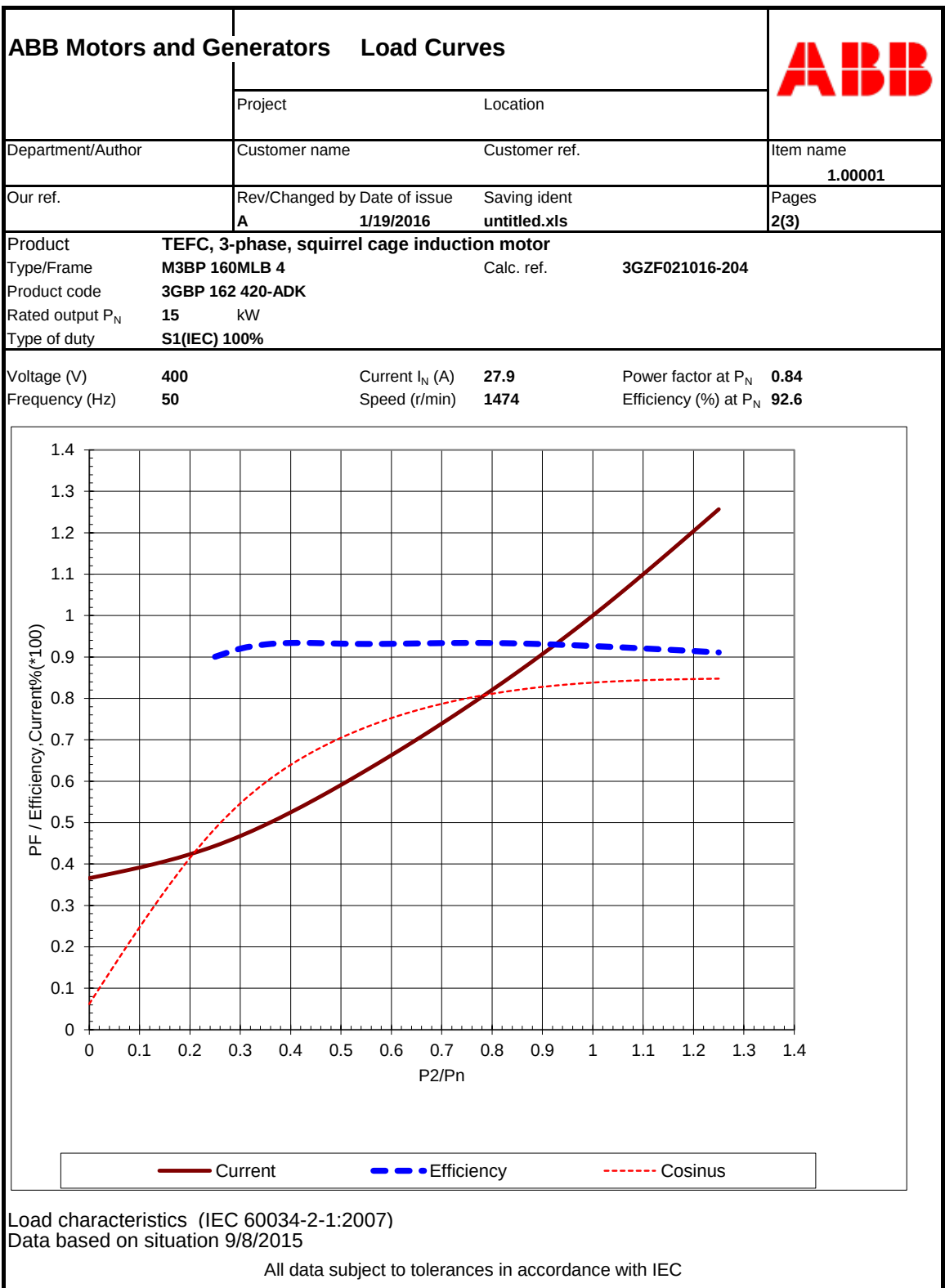
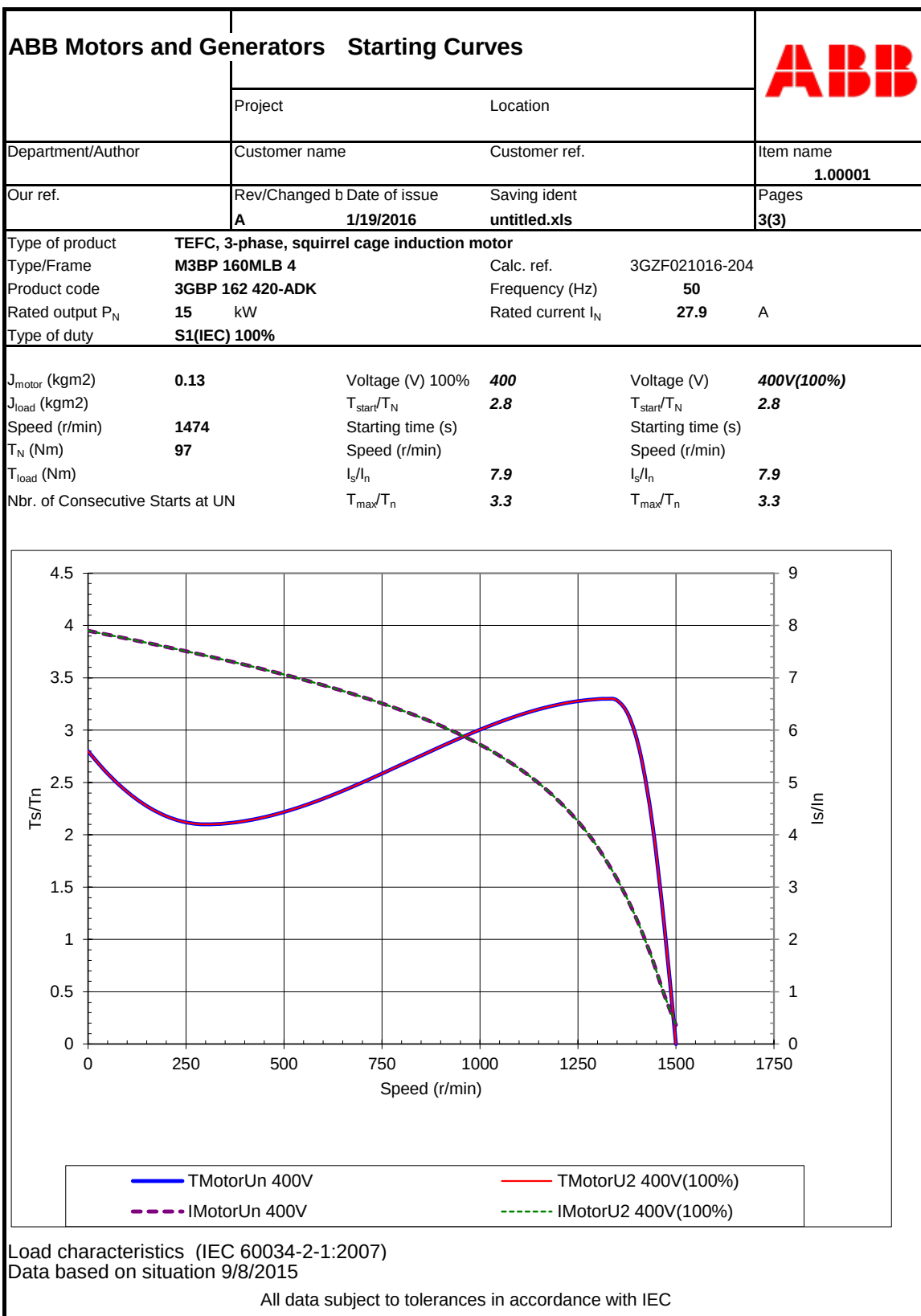
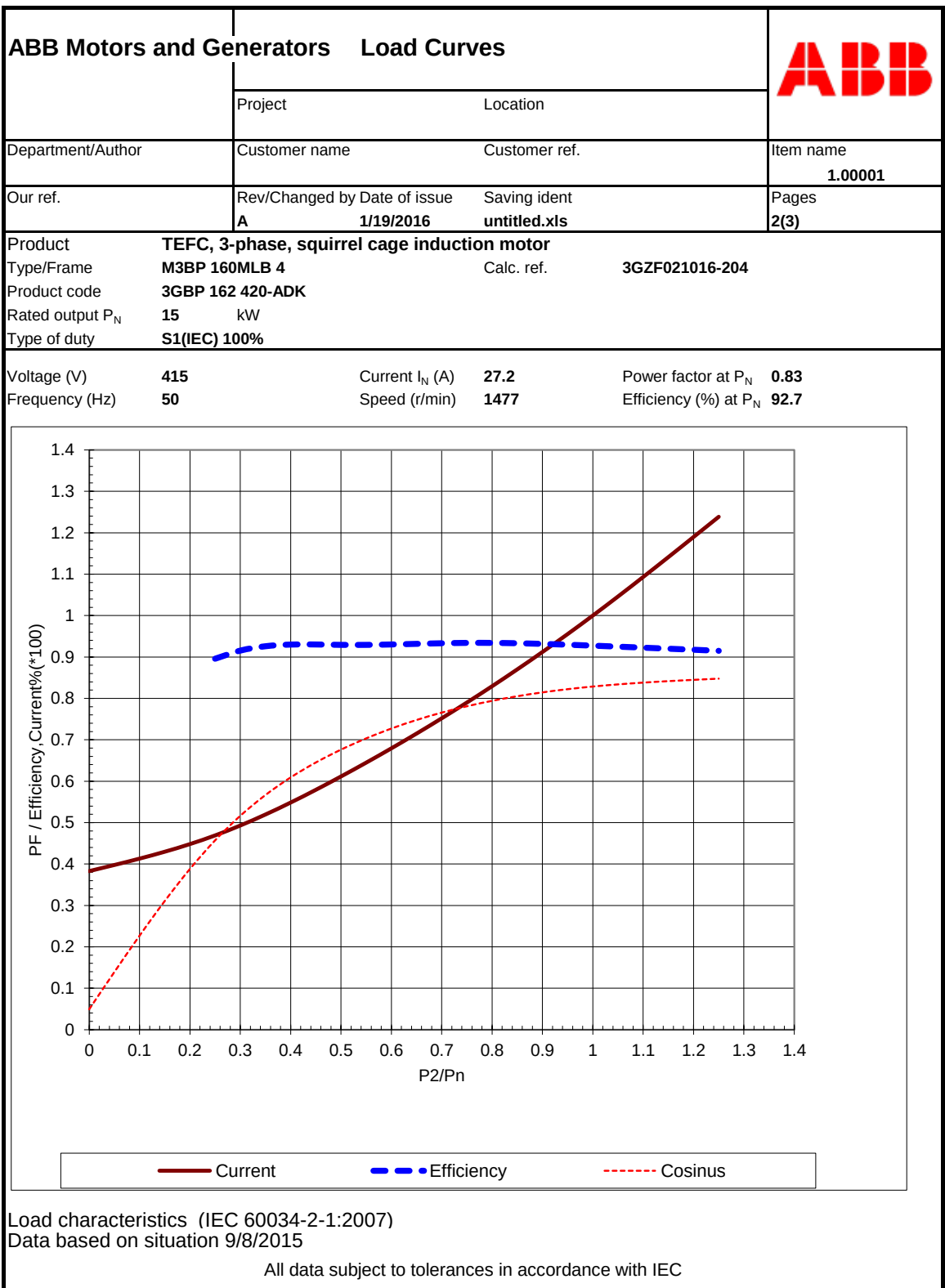


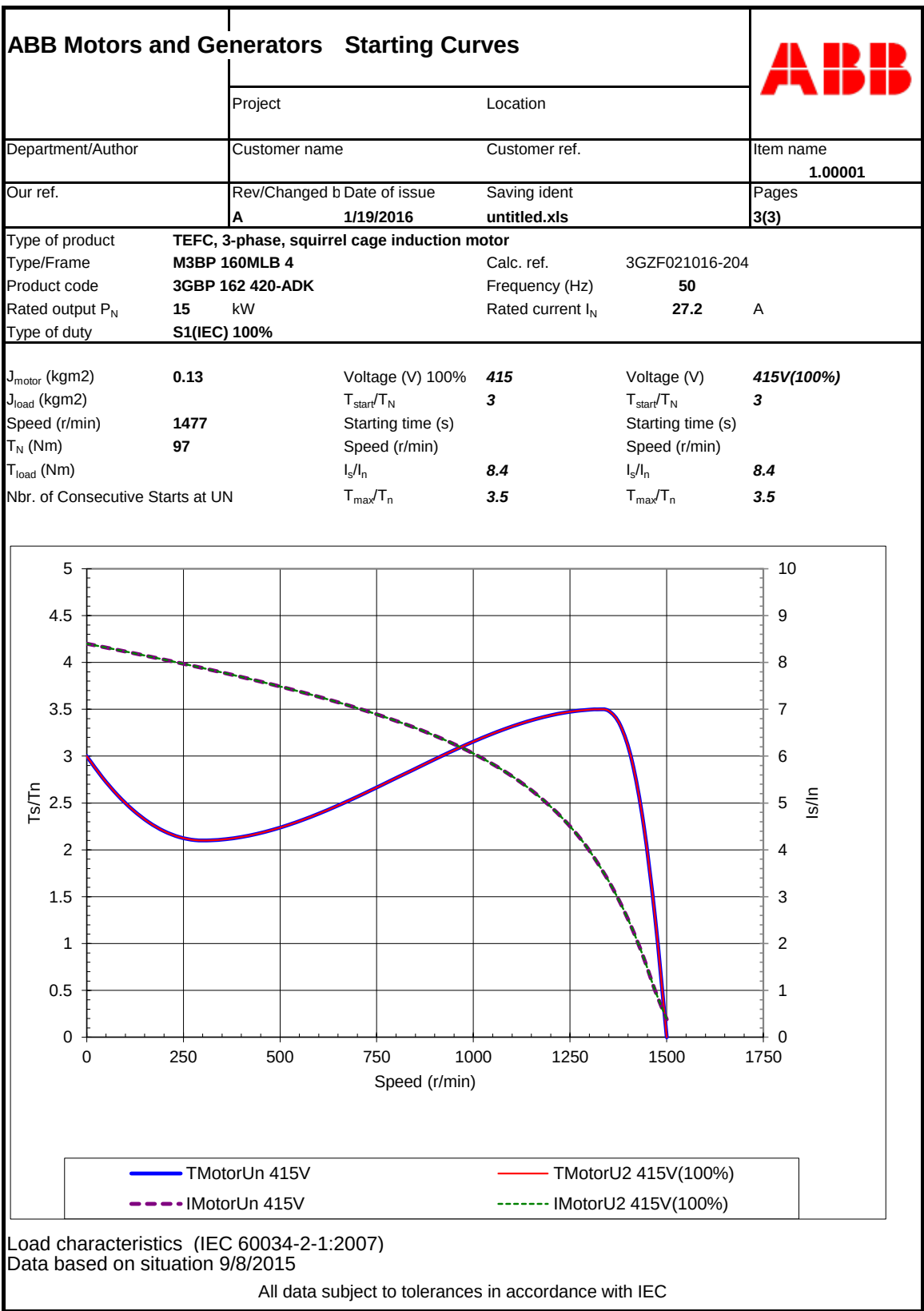
| ABB Motors and Generators                             |                                                                 | Technical Data Sheet - DOL                          |                                   |                                     |  |
|-------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------|-----------------------------------|-------------------------------------|-------------------------------------------------------------------------------------|
| Project                                               |                                                                 | Location                                            |                                   |                                     |                                                                                     |
| Department/Author                                     |                                                                 | Customer name                                       |                                   | Customer ref.                       | Item name<br><b>1.00001</b>                                                         |
| Our ref.                                              |                                                                 | Rev/Changed by<br><b>A</b>                          | Date of issue<br><b>1/19/2016</b> | Saving ident<br><b>untitled.xls</b> | Pages<br><b>1(3)</b>                                                                |
| No.                                                   | Definition                                                      | Data                                                | Unit                              | Remarks                             |                                                                                     |
| 1                                                     | Product                                                         | <b>TEFC, 3-phase, squirrel cage induction motor</b> |                                   |                                     |                                                                                     |
| 2                                                     | Product code                                                    | <b>EMM16154-PPN (3GBP162420-ADK+011+332+509)</b>    |                                   |                                     | Calc. ref. 3GZF021016-204                                                           |
| 3                                                     | Type/Frame                                                      | <b>M3BP 160MLB 4</b>                                |                                   |                                     |                                                                                     |
| 4                                                     | Mounting                                                        | <b>IM1001, B3(foot)</b>                             |                                   |                                     |                                                                                     |
| 5                                                     | Rated output P <sub>N</sub>                                     | <b>15</b>                                           | kW                                |                                     |                                                                                     |
| 6                                                     | Service factor                                                  | <b>1</b>                                            |                                   |                                     |                                                                                     |
| 7                                                     | Type of duty                                                    | <b>S1(IEC) 100%</b>                                 |                                   |                                     |                                                                                     |
| 8                                                     | Rated voltage U <sub>N</sub>                                    | <b>400</b>                                          | VD                                |                                     | ± 5 % (IEC 60034-1)                                                                 |
| 9                                                     | Rated frequency f <sub>N</sub>                                  | <b>50</b>                                           | Hz                                |                                     | ± 2 % (IEC 60034-1)                                                                 |
| 10                                                    | Rated speed n <sub>N</sub>                                      | <b>1474</b>                                         | r/min                             |                                     |                                                                                     |
| 11                                                    | Rated current I <sub>N</sub>                                    | <b>27.9</b>                                         | A                                 |                                     |                                                                                     |
| 12                                                    | No-load current                                                 | <b>10.2</b>                                         | A                                 |                                     |                                                                                     |
| 13                                                    | Starting current I <sub>s</sub> /I <sub>N</sub>                 | <b>7.9</b>                                          |                                   |                                     | Fullfilled IEC 60034-12 design N,H                                                  |
| 14                                                    | Nominal torque T <sub>N</sub>                                   | <b>97</b>                                           | Nm                                |                                     |                                                                                     |
| 15                                                    | Locked rotor torque T <sub>s</sub> /T <sub>N</sub>              | <b>2.8</b>                                          |                                   |                                     |                                                                                     |
| 16                                                    | Maximum torque T <sub>max</sub> /T <sub>N</sub>                 | <b>3.3</b>                                          |                                   |                                     |                                                                                     |
| 17                                                    | Minimum torque T <sub>min</sub> /T <sub>N</sub>                 | <b>2.1</b>                                          |                                   |                                     |                                                                                     |
| 18                                                    | Speed at minimum torque                                         | <b>300</b>                                          | r/min                             |                                     |                                                                                     |
| Load characteristics (IEC 60034-2-1:2007)             |                                                                 | Load %                                              | Current A                         | Efficiency %                        | Power factor                                                                        |
| 19                                                    | PLL determined from residual loss                               | <b>100</b>                                          | <b>27.9</b>                       | <b>92.6 / IE3</b>                   | <b>0.84</b>                                                                         |
| 20                                                    |                                                                 | <b>75</b>                                           | <b>21.7</b>                       | <b>93.4</b>                         | <b>0.8</b>                                                                          |
| 21                                                    |                                                                 | <b>50</b>                                           | <b>16.5</b>                       | <b>93.2</b>                         | <b>0.7</b>                                                                          |
| 22                                                    |                                                                 | <b>Start</b>                                        | <b>220</b>                        |                                     | <b>0.47</b>                                                                         |
| 23                                                    | Maximum starting time from hot                                  | <b>15</b>                                           | s                                 |                                     |                                                                                     |
| 24                                                    | Maximum starting time from cold                                 | <b>27</b>                                           | s                                 |                                     |                                                                                     |
