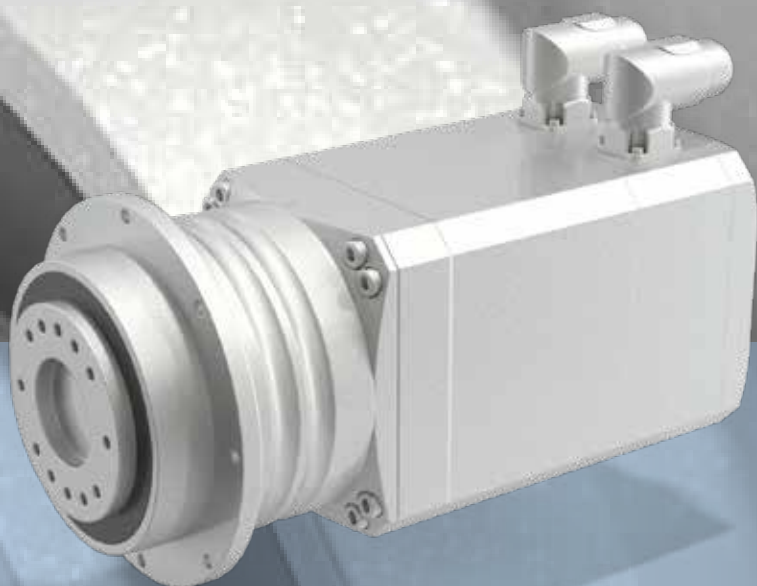




# BMS SERIES

Precision Planetary Servo Gear Motor

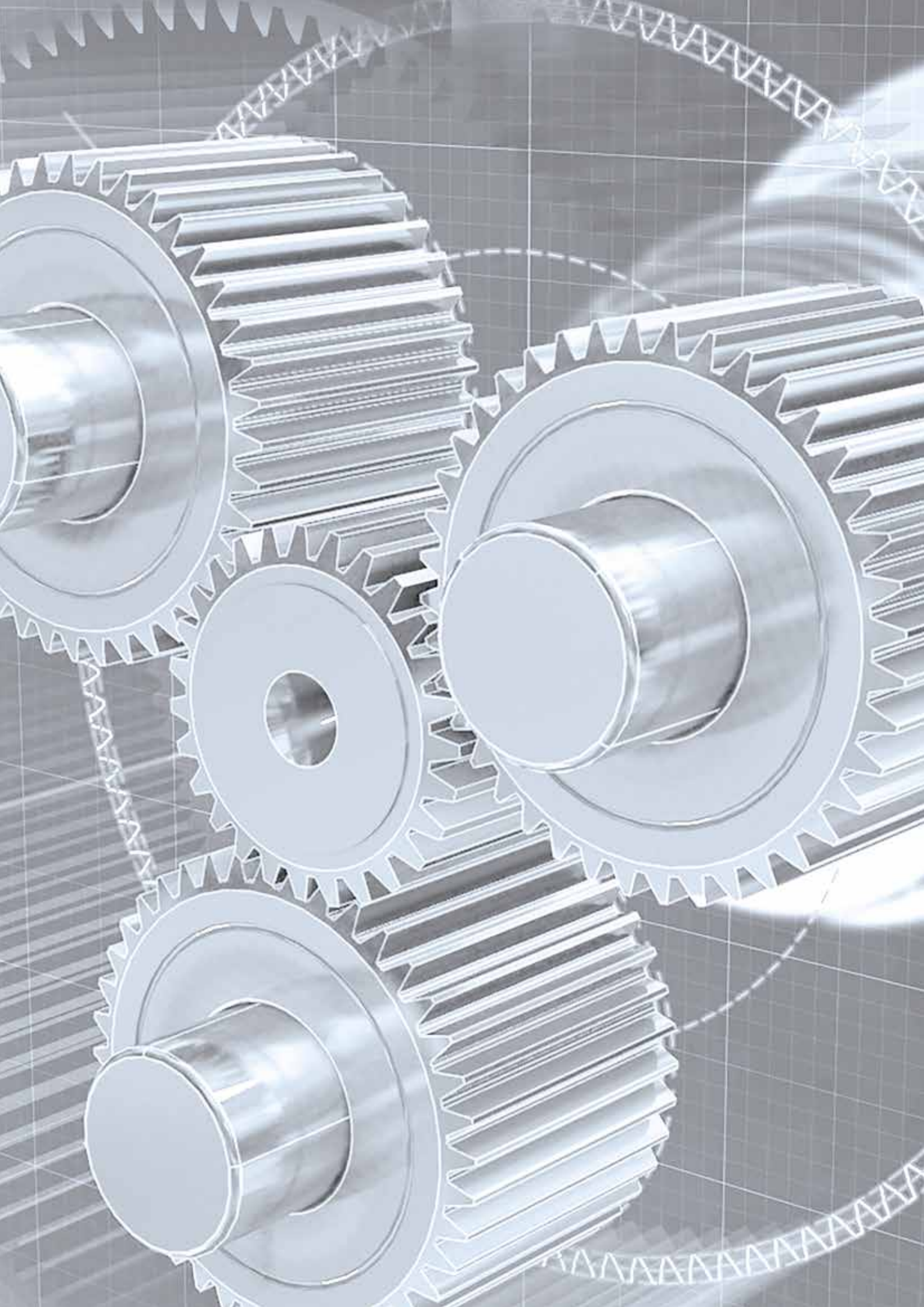
 **Bonfiglioli**



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# THE HIGHEST LEVEL OF PRECISION, EFFICIENCY AND ENERGY OPTIMIZATION

With almost 20 years of experience in creating tailored and forward-thinking motion control systems, Bonfiglioli has proven being a reliable partner as **one-stop shop for mechatronic applications** in industrial automation.

Bonfiglioli engineering specialists work side by side with customers to develop dedicated integrated solutions, covering the entire motion drive train according to an **Industry 4.0 approach**.

Thanks to the extensive know-how and the long-term collaboration with key customers, our two centers of excellence, located in Italy and Germany, develop **breakthrough mechatronic innovations**, including low backlash planetary gearboxes, servomotors, open and closed loop inverters, servo drives and energy regenerative units.

This, combined with a comprehensive range of **Professional Services**, enables us to respond to customers' requests by:

- providing **user friendly, plug & play solutions**
- **increasing** applications' **efficiency** and **productivity**
- designing **flexible, modular solutions** targeted to a wide range of applications
- granting access to real time data for **diagnostic, maintenance** and **predictive analytics**



ASSESSMENT &  
RECOMMENDATION



ENGINEERING &  
PLANNING



INSTALLATION &  
COMMISSIONING



RETROFIT &  
UPGRADE



MAINTENANCE &  
REPAIR

## Fully committed to the efficiency of customers' system over its life cycle

Bonfiglioli technical sales experts support customers with a proactive, flexible and dedicated approach **throughout the system's entire life cycle**.

- **Assessment and recommendation:** our team provides support starting from the very early stage of the project by assessing the requirements and developing a targeted analysis of the application, guiding customers in the choice of the most suitable components for their drive solution.
- **Engineering and planning:** our experts work with customers to co-engineer their application, offering consultancy in sizing, fine tuning and selecting the optimized drive train, always considering life cycle cost optimization.
- **Installation and commissioning:** we partner with our customers to ensure a quick, cost-effective and successful installation, optimizing the benefits and functions of their drive technology.
- **Retrofit and upgrade:** we update customers' machines with state-of-the-art technology to ensure constant levels of productivity, reliability and performance.
- **Maintenance and repair:** we work side by side with customers to avoid failures, reduce down times and ensure the best system operation.



# A COMPLETE INTEGRATED SOLUTION FOR ALL INDUSTRIAL APPLICATIONS

Our engineering specialists **work side by side with customers** to create the most effective solution, whether the request is to optimize an existing machine or to develop a new one. Our relationship with customers is based on an **active partnership** with fast decision-making processes to develop individually tailored offers.

Our full-range and modular offering provides the necessary products for the development of vertically integrated solutions in **a variety of sectors**, such as material handling, automated storage, textile and packaging. Our team of experts assists customers in designing cost effective and energy efficient machines, aligning performance to meet the specific requirements.



## A complete integrated solution

- Precision Planetary Gearboxes
- Industrial Gearboxes
- Permanent Magnet Synchronous Motors
- Synchronous Reluctance Motors
- Asynchronous Motors
- Servo Inverters
- Frequency Inverters
- Energy Regenerative Inverters
- Motion Control
- Industry 4.0 solutions

## Industry sector expertise



MATERIAL HANDLING



HOIST & CRANES



FOOD & BEVERAGE



AUTOMATED WAREHOUSE



PACKAGING



TEXTILES



MATERIAL WORKING

# BONFIGLIOLI DIGITAL TOOLS

Thanks to a powerful set of **software tools** and **online platforms**, developed through partnerships with the main market leaders, Bonfiglioli enables its customers to **engineer tailored applications** in a smooth and productive way: the components selection and sizing, as well as the design of the whole motion drive train, are made simpler and more reliable.

In addition, thanks to its in-depth knowledge of industrial solutions, **Bonfiglioli engineering team is ready to assist customers** in their selection and design process, providing high quality technical support for specific application developments.



## SERVOsoft | Develop optimized solutions

Bonfiglioli and SERVOsoft® work together to **support customers in sizing complete multi-axis servo systems**, including motors, gearboxes and servodrives with 15 mechanisms and up to 50 axes in a shared bus or standalone configuration.

With the Bonfiglioli products available on SERVOsoft, customers are able to select, size and design their customized and high performance applications.

In addition, the Bonfiglioli engineering team, thanks to its in-depth knowledge of the products, uses the high level servosizing tool SERVOsoft® to provide a **top level customer support** service by developing **optimized, energy-efficient and tailored engineering solutions** to meet individual needs.



## MOSAICO | Product configuration and order assistant

Bonfiglioli's **complete e-business system** guides customers, distributors and agents through the process of **selecting the right product** for their specific needs, and provides support for **design activities** and **order management**, greatly accelerating the selection and ordering process and improving accuracy.

Thanks to this web-based technology, customers can get in touch with Bonfiglioli technical service any time from anywhere around the world.



## EPLAN | Enhance your electrical design

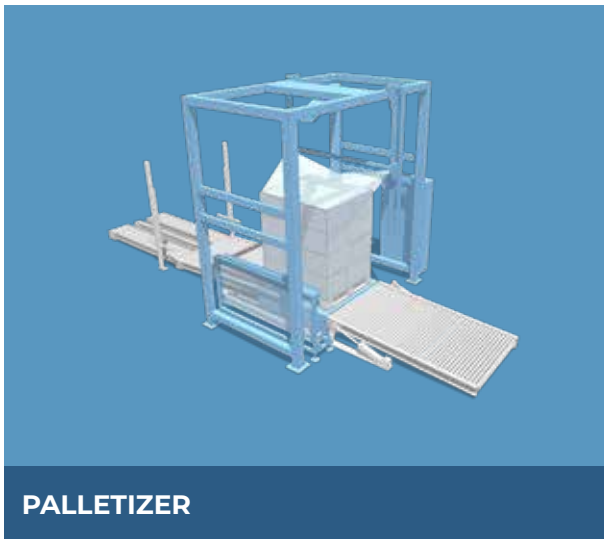
Bonfiglioli and EPLAN work together to **provide efficient engineering solutions**, aimed at reducing the gap between the initial concept and its development, programming and commissioning, thanks to:

- Always up-to-date device data and documentation
- Easy drag and drop function to develop optimized electrical drawings

# THE RIGHT SOLUTION FOR A WIDE SPECTRUM OF APPLICATIONS

Whether in material handling, automated storage, packaging, textile or automation technology, our precision planetary servo gearmotors are **optimized for numerous applications**.

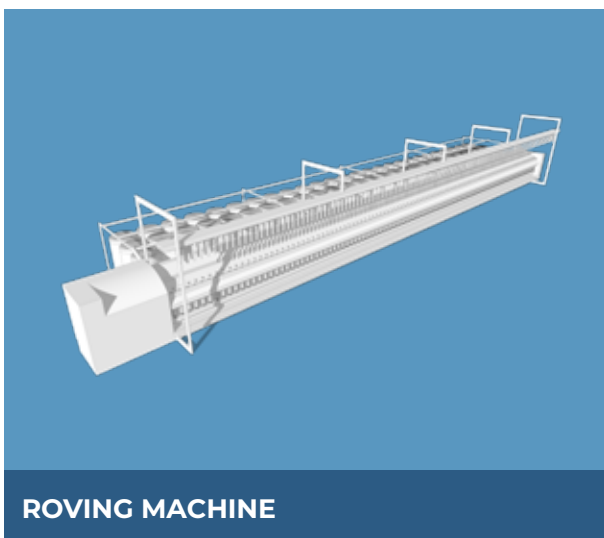
Our offer expands far beyond standard, providing the **right solutions tailored to customers' needs** in terms of performance and price.



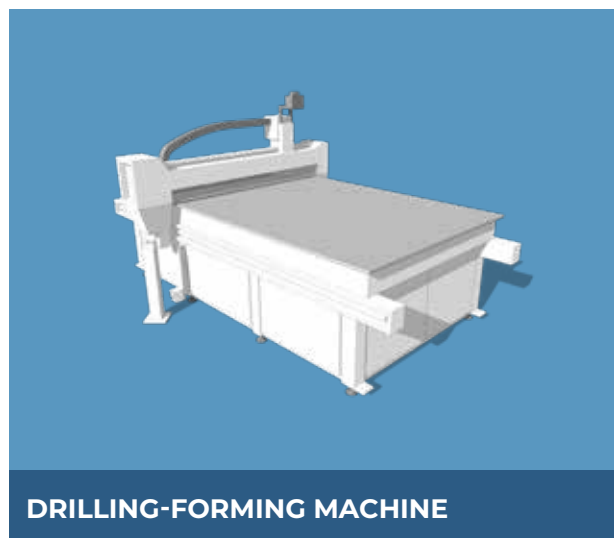
**PALLETIZER**



**AUTOMATED STORAGE**



**ROVING MACHINE**



**DRILLING-FORMING MACHINE**



# TECHNICAL INFORMATION

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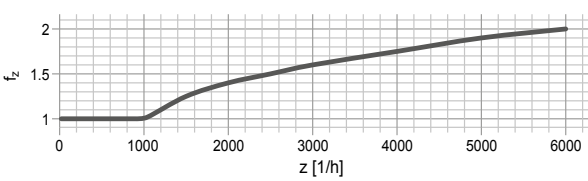
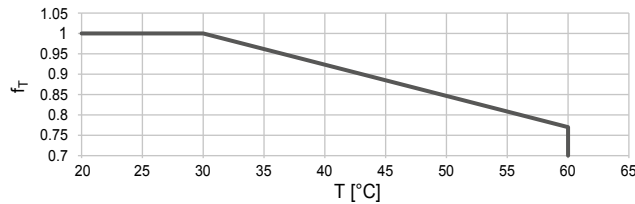
# GEAR MOTOR PARAMETERS

