



### *Data sheet for motors*

|  |                         |   |  |  |                            |           |
|--|-------------------------|---|--|--|----------------------------|-----------|
| Manufacturer   | Bharat Bijlee Ltd.      |   | Customer   |  |                            |           |
| Type of motor  | 3 phase Induction Motor |   | BBL Enquiry reference No   |  |                            |           |
| Quantity   |                         |   | Customer P.O.Number  |  |                            |           |
| Application  | CUSTOMER TO FURNISH     |   | W.O. No. / SAP No.   |  |                            |           |
| Tag no.  |                         |   | Output kW / Pole   |  | 9.3                        | / 4P      |
| BBL type Ref.  |                         | MD16M4A3                                | Frame size   |  | MJ160                      |           |
| Installation details   |                         |   | Applicable standards (latest edition)  |  |                            |           |
| Area classification (Safe / Hazardous)   |                         | Hazardous area                          | Performance: IS/IEC 60034-1 Maintenance IS:900                               |  | FLP Motors: IS/IEC 60079-1 |           |
| Location: indoor/outdoor/deck  |                         | Indoor                                  | Dimensions: IS 1231/IS 2223/IS:8223  |  |                            |           |
| Altitude (meters)  |                         | 1000 or less                            | Vibrations: IS 12075   |  |                            |           |
|  |                         |   | Noise level: IS 12065  |  |                            |           |
| Hazardous area details   |                         |   | Supply conditions and permissible variations (grid supply)                   |  |                            |           |
| Area classification GAS (Zone 1/Zone 2)  |                         | ZONE I                                  | Number of phases   |  | Three                      |           |
| Gas group  |                         | IIA, IIB                                | Voltage (Volts) and permissible variation                                    |  | 415                        | ±10%      |
| Temp.class   |                         | T5                                      | Frequency (Hz) and permissible variation                                     |  | 50                         | ±5%       |
| Type of Explosion protection (FLP/Type 'a'/Type 'b')   |                         | Ex 'd'                                  | Combined variation (absolute sum)  |  | ±10%                       |           |
| Approving authority for hazardous area   |                         | If Mine application then DGMS else PESO |  |  |                            |           |
| Electrical parameters  |                         |   |  |  |                            |           |
| Starting performance   |                         |   |  |  |                            |           |
| Method of starting   |                         | DOL                                     | Starting current (%FLC)  |  | 600                        |           |
| Load speed (rpm)   |                         | CUSTOMER TO FURNISH                     | Starting torque (%FLT)   |  | 200                        |           |
| Motor GD <sup>2</sup> (kgm <sup>2</sup> )  |                         | 0.141                                   | Pull out torque (%FLT)   |  | 250                        |           |
| Load GD <sup>2</sup> (kgm <sup>2</sup> )   |                         | CUSTOMER TO FURNISH                     | Locked rotor withstand time (hot/cold) (sec)                                 |  | 8                          | / 16      |
| Load torque-speed curve  |                         | Parabolic TS curve                      | Number of consecutive starts (hot/cold) (nos.) provided Load GD2 = Motor GD2 |  | 2 / 3                      |           |
| Starting time at rated voltage (sec)   |                         | PLEASE FURNISH ALL ABOVE DETAILS        |  |  |                            |           |
| Running Performance  |                         |   |  |  |                            |           |
| Efficiency class   |                         | -                                       | Duty and designation   |  | Continuous (S1)            |           |
| Ambient temp./temp.rise by resistance (deg.C)  |                         | 45 / 75                                 | CDF/Equivalent starts per hour/FI  |  | -                          |           |
| Enclosure  |                         | TEFC (TOTALLY ENCLOSED FAN COOLED)      | Insulation class / utilisation class on DOL                                  |  | F/B                        |           |
| Full load current (FLC) amps.  |                         | 17.4                                    | Rotor type (Squirrel Cage/ Slip ring )                                       |  | Squirrel Cage              |           |
| Full load speed (rpm)  |                         | 1450                                    | Rotor voltage/rotor current (RV/RA) (Volts/Amps)                             |  | Not applicable             |           |