| 25                                                    | Insulation class / Temperature class                            | <b>F / B</b>                                        |                                   |                                     |                                                                                     |
| 26                                                    | Ambient temperature                                             | <b>40</b>                                           | °C                                |                                     |                                                                                     |
| 27                                                    | Altitude                                                        | <b>1000</b>                                         | m.a.s.l.                          |                                     |                                                                                     |
| 28                                                    | Enclosure                                                       | <b>IP55</b>                                         |                                   |                                     |                                                                                     |
| 29                                                    | Cooling system                                                  | <b>IC411 self ventilated</b>                        |                                   |                                     |                                                                                     |
| 30                                                    | Bearing DE/NDE                                                  | <b>6309/C3 - 6209/C3</b>                            |                                   |                                     |                                                                                     |
| 31                                                    | Type of Grease                                                  |                                                     |                                   |                                     |                                                                                     |
| 32                                                    | Sound pressure level (LP dB(A) 1m)                              | <b>62</b>                                           | dB(A)                             |                                     | at load                                                                             |
| 33                                                    | Moment of inertia J = ¼ GD2                                     | <b>0.125</b>                                        | kg-m2                             |                                     |                                                                                     |
| 34                                                    | Balancing                                                       |                                                     |                                   |                                     |                                                                                     |
| 35                                                    | Vibration class                                                 |                                                     |                                   |                                     |                                                                                     |
| 36                                                    | Position of terminal box                                        | <b>Top</b>                                          |                                   |                                     |                                                                                     |
| 37                                                    | Terminal box entries; no, dimens.                               |                                                     |                                   |                                     |                                                                                     |
| 38                                                    | Number of power terminals                                       |                                                     |                                   |                                     |                                                                                     |
| 39                                                    | Direction of rotation                                           | <b>CW or CCW</b>                                    |                                   |                                     |                                                                                     |
| 40                                                    | Weight of rotor                                                 | <b>45</b>                                           | kg                                |                                     |                                                                                     |
| 41                                                    | Total weight of motor                                           | <b>181</b>                                          | kg                                |                                     |                                                                                     |
| 42                                                    | Dimension drawing no.                                           |                                                     |                                   |                                     |                                                                                     |
| 43                                                    |                                                                 |                                                     |                                   |                                     |                                                                                     |
| 44                                                    |                                                                 |                                                     |                                   |                                     |                                                                                     |
| 45                                                    |                                                                 |                                                     |                                   |                                     |                                                                                     |
| Ex-motors                                             |                                                                 |                                                     |                                   |                                     |                                                                                     |
| 46                                                    |                                                                 |                                                     |                                   |                                     |                                                                                     |
| 47                                                    |                                                                 |                                                     |                                   |                                     |                                                                                     |
| 48                                                    |                                                                 |                                                     |                                   |                                     |                                                                                     |
| Option Variant Codes / Definition                     |                                                                 |                                                     |                                   |                                     |                                                                                     |
| 49                                                    | 011 = Fulfilling CSA and NRCAN                                  |                                                     |                                   |                                     |                                                                                     |
| 50                                                    | 332 = Baldor Catalog number stamped on rating plate             |                                                     |                                   |                                     |                                                                                     |
| 51                                                    | 509 = Fulfilling EISA Subtype I efficiency requirements, CC031A |                                                     |                                   |                                     |                                                                                     |
| 52                                                    |                                                                 |                                                     |                                   |                                     |                                                                                     |
| Remarks:                                              |                                                                 |                                                     |                                   |                                     |                                                                                     |