| Symbol         | U.m.                    | Description                                                                                                                         |
|----------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| $A_{2/3 \max}$ | [N]                     | Admissible axial force on shaft                                                                                                     |
| $A_{2/3 \max}$ | [N]                     | Axial force acting simultaneously with radial force                                                                                 |
| $C_B$          | [Nm]                    | Constant for bearing's lifetime calculation                                                                                         |
| $C_t$          | [Nm/arcmin]             | Torsional stiffness                                                                                                                 |
| $f$            | -                       | Factor ratio between axial and radial force                                                                                         |
| $f_d$          | -                       | Thermal derating factor                                                                                                             |
| $f_n$          | [Hz]                    | Rated frequency                                                                                                                     |
| $f_T$          | -                       | Temperature adjusting factor                                                                                                        |
| $f_z$          | -                       | Cycle factor                                                                                                                        |
| $i$            | -                       | Gearbox ratio                                                                                                                       |
| $I_a$          | [A]                     | Current at maximum acceleration torque ( $M_{a2}$ )                                                                                 |
| $I_b$          | [A]                     | Brake current                                                                                                                       |
| $I_n$          | [A]                     | Current at rated torque ( $M_{n2}$ )                                                                                                |
| $I_p$          | [A]                     | Current at emergency stop torque ( $M_{p2}$ )                                                                                       |
| $I_0$          | [A]                     | Current at stall torque ( $M_{02}$ )                                                                                                |
| $J_b$          | [kg cm <sup>2</sup> ]   | Brake moment of inertia                                                                                                             |
| $J_1$          | [kg cm <sup>2</sup> ]   | Moment of inertia at motor shaft                                                                                                    |
| $K_e$          | [mV/min <sup>-1</sup> ] | Back EMF constant                                                                                                                   |
| $K_n$          | -                       | Speed constant                                                                                                                      |
| $K_p$          | -                       | Gear motor parameter for calculating the thermal derating factor ( $f_d$ )                                                          |
| $L_{pp}$       | [mH]                    | Stator phase-phase inductance                                                                                                       |
| $L_z$          | [mm]                    | Factor for bearing lifetime calculation                                                                                             |
| $L_{10h}$      | [h]                     | Bearings basic rating life                                                                                                          |
| $\Delta m_b$   | [kg]                    | Mass increase with brake                                                                                                            |
| $\Delta m_j$   | [kg]                    | Mass increase with additional inertia                                                                                               |
| $m$            | [kg]                    | Mass without brake/ flywheel                                                                                                        |
| $M_{a2}$       | [Nm]                    | Maximum acceleration torque                                                                                                         |
| $M_b$          | [Nm]                    | Brake torque                                                                                                                        |
| $M_{b2}$       | [Nm]                    | Brake torque on shaft                                                                                                               |
| $M_{n2}$       | [Nm]                    | Rated torque                                                                                                                        |
| $M_{p2}$       | [Nm]                    | Emergency stop torque. 1000 times during service life of the gearbox                                                                |
| $M_{th2}$      | [Nm]                    | Equivalent thermal torque                                                                                                           |
| $M_{T2 \max}$  | [Nm]                    | Maximum shaft tilting moment                                                                                                        |
| $M_{02}$       | [Nm]                    | Stall torque                                                                                                                        |
| $M_2$          | [Nm]                    | Gear motor torque at equivalent speed ( $n_{2 \text{ EQU}}$ )                                                                       |
| $n_{a2}$       | [min <sup>-1</sup> ]    | Maximum permissible speed at maximum acceleration torque ( $M_{a2}$ )                                                               |
| $n_{n2}$       | [min <sup>-1</sup> ]    | Rated speed                                                                                                                         |
| $p$            | -                       | Bearing lifetime exponent                                                                                                           |
| $P_b$          | [W]                     | Brake electrical power at 20 °C                                                                                                     |
| $P_n$          | [kW]                    | Rated power                                                                                                                         |
| $R_{pp}$       | [Ohm]                   | Stator phase-phase resistance                                                                                                       |
| $t_1$          | [ms]                    | Brake engaging time                                                                                                                 |
| $t_2$          | [ms]                    | Brake release time                                                                                                                  |
| $V_b$          | [V <sub>DC</sub> ]      | Brake DC voltage                                                                                                                    |
| $V_n$          | [V <sub>AC</sub> ]      | Gear motor rated voltage                                                                                                            |
| $\varphi_R$    | [arcmin]                | Reduced backlash is calculated in static conditions and with the application of a torque equal to 2% of the gear unit rated torque  |
| $\varphi_s$    | [arcmin]                | Standard backlash is calculated in static conditions and with the application of a torque equal to 2% of the gear unit rated torque |
| $2p$           | -                       | Number of poles                                                                                                                     |

# APPLICATION PARAMETERS

| Symbol                    | U.m.                 | Description                               |
|---------------------------|----------------------|-------------------------------------------|
| $A_2$                     | [N]                  | Axial force on shaft                      |
| $A_{2\text{ EQU}}$        | [N]                  | Equivalent axial force applying on shaft  |
| $A_{2\text{ MAX}}$        | [N]                  | Maximum axial force applying on shaft     |
| ED                        | [s]                  | Duration of the duty                      |
| ED%                       | [%]                  | Cyclic duration factor                    |
| $L_{10h\text{ TARGET}}$   | [h]                  | Bearings desired basic rating life        |
| $M_{2(1) \dots M_{2(n)}}$ | [Nm]                 | Torque at times $t_1 \dots t_n$           |
| $M_{2\text{ EQU}}$        | [Nm]                 | Equivalent torque                         |
| $M_{2\text{ MAX}}$        | [Nm]                 | Maximum torque in case of emergency       |
| $M_{2\text{ PEAK}}$       | [Nm]                 | Maximum torque of the load diagram        |
| $M_{T2\text{ EQU}}$       | [Nm]                 | Equivalent shaft tilting moment           |
| $M_{T2\text{ MAX}}$       | [Nm]                 | Maximum permissible shaft tilting moment  |
| $n_{\text{MAX}}$          | [min <sup>-1</sup> ] | Maximum speed of the speed diagram        |
| $n_{2(1) \dots n_{2(n)}}$ | [Nm]                 | Speed based on the times $t_1 \dots t_n$  |
| $n_{2\text{ EQU}}$        | [min <sup>-1</sup> ] | Equivalent speed                          |
| $R_2$                     | [N]                  | Radial force on shaft                     |
| $R_{2\text{ EQU}}$        | [N]                  | Equivalent radial force applying on shaft |
| $R_{2\text{ MAX}}$        | [N]                  | Maximum radial force applying on shaft    |
| T                         | [ °C ]               | Ambient temperature                       |
| $t_1 \dots t_n$           | [s]                  | Operating time                            |
| $t_{\Sigma}$              | [s]                  | Cycle duration including break pause      |
| Z                         | [1/h]                | Number of cycles per hour                 |

# SELECTING THE GEAR MOTOR

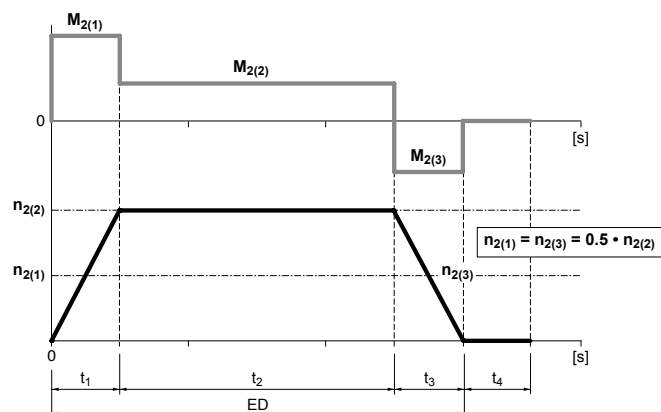
|     |                                                         |                   |                      |                                                                                                                                                                                     |
|-----|---------------------------------------------------------|-------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) | Cyclic duration factor                                  | ED%               | [%]                  | $ED\% = \frac{ED}{t_{\Sigma}} \cdot 100$                                                                                                                                            |
|     | Duration of the duty                                    | ED                | [s]                  | $ED = t_1 + t_2 + \dots + t_n$                                                                                                                                                      |
| (b) | Cycle factor<br>(For Z>6000 please contact us!)         | $f_z$             | -                    |                                                                                                   |
| (c) | Equivalent torque                                       | $M_{2\text{EQU}}$ | [Nm]                 | $M_{2\text{EQU}} = \sqrt[3]{\frac{ n_{2(1)}  \cdot t_1 \cdot  M_{2(1)} ^3 + \dots +  n_{2(n)}  \cdot t_n \cdot  M_{2(n)} ^3}{ n_{2(1)}  \cdot t_1 + \dots +  n_{2(n)}  \cdot t_n}}$ |
| (d) | Equivalent speed                                        | $n_{2\text{EQU}}$ | [min <sup>-1</sup> ] | $n_{2\text{EQU}} = \frac{ n_{2(1)}  \cdot t_1 +  n_{2(2)}  \cdot t_2 + \dots +  n_{2(n)}  \cdot t_n}{t_{\Sigma}}$                                                                   |
| (e) | Gear motor torque at equivalent speed $n_{2\text{EQU}}$ | $M_2$             | [Nm]                 | $M_2 = M_{0.2} + (M_{n2} - M_{0.2}) \cdot (n_{2\text{EQU}} / n_{n2})$                                                                                                               |
| (f) | Thermal derating factor                                 | $f_d$             | -                    | $f_d = 0.9 - K_p \cdot (n_{2\text{EQU}} \cdot i / 40000)^2$                                                                                                                         |
| (g) | Equivalent thermal torque of the gear motor             | $M_{\text{th}2}$  | [Nm]                 | $M_{\text{th}2} = M_2 \cdot f_d$                                                                                                                                                    |
| (h) | Temperature adjusting factor                            | $f_T$             | -                    |                                                                                                 |

