

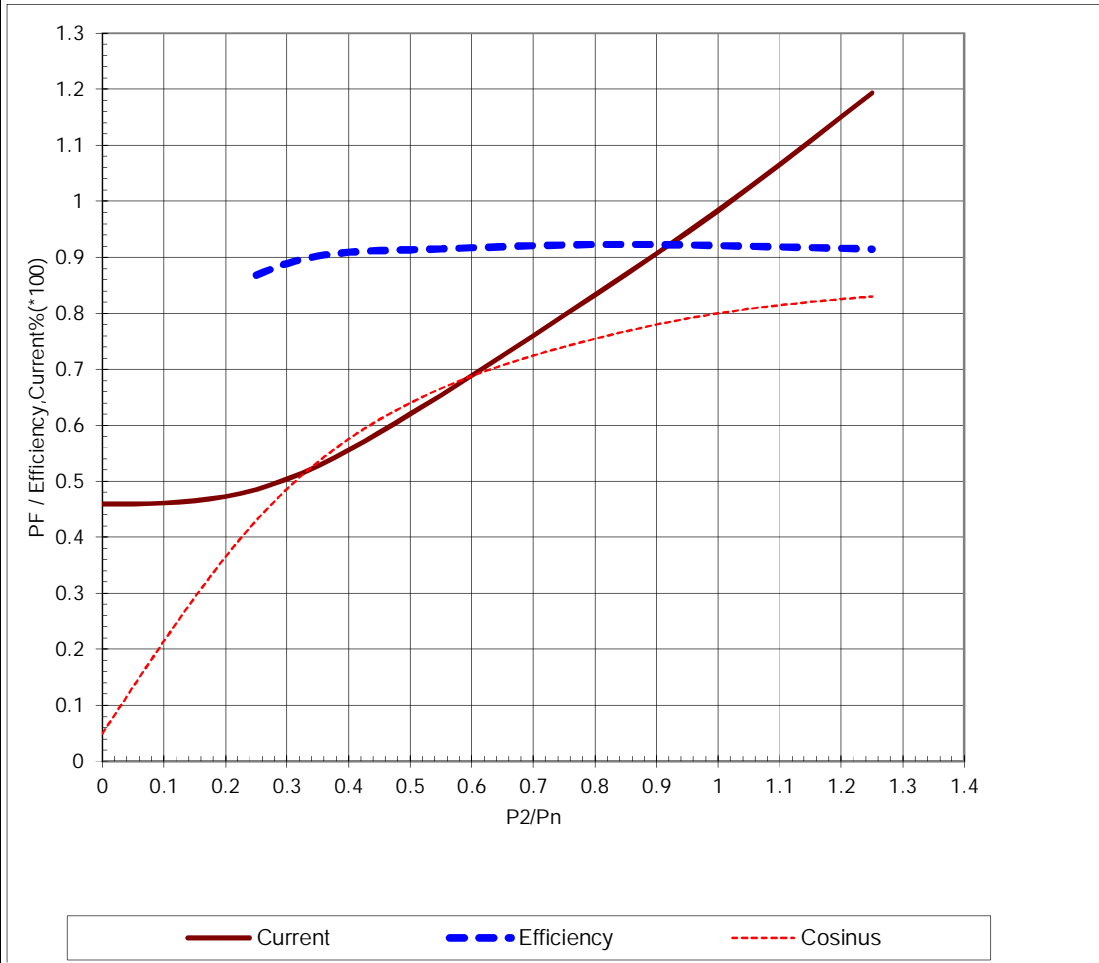


ABB Motors and Generators		Technical Data Sheet				
Project		Location				
Department/Author		Customer name		Customer ref.		
Our ref.		Rev/Changed by <b>A</b>		Date of issue <b>1/18/2019</b>		
		Saving ident <b>untitled.xls</b>		Item name <b>1.00001</b>		
				Pages <b>1(3)</b>		
No.	Definition	Data	Unit	Remarks		
1	Product	<b>TEFC, 3-phase, squirrel cage induction motor</b>				
2	Product code	<b>3GBA 162 420-BDDIN</b>				
3	Type/Frame	<b>M2BAX 160MLB 4</b>				
4	Mounting	<b>IM3001, B5(flange)</b>				
5	Rated output P <sub>N</sub>	<b>15</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>1470</b>	r/min			
11	Rated current I <sub>N</sub>	<b>28.8</b>	A			
12						
13	Starting current I <sub>s</sub> /I <sub>N</sub>	<b>7.5</b>				
14	Nominal torque T <sub>N</sub>	<b>97.4</b>	Nm			
15	Locked rotor torque T <sub>S</sub> /T <sub>N</sub>	<b>2.6</b>				
16	Maximum torque T <sub>max</sub> /T <sub>N</sub>	<b>3.4</b>				
17						
18						
Load characteristics		Load %	Current A	Efficiency %	Power factor	
19	PLL determined from residual loss	<b>100</b>	<b>28.8</b>	<b>92.1 / IE3</b>	<b>0.8</b>	
20		<b>75</b>	<b>22.9</b>	<b>92.2</b>	<b>0.74</b>	
21		<b>50</b>	<b>17.8</b>	<b>91.3</b>	<b>0.64</b>	
22						
23	Thermal withstand time hot	<b>13</b>	s			
24	Thermal withstand time cold	<b>22</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>6209-2Z/C3 - 6209-2Z/C3</b>				
31	Sound pressure level (LP dB(A) 1m)	<b>68</b>	dB(A)	at no-load		
32	Moment of inertia J = ¼ GD <sup>2</sup>	<b>0.135</b>	kg·m <sup>2</sup>			
33	Position of terminal box	<b>Top</b>				
34	Direction of rotation	<b>Bi-directional</b>				
35	Total weight of motor	<b>159</b>	kg			
36		<b>User defined motor</b>				
37						
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40						
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43						
44						
45						
Ex-motors						
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48						
Option Variant Codes / Definition						
49						
50						
51						
52						
Remarks:						
6/26/2015 10:29:00 AM						


