28	Degree of protection	IP55				
29	Cooling system	IC411 self ventilated				
30	Bearing DE/NDE	6209-2Z/C3 - 6209-2Z/C3				
31	Sound pressure level (LP dB(A) 1m)	77	dB(A)	at no-load		
32	Moment of inertia J = ¼ GD ²	0.0544	kg·m ²			
33	Position of terminal box	Top				
34	Direction of rotation	Bi-directional				
35	Weight of rotor	27	kg			
36	Total weight of motor	120	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


ABB Motors and Generators	Load Curves		
	Project	Location	
Department/Author	Customer name	Customer ref.	Item name 1.00001
Our ref.	Rev/Changed by A	Date of issue 1/16/2019	Saving ident untitled.xls
Pages	2(3)		
Product	TEFC, 3-phase, squirrel cage induction motor		
Type/Frame	M2BAX 160MLB 2	Calc. ref.	3GZH021016-2
Product code	3GBA 161 420-BDCIN		
Rated output P _N	15 kW		
Type of duty	S1 100%		

Voltage (V) **415** Current I_N (A) **26.5** Power factor at P_N **0.87**
 Frequency (Hz) **50** Speed (r/min) **2928** Efficiency (%) at P_N **90.3**



Data based on situation 9/19/2015


All data subject to tolerances in accordance with IS/IEC 60034-1 : 2004

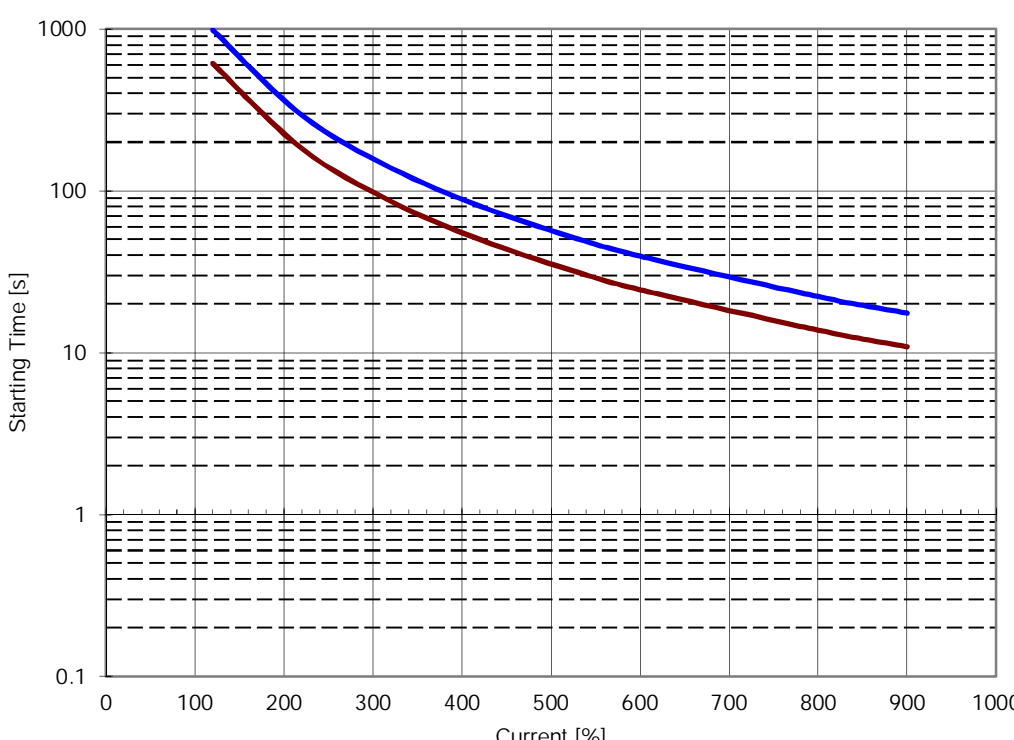
ABB Motors and Generators	Starting Curves			
	Project	Location		
Department/Author	Customer name	Customer ref.		Item name 1.00001
Our ref.	Rev/Changed by A	Date of issue 1/16/2019	Saving ident untitled.xls	Pages 3(3)
Type of product	TEFC, 3-phase, squirrel cage induction motor			
Type/Frame	M2BAX 160MLB 2	Calc. ref.	3GZH021016-2	
Product code	3GBA 161 420-BDCIN	Frequency (Hz)	50	
Rated output P _N	15 kW	Rated current I _N	26.5	A
Type of duty	S1 100%			
J _{motor} (kgm ²)	0.054	Voltage (V) 100%	415	Voltage (V) 415V(100%)
J _{load} (kgm ²)		T _{start} /T _N	2.1	T _{start} /T _N 2.1
Speed (r/min)	2928	Starting time (s)	0.1	Starting time (s)
T _N (Nm)	49	Speed (r/min)		Speed (r/min)
T _{load} (Nm)		I _s /I _N	7	I _s /I _N 7
		T _{max} /T _N	3	T _{max} /T _N 3