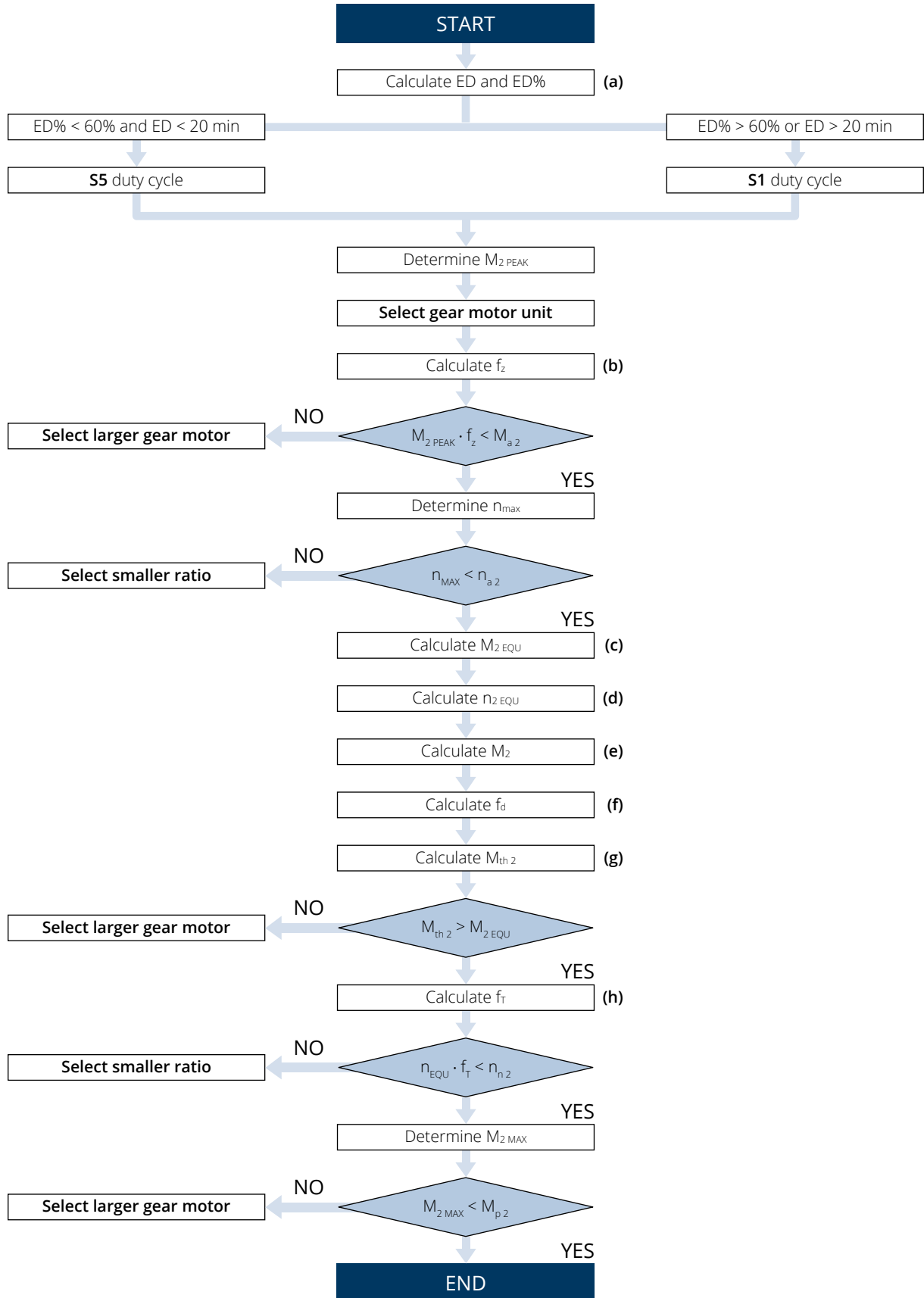
## Load diagram

—  $M_2$ : Output torque

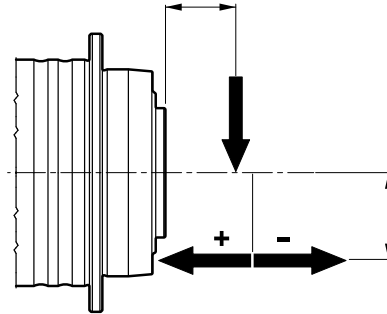
## Speed diagram

—  $n_2$ : Output speed





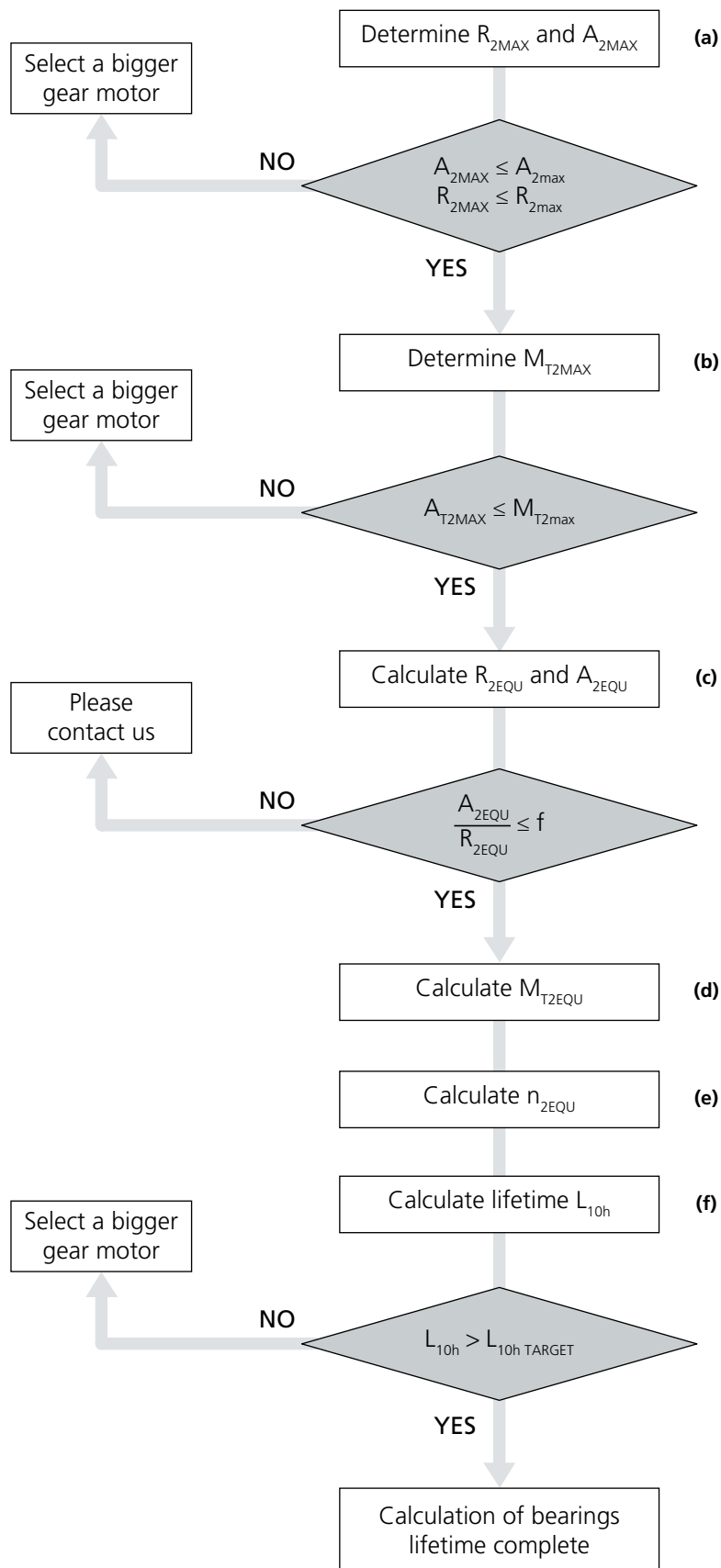
# SERVICE LIFE OF BEARINGS



|     |                                                   |                     |                      |                                                                                                                                                                                      |
|-----|---------------------------------------------------|---------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) | Maximum radial force applied on output shaft      | $R_{2\text{ MAX}}$  | [N]                  | Please consider the specific conditions<br>(e.g. belt drives under acceleration torque)                                                                                              |
|     | Maximum axial force applied on output shaft       | $A_{2\text{ MAX}}$  | [N]                  |                                                                                                                                                                                      |
| (b) | Maximum tilting moment applied on output shaft    | $M_{T2\text{ MAX}}$ | [Nm]                 | $M_{T2\text{ MAX}} = \frac{R_{2\text{ MAX}} \cdot (x + L_z) \pm A_{2\text{ MAX}} \cdot y}{1000}$                                                                                     |
| (c) | Equivalent forces applied on output shaft         | $R_{2\text{ EQU}}$  | [N]                  | $R_{2\text{ EQU}} = \sqrt[3]{\frac{ n_{2(1)}  \cdot t_1 \cdot  R_{2(1)} ^3 + \dots +  n_{2(n)}  \cdot t_n \cdot  R_{2(n)} ^3}{ n_{2(1)}  \cdot t_1 + \dots +  n_{2(n)}  \cdot t_n}}$ |
|     |                                                   | $A_{2\text{ EQU}}$  | [N]                  | $A_{2\text{ EQU}} = \sqrt[3]{\frac{ n_{2(1)}  \cdot t_1 \cdot  A_{2(1)} ^3 + \dots +  n_{2(n)}  \cdot t_n \cdot  A_{2(n)} ^3}{ n_{2(1)}  \cdot t_1 + \dots +  n_{2(n)}  \cdot t_n}}$ |
| (d) | Equivalent tilting moment applied on output shaft | $M_{T2\text{ EQU}}$ | [Nm]                 | $M_{T2\text{ EQU}} = \frac{R_{2\text{ EQU}} \cdot (x + L_z) + A_{2\text{ EQU}} \cdot y}{1000}$                                                                                       |
| (e) | Equivalent output speed                           | $n_{2\text{ EQU}}$  | [min <sup>-1</sup> ] | $n_{2\text{ EQU}} = \frac{ n_{2(1)}  \cdot t_1 +  n_{2(2)}  \cdot t_2 + \dots +  n_{2(n)}  \cdot t_n}{t_1 + t_2 + \dots + t_n}$                                                      |
| (f) | Bearings basic rating life                        | $L_{10h}$           | [h]                  | $L_{10h} = \frac{16666}{n_{2\text{ EQU}}} \cdot \left( \frac{C_B}{M_{T2\text{ EQU}}} \right)^p$                                                                                      |

| BMS 060             |      | BMS 070 |      | BMS 090 |      | BMS 130 |  | BMS 160 |  |
|---------------------|------|---------|------|---------|------|---------|--|---------|--|
| $L_z$               | [mm] | 48      | 72   | 78      | 100  | 128     |  |         |  |
| $M_{T2\text{ max}}$ | [Nm] | 115     | 318  | 430     | 1200 | 3700    |  |         |  |
| $C_B$               | [Nm] | 490     | 1335 | 1815    | 5055 | 16200   |  |         |  |
| p                   | -    | 3.33    | 3.33 | 3.33    | 3.33 | 3.33    |  |         |  |
| f                   |      | 0.37    |      |         |      |         |  |         |  |





# **BMS**

## **BONFIGLIOLI MOTION SOLUTION**

Bonfiglioli Motion Solution (BMS) represents the edge of products integration. BMS is the result of the deep knowledge Bonfiglioli has in precision planetary gearboxes and low inertia permanent magnet servomotor technologies.

Compared to solutions based on separate units, interfaced BMS ensures several competitive advantages, such as:

- reduced outline dimensions
- maximized performances thanks to optimized gear motor selection
- longer lifetime
- higher stiffness
- top in class energy efficiency

Low-backlash planetary gearboxes of the BMS series feature a flanged output shaft and are perfectly suited for high demanding applications in term of stiffness and radial load.

In combination with top class torque density and dynamics servomotors, BMS perfectly matches the performance demand of every motion control application.

BMS series provides a straightforward selection of the compact unit using a unique selection method.

When dynamics and high precision are required, and compactness makes the difference, it is a relevant advantage to have a mechatronic product easy to select, order and install.

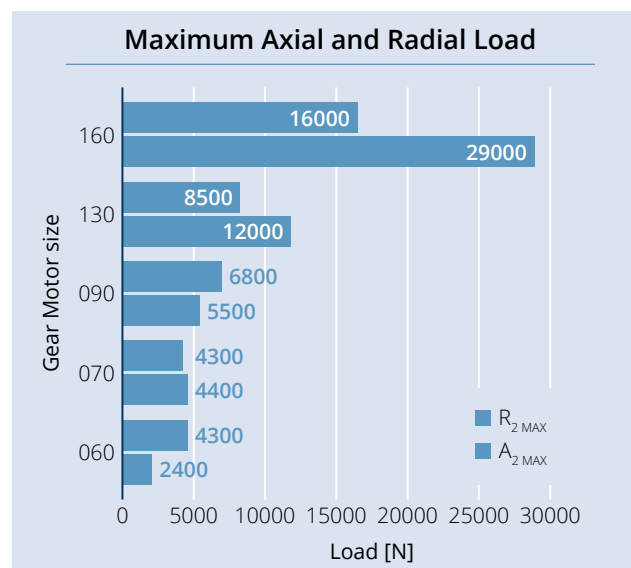
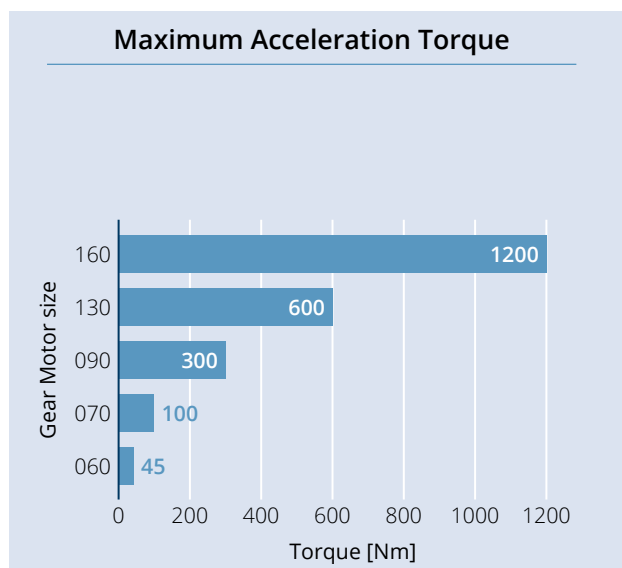


## BMS FEATURES

- Output torque: 8... 800 Nm
- Output speed: 43... 875 rpm
- Designed for continuous duty & intermittent duty
- Universal mounting position
- Power supply: 230 & 400 VAC
- Two classes of precision:
  - 1-stage unit backlash: standard  $\varphi_s \leq 5'$  - reduced  $\varphi_R \leq 3'$
  - 2-stage unit backlash: standard  $\varphi_s \leq 7'$  - reduced  $\varphi_R \leq 5'$
- IP65 degree of protection
- Ambient temperature -20 °C... +30 °C
- Lubrication optimized for S1 and S5 duty types

| Duty              | BMS 060... BMS 160                 |
|-------------------|------------------------------------|
| S1 (continuous)   | Synthetic oil viscosity ISO VG 220 |
| S5 (intermittent) | NLGI grease consistency 00         |

| Distribution of nominal torque $M_{n2}$ [Nm] |     |     |     |     |     |     |     |     |     |     |     |     |
|----------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| [i]                                          | 4   | 5   | 7   | 10  | 16  | 20  | 25  | 28  | 35  | 40  | 50  | 70  |
| BMS 060                                      | 30  | 30  | 25  | 20  | 30  | 30  | 30  | 30  | 30  | -   | -   | -   |
| BMS 070                                      | 70  | 70  | 60  | 40  | 70  | 70  | 70  | 70  | 70  | 70  | 70  | 60  |
| BMS 090                                      | 200 | 180 | 160 | 110 | 200 | 180 | 180 | 200 | 180 | 200 | 180 | -   |
| BMS 130                                      | 400 | 400 | 360 | 280 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 360 |
| BMS 160                                      | -   | -   | -   | -   | 800 | 800 | 800 | 800 | 800 | 800 | 800 | -   |



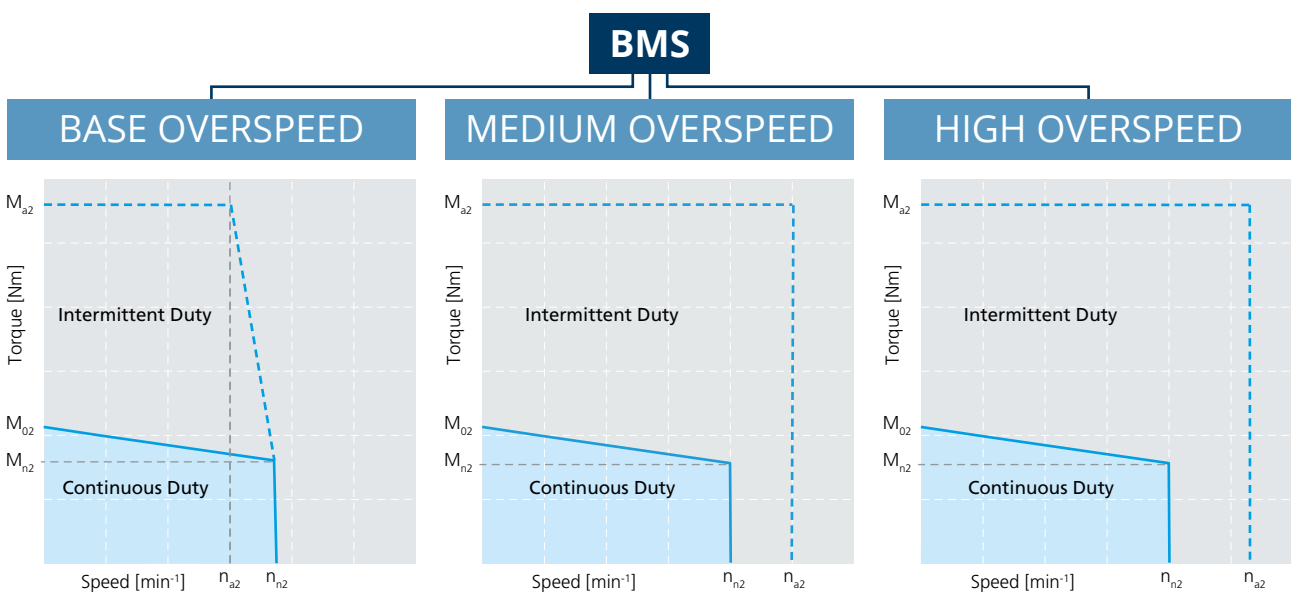
# BMS OVERSPEED

BMS gear motor rating is defined by the torque-speed selected with the overspeed variant. The permissible operating range corresponds to the area in the torque-speed characteristics limited by the thermal, electrical and mechanical limit curves.

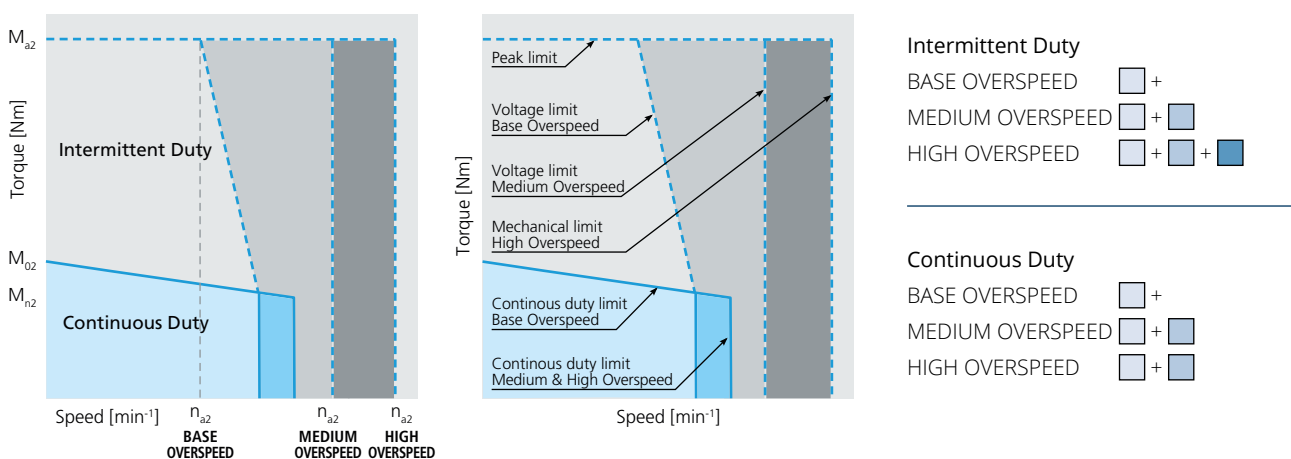
The continuous operating zone is enclosed by torque curve for S1 duty up to the intersection with the voltage limit or the mechanical limit curve. Continuous duty above the S1 characteristic curve is not thermally permitted for the gear motor.

The intermittent duty zone is the area between the short-term peak torque curve and the voltage limit or the mechanical limit curve.

According to the application requirements, in terms of speed-torque and operation cycle, it is possible to select the suitable gear motor choosing between the BASE (B), MEDIUM (M) or HIGH (H) overspeed variants.



The following diagrams highlight the extension of the gear motor operating areas according to the selected overspeed (B, M, H). Applications that need high torque overloads at high speed require a MEDIUM or HIGH overspeed variant. On the other side, the selected overspeed affects the drive selection: the higher the maximum speed  $n_{a2}$  the higher the required current  $I_a$ .