| Data based on situation 9/8/2015                      |                                                                 |                                                     |                                   |                                     |                                                                                     |
| All data subject to tolerances in accordance with IEC |                                                                 |                                                     |                                   |                                     |                                                                                     |
| Guaranteed values on request                          |                                                                 |                                                     |                                   |                                     |                                                                                     |



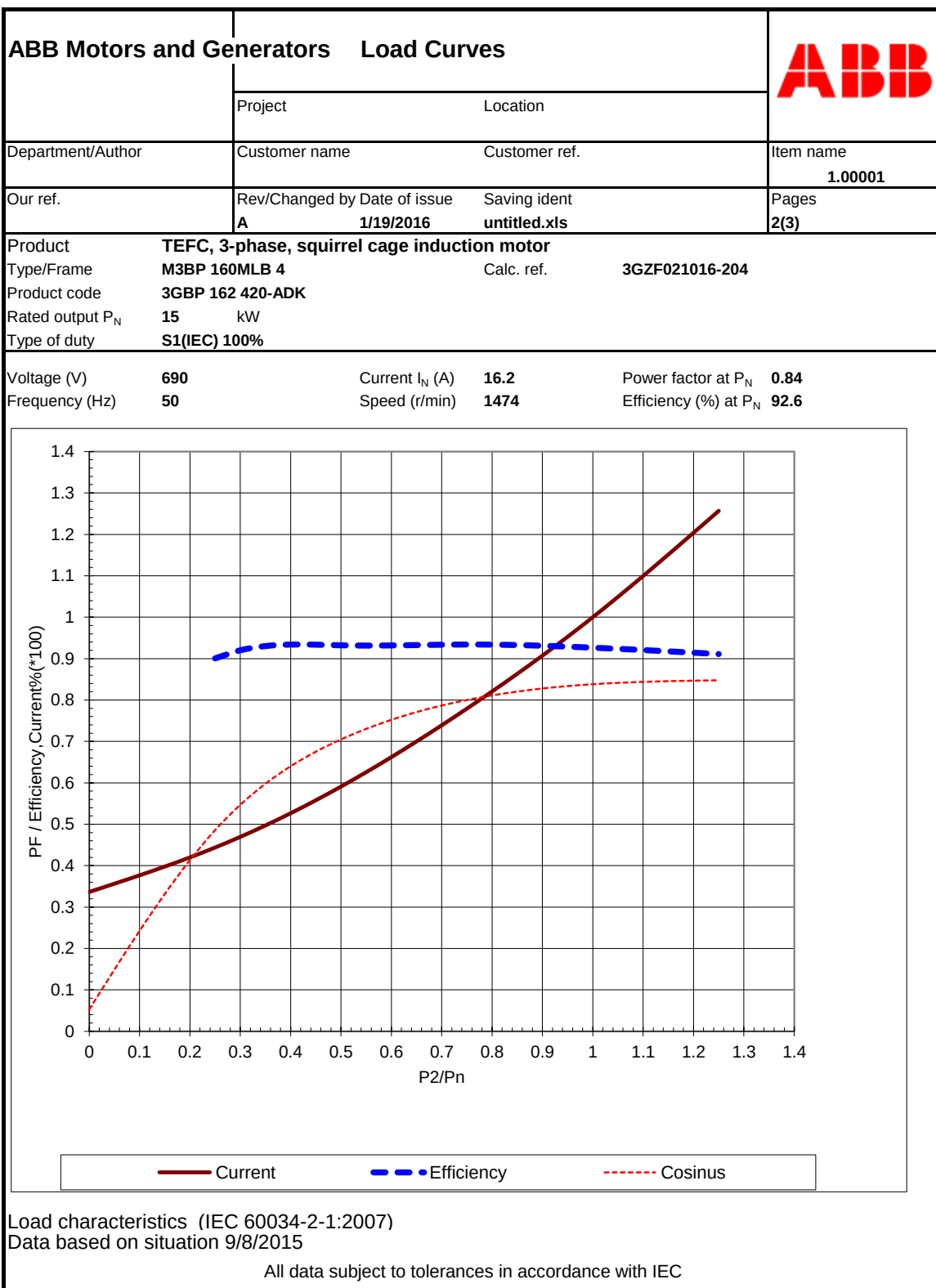


| ABB Motors and Generators                             |                                                                 | Technical Data Sheet - DOL                          |                                     |                                    |  |                |
|-------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------|-------------------------------------|------------------------------------|-------------------------------------------------------------------------------------|----------------|
| Project                                               |                                                                 | Location                                            |                                     |                                    |                                                                                     |                |
| Department/Author                                     | Customer name                                                   | Customer ref.                                       |                                     |                                    | Item name<br><b>1.00001</b>                                                         |                |
| Our ref.                                              | Rev/Changed by<br><b>A</b>                                      | Date of issue<br><b>1/19/2016</b>                   | Saving ident<br><b>untitled.xls</b> |                                    | Pages<br><b>1(3)</b>                                                                |                |
| No.                                                   | Definition                                                      | Data                                                | Unit                                | Remarks                            |                                                                                     |                |
| 1                                                     | Product                                                         | <b>TEFC, 3-phase, squirrel cage induction motor</b> |                                     |                                    |                                                                                     |                |
| 2                                                     | Product code                                                    | <b>EMM16154-PPN (3GBP162420-ADK+011+332+509)</b>    |                                     |                                    | Calc. ref.                                                                          | 3GZF021016-204 |
| 3                                                     | Type/Frame                                                      | <b>M3BP 160MLB 4</b>                                |                                     |                                    |                                                                                     |                |
| 4                                                     | Mounting                                                        | <b>IM1001, B3(foot)</b>                             |                                     |                                    |                                                                                     |                |
| 5                                                     | Rated output P <sub>N</sub>                                     | <b>15</b>                                           | kW                                  |                                    |                                                                                     |                |
| 6                                                     | Service factor                                                  | <b>1</b>                                            |                                     |                                    |                                                                                     |                |
| 7                                                     | Type of duty                                                    | <b>S1(IEC) 100%</b>                                 |                                     |                                    |                                                                                     |                |
| 8                                                     | Rated voltage U <sub>N</sub>                                    | <b>415</b>                                          | VD                                  | ± 5 % (IEC 60034-1)                |                                                                                     |                |
| 9                                                     | Rated frequency f <sub>N</sub>                                  | <b>50</b>                                           | Hz                                  | ± 2 % (IEC 60034-1)                |                                                                                     |                |
| 10                                                    | Rated speed n <sub>N</sub>                                      | <b>1477</b>                                         | r/min                               |                                    |                                                                                     |                |
| 11                                                    | Rated current I <sub>N</sub>                                    | <b>27.2</b>                                         | A                                   |                                    |                                                                                     |                |
| 12                                                    | No-load current                                                 | <b>10.4</b>                                         | A                                   |                                    |                                                                                     |                |
| 13                                                    | Starting current I <sub>s</sub> /I <sub>N</sub>                 | <b>8.4</b>                                          |                                     | Fullfilled IEC 60034-12 design N,H |                                                                                     |                |
| 14                                                    | Nominal torque T <sub>N</sub>                                   | <b>97</b>                                           | Nm                                  |                                    |                                                                                     |                |
| 15                                                    | Locked rotor torque T <sub>s</sub> /T <sub>N</sub>              | <b>3</b>                                            |                                     |                                    |                                                                                     |                |
| 16                                                    | Maximum torque T <sub>max</sub> /T <sub>N</sub>                 | <b>3.5</b>                                          |                                     |                                    |                                                                                     |                |
| 17                                                    | Minimum torque T <sub>min</sub> /T <sub>N</sub>                 | <b>2.1</b>                                          |                                     |                                    |                                                                                     |                |
| 18                                                    | Speed at minimum torque                                         | <b>300</b>                                          | r/min                               |                                    |                                                                                     |                |
| Load characteristics (IEC 60034-2-1:2007)             |                                                                 | Load %                                              | Current A                           | Efficiency %                       | Power factor                                                                        |                |
| 19                                                    | PLL determined from residual loss                               | <b>100</b>                                          | <b>27.2</b>                         | <b>92.7 / IE3</b>                  | <b>0.83</b>                                                                         |                |
| 20                                                    |                                                                 | <b>75</b>                                           | <b>21.5</b>                         | <b>93.4</b>                        | <b>0.78</b>                                                                         |                |
