

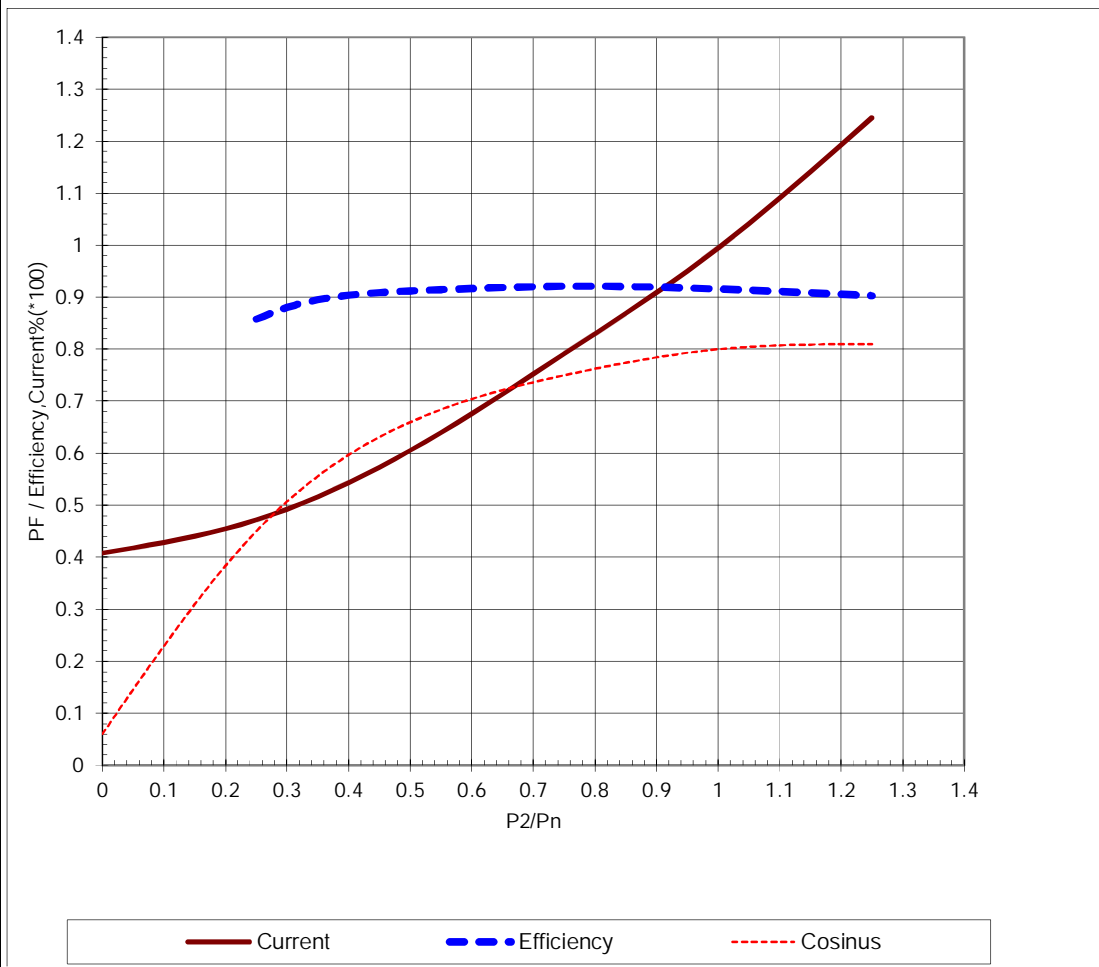


ABB Motors and Generators		Technical Data Sheet				
Department/Author		Project	Location		Item name	
Our ref.		Rev/Changed by	Date of issue	Saving ident	Pages	
		A	1/16/2019	untitled.xls	1(3)	
No.	Definition	Data	Unit	Remarks		
1	Product	<b>TEFC, 3-phase, squirrel cage induction motor</b>				
2	Product code	<b>3GBA 182 420-HDCIN</b>		Calc. ref.	3GZH021018-3	
3	Type/Frame	<b>M2BAX 180MLB 4</b>				
4	Mounting	<b>IM2001, B35(foot-flange)</b>				
5	Rated output P <sub>N</sub>	<b>22</b>	kW			
6	Service factor	<b>1</b>				
7	Type of duty	<b>S1 100%</b>				
8	Rated voltage U <sub>N</sub>	<b>415</b>	VD	+10, -10 %		
9	Rated frequency f <sub>N</sub>	<b>50</b>	Hz	+5, -5 %		
10	Rated speed n <sub>N</sub>	<b>1460</b>	r/min			
11	Rated current I <sub>N</sub>	<b>42</b>	A			
12						
13	Starting current I <sub>s</sub> /I <sub>N</sub>	<b>7</b>				
14	Nominal torque T <sub>N</sub>	<b>144</b>	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>3.2</b>				
17						
18						
Load characteristics		Load %	Current A	Efficiency %	Power factor	
19	PLL determined from residual loss	<b>100</b>	<b>42</b>	<b>91.6 / IE2</b>	<b>0.8</b>	
20		<b>75</b>	<b>33.2</b>	<b>92.1</b>	<b>0.75</b>	
21		<b>50</b>	<b>25.4</b>	<b>91.2</b>	<b>0.66</b>	
22						
23	Thermal withstand time hot	<b>11</b>	s			
24	Thermal withstand time cold	<b>17</b>	s			
25	Insulation class / Temperature class	<b>F / B</b>				