# BMS DESIGNATION

| BMS               | F                   | 060                 | B | 5 | 065B | 400 | STD | S1 | UH1 | PTC | RES1 | F24 | AN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                |                |     |                     |                     |     |                     |                     |
|-------------------|---------------------|---------------------|---|---|------|-----|-----|----|-----|-----|------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------|----------------|-----|---------------------|---------------------|-----|---------------------|---------------------|
|                   |                     |                     |   |   |      |     |     |    |     |     |      |     | <div>Connections</div> <div>AN Angled turning receptacles</div> <div>ST Straight receptacles</div> <div>Brake</div> <div>(blank) No brake or flywheel (default)</div> <div>F24 Brake 24 Vdc</div> <div>F1 Additional flywheel / inertia</div> <div>Feedback device</div> <div>RES1<sup>(1)</sup> 2-pole resolver 8 kHz</div> <div>RES2 2-pole resolver 10 kHz</div> <div>ENB1 Optical encoder EnDat Single Turn</div> <div>ENB2 Optical encoder EnDat Multi Turn</div> <div>ENB3 Optical encoder Hiperface Single Turn</div> <div>ENB4 Optical encoder Hiperface Multi Turn</div> <div>ENB5 Capacitive encoder Hiperface Single Turn</div> <div>ENB6 Capacitive encoder Hiperface Multi Turn</div> <div>Thermal protection</div> <div>PTC PTC</div> <div>KTY KTY84-130</div> <div>TC1 PT1000</div> <div>Lubricant</div> <div>(blank) Standard (default)</div> <div>UH1 Food grade synthetic lubricant</div> <div>Duty</div> <div>S1 Continuous duty</div> <div>S5 Intermittent duty</div> <div>Backlash</div> <table><thead><tr><th></th><th>Gear ratio ≤10</th><th>Gear ratio &gt;10</th></tr></thead><tbody><tr><td>STD</td><td><math>\varphi_s \leq 5'</math></td><td><math>\varphi_s \leq 7'</math></td></tr><tr><td>LOW</td><td><math>\varphi_R \leq 3'</math></td><td><math>\varphi_R \leq 5'</math></td></tr></tbody></table> <div>Supply AC voltage</div> <div>230 230 V</div> <div>400 400 V</div> <div>Motor size</div> <div>065A... 170C</div> <div>Gear ratio</div> <div>4... 70</div> <div>Overspeed</div> <div>B Base</div> <div>M Medium</div> <div>H High</div> <div>Gearbox size</div> <div>060... 160</div> <div>Version</div> <div>F Flanged</div> |  | Gear ratio ≤10 | Gear ratio >10 | STD | $\varphi_s \leq 5'$ | $\varphi_s \leq 7'$ | LOW | $\varphi_R \leq 3'$ | $\varphi_R \leq 5'$ |
|                   | Gear ratio ≤10      | Gear ratio >10      |   |   |      |     |     |    |     |     |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                |                |     |                     |                     |     |                     |                     |
| STD               | $\varphi_s \leq 5'$ | $\varphi_s \leq 7'$ |   |   |      |     |     |    |     |     |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                |                |     |                     |                     |     |                     |                     |
| LOW               | $\varphi_R \leq 3'$ | $\varphi_R \leq 5'$ |   |   |      |     |     |    |     |     |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                |                |     |                     |                     |     |                     |                     |
| Gear motor series |                     |                     |   |   |      |     |     |    |     |     |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                |                |     |                     |                     |     |                     |                     |
| BMS               |                     |                     |   |   |      |     |     |    |     |     |      |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                |                |     |                     |                     |     |                     |                     |

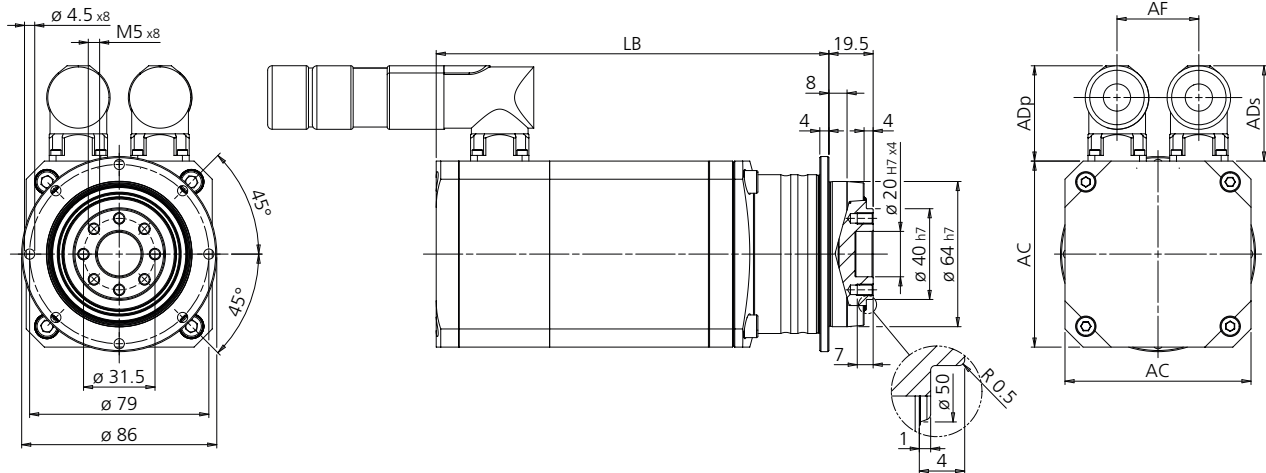
(1) Not available for motor sizes 065A and 065B

(1) Not available for motor sizes 065A and 065B



# BMS F 060

## DIMENSIONS AND TECHNICAL DATA



### DIMENSION LB

#### Variants

|     |             |          |
|-----|-------------|----------|
| LB2 | RES1 / RES2 |          |
| LB3 | RES1 / RES2 | F24 / F1 |
| LB4 | ENB1 / ENB2 |          |
| LB5 | ENB3...ENB6 |          |
| LB6 | ENB1 / ENB2 | F24 / F1 |
| LB7 | ENB3...ENB6 | F24 / F1 |

### DIMENSION V

#### Variants

|     |                            |          |
|-----|----------------------------|----------|
| V8  | RES1 / RES2<br>ENB1...ENB6 |          |
| V9  | RES1 / RES2                | F24 / F1 |
| V10 | ENB1 / ENB2                | F24 / F1 |
| V11 | ENB5...ENB6                | F24 / F1 |

| Motor size | AC | LB2 | LB3 | LB4 | LB5 | LB6 | LB7 | ADp | ADs | AF | LLp | LLs | V8 | V9 | V10 | V11 |
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|-----|-----|
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|-----|-----|

#### BMS 060 - 4... 10 - 1 STAGE

|      |    |     |     |     |     |     |     |    |    |    |     |    |     |     |     |     |
|------|----|-----|-----|-----|-----|-----|-----|----|----|----|-----|----|-----|-----|-----|-----|
| 065A | 65 | 137 | 168 | 155 | 155 | 204 | 204 | 42 | 42 | 32 | 102 | 83 | 114 | 114 | 163 | 163 |
| 065B |    | 160 | 191 | 178 | 178 | 227 | 227 | 42 | 42 | 32 | 102 | 83 | 137 | 137 | 186 | 186 |
| 082B | 82 | 173 | 213 | 196 | 173 | 236 | 236 | 42 | 42 | 36 | 102 | 83 | 145 | 145 | 208 | 208 |
| 082C |    | 193 | 233 | 216 | 193 | 256 | 256 | 42 | 42 | 36 | 102 | 83 | 165 | 165 | 228 | 228 |

#### BMS 060 - 16... 35 - 2 STAGE

|      |    |     |     |     |     |     |     |    |    |    |     |    |     |     |     |     |
|------|----|-----|-----|-----|-----|-----|-----|----|----|----|-----|----|-----|-----|-----|-----|
| 065A | 65 | 175 | 206 | 193 | 193 | 242 | 242 | 42 | 42 | 32 | 102 | 83 | 114 | 114 | 163 | 163 |
| 065B |    | 198 | 229 | 216 | 216 | 265 | 265 | 42 | 42 | 32 | 102 | 83 | 137 | 137 | 186 | 186 |
| 082B | 82 | 211 | 251 | 234 | 211 | 274 | 274 | 42 | 42 | 36 | 102 | 83 | 183 | 183 | 246 | 246 |
| 082C |    | 231 | 271 | 254 | 231 | 294 | 294 | 42 | 42 | 36 | 102 | 83 | 203 | 203 | 266 | 266 |

| Gear motor stages | i        | $\varphi_s$ | $\varphi_r$ | $R_{2max}$ | $A_{2max}$ |
|-------------------|----------|-------------|-------------|------------|------------|
|                   |          | $\leq$      |             |            |            |
|                   |          | [arcmin]    |             | [N]        | [N]        |
| 1                 | 4... 10  | 5'          | 3'          | 2400       | 4300       |
| 2                 | 16... 35 | 7'          | 5'          | 2400       | 4300       |

# BMS F 060

## PERFORMANCE DATA • BASE OVERSPEED

| Designation         |     | n <sub>n2</sub>      | n <sub>a2</sub>      | M <sub>n2</sub> | M <sub>02</sub> | M <sub>a2</sub> | M <sub>p2</sub> | I <sub>n</sub> | I <sub>0</sub> | I <sub>a</sub> | I <sub>p</sub> | C <sub>t</sub> | J <sub>1</sub> | m    | K <sub>p</sub> |
|---------------------|-----|----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|------|----------------|
|                     |     | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]            | [Nm]            | [Nm]            | [Nm]            | [A]            | [A]            | [A]            | [A]            | [Nm/arcmin]    | [kg cm²]       | [kg] |                |
| BMS F 060 B 35 065A | 400 | 86                   | 106                  | 28              | 30              | 45              | 80              | 0.72           | 0.76           | 1.23           | 2.18           | 12             | 0.28           | 3.9  | 7.4            |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.16           | 1.23           | 1.97           | 3.50           |                |                |      |                |
| BMS F 060 B 28 065A | 400 | 107                  | 125                  | 22              | 24              | 45              | 71              | 0.72           | 0.76           | 1.53           | 2.43           | 12             | 0.28           | 3.9  | 8.3            |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.16           | 1.23           | 2.46           | 3.90           |                |                |      |                |
| BMS F 060 B 25 065A | 400 | 120                  | 124                  | 20              | 21              | 45              | 64              | 0.72           | 0.76           | 1.72           | 2.43           | 12             | 0.31           | 3.9  | 8.8            |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.16           | 1.23           | 2.75           | 3.90           |                |                |      |                |
| BMS F 060 B 20 065A | 400 | 150                  | 130                  | 16              | 17              | 45              | 51              | 0.72           | 0.76           | 2.14           | 2.43           | 12             | 0.33           | 3.9  | 10             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.16           | 1.23           | 3.44           | 3.90           |                |                |      |                |
| BMS F 060 B 16 065A | 400 | 188                  | 156                  | 13              | 14              | 41              | 41              | 0.72           | 0.76           | 2.43           | 2.43           | 12             | 0.34           | 3.9  | 11             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.16           | 1.23           | 3.90           | 3.90           |                |                |      |                |
| BMS F 060 B 16 065B | 400 | 188                  | 194                  | 26              | 27              | 45              | 78              | 1.33           | 1.35           | 2.64           | 4.60           | 12             | 0.54           | 4.5  | 20             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.30           | 2.30           | 4.59           | 8.00           |                |                |      |                |
| BMS F 060 B 10 065A | 400 | 300                  | 250                  | 8.0             | 9.0             | 26              | 26              | 0.72           | 0.76           | 2.43           | 2.43           | 12             | 0.27           | 2.9  | 17             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.16           | 1.23           | 3.90           | 3.90           |                |                |      |                |
| BMS F 060 B 10 065B | 400 | 300                  | 300                  | 16              | 17              | 30              | 49              | 1.33           | 1.35           | 2.82           | 4.60           | 12             | 0.47           | 3.5  | 32             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.30           | 2.30           | 4.90           | 8.00           |                |                |      |                |
| BMS F 060 B 7 065B  | 400 | 429                  | 286                  | 11              | 12              | 34              | 34              | 1.33           | 1.35           | 4.56           | 4.56           | 12             | 0.49           | 3.5  | 46             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.30           | 2.30           | 7.93           | 7.93           |                |                |      |                |
| BMS F 060 B 7 082B  | 400 | 429                  | 443                  | 21              | 22              | 38              | 59              | 2.50           | 2.60           | 5.68           | 8.83           | 12             | 1.49           | 5.1  | 28             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 4.30           | 4.50           | 9.90           | 15.4           |                |                |      |                |
| BMS F 060 B 5 065B  | 400 | 600                  | 400                  | 8.0             | 9.0             | 25              | 25              | 1.33           | 1.35           | 4.60           | 4.60           | 13             | 0.53           | 3.5  | 65             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.30           | 2.30           | 8.00           | 8.00           |                |                |      |                |
| BMS F 060 B 5 082B  | 400 | 600                  | 440                  | 15              | 16              | 43              | 43              | 2.50           | 2.60           | 8.90           | 8.90           | 13             | 1.53           | 5.1  | 39             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 4.3            | 4.5            | 15.5           | 15.5           |                |                |      |                |
| BMS F 060 B 5 082C  | 400 | 600                  | 560                  | 19              | 22              | 45              | 58              | 2.90           | 3.30           | 7.75           | 9.90           | 13             | 1.83           | 6.2  | 49             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 5.10           | 5.80           | 13.6           | 17.4           |                |                |      |                |
| BMS F 060 B 4 082B  | 400 | 750                  | 550                  | 12              | 13              | 34              | 34              | 2.50           | 2.60           | 8.90           | 8.90           | 13             | 1.58           | 5.1  | 47             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 4.30           | 4.50           | 15.5           | 15.5           |                |                |      |                |
| BMS F 060 B 4 082C  | 400 | 750                  | 575                  | 15              | 18              | 45              | 46              | 2.90           | 3.30           | 9.68           | 9.90           | 13             | 1.88           | 6.2  | 59             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 5.10           | 5.80           | 17.0           | 17.4           |                |                |      |                |