| 21                                                    |                                                                 | <b>50</b>                                           | <b>16.6</b>                         | <b>92.9</b>                        | <b>0.68</b>                                                                         |                |
| 22                                                    |                                                                 | <b>Start</b>                                        | <b>228</b>                          |                                    | <b>0.48</b>                                                                         |                |
| 23                                                    | Maximum starting time from hot                                  | <b>15</b>                                           | s                                   |                                    |                                                                                     |                |
| 24                                                    | Maximum starting time from cold                                 | <b>27</b>                                           | s                                   |                                    |                                                                                     |                |
| 25                                                    | Insulation class / Temperature class                            | <b>F / B</b>                                        |                                     |                                    |                                                                                     |                |
| 26                                                    | Ambient temperature                                             | <b>40</b>                                           | °C                                  |                                    |                                                                                     |                |
| 27                                                    | Altitude                                                        | <b>1000</b>                                         | m.a.s.l.                            |                                    |                                                                                     |                |
| 28                                                    | Enclosure                                                       | <b>IP55</b>                                         |                                     |                                    |                                                                                     |                |
| 29                                                    | Cooling system                                                  | <b>IC411 self ventilated</b>                        |                                     |                                    |                                                                                     |                |
| 30                                                    | Bearing DE/NDE                                                  | <b>6309/C3 - 6209/C3</b>                            |                                     |                                    |                                                                                     |                |
| 31                                                    | Type of Grease                                                  |                                                     |                                     |                                    |                                                                                     |                |
| 32                                                    | Sound pressure level (LP dB(A) 1m)                              | <b>62</b>                                           | dB(A)                               | at load                            |                                                                                     |                |
| 33                                                    | Moment of inertia J = ¼ GD <sup>2</sup>                         | <b>0.125</b>                                        | kg-m <sup>2</sup>                   |                                    |                                                                                     |                |
| 34                                                    | Balancing                                                       |                                                     |                                     |                                    |                                                                                     |                |
| 35                                                    | Vibration class                                                 |                                                     |                                     |                                    |                                                                                     |                |
| 36                                                    | Position of terminal box                                        | <b>Top</b>                                          |                                     |                                    |                                                                                     |                |
| 37                                                    | Terminal box entries; no, dimens.                               |                                                     |                                     |                                    |                                                                                     |                |
| 38                                                    | Number of power terminals                                       |                                                     |                                     |                                    |                                                                                     |                |
| 39                                                    | Direction of rotation                                           | <b>CW or CCW</b>                                    |                                     |                                    |                                                                                     |                |
| 40                                                    | Weight of rotor                                                 | <b>45</b>                                           | kg                                  |                                    |                                                                                     |                |
| 41                                                    | Total weight of motor                                           | <b>181</b>                                          | kg                                  |                                    |                                                                                     |                |
| 42                                                    | Dimension drawing no.                                           |                                                     |                                     |                                    |                                                                                     |                |
| 43                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| 44                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| 45                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| Ex-motors                                             |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| 46                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| 47                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| 48                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| Option Variant Codes / Definition                     |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| 49                                                    | 011 = Fulfilling CSA and NRCAN                                  |                                                     |                                     |                                    |                                                                                     |                |
| 50                                                    | 332 = Baldor Catalog number stamped on rating plate             |                                                     |                                     |                                    |                                                                                     |                |
| 51                                                    | 509 = Fulfilling EISA Subtype I efficiency requirements, CC031A |                                                     |                                     |                                    |                                                                                     |                |
| 52                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| Remarks:                                              |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| Data based on situation 9/8/2015                      |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| All data subject to tolerances in accordance with IEC |                                                                 |                                                     |                                     |                                    |                                                                                     |                |
| Guaranteed values on request                          |                                                                 |                                                     |                                     |                                    |                                                                                     |                |

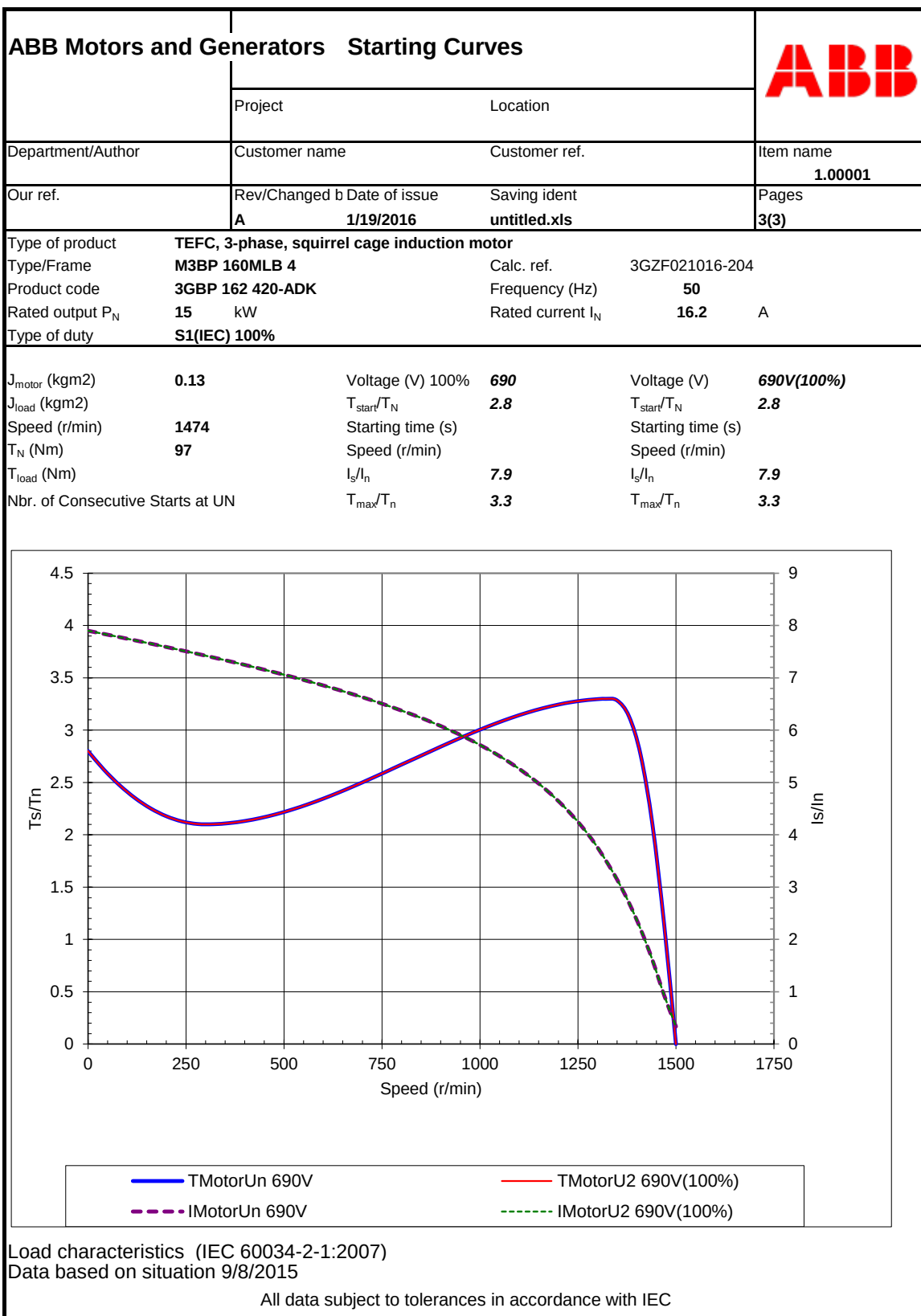




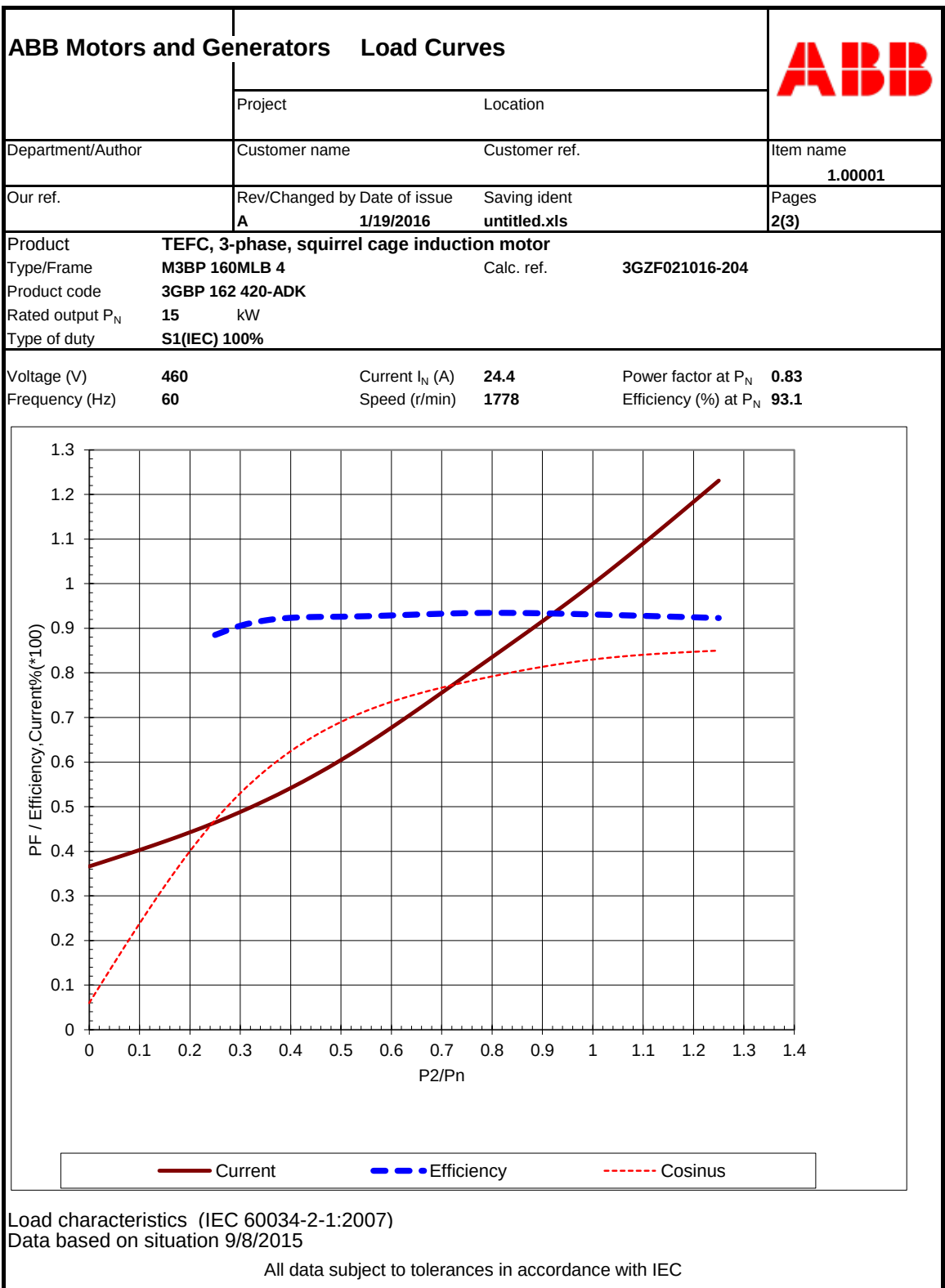