<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>1/18/2019</b>	Saving ident <b>untitled.xls</b>
			Pages <b>2(3)</b>

**Product** TEFC, 3-phase, squirrel cage induction motor  
**Type/Frame** M2BAX 160MLB 4  
**Product code** 3GBA 162 420-BDDIN  
**Rated output P<sub>N</sub>** 15 kW  
**Type of duty** S1 100%

**Voltage (V)** 415      **Current I<sub>N</sub> (A)** 28.8      **Power factor at P<sub>N</sub>** 0.8  
**Frequency (Hz)** 50      **Speed (r/min)** 1470      **Efficiency (%) at P<sub>N</sub>** 92.1



Data based on situation 6/26/2015  
 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>1/18/2019</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 160MLB 4</b>			
Product code	<b>3GBA 162 420-BDDIN</b>	Frequency (Hz)	<b>50</b>	
Rated output P <sub>N</sub>	<b>15 kW</b>	Rated current I <sub>N</sub>	<b>28.8</b>	A
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>2.6</b>	T <sub>start</sub> /T <sub>N</sub> <b>2.6</b>
Speed (r/min)	<b>1470</b>	Starting time (s)	<b>0.1</b>	Starting time (s)
T <sub>N</sub> (Nm)	<b>97</b>	Speed (r/min)		Speed (r/min) <b>939</b>
T <sub>load</sub> (Nm)		I <sub>s</sub> /I <sub>N</sub>	<b>7.5</b>	I <sub>s</sub> /I <sub>N</sub> <b>7.5</b>
		T <sub>max</sub> /T <sub>N</sub>	<b>3.4</b>	T <sub>max</sub> /T <sub>N</sub> <b>3.4</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  $T_s/T_n$  (0 to 4.5), and the right y-axis represents the current ratio  $I_s/I_n$  (0 to 9). Two torque curves are shown: a solid blue line for  $T_{MotorUn}$  at 415V and a solid red line for  $T_{MotorU2}$  at 415V(100%). Two current curves are shown: a dashed purple line for  $I_{MotorUn}$  at 415V and a dashed green line for  $I_{MotorU2}$  at 415V(100%). The 415V(100%) curves show a higher starting torque and a lower starting current compared to the 415V curves.

Data based on situation 6/26/2015

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

<b>ABB Motors and Generators</b>	<b>Thermal Withstand Curve</b>		<b>ABB</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>1/18/2019</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 160MLB 4</b>			
Product code	<b>3GBA 162 420-BDDIN</b>	Frequency (Hz)	<b>50</b>	
Rated output P <sub>N</sub>	<b>15 kW</b>	Rated current I <sub>N</sub>	<b>28.8</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>2.6</b>	T <sub>start</sub> /T <sub>N</sub> <b>2.6</b>
Speed (r/min)	<b>1470</b>	Starting time (s)	<b>0.1</b>	Starting time (s)
T <sub>N</sub> (Nm)	<b>97</b>	Speed (r/min)		Speed (r/min) <b>939</b>
T <sub>load</sub> (Nm)		I <sub>s</sub> /I <sub>N</sub>	<b>7.5</b>	I <sub>s</sub> /I <sub>N</sub> <b>7.5</b>
		T <sub>max</sub> /T <sub>N</sub>	<b>3.4</b>	T <sub>max</sub> /T <sub>N</sub> <b>3.4</b>

Current [%]	Starting Time [s] (Running Hot)	Starting Time [s] (Running Cold)
100	~500	~800
200	~150	~250
400	~50	~80
600	~25	~40
800	~15	~25
1000	~8	~12

Data based on situation 6/26/2015  
All data subject to tolerances in accordance with IS/IEC 60034-1 : 2004