# BMS F 060

## PERFORMANCE DATA • MEDIUM OVERSPEED

| Designation         |     | n <sub>n2</sub>      | n <sub>a2</sub>      | M <sub>n2</sub> | M <sub>02</sub> | M <sub>a2</sub> | M <sub>p2</sub> | I <sub>n</sub> | I <sub>0</sub> | I <sub>a</sub> | I <sub>p</sub> | C <sub>t</sub> | J <sub>1</sub> | m    | K <sub>p</sub> |
|---------------------|-----|----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|------|----------------|
|                     |     | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]            | [Nm]            | [Nm]            | [Nm]            | [A]            | [A]            | [A]            | [A]            | [Nm/arcmin]    | [kg cm²]       | [kg] |                |
| BMS F 060 M 35 065A | 400 | 129                  | 142                  | 27              | 30              | 45              | 80              | 0.88           | 0.98           | 1.56           | 2.78           | 12             | 0.28           | 3.9  | 7.4            |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.74           | 1.90           | 3.13           | 5.56           |                |                |      |                |
| BMS F 060 M 28 065A | 400 | 161                  | 161                  | 21              | 24              | 45              | 71              | 0.88           | 0.98           | 1.95           | 3.10           | 12             | 0.28           | 3.9  | 8.3            |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.74           | 1.90           | 3.91           | 6.20           |                |                |      |                |
| BMS F 060 M 25 065A | 400 | 180                  | 164                  | 19              | 21              | 45              | 64              | 0.88           | 0.98           | 2.19           | 3.10           | 12             | 0.31           | 3.9  | 8.8            |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.74           | 1.90           | 4.38           | 6.20           |                |                |      |                |
| BMS F 060 M 20 065A | 400 | 225                  | 175                  | 15              | 17              | 45              | 51              | 0.88           | 0.98           | 2.74           | 3.10           | 12             | 0.33           | 3.9  | 10             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.74           | 1.90           | 5.47           | 6.20           |                |                |      |                |
| BMS F 060 M 16 065A | 400 | 281                  | 188                  | 12              | 14              | 41              | 41              | 0.88           | 0.98           | 3.10           | 3.10           | 12             | 0.34           | 3.9  | 11             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.74           | 1.90           | 6.20           | 6.20           |                |                |      |                |
| BMS F 060 M 16 065B | 400 | 281                  | 312                  | 24              | 27              | 45              | 78              | 1.85           | 1.98           | 3.85           | 6.70           | 12             | 0.54           | 4.5  | 20             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 3.20           | 3.40           | 6.60           | 11.5           |                |                |      |                |
| BMS F 060 M 10 065A | 400 | 400                  | 300                  | 7.6             | 9.0             | 26              | 26              | 0.88           | 0.98           | 3.10           | 3.10           | 12             | 0.27           | 2.9  | 17             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 1.74           | 1.90           | 6.20           | 6.20           |                |                |      |                |
| BMS F 060 M 10 065B | 400 | 400                  | 500                  | 15              | 17              | 30              | 49              | 1.85           | 1.98           | 4.10           | 6.70           | 12             | 0.47           | 3.5  | 32             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 3.20           | 3.40           | 7.04           | 11.5           |                |                |      |                |
| BMS F 060 M 7 065B  | 400 | 571                  | 500                  | 11              | 12              | 34              | 34              | 1.85           | 1.98           | 6.64           | 6.64           | 12             | 0.49           | 3.5  | 46             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 3.20           | 3.40           | 11.4           | 11.4           |                |                |      |                |
| BMS F 060 M 7 082B  | 400 | 571                  | 714                  | 20              | 22              | 38              | 59              | 3.40           | 3.90           | 8.43           | 13.1           | 12             | 1.49           | 5.1  | 28             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 5.30           | 6.00           | 13.2           | 20.4           |                |                |      |                |
| BMS F 060 M 5 065B  | 400 | 700                  | 700                  | 7.6             | 9.0             | 25              | 25              | 1.85           | 1.98           | 6.70           | 6.70           | 13             | 0.53           | 3.5  | 65             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 3.20           | 3.40           | 11.5           | 11.5           |                |                |      |                |
| BMS F 060 M 5 082B  | 400 | 700                  | 700                  | 14              | 16              | 43              | 43              | 3.40           | 3.90           | 13.2           | 13.2           | 13             | 1.53           | 5.1  | 39             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 5.30           | 6.00           | 20.6           | 20.6           |                |                |      |                |
| BMS F 060 M 5 082C  | 400 | 700                  | 800                  | 18              | 22              | 45              | 58              | 3.90           | 4.80           | 11.3           | 14.4           | 13             | 1.83           | 6.2  | 49             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 6.80           | 8.40           | 19.6           | 25.1           |                |                |      |                |
| BMS F 060 M 4 082B  | 400 | 875                  | 875                  | 11              | 13              | 34              | 34              | 3.40           | 3.90           | 13.2           | 13.2           | 13             | 1.58           | 5.1  | 47             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 5.30           | 6.00           | 20.6           | 20.6           |                |                |      |                |
| BMS F 060 M 4 082C  | 400 | 875                  | 875                  | 14              | 18              | 45              | 46              | 3.90           | 4.80           | 14.1           | 14.4           | 13             | 1.88           | 6.2  | 59             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 6.80           | 8.40           | 24.6           | 25.1           |                |                |      |                |



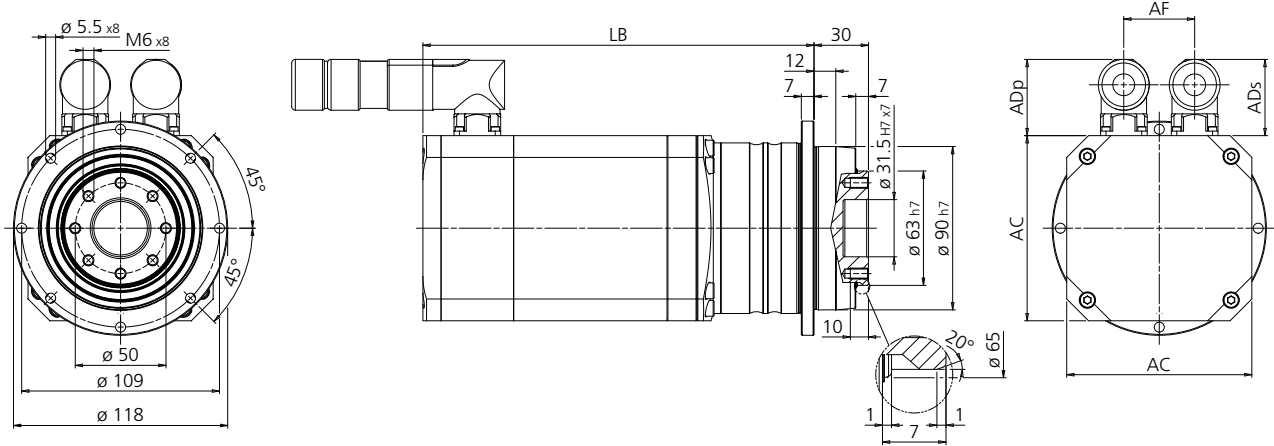
# BMS F 060

## PERFORMANCE DATA • HIGH OVERSPEED

| Designation         |     | n <sub>n2</sub>      | n <sub>a2</sub>      | M <sub>n2</sub> | M <sub>02</sub> | M <sub>a2</sub> | M <sub>p2</sub> | I <sub>n</sub> | I <sub>0</sub> | I <sub>a</sub> | I <sub>p</sub> | C <sub>t</sub> | J <sub>1</sub> | m    | K <sub>p</sub> |
|---------------------|-----|----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|------|----------------|
|                     |     | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]            | [Nm]            | [Nm]            | [Nm]            | [A]            | [A]            | [A]            | [A]            | [Nm/arcmin]    | [kg cm²]       | [kg] |                |
| BMS F 060 H 35 065A | 400 | 129                  | 171                  | 27              | 30              | 45              | 80              | 1.21           | 1.38           | 2.22           | 3.94           | 12             | 0.28           | 3.9  | 7.4            |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.09           | 2.39           | 3.88           | 6.90           |                |                |      |                |
| BMS F 060 H 28 065A | 400 | 161                  | 214                  | 21              | 24              | 45              | 71              | 1.21           | 1.38           | 2.77           | 4.40           | 12             | 0.28           | 3.9  | 8.3            |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.09           | 2.39           | 4.85           | 7.70           |                |                |      |                |
| BMS F 060 H 25 065A | 400 | 180                  | 240                  | 19              | 21              | 45              | 64              | 1.21           | 1.38           | 3.11           | 4.40           | 12             | 0.31           | 3.9  | 8.8            |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.09           | 2.39           | 5.44           | 7.70           |                |                |      |                |
| BMS F 060 H 20 065A | 400 | 225                  | 250                  | 15              | 17              | 45              | 51              | 1.21           | 1.38           | 3.88           | 4.40           | 12             | 0.33           | 3.9  | 10             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.09           | 2.39           | 6.79           | 7.70           |                |                |      |                |
| BMS F 060 H 16 065A | 400 | 281                  | 281                  | 12              | 14              | 41              | 41              | 1.21           | 1.38           | 4.40           | 4.40           | 12             | 0.34           | 3.9  | 11             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.09           | 2.39           | 7.70           | 7.70           |                |                |      |                |
| BMS F 060 H 16 065B | 400 | 281                  | 375                  | 24              | 27              | 45              | 78              | 2.43           | 2.68           | 5.22           | 9.10           | 12             | 0.54           | 4.5  | 20             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 4.20           | 4.70           | 9.13           | 15.9           |                |                |      |                |
| BMS F 060 H 10 065A | 400 | 400                  | 450                  | 7.6             | 9.0             | 26              | 26              | 1.21           | 1.38           | 4.40           | 4.40           | 12             | 0.27           | 2.9  | 17             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 2.09           | 2.39           | 7.70           | 7.70           |                |                |      |                |
| BMS F 060 H 10 065B | 400 | 400                  | 600                  | 15              | 17              | 30              | 49              | 2.43           | 2.68           | 5.57           | 9.10           | 12             | 0.47           | 3.5  | 32             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 4.20           | 4.70           | 9.73           | 15.9           |                |                |      |                |
| BMS F 060 H 7 065B  | 400 | 571                  | 714                  | 11              | 12              | 34              | 34              | 2.43           | 2.68           | 9.02           | 9.02           | 12             | 0.49           | 3.5  | 46             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 4.20           | 4.70           | 15.8           | 15.8           |                |                |      |                |
| BMS F 060 H 7 082B  | 400 | 571                  | 857                  | 20              | 22              | 38              | 59              | 4.30           | 5.20           | 11.3           | 17.6           | 12             | 1.49           | 5.1  | 28             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 7.60           | 9.00           | 19.8           | 30.7           |                |                |      |                |
| BMS F 060 H 5 065B  | 400 | 700                  | 1000                 | 7.6             | 9.0             | 25              | 25              | 2.43           | 2.68           | 9.10           | 9.10           | 13             | 0.53           | 3.5  | 65             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 4.20           | 4.70           | 15.9           | 15.9           |                |                |      |                |
| BMS F 060 H 5 082B  | 400 | 700                  | 1000                 | 14              | 16              | 43              | 43              | 4.30           | 5.20           | 17.7           | 17.7           | 13             | 1.53           | 5.1  | 39             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 7.60           | 9.00           | 31.0           | 31.0           |                |                |      |                |
| BMS F 060 H 5 082C  | 400 | 700                  | 1100                 | 18              | 22              | 45              | 58              | 4.50           | 6.20           | 14.6           | 18.6           | 13             | 1.83           | 6.2  | 49             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 7.60           | 10.6           | 25.0           | 32.0           |                |                |      |                |
| BMS F 060 H 4 082B  | 400 | 875                  | 1250                 | 11              | 13              | 34              | 34              | 4.30           | 5.20           | 17.7           | 17.7           | 13             | 1.58           | 5.1  | 47             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 7.60           | 9.00           | 31.0           | 31.0           |                |                |      |                |
| BMS F 060 H 4 082C  | 400 | 875                  | 1175                 | 14              | 18              | 45              | 46              | 4.50           | 6.20           | 18.2           | 18.6           | 13             | 1.88           | 6.2  | 59             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 7.60           | 10.6           | 31.3           | 32.0           |                |                |      |                |

# BMS F 070

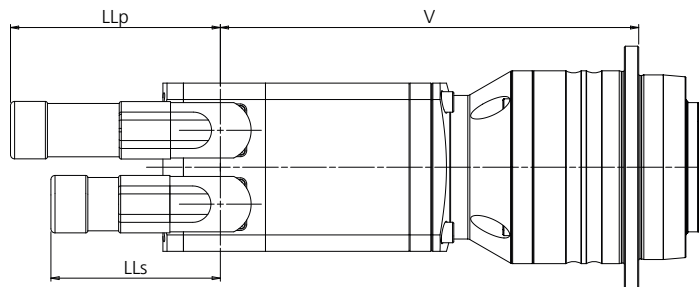
## DIMENSIONS AND TECHNICAL DATA



### DIMENSION LB

#### Variants

|     |             |          |
|-----|-------------|----------|
| LB2 | RES1 / RES2 |          |
| LB3 | RES1 / RES2 | F24 / F1 |
| LB4 | ENB1 / ENB2 |          |
| LB5 | ENB3...ENB6 |          |
| LB6 | ENB1 / ENB2 | F24 / F1 |
| LB7 | ENB3...ENB6 | F24 / F1 |



### DIMENSION V

#### Variants

|     |                            |          |
|-----|----------------------------|----------|
| V8  | RES1 / RES2<br>ENB1...ENB6 |          |
| V9  | RES1 / RES2                | F24 / F1 |
| V10 | ENB1 / ENB2                | F24 / F1 |
| V11 | ENB3...ENB6                | F24 / F1 |

| Motor size | AC | LB2 | LB3 | LB4 | LB5 | LB6 | LB7 | ADp | ADs | AF | LLp | LLs | V8 | V9 | V10 | V11 |
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|-----|-----|
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|-----|-----|

#### BMS 070 - 4... 10 - 1 STAGE

|      |     |     |     |     |     |     |     |    |    |    |     |    |     |     |     |     |
|------|-----|-----|-----|-----|-----|-----|-----|----|----|----|-----|----|-----|-----|-----|-----|
| 102A | 102 | 189 | 229 | 212 | 189 | 252 | 229 | 42 | 42 | 39 | 102 | 83 | 159 | 159 | 199 | 199 |
| 102B |     | 216 | 256 | 239 | 216 | 279 | 256 | 42 | 42 | 39 | 102 | 83 | 186 | 186 | 226 | 226 |
| 102C |     | 243 | 283 | 266 | 243 | 306 | 283 | 42 | 42 | 39 | 102 | 83 | 213 | 213 | 253 | 253 |
| 118B | 118 | 243 | 293 | 268 | 243 | 318 | 293 | 42 | 42 | 50 | 102 | 83 | 208 | 258 | 258 | 258 |
| 118C |     | 276 | 326 | 301 | 276 | 351 | 326 | 42 | 42 | 50 | 102 | 83 | 241 | 291 | 291 | 291 |

#### BMS 070 - 16... 70 - 2 STAGE

|      |    |     |     |     |     |     |     |    |    |    |     |    |     |     |     |     |
|------|----|-----|-----|-----|-----|-----|-----|----|----|----|-----|----|-----|-----|-----|-----|
| 065A | 65 | 195 | 226 | 213 | 213 | 262 | 262 | 42 | 42 | 32 | 102 | 83 | 172 | 172 | 221 | 221 |
| 065B |    | 218 | 249 | 236 | 236 | 285 | 285 | 42 | 42 | 32 | 102 | 83 | 195 | 195 | 244 | 244 |
| 082B | 82 | 232 | 272 | 255 | 232 | 295 | 295 | 42 | 42 | 36 | 102 | 83 | 204 | 204 | 267 | 267 |
| 082C |    | 252 | 292 | 275 | 252 | 315 | 315 | 42 | 42 | 36 | 102 | 83 | 224 | 224 | 287 | 287 |

| Gear motor stages | i        | $\varphi_s$ | $\varphi_r$ | $R_{2max}$ | $A_{2max}$ |
|-------------------|----------|-------------|-------------|------------|------------|
|                   |          | ≤           |             |            |            |
|                   |          | [arcmin]    |             |            | [N]        |
| 1                 | 4... 10  | 5'          | 3'          | 4400       | 4300       |
| 2                 | 16... 70 | 7'          | 5'          | 4400       | 4300       |