The graph plots torque ratios (Ts/Tn) and current ratios (Is/In) against speed in 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: one for 415V (solid lines) and one for 415V(100%) (dashed lines). The torque curves (Ts/Tn) show a peak around 2500 r/min, while the current curves (Is/In) show a peak around 2500 r/min and then drop sharply to zero at 3000 r/min.

Speed (r/min)	Ts/Tn (415V)	Ts/Tn (415V(100%))	Is/In (415V)	Is/In (415V(100%))
0	2.1	2.1	7.0	7.0
250	2.0	2.0	6.5	6.5
500	2.0	2.0	6.0	6.0
750	2.1	2.1	5.5	5.5
1000	2.2	2.2	5.0	5.0
1250	2.4	2.4	4.5	4.5
1500	2.7	2.7	4.0	4.0
1750	3.0	3.0	3.5	3.5
2000	3.2	3.2	3.0	3.0
2250	3.3	3.3	2.5	2.5
2500	3.4	3.4	2.0	2.0
2750	3.0	3.0	1.5	1.5
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

ABB Motors and Generators	Thermal Withstand Curve		
	Project	Location	
Department/Author	Customer name	Customer ref.	Item name 1.00001
Our ref.	Rev/Changed by A	Date of issue 1/16/2019	Saving ident untitled.xls
Pages 5(3)			
Type of product	TEFC, 3-phase, squirrel cage induction motor		
Type/Frame	M2BAX 160MLB 2	Calc. ref.	3GZH021016-2
Product code	3GBA 161 420-BDCIN	Frequency (Hz)	50
Rated output P _N	15 kW	Rated current I _N	26.5 A
Type of duty	S1 100%		
J _{motor} (kgm ²)	0.054	Voltage (V) 100%	415
J _{load} (kgm ²)		Voltage (V)	415V(100%)
Speed (r/min)	2928	T _{start} /T _N	2.1
T _N (Nm)	49	Starting time (s)	0.1
T _{load} (Nm)		Speed (r/min)	
		I _s /I _n	7
		T _{max} /T _n	3
		I _s /I _n	7
		T _{max} /T _n	3



The graph plots Starting Time [s] on a logarithmic y-axis (0.1 to 1000) against Current [%] on a linear x-axis (0 to 1000). Two curves are shown: a red line for 'Running Hot' and a blue line for 'Running Cold'. Both curves show that starting time decreases as current increases. The 'Running Cold' curve is consistently higher than the 'Running Hot' curve.

Current [%]	Starting Time [s] (Running Hot)	Starting Time [s] (Running Cold)
100	~500	~1000
200	~100	~200
300	~40	~80
400	~25	~50
500	~18	~35
600	~14	~28
700	~11	~23
800	~9	~19
900	~7	~16

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