| ABB Motors and Generators                             |                                                                 | Technical Data Sheet - DOL                          |                                     |                                    |  |  |
|-------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------|-------------------------------------|------------------------------------|-------------------------------------------------------------------------------------|--|
| Project                                               |                                                                 | Location                                            |                                     |                                    |                                                                                     |  |
| Department/Author                                     | Customer name                                                   | Customer ref.                                       |                                     |                                    | Item name<br><b>1.00001</b>                                                         |  |
| Our ref.                                              | Rev/Changed by<br><b>A</b>                                      | Date of issue<br><b>1/19/2016</b>                   | Saving ident<br><b>untitled.xls</b> |                                    | Pages<br><b>1(3)</b>                                                                |  |
| No.                                                   | Definition                                                      | Data                                                | Unit                                | Remarks                            |                                                                                     |  |
| 1                                                     | Product                                                         | <b>TEFC, 3-phase, squirrel cage induction motor</b> |                                     |                                    |                                                                                     |  |
| 2                                                     | Product code                                                    | <b>EMM16154-PPN (3GBP162420-ADK+011+332+509)</b>    |                                     |                                    | Calc. ref. 3GZF021016-204                                                           |  |
| 3                                                     | Type/Frame                                                      | <b>M3BP 160MLB 4</b>                                |                                     |                                    |                                                                                     |  |
| 4                                                     | Mounting                                                        | <b>IM1001, B3(foot)</b>                             |                                     |                                    |                                                                                     |  |
| 5                                                     | Rated output P <sub>N</sub>                                     | <b>15</b>                                           | kW                                  |                                    |                                                                                     |  |
| 6                                                     | Service factor                                                  | <b>1</b>                                            |                                     |                                    |                                                                                     |  |
| 7                                                     | Type of duty                                                    | <b>S1(IEC) 100%</b>                                 |                                     |                                    |                                                                                     |  |
| 8                                                     | Rated voltage U <sub>N</sub>                                    | <b>690</b>                                          | VY                                  | ± 5 % (IEC 60034-1)                |                                                                                     |  |
| 9                                                     | Rated frequency f <sub>N</sub>                                  | <b>50</b>                                           | Hz                                  | ± 2 % (IEC 60034-1)                |                                                                                     |  |
| 10                                                    | Rated speed n <sub>N</sub>                                      | <b>1474</b>                                         | r/min                               |                                    |                                                                                     |  |
| 11                                                    | Rated current I <sub>N</sub>                                    | <b>16.2</b>                                         | A                                   |                                    |                                                                                     |  |
| 12                                                    | No-load current                                                 | <b>5.4</b>                                          | A                                   |                                    |                                                                                     |  |
| 13                                                    | Starting current I <sub>s</sub> /I <sub>N</sub>                 | <b>7.9</b>                                          |                                     | Fullfilled IEC 60034-12 design N,H |                                                                                     |  |
| 14                                                    | Nominal torque T <sub>N</sub>                                   | <b>97</b>                                           | Nm                                  |                                    |                                                                                     |  |
| 15                                                    | Locked rotor torque T <sub>s</sub> /T <sub>N</sub>              | <b>2.8</b>                                          |                                     |                                    |                                                                                     |  |
| 16                                                    | Maximum torque T <sub>max</sub> /T <sub>N</sub>                 | <b>3.3</b>                                          |                                     |                                    |                                                                                     |  |
| 17                                                    | Minimum torque T <sub>min</sub> /T <sub>N</sub>                 | <b>2.1</b>                                          |                                     |                                    |                                                                                     |  |
| 18                                                    | Speed at minimum torque                                         | <b>300</b>                                          | r/min                               |                                    |                                                                                     |  |
| Load characteristics (IEC 60034-2-1:2007)             |                                                                 | Load %                                              | Current A                           | Efficiency %                       | Power factor                                                                        |  |
| 19                                                    | PLL determined from residual loss                               | <b>100</b>                                          | <b>16.2</b>                         | <b>92.6 / IE3</b>                  | <b>0.84</b>                                                                         |  |
| 20                                                    |                                                                 | <b>75</b>                                           | <b>12.6</b>                         | <b>93.4</b>                        | <b>0.8</b>                                                                          |  |
| 21                                                    |                                                                 | <b>50</b>                                           | <b>9.6</b>                          | <b>93.2</b>                        | <b>0.7</b>                                                                          |  |
| 22                                                    |                                                                 | <b>Start</b>                                        | <b>128</b>                          |                                    | <b>0.47</b>                                                                         |  |
| 23                                                    | Maximum starting time from hot                                  | <b>15</b>                                           | s                                   |                                    |                                                                                     |  |
| 24                                                    | Maximum starting time from cold                                 | <b>27</b>                                           | s                                   |                                    |                                                                                     |  |