# BMS F 070

## PERFORMANCE DATA • BASE OVERSPEED

| Designation         |            | $n_{n2}$             | $n_{a2}$             | $M_{n2}$ | $M_{02}$ | $M_{a2}$ | $M_{p2}$ | $I_n$        | $I_0$        | $I_a$        | $I_p$        | $C_t$       | $J_1$                 | $m$  | $K_p$ |
|---------------------|------------|----------------------|----------------------|----------|----------|----------|----------|--------------|--------------|--------------|--------------|-------------|-----------------------|------|-------|
|                     |            | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]     | [Nm]     | [Nm]     | [Nm]     | [A]          | [A]          | [A]          | [A]          | [Nm/arcmin] | [kg cm <sup>2</sup> ] | [kg] |       |
| BMS F 070 B 70 065A | 400<br>230 | 43                   | 53                   | 56       | 60       | 90       | 160      | 0.72<br>1.16 | 0.76<br>1.23 | 1.23<br>1.97 | 2.18<br>3.50 | 29          | 0.13                  | 6.9  | 9.4   |
| BMS F 070 B 50 065A | 400<br>230 | 60                   | 60                   | 40       | 43       | 100      | 128      | 0.72<br>1.16 | 0.76<br>1.23 | 1.91<br>3.06 | 2.43<br>3.90 | 29          | 0.13                  | 6.9  | 11    |
| BMS F 070 B 40 065A | 400<br>230 | 75                   | 63                   | 32       | 34       | 100      | 102      | 0.72<br>1.16 | 0.76<br>1.23 | 2.38<br>3.82 | 2.43<br>3.90 | 29          | 0.14                  | 6.9  | 13    |
| BMS F 070 B 40 065B | 400<br>230 | 75                   | 85                   | 64       | 68       | 100      | 180      | 1.33<br>2.30 | 1.35<br>2.30 | 2.35<br>4.08 | 4.22<br>7.35 | 29          | 0.34                  | 7.5  | 25    |
| BMS F 070 B 35 065A | 400<br>230 | 86                   | 71                   | 28       | 30       | 89       | 89       | 0.72<br>1.16 | 0.76<br>1.23 | 2.42<br>3.89 | 2.42<br>3.89 | 29          | 0.15                  | 6.9  | 14    |
| BMS F 070 B 35 065B | 400<br>230 | 86                   | 86                   | 56       | 60       | 100      | 172      | 1.33<br>2.30 | 1.35<br>2.30 | 2.68<br>4.66 | 4.60<br>8.00 | 29          | 0.35                  | 7.5  | 26    |
| BMS F 070 B 28 065A | 400<br>230 | 107                  | 89                   | 22       | 24       | 71       | 71       | 0.72<br>1.16 | 0.76<br>1.23 | 2.42<br>3.88 | 2.43<br>3.90 | 29          | 0.16                  | 6.9  | 15    |
| BMS F 070 B 28 065B | 400<br>230 | 107                  | 89                   | 45       | 48       | 100      | 137      | 1.33<br>2.30 | 1.35<br>2.30 | 3.35<br>5.83 | 4.60<br>8.00 | 29          | 0.36                  | 7.5  | 29    |
| BMS F 070 B 25 065A | 400<br>230 | 120                  | 100                  | 20       | 21       | 64       | 64       | 0.72<br>1.16 | 0.76<br>1.23 | 2.43<br>3.90 | 2.43<br>3.90 | 29          | 0.18                  | 6.9  | 16    |
| BMS F 070 B 25 065B | 400<br>230 | 120                  | 96                   | 40       | 43       | 100      | 123      | 1.33<br>2.30 | 1.35<br>2.30 | 3.76<br>6.53 | 4.60<br>8.00 | 29          | 0.38                  | 7.5  | 31    |
| BMS F 070 B 20 065B | 400<br>230 | 150                  | 100                  | 32       | 34       | 98       | 98       | 1.33<br>2.30 | 1.35<br>2.30 | 4.60<br>8.00 | 4.60<br>8.00 | 29          | 0.42                  | 7.5  | 35    |
| BMS F 070 B 20 082B | 400<br>230 | 150                  | 160                  | 60       | 64       | 100      | 170      | 2.50<br>4.30 | 2.60<br>4.50 | 5.24<br>9.12 | 8.90<br>15.5 | 29          | 1.42                  | 9.1  | 30    |
| BMS F 070 B 16 065B | 400<br>230 | 188                  | 125                  | 26       | 27       | 78       | 78       | 1.33<br>2.30 | 1.35<br>2.30 | 4.58<br>7.96 | 4.58<br>7.96 | 29          | 0.44                  | 7.5  | 39    |
| BMS F 070 B 16 082B | 400<br>230 | 188                  | 175                  | 48       | 51       | 100      | 136      | 2.50<br>4.30 | 2.60<br>4.50 | 6.54<br>11.4 | 8.90<br>15.5 | 29          | 1.44                  | 9.1  | 34    |
| BMS F 070 B 16 082C | 400<br>230 | 188                  | 200                  | 61       | 70       | 100      | 180      | 2.90<br>5.10 | 3.30<br>5.80 | 5.38<br>9.46 | 9.68<br>17.0 | 29          | 1.74                  | 10   | 43    |
| BMS F 070 B 10 102A | 400<br>230 | 300                  | 320                  | 34       | 40       | 60       | 110      | 2.80<br>4.82 | 3.30<br>5.68 | 5.56<br>9.60 | 10.2<br>17.6 | 29          | 2.10                  | 8.6  | 7.7   |
| BMS F 070 B 7 102A  | 400<br>230 | 429                  | 300                  | 24       | 28       | 77       | 147      | 2.80<br>4.82 | 3.30<br>5.68 | 10.2<br>17.6 | 10.2<br>17.6 | 30          | 2.19                  | 8.6  | 11    |
| BMS F 070 B 7 102B  | 400<br>230 | 429                  | 457                  | 47       | 50       | 90       | 147      | 5.40<br>9.50 | 5.50<br>9.70 | 12.2<br>21.4 | 20.0<br>35.0 | 30          | 3.69                  | 10   | 20    |
| BMS F 070 B 7 102C  | 400<br>230 | 429                  | 500                  | 60       | 60       | 90       | 160      | 5.80<br>10.2 | 6.50<br>12.0 | 9.64<br>17.0 | 17.1<br>30.2 | 30          | 4.99                  | 12   | 26    |
| BMS F 070 B 5 102A  | 400<br>230 | 600                  | 420                  | 17       | 20       | 55       | 105      | 2.80<br>4.82 | 3.30<br>5.68 | 10.2<br>17.6 | 10.2<br>17.6 | 31          | 2.36                  | 8.6  | 15    |
| BMS F 070 B 5 102B  | 400<br>230 | 600                  | 440                  | 34       | 36       | 100      | 105      | 5.40<br>9.50 | 5.50<br>9.70 | 19.0<br>33.3 | 20.0<br>35.0 | 31          | 3.86                  | 10   | 28    |
| BMS F 070 B 5 118B  | 400<br>230 | 600                  | 640                  | 48       | 51       | 100      | 150      | 7.90<br>13.5 | 8.00<br>14.0 | 18.7<br>32.0 | 28.0<br>48.0 | 31          | 8.26                  | 14   | 38    |
| BMS F 070 B 5 118C  | 400<br>230 | 600                  | 680                  | 61       | 70       | 100      | 180      | 8.40<br>14.0 | 10.0<br>16.0 | 16.4<br>27.2 | 29.5<br>48.9 | 31          | 10.4                  | 16   | 52    |
| BMS F 070 B 4 102B  | 400<br>230 | 750                  | 550                  | 27       | 29       | 84       | 105      | 5.40<br>9.50 | 5.50<br>9.70 | 20.0<br>35.0 | 20.0<br>35.0 | 32          | 4.06                  | 10   | 35    |
| BMS F 070 B 4 118B  | 400<br>230 | 750                  | 750                  | 38       | 41       | 100      | 120      | 7.90<br>13.5 | 8.00<br>14.0 | 23.3<br>40.0 | 28.0<br>48.0 | 32          | 8.46                  | 14   | 51    |
| BMS F 070 B 4 118C  | 400<br>230 | 750                  | 775                  | 49       | 56       | 100      | 156      | 8.40<br>14.0 | 10.0<br>16.0 | 20.5<br>34.0 | 32.0<br>53.0 | 32          | 10.6                  | 16   | 65    |

# BMS F 070

## PERFORMANCE DATA • MEDIUM OVERSPEED

| Designation                                | n <sub>n2</sub>      | n <sub>a2</sub>      | M <sub>n2</sub> | M <sub>02</sub> | M <sub>a2</sub> | M <sub>p2</sub> | I <sub>n</sub> | I <sub>0</sub> | I <sub>a</sub> | I <sub>p</sub> | C <sub>t</sub> | J <sub>1</sub> | m    | K <sub>p</sub> |
|--------------------------------------------|----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|------|----------------|
|                                            | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]            | [Nm]            | [Nm]            | [Nm]            | [A]            | [A]            | [A]            | [A]            | [Nm/arcmin]    | [kg cm²]       | [kg] |                |
| BMS F 070 M 70 065A <div>400<br/>230</div> | 57                   | 71                   | 55              | 60              | 90              | 160             | 0.88<br>1.74   | 0.98<br>1.90   | 1.56<br>3.13   | 2.78<br>5.56   | 29             | 0.13           | 6.9  | 9.4            |
| BMS F 070 M 50 065A <div>400<br/>230</div> | 70                   | 80                   | 39              | 43              | 100             | 128             | 0.88<br>1.74   | 0.98<br>1.90   | 2.43<br>4.86   | 3.10<br>6.20   | 29             | 0.13           | 6.9  | 11             |
| BMS F 070 M 40 065A <div>400<br/>230</div> | 88                   | 75                   | 31              | 34              | 100             | 102             | 0.88<br>1.74   | 0.98<br>1.90   | 3.04<br>6.08   | 3.10<br>6.20   | 29             | 0.14           | 6.9  | 13             |
| BMS F 070 M 40 065B <div>400<br/>230</div> | 88                   | 130                  | 62              | 68              | 100             | 180             | 1.85<br>3.20   | 1.98<br>3.40   | 3.42<br>5.87   | 6.15<br>10.6   | 29             | 0.34           | 7.5  | 25             |
| BMS F 070 M 35 065A <div>400<br/>230</div> | 100                  | 86                   | 27              | 30              | 89              | 89              | 0.88<br>1.74   | 0.98<br>1.90   | 3.09<br>6.18   | 3.09<br>6.18   | 29             | 0.15           | 6.9  | 14             |
| BMS F 070 M 35 065B <div>400<br/>230</div> | 100                  | 143                  | 55              | 60              | 100             | 172             | 1.85<br>3.20   | 1.98<br>3.40   | 3.91<br>6.71   | 6.70<br>11.5   | 29             | 0.35           | 7.5  | 26             |
| BMS F 070 M 28 065A <div>400<br/>230</div> | 125                  | 107                  | 22              | 24              | 71              | 71              | 0.88<br>1.74   | 0.98<br>1.90   | 3.08<br>6.17   | 3.10<br>6.20   | 29             | 0.16           | 6.9  | 15             |
| BMS F 070 M 28 065B <div>400<br/>230</div> | 125                  | 161                  | 44              | 48              | 100             | 137             | 1.85<br>3.20   | 1.98<br>3.40   | 4.88<br>8.38   | 6.70<br>11.5   | 29             | 0.36           | 7.5  | 29             |
| BMS F 070 M 25 065A <div>400<br/>230</div> | 140                  | 120                  | 20              | 21              | 64              | 64              | 0.88<br>1.74   | 0.98<br>1.90   | 3.10<br>6.20   | 3.10<br>6.20   | 29             | 0.18           | 6.9  | 16             |
| BMS F 070 M 25 065B <div>400<br/>230</div> | 140                  | 160                  | 39              | 43              | 100             | 123             | 1.85<br>3.20   | 1.98<br>3.40   | 5.47<br>9.39   | 6.70<br>11.5   | 29             | 0.38           | 7.5  | 31             |
| BMS F 070 M 20 065B <div>400<br/>230</div> | 175                  | 175                  | 31              | 34              | 98              | 98              | 1.85<br>3.20   | 1.98<br>3.40   | 6.70<br>11.5   | 6.70<br>11.5   | 29             | 0.42           | 7.5  | 35             |
| BMS F 070 M 20 082B <div>400<br/>230</div> | 175                  | 250                  | 58              | 64              | 100             | 170             | 3.40<br>5.30   | 3.90<br>6.00   | 7.76<br>12.1   | 13.2<br>20.6   | 29             | 1.42           | 9.1  | 30             |
| BMS F 070 M 16 065B <div>400<br/>230</div> | 219                  | 219                  | 25              | 27              | 78              | 78              | 1.85<br>3.20   | 1.98<br>3.40   | 6.67<br>11.4   | 6.67<br>11.4   | 29             | 0.44           | 7.5  | 39             |
| BMS F 070 M 16 082B <div>400<br/>230</div> | 219                  | 281                  | 46              | 51              | 100             | 136             | 3.40<br>5.30   | 3.90<br>6.00   | 9.71<br>15.1   | 13.2<br>20.6   | 29             | 1.44           | 9.1  | 34             |
| BMS F 070 M 16 082C <div>400<br/>230</div> | 219                  | 313                  | 59              | 70              | 100             | 180             | 3.90<br>6.80   | 4.80<br>8.40   | 7.83<br>13.6   | 14.1<br>24.6   | 29             | 1.74           | 10   | 43             |
| BMS F 070 M 10 102A <div>400<br/>230</div> | 350                  | 510                  | 33              | 40              | 60              | 110             | 3.80<br>6.88   | 4.90<br>8.82   | 8.18<br>14.9   | 15.0<br>27.3   | 29             | 2.10           | 8.6  | 7.7            |
| BMS F 070 M 7 102A <div>400<br/>230</div>  | 500                  | 500                  | 23              | 28              | 77              | 147             | 3.80<br>6.88   | 4.90<br>8.82   | 15.0<br>27.3   | 15.0<br>27.3   | 30             | 2.19           | 8.6  | 11             |
| BMS F 070 M 7 102B <div>400<br/>230</div>  | 500                  | 714                  | 45              | 50              | 90              | 147             | 7.50<br>12.6   | 8.30<br>14.0   | 18.4<br>31.2   | 30.0<br>51.0   | 30             | 3.69           | 10   | 20             |
| BMS F 070 M 7 102C <div>400<br/>230</div>  | 500                  | 714                  | 57              | 60              | 90              | 160             | 7.80<br>13.5   | 9.70<br>17.0   | 14.2<br>24.8   | 25.3<br>44.1   | 30             | 4.99           | 12   | 26             |
| BMS F 070 M 5 102A <div>400<br/>230</div>  | 600                  | 700                  | 17              | 20              | 55              | 105             | 3.80<br>6.88   | 4.90<br>8.82   | 15.0<br>27.3   | 15.0<br>27.3   | 31             | 2.36           | 8.6  | 15             |
| BMS F 070 M 5 102B <div>400<br/>230</div>  | 600                  | 800                  | 32              | 36              | 100             | 105             | 7.50<br>12.6   | 8.30<br>14.0   | 28.6<br>48.6   | 30.0<br>51.0   | 31             | 3.86           | 10   | 28             |
| BMS F 070 M 5 118B <div>400<br/>230</div>  | 600                  | 1000                 | 46              | 51              | 100             | 150             | 10.2<br>18.3   | 12.0<br>21.0   | 26.7<br>48.7   | 40.0<br>73.0   | 31             | 8.26           | 14   | 38             |
| BMS F 070 M 5 118C <div>400<br/>-</div>    | 600                  | 1000                 | 58              | 70              | 100             | 180             | 10.9<br>-      | 14.0<br>-      | 24.1<br>-      | 43.4<br>-      | 31             | 10.4           | 16   | 52             |
| BMS F 070 M 4 102B <div>400<br/>230</div>  | 750                  | 760                  | 26              | 29              | 84              | 105             | 7.50<br>12.6   | 8.30<br>14.0   | 30.0<br>51.0   | 30.0<br>51.0   | 32             | 4.06           | 10   | 35             |
| BMS F 070 M 4 118B <div>400<br/>230</div>  | 750                  | 1125                 | 36              | 41              | 100             | 120             | 10.2<br>18.3   | 12.0<br>21.0   | 33.3<br>60.8   | 40.0<br>73.0   | 32             | 8.46           | 14   | 51             |
| BMS F 070 M 4 118C <div>400<br/>-</div>    | 750                  | 1125                 | 46              | 56              | 100             | 156             | 10.9<br>-      | 14.0<br>-      | 30.1<br>-      | 47.0<br>-      | 32             | 10.6           | 16   | 65             |