| Full load torque (FLT) kg-m  |                         | 6.25                                    | Stator/rotor time constant (min)   |  | 90/122                     |           |
| Efficiency in % at FL/0.75FL/0.5FL   |                         | 88.5 88.0 87.0                          | Power factor at FL/0.75FL/0.5FL  |  | 0.84                       | 0.80 0.72 |
| Mechanical parameters  |                         |   |  |  |                            |           |
| Mounting   |                         | B3                                      | Mounting dimensions  |  | Refer GA drawing           |           |
| Shaft extention  |                         | Single cylindrical                      | Direction of rotation viewed from DE   |  | Clockwise                  |           |
| Degree of protection   |                         | IP 55                                   | Suitable for bidirectional rotation  |  | Yes                        |           |
| Method of cooling (TEFC/forced cooled/TESC)  |                         | TEFC (IC 411)                           | Paint type   |  | Acid Alkali Proof          |           |
| Net weight of motor (kg)   |                         | 136                                     | Paint shade  |  | 632 as per IS 5            |           |
|  |                         |   | Earthing provision (two terminals on stator body)                            |  | Yes                        |           |
| Bearings   |                         |   | Terminal box   |  |                            |           |
| Coupling (Direct/flexible/Belt & Pulley/Gearbox)   |                         | Direct                                  | Terminal box location when viewed from DE                                    |  | As per GA drawing          |           |
| Dimenssions of pulley (OD x width) mm  |                         | -                                       | Direction of cable entry   |  | As per GA drawing          |           |
| Bearings (roller/ball/angular contact)   |                         | Ball /Ball                              | Cable size and type(Aluminium)   |  | 2R X 3C X 35 SQ MM         |           |
| Bearing size DE/NDE  |                         | 6209 2Z C3/6209 2Z C3                   | Earthing provision (one terminal in TB)                                      |  | Yes                        |           |
| Type of lubrication  |                         | LITHIUM SOAP BASE GREASE                | No of phase/winding connection/number of terminals                           |  | 3 / DELTA / 6              |           |
| Accessories  |                         |   |  |  |                            |           |
| RTDs - 3 numbers simplex(w/o controller)   |                         |   | Arrow plate for direction of rotation  |  |                            |           |
| BTDs - 1 number per bearing(w/o controller)  |                         |   | Double compression glands (main cable)                                       |  |                            |           |
| Space heaters - single phase 50z, 230V   |                         |   | Double compression glands (Space heater/Thermisters/RTDs)                    |  |                            |           |
| Thermisters - PTC  |                         |   | Brake (Type/voltage/torque)  |  |                            |           |
| Additional T-Box for Accessories   |                         |   |  |  |                            |           |
| Additional nameplate   |                         |   |  |  |                            |           |
| Notes:   |                         |   |  |  |                            |           |
| 1) All performance values are subject to IS/IEC 60034-1 tolerances, unless otherwise specified.          |                         |   |  |  |                            |           |
| 2) Performance values are at rated voltage and rated frequency condition and for DOL starting condition. |                         |   |  |  |                            |           |
| 3) Motor GD <sup>2</sup> = Load GD <sup>2</sup> assumed wherever not mentioned.                          |                         |   |  |  |                            |           |
| 4) Where starting time is more than 10 seconds, provision of heavy duty relays is mandatory.             |                         |   |  |  |                            |           |
| 5) Kilowatt rating is mandatory and HP is approximate.   |                         |   |  |  |                            |           |
| 6) Accessories provided are marked as "YES"  |                         |   |  |  |                            |           |
|  |                         |   |  |  | Prepared by                |           |
|  |                         |   |  |  | Approved by                |           |

|            |  |                   |  |          |  |
|------------|--|-------------------|--|----------|--|
|            |  |                   |  | Revision |  |
| Project:   |  | Contractor/Client |  | Date:    |  |
| Consultant |  | Package           |  |          |  |