| 25                                                    | Insulation class / Temperature class                            | <b>F / B</b>                                        |                                     |                                    |                                                                                     |  |
| 26                                                    | Ambient temperature                                             | <b>40</b>                                           | °C                                  |                                    |                                                                                     |  |
| 27                                                    | Altitude                                                        | <b>1000</b>                                         | m.a.s.l.                            |                                    |                                                                                     |  |
| 28                                                    | Enclosure                                                       | <b>IP55</b>                                         |                                     |                                    |                                                                                     |  |
| 29                                                    | Cooling system                                                  | <b>IC411 self ventilated</b>                        |                                     |                                    |                                                                                     |  |
| 30                                                    | Bearing DE/NDE                                                  | <b>6309/C3 - 6209/C3</b>                            |                                     |                                    |                                                                                     |  |
| 31                                                    | Type of Grease                                                  |                                                     |                                     |                                    |                                                                                     |  |
| 32                                                    | Sound pressure level (LP dB(A) 1m)                              | <b>62</b>                                           | dB(A)                               | at load                            |                                                                                     |  |
| 33                                                    | Moment of inertia J = ¼ GD <sup>2</sup>                         | <b>0.125</b>                                        | kg-m <sup>2</sup>                   |                                    |                                                                                     |  |
| 34                                                    | Balancing                                                       |                                                     |                                     |                                    |                                                                                     |  |
| 35                                                    | Vibration class                                                 |                                                     |                                     |                                    |                                                                                     |  |
| 36                                                    | Position of terminal box                                        | <b>Top</b>                                          |                                     |                                    |                                                                                     |  |
| 37                                                    | Terminal box entries; no, dimens.                               |                                                     |                                     |                                    |                                                                                     |  |
| 38                                                    | Number of power terminals                                       |                                                     |                                     |                                    |                                                                                     |  |
| 39                                                    | Direction of rotation                                           | <b>CW or CCW</b>                                    |                                     |                                    |                                                                                     |  |
| 40                                                    | Weight of rotor                                                 | <b>45</b>                                           | kg                                  |                                    |                                                                                     |  |
| 41                                                    | Total weight of motor                                           | <b>181</b>                                          | kg                                  |                                    |                                                                                     |  |
| 42                                                    | Dimension drawing no.                                           |                                                     |                                     |                                    |                                                                                     |  |
| 43                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| 44                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| 45                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| Ex-motors                                             |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| 46                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| 47                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| 48                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| Option Variant Codes / Definition                     |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| 49                                                    | 011 = Fulfilling CSA and NRCAN                                  |                                                     |                                     |                                    |                                                                                     |  |
| 50                                                    | 332 = Baldor Catalog number stamped on rating plate             |                                                     |                                     |                                    |                                                                                     |  |
| 51                                                    | 509 = Fulfilling EISA Subtype I efficiency requirements, CC031A |                                                     |                                     |                                    |                                                                                     |  |
| 52                                                    |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| Remarks:                                              |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| Data based on situation 9/8/2015                      |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| All data subject to tolerances in accordance with IEC |                                                                 |                                                     |                                     |                                    |                                                                                     |  |
| Guaranteed values on request                          |                                                                 |                                                     |                                     |                                    |                                                                                     |  |







| ABB Motors and Generators                             |                                                                 | Technical Data Sheet - DOL                   |           |                                   |  |  |
|-------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------|-----------|-----------------------------------|-------------------------------------------------------------------------------------|--|
|                                                       |                                                                 | Project                                      |           | Location                          |                                                                                     |  |
| Department/Author                                     |                                                                 | Customer name                                |           | Customer ref.                     |                                                                                     |  |
| Our ref.                                              |                                                                 | Rev/Changed by<br>A                          |           | Date of issue<br>1/19/2016        |                                                                                     |  |
|                                                       |                                                                 | Saving ident<br>untitled.xls                 |           | Pages<br>1(3)                     |                                                                                     |  |