# BMS F 070

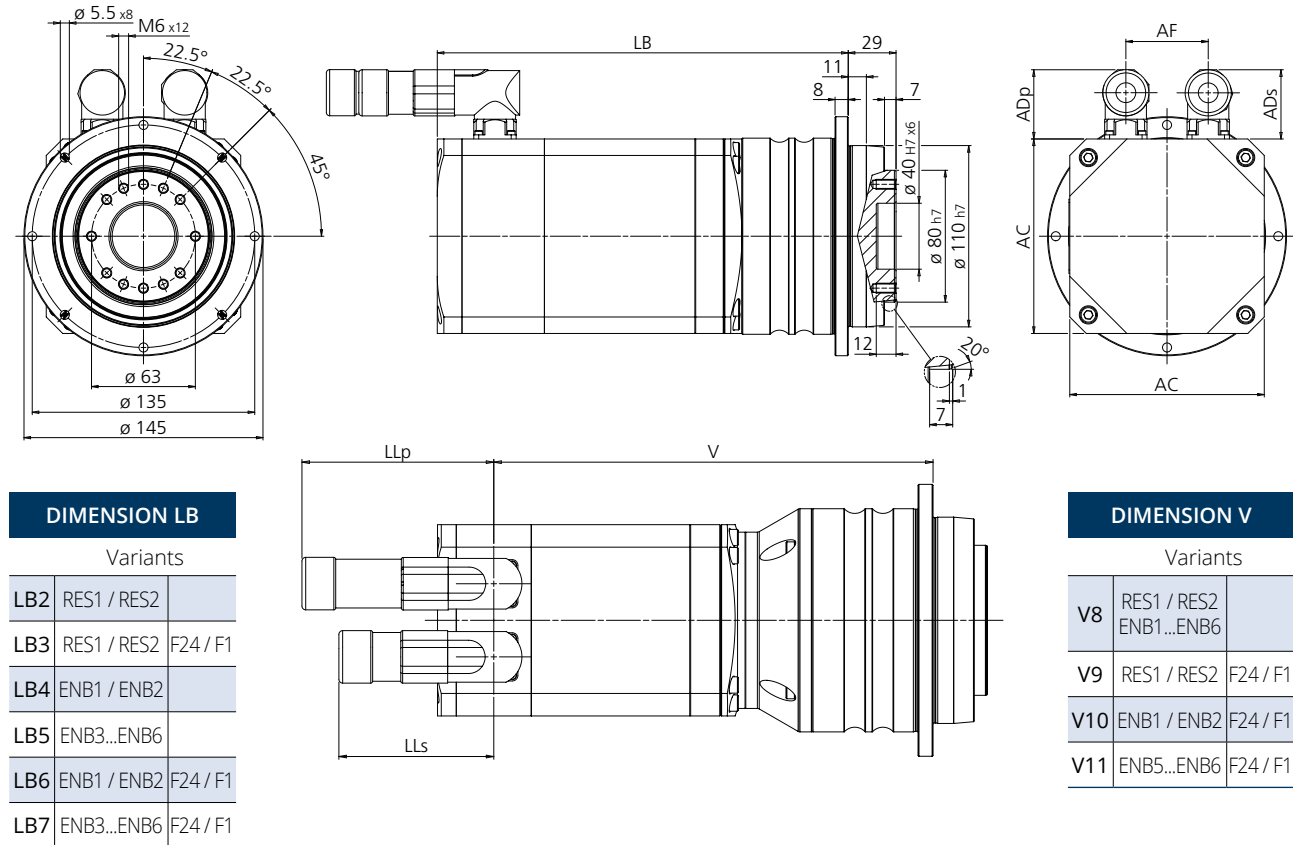
## PERFORMANCE DATA • HIGH OVERSPEED

| Designation         |                   | $n_{n2}$             | $n_{a2}$             | $M_{n2}$ | $M_{02}$ | $M_{a2}$ | $M_{p2}$ | $I_n$                | $I_0$               | $I_a$               | $I_p$               | $C_t$       | $J_1$                 | $m$  | $K_p$ |
|---------------------|-------------------|----------------------|----------------------|----------|----------|----------|----------|----------------------|---------------------|---------------------|---------------------|-------------|-----------------------|------|-------|
|                     |                   | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]     | [Nm]     | [Nm]     | [Nm]     | [A]                  | [A]                 | [A]                 | [A]                 | [Nm/arcmin] | [kg cm <sup>2</sup> ] | [kg] |       |
| BMS F 070 H 70 065A | $\frac{400}{230}$ | 57                   | 86                   | 55       | 60       | 90       | 160      | $\frac{1.21}{2.09}$  | $\frac{1.38}{2.39}$ | $\frac{2.22}{3.88}$ | $\frac{3.94}{6.90}$ | 29          | 0.13                  | 6.9  | 9.4   |
| BMS F 070 H 50 065A | $\frac{400}{230}$ | 70                   | 110                  | 39       | 43       | 100      | 128      | $\frac{1.21}{2.09}$  | $\frac{1.38}{2.39}$ | $\frac{3.45}{6.04}$ | $\frac{4.40}{7.70}$ | 29          | 0.13                  | 6.9  | 11    |
| BMS F 070 H 40 065A | $\frac{400}{230}$ | 88                   | 105                  | 31       | 34       | 100      | 102      | $\frac{1.21}{2.09}$  | $\frac{1.38}{2.39}$ | $\frac{4.31}{7.55}$ | $\frac{4.40}{7.70}$ | 29          | 0.14                  | 6.9  | 13    |
| BMS F 070 H 40 065B | $\frac{400}{230}$ | 88                   | 150                  | 62       | 68       | 100      | 180      | $\frac{2.43}{4.20}$  | $\frac{2.68}{4.70}$ | $\frac{4.64}{8.11}$ | $\frac{8.36}{14.6}$ | 29          | 0.34                  | 7.5  | 25    |
| BMS F 070 H 35 065A | $\frac{400}{230}$ | 100                  | 120                  | 27       | 30       | 89       | 89       | $\frac{1.21}{2.09}$  | $\frac{1.38}{2.39}$ | $\frac{4.39}{7.68}$ | $\frac{4.39}{7.68}$ | 29          | 0.15                  | 6.9  | 14    |
| BMS F 070 H 35 065B | $\frac{400}{230}$ | 100                  | 171                  | 55       | 60       | 100      | 172      | $\frac{2.43}{4.20}$  | $\frac{2.68}{4.70}$ | $\frac{5.31}{9.27}$ | $\frac{9.10}{15.9}$ | 29          | 0.35                  | 7.5  | 26    |
| BMS F 070 H 28 065A | $\frac{400}{230}$ | 125                  | 150                  | 22       | 24       | 71       | 71       | $\frac{1.21}{2.09}$  | $\frac{1.38}{2.39}$ | $\frac{4.38}{7.66}$ | $\frac{4.40}{7.70}$ | 29          | 0.16                  | 6.9  | 15    |
| BMS F 070 H 28 065B | $\frac{400}{230}$ | 125                  | 214                  | 44       | 48       | 100      | 137      | $\frac{2.43}{4.20}$  | $\frac{2.7}{4.70}$  | $\frac{6.63}{11.6}$ | $\frac{9.10}{15.9}$ | 29          | 0.36                  | 7.5  | 29    |
| BMS F 070 H 25 065A | $\frac{400}{230}$ | 140                  | 168                  | 20       | 21       | 64       | 64       | $\frac{1.21}{2.09}$  | $\frac{1.38}{2.39}$ | $\frac{4.40}{7.70}$ | $\frac{4.40}{7.70}$ | 29          | 0.18                  | 6.9  | 16    |
| BMS F 070 H 25 065B | $\frac{400}{230}$ | 140                  | 232                  | 39       | 43       | 100      | 123      | $\frac{2.43}{4.20}$  | $\frac{2.68}{4.70}$ | $\frac{7.43}{13.0}$ | $\frac{9.10}{15.9}$ | 29          | 0.38                  | 7.5  | 31    |
| BMS F 070 H 20 065B | $\frac{400}{230}$ | 175                  | 250                  | 31       | 34       | 98       | 98       | $\frac{2.43}{4.20}$  | $\frac{2.68}{4.70}$ | $\frac{9.10}{15.9}$ | $\frac{9.10}{15.9}$ | 29          | 0.42                  | 7.5  | 35    |
| BMS F 070 H 20 082B | $\frac{400}{230}$ | 175                  | 300                  | 58       | 64       | 100      | 170      | $\frac{4.30}{7.60}$  | $\frac{5.20}{9.00}$ | $\frac{10.4}{18.2}$ | $\frac{17.7}{31.0}$ | 29          | 1.42                  | 9.1  | 30    |
| BMS F 070 H 16 065B | $\frac{400}{230}$ | 219                  | 313                  | 25       | 27       | 78       | 78       | $\frac{2.43}{4.20}$  | $\frac{2.68}{4.70}$ | $\frac{9.05}{15.8}$ | $\frac{9.05}{15.8}$ | 29          | 0.44                  | 7.5  | 39    |
| BMS F 070 H 16 082B | $\frac{400}{230}$ | 219                  | 375                  | 46       | 51       | 100      | 136      | $\frac{4.30}{7.60}$  | $\frac{5.20}{9.00}$ | $\frac{13.0}{22.8}$ | $\frac{17.7}{31.0}$ | 29          | 1.44                  | 9.1  | 34    |
| BMS F 070 H 16 082C | $\frac{400}{230}$ | 219                  | 375                  | 59       | 70       | 100      | 180      | $\frac{4.50}{7.60}$  | $\frac{6.20}{10.6}$ | $\frac{10.1}{17.4}$ | $\frac{18.2}{31.3}$ | 29          | 1.74                  | 10   | 43    |
| BMS F 070 H 10 102A | $\frac{400}{230}$ | 350                  | 600                  | 33       | 40       | 60       | 110      | $\frac{4.60}{8.29}$  | $\frac{6.30}{11.4}$ | $\frac{10.4}{19.1}$ | $\frac{19.0}{35.1}$ | 29          | 2.10                  | 8.6  | 7.7   |
| BMS F 070 H 7 102A  | $\frac{400}{230}$ | 500                  | 643                  | 23       | 28       | 77       | 147      | $\frac{4.60}{8.29}$  | $\frac{6.30}{11.4}$ | $\frac{19.0}{35.1}$ | $\frac{19.0}{35.1}$ | 30          | 2.19                  | 8.6  | 11    |
| BMS F 070 H 7 102B  | $\frac{400}{230}$ | 500                  | 857                  | 45       | 50       | 90       | 147      | $\frac{9.30}{15.40}$ | $\frac{11.0}{18.2}$ | $\frac{24.5}{40.4}$ | $\frac{40.0}{66.0}$ | 30          | 3.69                  | 10   | 20    |
| BMS F 070 H 7 102C  | $\frac{400}{230}$ | 500                  | 857                  | 57       | 60       | 90       | 160      | $\frac{8.40}{14.80}$ | $\frac{12.4}{21.8}$ | $\frac{18.4}{32.1}$ | $\frac{32.7}{57.1}$ | 30          | 4.99                  | 12   | 26    |
| BMS F 070 H 5 102A  | $\frac{400}{230}$ | 600                  | 900                  | 17       | 20       | 55       | 105      | $\frac{4.60}{8.29}$  | $\frac{6.30}{11.4}$ | $\frac{19.0}{35.1}$ | $\frac{19.0}{35.1}$ | 31          | 2.36                  | 8.6  | 15    |
| BMS F 070 H 5 102B  | $\frac{400}{230}$ | 600                  | 1080                 | 32       | 36       | 100      | 105      | $\frac{9.30}{15.40}$ | $\frac{11.0}{18.2}$ | $\frac{38.1}{62.9}$ | $\frac{40.0}{66.0}$ | 31          | 3.86                  | 10   | 28    |
| BMS F 070 H 5 118B  | $\frac{400}{-}$   | 600                  | 1200                 | 46       | 51       | 100      | 150      | $\frac{11.40}{-}$    | $\frac{15.8}{-}$    | $\frac{36.7}{-}$    | $\frac{55.0}{-}$    | 31          | 8.26                  | 14   | 38    |
| BMS F 070 H 5 118C  | $\frac{400}{-}$   | 600                  | 1200                 | 58       | 70       | 100      | 180      | $\frac{11.80}{-}$    | $\frac{18.9}{-}$    | $\frac{31.8}{-}$    | $\frac{57.2}{-}$    | 31          | 10.4                  | 16   | 52    |
| BMS F 070 H 4 102B  | $\frac{400}{230}$ | 750                  | 135                  | 26       | 29       | 84       | 105      | $\frac{9.30}{15.40}$ | $\frac{11.0}{18.2}$ | $\frac{40.0}{66.0}$ | $\frac{40.0}{66.0}$ | 32          | 4.06                  | 10   | 35    |
| BMS F 070 H 4 118B  | $\frac{400}{-}$   | 750                  | 1500                 | 36       | 41       | 100      | 120      | $\frac{11.40}{-}$    | $\frac{15.8}{-}$    | $\frac{45.8}{-}$    | $\frac{55.0}{-}$    | 32          | 8.46                  | 14   | 51    |
| BMS F 070 H 4 118C  | $\frac{400}{-}$   | 750                  | 1500                 | 46       | 56       | 100      | 156      | $\frac{11.80}{-}$    | $\frac{18.9}{-}$    | $\frac{39.7}{-}$    | $\frac{62.0}{-}$    | 32          | 10.6                  | 16   | 65    |



# BMS F 090

## DIMENSIONS AND TECHNICAL DATA



| Motor size | AC | LB2 | LB3 | LB4 | LB5 | LB6 | LB7 | ADp | ADs | AF | LLp | LLs | V8 | V9 | V10 | V11 |
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|-----|-----|
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|-----|-----|

BMS 090 - 4... 10 - 1 STAGE

|      |     |     |     |     |     |     |     |    |    |    |     |    |     |     |     |     |
|------|-----|-----|-----|-----|-----|-----|-----|----|----|----|-----|----|-----|-----|-----|-----|
| 118A | 118 | 218 | 268 | 243 | 218 | 293 | 268 | 42 | 42 | 50 | 102 | 83 | 183 | 233 | 233 | 233 |
| 118B |     | 249 | 299 | 274 | 249 | 324 | 299 | 42 | 42 | 50 | 102 | 83 | 214 | 264 | 264 | 264 |
| 118C |     | 282 | 332 | 307 | 282 | 357 | 332 | 42 | 42 | 50 | 102 | 83 | 247 | 297 | 297 | 297 |
| 145B | 145 | 268 | 318 | 293 | 268 | 343 | 318 | 42 | 42 | 45 | 102 | 83 | 233 | 283 | 283 | 283 |
| 145C |     | 303 | 353 | 328 | 303 | 378 | 353 | 42 | 42 | 45 | 102 | 83 | 268 | 318 | 318 | 318 |
| 170B | 170 | 294 | 369 | 332 | 294 | 407 | 369 | 62 | 42 | 90 | 129 | 83 | 267 | 342 | 342 | 342 |
| 170C |     | 348 | 423 | 386 | 348 | 461 | 423 | 62 | 42 | 90 | 129 | 83 | 321 | 396 | 396 | 396 |