26	Ambient temperature	<b>50</b>	°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>6310-2Z/C3 - 6209-2Z/C3</b>				
31	Sound pressure level (LP dB(A) 1m)	<b>73</b>	dB(A)	at no-load		
32	Moment of inertia J = ¼ GD <sup>2</sup>	<b>0.1396</b>	kg·m <sup>2</sup>			
33	Position of terminal box	<b>Top</b>				
34	Direction of rotation	<b>Bi-directional</b>				
35	Weight of rotor	<b>51</b>	kg			
36	Total weight of motor	<b>171</b>	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 180MLB 4</b>	Calc. ref.	<b>3GZH021018-3</b>
Product code	<b>3GBA 182 420-HDCIN</b>		
Rated output P <sub>N</sub>	<b>22 kW</b>		
Type of duty	<b>S1 100%</b>		

Voltage (V)	<b>415</b>	Current I <sub>N</sub> (A)	<b>42</b>	Power factor at P <sub>N</sub>	<b>0.8</b>
Frequency (Hz)	<b>50</b>	Speed (r/min)	<b>1460</b>	Efficiency (%) at P <sub>N</sub>	<b>91.6</b>



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 <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 180MLB 4</b>	Calc. ref.	<b>3GZH021018-3</b>	
Product code	<b>3GBA 182 420-HDCIN</b>	Frequency (Hz)	<b>50</b>	
Rated output P <sub>N</sub>	<b>22 kW</b>	Rated current I <sub>N</sub>	<b>42</b>	<b>A</b>
Type of duty	<b>S1 100%</b>			
J <sub>motor</sub> (kgm <sup>2</sup> )	<b>0.14</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>1460</b>	Starting time (s)	<b>0.1</b>	Starting time (s)
T <sub>N</sub> (Nm)	<b>144</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>3.2</b>	T <sub>max</sub> /T <sub>N</sub> <b>3.2</b>