| No.                                                   | Definition                                                      | Data                                         | Unit      | Remarks                           |                                                                                     |  |
| 1                                                     | Product                                                         | TEFC, 3-phase, squirrel cage induction motor |           |                                   |                                                                                     |  |
| 2                                                     | Product code                                                    | EMM16154-PPN (3GBP162420-ADK+011+332+509)    |           |                                   | Calc. ref. 3GZF021016-204                                                           |  |
| 3                                                     | Type/Frame                                                      | M3BP 160MLB 4                                |           |                                   |                                                                                     |  |
| 4                                                     | Mounting                                                        | IM1001, B3(foot)                             |           |                                   |                                                                                     |  |
| 5                                                     | Rated output P <sub>N</sub>                                     | 15                                           | kW        |                                   |                                                                                     |  |
| 6                                                     | Service factor                                                  | 1                                            |           |                                   |                                                                                     |  |
| 7                                                     | Type of duty                                                    | S1(IEC) 100%                                 |           |                                   |                                                                                     |  |
| 8                                                     | Rated voltage U <sub>N</sub>                                    | 460                                          | VD        | ± 5 % (IEC 60034-1)               |                                                                                     |  |
| 9                                                     | Rated frequency f <sub>N</sub>                                  | 60                                           | Hz        | ± 2 % (IEC 60034-1)               |                                                                                     |  |
| 10                                                    | Rated speed n <sub>N</sub>                                      | 1778                                         | r/min     |                                   |                                                                                     |  |
| 11                                                    | Rated current I <sub>N</sub>                                    | 24.4                                         | A         |                                   |                                                                                     |  |
| 12                                                    | No-load current                                                 | 8.9                                          | A         |                                   |                                                                                     |  |
| 13                                                    | Starting current I <sub>s</sub> /I <sub>N</sub>                 | 8.9                                          |           | Fulfilled IEC 60034-12 design N,H |                                                                                     |  |
| 14                                                    | Nominal torque T <sub>N</sub>                                   | 81                                           | Nm        |                                   |                                                                                     |  |
| 15                                                    | Locked rotor torque T <sub>s</sub> /T <sub>N</sub>              | 3                                            |           |                                   |                                                                                     |  |
| 16                                                    | Maximum torque T <sub>max</sub> /T <sub>N</sub>                 | 3.7                                          |           |                                   |                                                                                     |  |
| 17                                                    | Minimum torque T <sub>min</sub> /T <sub>N</sub>                 | 2.3                                          |           |                                   |                                                                                     |  |
| 18                                                    | Speed at minimum torque                                         | 360                                          | r/min     |                                   |                                                                                     |  |
| Load characteristics (IEC 60034-2-1:2007)             |                                                                 | Load %                                       | Current A | Efficiency %                      | Power factor                                                                        |  |
| 19                                                    | PLL determined from residual loss                               | 100                                          | 24.4      | 93.1 / IE3                        | 0.83                                                                                |  |
| 20                                                    |                                                                 | 75                                           | 19.4      | 93.4                              | 0.78                                                                                |  |
| 21                                                    |                                                                 | 50                                           | 14.7      | 92.6                              | 0.69                                                                                |  |
| 22                                                    |                                                                 | Start                                        | 217       |                                   | 0.44                                                                                |  |
| 23                                                    | Maximum starting time from hot                                  | 15                                           | s         |                                   |                                                                                     |  |
| 24                                                    | Maximum starting time from cold                                 | 27                                           | s         |                                   |                                                                                     |  |
| 25                                                    | Insulation class / Temperature class                            | F / B                                        |           |                                   |                                                                                     |  |
| 26                                                    | Ambient temperature                                             | 40                                           | °C        |                                   |                                                                                     |  |
| 27                                                    | Altitude                                                        | 1000                                         | m.a.s.l.  |                                   |                                                                                     |  |
| 28                                                    | Enclosure                                                       | IP55                                         |           |                                   |                                                                                     |  |
| 29                                                    | Cooling system                                                  | IC411 self ventilated                        |           |                                   |                                                                                     |  |
| 30                                                    | Bearing DE/NDE                                                  | 6309/C3 - 6209/C3                            |           |                                   |                                                                                     |  |
| 31                                                    | Type of Grease                                                  |                                              |           |                                   |                                                                                     |  |
| 32                                                    | Sound pressure level (LP dB(A) 1m)                              | 70                                           | dB(A)     | at load                           |                                                                                     |  |
| 33                                                    | Moment of inertia J = ¼ GD2                                     | 0.125                                        | kg-m2     |                                   |                                                                                     |  |
| 34                                                    | Balancing                                                       |                                              |           |                                   |                                                                                     |  |
| 35                                                    | Vibration class                                                 |                                              |           |                                   |                                                                                     |  |
| 36                                                    | Position of terminal box                                        | Top                                          |           |                                   |                                                                                     |  |
| 37                                                    | Terminal box entries; no, dimens.                               |                                              |           |                                   |                                                                                     |  |
| 38                                                    | Number of power terminals                                       |                                              |           |                                   |                                                                                     |  |
| 39                                                    | Direction of rotation                                           | CW or CCW                                    |           |                                   |                                                                                     |  |
| 40                                                    | Weight of rotor                                                 | 45                                           | kg        |                                   |                                                                                     |  |
| 41                                                    | Total weight of motor                                           | 181                                          | kg        |                                   |                                                                                     |  |
| 42                                                    | Dimension drawing no.                                           |                                              |           |                                   |                                                                                     |  |
| 43                                                    |                                                                 |                                              |           |                                   |                                                                                     |  |
| 44                                                    |                                                                 |                                              |           |                                   |                                                                                     |  |
| 45                                                    |                                                                 |                                              |           |                                   |                                                                                     |  |
| Ex-motors                                             |                                                                 |                                              |           |                                   |                                                                                     |  |
| 46                                                    |                                                                 |                                              |           |                                   |                                                                                     |  |
| 47                                                    |                                                                 |                                              |           |                                   |                                                                                     |  |
| 48                                                    |                                                                 |                                              |           |                                   |                                                                                     |  |
| Option Variant Codes / Definition                     |                                                                 |                                              |           |                                   |                                                                                     |  |
| 49                                                    | 011 = Fulfilling CSA and NRCAN                                  |                                              |           |                                   |                                                                                     |  |
| 50                                                    | 332 = Baldor Catalog number stamped on rating plate             |                                              |           |                                   |                                                                                     |  |
| 51                                                    | 509 = Fulfilling EISA Subtype I efficiency requirements, CC031A |                                              |           |                                   |                                                                                     |  |
| 52                                                    |                                                                 |                                              |           |                                   |                                                                                     |  |
| Remarks:                                              |                                                                 |                                              |           |                                   |                                                                                     |  |
| Data based on situation 9/8/2015                      |                                                                 |                                              |           |                                   |                                                                                     |  |
| All data subject to tolerances in accordance with IEC |                                                                 |                                              |           |                                   |                                                                                     |  |
| Guaranteed values on request                          |                                                                 |                                              |           |                                   |                                                                                     |  |



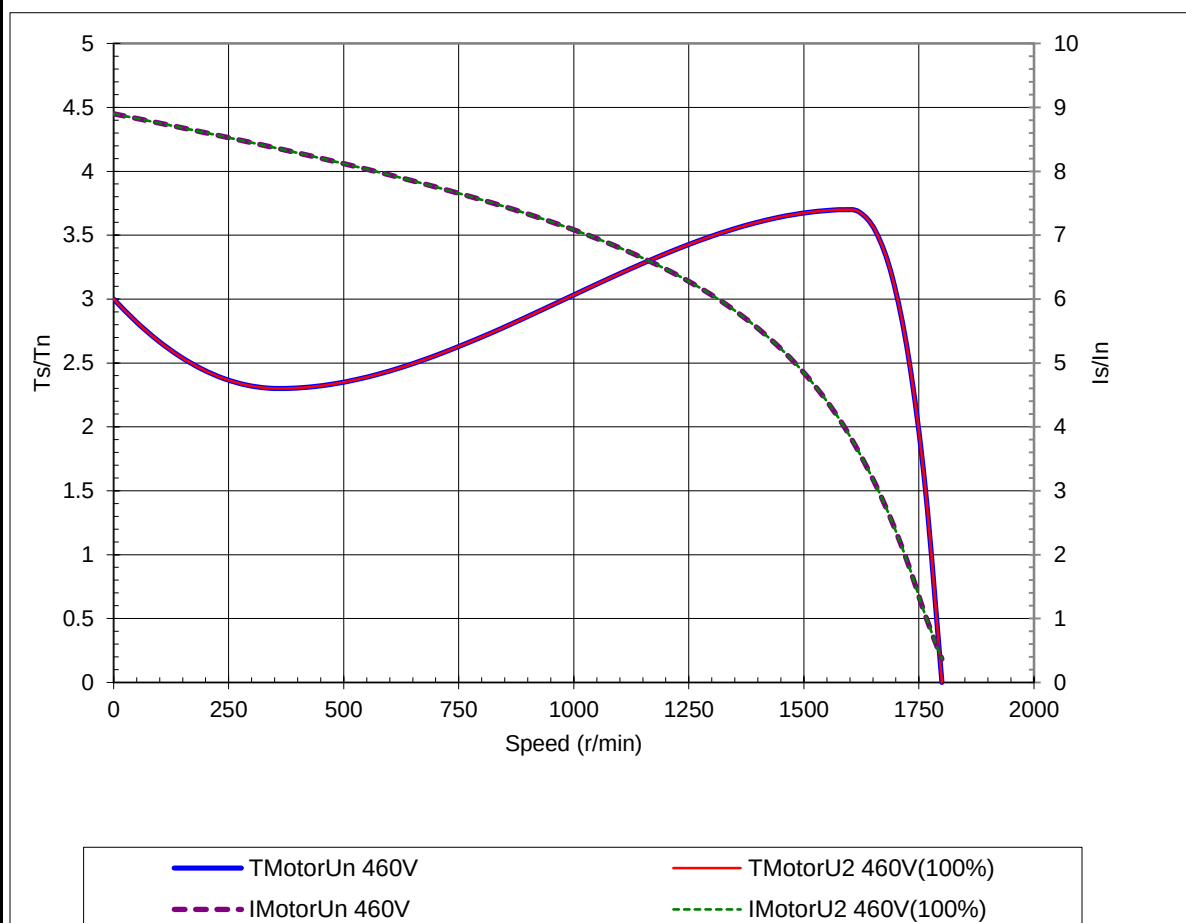
# ABB Motors and Generators Starting Curves



|                   |                             |                     |                |
|-------------------|-----------------------------|---------------------|----------------|
|                   | Project                     | Location            |                |
| Department/Author | Customer name               | Customer ref.       | Item name      |
|                   |                             |                     | <b>1.00001</b> |
| Our ref.          | Rev/Changed b Date of issue | Saving ident        | Pages          |
|                   | <b>A 1/19/2016</b>          | <b>untitled.xls</b> | <b>3(3)</b>    |

|                    |                                                     |                     |                |
|--------------------|-----------------------------------------------------|---------------------|----------------|
| Type of product    | <b>TEFC, 3-phase, squirrel cage induction motor</b> |                     |                |
| Type/Frame         | <b>M3BP 160MLB 4</b>                                | Calc. ref.          | 3GZF021016-204 |
| Product code       | <b>3GBP 162 420-ADK</b>                             | Frequency (Hz)      | <b>60</b>      |
| Rated output $P_N$ | <b>15 kW</b>                                        | Rated current $I_N$ | <b>24.4 A</b>  |
| Type of duty       | <b>S1(IEC) 100%</b>                                 |                     |                |

|                                  |             |                   |            |                   |                   |
|----------------------------------|-------------|-------------------|------------|-------------------|-------------------|
| $J_{motor}$ (kgm <sup>2</sup> )  | <b>0.13</b> | Voltage (V) 100%  | <b>460</b> | Voltage (V)       | <b>460V(100%)</b> |
| $J_{load}$ (kgm <sup>2</sup> )   |             | $T_{start}/T_N$   | <b>3</b>   | $T_{start}/T_N$   | <b>3</b>          |
| Speed (r/min)                    | <b>1778</b> | Starting time (s) |            | Starting time (s) |                   |
| $T_N$ (Nm)                       | <b>81</b>   | Speed (r/min)     |            | Speed (r/min)     |                   |
| $T_{load}$ (Nm)                  |             | $I_s/I_N$         | <b>8.9</b> | $I_s/I_N$         | <b>8.9</b>        |
| Nbr. of Consecutive Starts at UN |             | $T_{max}/T_N$     | <b>3.7</b> | $T_{max}/T_N$     | <b>3.7</b>        |



Load characteristics (IEC 60034-2-1:2007)  
Data based on situation 9/8/2015

All data subject to tolerances in accordance with IEC