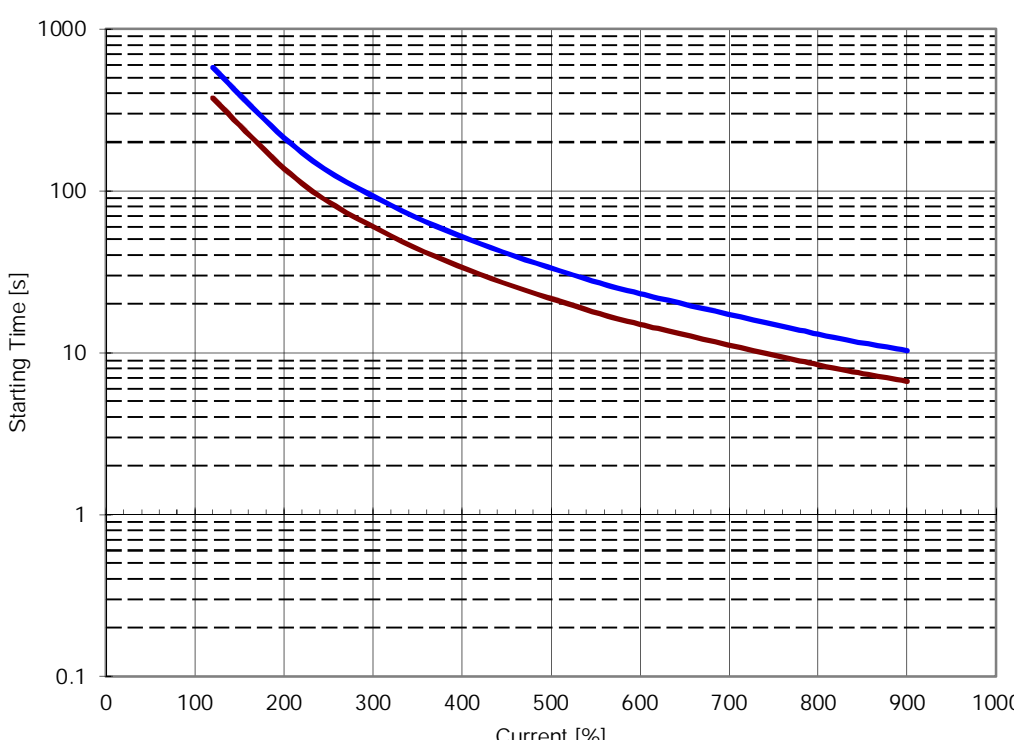
The graph displays the starting characteristics of the motor. The x-axis represents Speed in r/min, ranging from 0 to 1750. The left y-axis represents the torque ratio  $T_s/T_n$ , ranging from 0 to 4.5. The right y-axis represents the current ratio  $I_s/I_n$ , ranging from 0 to 9. Four curves are plotted: a solid blue line for  $T_{MotorUn}$  at 415V, a solid red line for  $T_{MotorU2}$  at 415V(100%), a dashed purple line for  $I_{MotorUn}$  at 415V, and a dashed green line for  $I_{MotorU2}$  at 415V(100%). The torque curves show a peak around 1250 r/min, while the current curves show a peak around 1000 r/min. The 100% voltage curves generally show higher torque and lower current compared to the 415V curves.

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>
Pages <b>5(3)</b>	Type of product <b>TEFC, 3-phase, squirrel cage induction motor</b> Type/Frame <b>M2BAX 180MLB 4</b> Calc. ref. <b>3GZH021018-3</b> Product code <b>3GBA 182 420-HDCIN</b> Frequency (Hz) <b>50</b> Rated output P <sub>N</sub> <b>22 kW</b> Rated current I <sub>N</sub> <b>42 A</b> Type of duty <b>S1 100%</b>		
J <sub>motor</sub> (kgm <sup>2</sup> ) <b>0.14</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>1460</b>	Starting time (s) <b>0.1</b>	Starting time (s)	
T <sub>N</sub> (Nm) <b>144</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>3.2</b>	T <sub>max</sub> /T <sub>N</sub> <b>3.2</b>	



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 blue line for 'Running Cold' and a red line for 'Running Hot'. Both curves show a decrease in starting time as current increases. The 'Running Cold' curve starts at approximately 500s at 100% current and drops to about 10s at 900% current. The 'Running Hot' curve starts at approximately 300s at 100% current and drops to about 7s at 900% current.

Current [%]	Starting Time [s] (Running Cold)	Starting Time [s] (Running Hot)
100	~500	~300
200	~150	~100
300	~100	~70
400	~70	~50
500	~50	~40
600	~40	~30
700	~30	~25
800	~25	~20
900	~20	~15

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