BMS 090 - 16... 50 - 2 STAGE

|      |     |     |     |     |     |     |     |    |    |    |     |    |     |     |     |     |
|------|-----|-----|-----|-----|-----|-----|-----|----|----|----|-----|----|-----|-----|-----|-----|
| 102A | 102 | 237 | 277 | 260 | 237 | 300 | 277 | 42 | 42 | 39 | 102 | 83 | 207 | 207 | 247 | 247 |
| 102B |     | 264 | 304 | 287 | 264 | 327 | 304 | 42 | 42 | 39 | 102 | 83 | 234 | 234 | 274 | 274 |
| 102C |     | 291 | 331 | 314 | 291 | 354 | 331 | 42 | 42 | 39 | 102 | 83 | 261 | 261 | 301 | 301 |
| 118B | 118 | 292 | 342 | 317 | 292 | 367 | 342 | 42 | 42 | 50 | 102 | 83 | 325 | 325 | 365 | 365 |
| 118C |     | 325 | 375 | 350 | 325 | 400 | 375 | 42 | 42 | 50 | 102 | 83 | 352 | 352 | 392 | 392 |

| Gear motor stages | i        | $\psi_s$ | $\psi_r$ | $R_{2max}$ | $A_{2max}$ |
|-------------------|----------|----------|----------|------------|------------|
|                   |          | $\leq$   |          |            |            |
|                   |          | [arcmin] |          | [N]        | [N]        |
| 1                 | 4... 10  | 5'       | 3'       | 5500       | 6800       |
| 2                 | 16... 50 | 7'       | 5'       | 5500       | 6800       |

# BMS F 090

## PERFORMANCE DATA • BASE OVERSPEED

| Designation         | $n_{n_2}$            | $n_{a_2}$            | $M_{n_2}$ | $M_{0_2}$ | $M_{a_2}$ | $M_{p_2}$ | $I_n$ | $I_0$        | $I_a$        | $I_p$        | $C_t$        | $J_1$                 | $m$  | $K_p$ |     |
|---------------------|----------------------|----------------------|-----------|-----------|-----------|-----------|-------|--------------|--------------|--------------|--------------|-----------------------|------|-------|-----|
|                     | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]      | [Nm]      | [Nm]      | [Nm]      | [A]   | [A]          | [A]          | [A]          | [Nm/arcmin]  | [kg cm <sup>2</sup> ] | [kg] |       |     |
| BMS F 090 B 50 102A | $\frac{400}{230}$    | 60                   | 70        | 170       | 180       | 280       | 500   | 2.80<br>4.82 | 3.30<br>5.68 | 5.19<br>8.96 | 9.27<br>16.0 | 70                    | 1.72 | 14    | 10  |
| BMS F 090 B 40 102A | $\frac{400}{230}$    | 75                   | 75        | 136       | 160       | 300       | 500   | 2.80<br>4.82 | 3.30<br>5.68 | 6.95<br>12.0 | 10.2<br>17.6 | 70                    | 1.73 | 14    | 11  |
| BMS F 090 B 35 102A | $\frac{400}{230}$    | 86                   | 80        | 119       | 140       | 280       | 500   | 2.80<br>4.82 | 3.30<br>5.68 | 7.42<br>12.8 | 10.2<br>17.6 | 70                    | 1.77 | 14    | 13  |
| BMS F 090 B 28 102A | $\frac{400}{230}$    | 107                  | 79        | 95        | 112       | 300       | 500   | 2.80<br>4.82 | 3.30<br>5.68 | 9.94<br>17.1 | 10.2<br>17.6 | 70                    | 1.78 | 14    | 15  |
| BMS F 090 B 28 102B | $\frac{400}{230}$    | 107                  | 125       | 188       | 200       | 300       | 500   | 5.40<br>9.50 | 5.50<br>9.70 | 10.2<br>17.9 | 17.0<br>29.8 | 70                    | 3.28 | 15    | 26  |
| BMS F 090 B 25 102A | $\frac{400}{230}$    | 120                  | 88        | 85        | 100       | 275       | 500   | 2.80<br>4.82 | 3.30<br>5.68 | 10.2<br>17.6 | 10.2<br>17.6 | 70                    | 1.86 | 14    | 15  |
| BMS F 090 B 25 102B | $\frac{400}{230}$    | 120                  | 140       | 168       | 180       | 280       | 500   | 5.40<br>9.50 | 5.50<br>9.70 | 10.7<br>18.7 | 19.0<br>33.3 | 70                    | 3.36 | 15    | 28  |
| BMS F 090 B 20 102B | $\frac{400}{230}$    | 150                  | 150       | 134       | 144       | 280       | 420   | 5.40<br>9.50 | 5.50<br>9.70 | 13.3<br>23.3 | 20.0<br>35.0 | 70                    | 3.46 | 15    | 31  |
| BMS F 090 B 20 102C | $\frac{400}{230}$    | 150                  | 160       | 170       | 180       | 280       | 500   | 5.80<br>10.2 | 6.50<br>12.0 | 10.5<br>18.5 | 18.8<br>33.0 | 70                    | 4.76 | 17    | 37  |
| BMS F 090 B 16 102B | $\frac{400}{230}$    | 188                  | 156       | 107       | 115       | 300       | 336   | 5.40<br>9.50 | 5.50<br>9.70 | 17.9<br>31.3 | 20.0<br>35.0 | 70                    | 3.49 | 15    | 41  |
| BMS F 090 B 16 118B | $\frac{400}{230}$    | 188                  | 219       | 152       | 163       | 300       | 480   | 7.90<br>13.5 | 8.00<br>14.0 | 17.5<br>30.0 | 28.0<br>48.0 | 70                    | 7.89 | 19    | 19  |
| BMS F 090 B 16 118C | $\frac{400}{230}$    | 188                  | 219       | 195       | 200       | 300       | 500   | 8.40<br>14.0 | 10.0<br>16.0 | 15.4<br>25.5 | 25.6<br>42.5 | 70                    | 10.0 | 21    | 26  |
| BMS F 090 B 10 118A | $\frac{400}{230}$    | 300                  | 250       | 51        | 56        | 150       | 150   | 3.90<br>6.64 | 4.30<br>7.30 | 14.0<br>23.9 | 14.0<br>23.9 | 70                    | 4.78 | 15    | 13  |
| BMS F 090 B 10 118B | $\frac{400}{230}$    | 300                  | 360       | 95        | 102       | 170       | 300   | 7.90<br>13.5 | 8.00<br>14.0 | 15.9<br>27.2 | 28.0<br>48.0 | 70                    | 8.18 | 17    | 26  |
| BMS F 090 B 7 118B  | $\frac{400}{230}$    | 429                  | 386       | 67        | 71        | 210       | 210   | 7.90<br>13.5 | 8.00<br>14.0 | 28.0<br>48.0 | 28.0<br>48.0 | 72                    | 8.35 | 17    | 37  |
| BMS F 090 B 7 118C  | $\frac{400}{230}$    | 429                  | 357       | 85        | 98        | 250       | 273   | 8.40<br>14.0 | 10.0<br>16.0 | 29.3<br>48.5 | 32.0<br>53.0 | 72                    | 10.5 | 19    | 46  |
| BMS F 090 B 7 145B  | $\frac{400}{230}$    | 429                  | 400       | 112       | 118       | 250       | 322   | 12.5<br>21.9 | 13.0<br>23.0 | 38.8<br>68.3 | 50.0<br>88.0 | 72                    | 13.4 | 22    | 50  |
| BMS F 090 B 7 145C  | $\frac{400}{230}$    | 429                  | 429       | 134       | 154       | 250       | 413   | 14.2<br>22.9 | 16.0<br>27.0 | 32.7<br>52.7 | 54.0<br>87.0 | 72                    | 18.2 | 25    | 58  |
| BMS F 090 B 5 118B  | $\frac{400}{230}$    | 500                  | 540       | 48        | 51        | 150       | 150   | 7.90<br>13.5 | 8.00<br>14.0 | 28.0<br>48.0 | 28.0<br>48.0 | 75                    | 8.67 | 17    | 51  |
| BMS F 090 B 5 118C  | $\frac{400}{230}$    | 500                  | 480       | 61        | 70        | 195       | 195   | 8.40<br>14.0 | 10.0<br>16.0 | 32.0<br>53.0 | 32.0<br>53.0 | 75                    | 10.8 | 19    | 65  |
| BMS F 090 B 5 145B  | $\frac{400}{230}$    | 500                  | 480       | 80        | 84        | 230       | 230   | 12.5<br>21.9 | 13.0<br>23.0 | 50.0<br>88.0 | 50.0<br>88.0 | 75                    | 13.7 | 22    | 67  |
| BMS F 090 B 5 145C  | $\frac{400}{230}$    | 500                  | 400       | 96        | 110       | 280       | 295   | 14.2<br>22.9 | 16.0<br>27.0 | 51.3<br>82.6 | 54.0<br>87.0 | 75                    | 18.5 | 25    | 81  |
| BMS F 090 B 5 170B  | $\frac{400}{230}$    | 500                  | 640       | 138       | 170       | 280       | 450   | 18.6<br>32.2 | 23.0<br>40.0 | 43.6<br>75.3 | 70.0<br>121  | 75                    | 29.1 | 32    | 89  |
| BMS F 090 B 5 170C  | $\frac{400}{-}$      | 500                  | 640       | 180       | 180       | 280       | 500   | 24.9<br>-    | 31.0<br>-    | 43.0<br>-    | 76.8<br>-    | 75                    | 48.4 | 37    | 116 |
| BMS F 090 B 4 145B  | $\frac{400}{230}$    | 625                  | 600       | 64        | 67        | 184       | 184   | 12.5<br>21.9 | 13.0<br>23.0 | 50.0<br>88.0 | 50.0<br>88.0 | 77                    | 14.0 | 22    | 85  |
| BMS F 090 B 4 145C  | $\frac{400}{230}$    | 625                  | 500       | 77        | 88        | 236       | 236   | 14.2<br>22.9 | 16.0<br>27.0 | 54.0<br>87.0 | 54.0<br>87.0 | 77                    | 18.8 | 25    | 101 |
| BMS F 090 B 4 170B  | $\frac{400}{230}$    | 625                  | 625       | 110       | 136       | 300       | 360   | 18.6<br>32.2 | 23.0<br>40.0 | 58.3<br>101  | 70.0<br>121  | 77                    | 29.4 | 32    | 99  |
| BMS F 090 B 4 170C  | $\frac{400}{-}$      | 625                  | 750       | 144       | 180       | 300       | 500   | 24.9<br>-    | 31.0<br>-    | 57.6<br>-    | 96.0<br>-    | 77                    | 48.7 | 37    | 127 |

# BMS F 090

## PERFORMANCE DATA • MEDIUM OVERSPEED

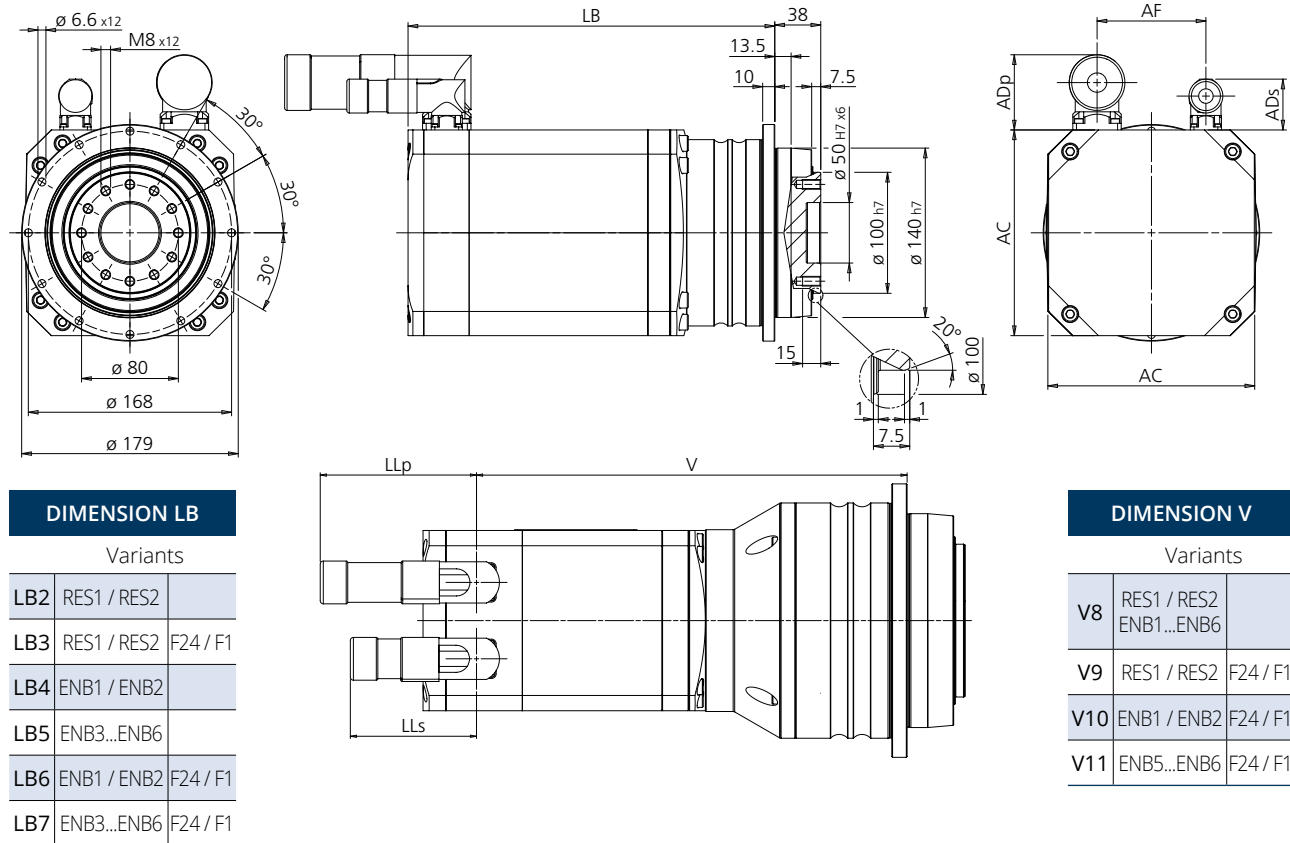
| Designation                                | n <sub>n2</sub>      | n <sub>a2</sub>      | M <sub>n2</sub> | M <sub>02</sub> | M <sub>a2</sub> | M <sub>p2</sub> | I <sub>n</sub> | I <sub>0</sub> | I <sub>a</sub> | I <sub>p</sub> | C <sub>t</sub> | J <sub>1</sub>        | m    | K <sub>p</sub> |
|--------------------------------------------|----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|-----------------------|------|----------------|
|                                            | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]            | [Nm]            | [Nm]            | [Nm]            | [A]            | [A]            | [A]            | [A]            | [Nm/arcmin]    | [kg cm <sup>2</sup> ] | [kg] |                |
| BMS F 090 M 50 102A <div>400<br/>230</div> | 70                   | 90                   | 165             | 200             | 280             | 500             | 3.80<br>6.88   | 4.90<br>8.82   | 7.64<br>13.9   | 13.6<br>24.8   | 70             | 1.72                  | 14   | 10             |
| BMS F 090 M 40 102A <div>400<br/>230</div> | 75                   | 113                  | 136             | 160             | 300             | 500             | 3.80<br>6.88   | 4.90<br>8.82   | 10.2<br>18.6   | 15.0<br>27.3   | 70             | 1.73                  | 14   | 11             |
| BMS F 090 M 35 102A <div>400<br/>230</div> | 86                   | 129                  | 119             | 140             | 280             | 500             | 3.80<br>6.88   | 4.90<br>8.82   | 10.9<br>19.9   | 15.0<br>27.3   | 70             | 1.77                  | 14   | 13             |
| BMS F 090 M 28 102A <div>400<br/>230</div> | 107                  | 125                  | 95              | 112             | 300             | 500             | 3.80<br>6.88   | 4.90<br>8.82   | 14.6<br>26.6   | 15.0<br>27.3   | 70             | 1.78                  | 14   | 15             |
| BMS F 090 M 28 102B <div>400<br/>230</div> | 107                  | 161                  | 188             | 200             | 300             | 500             | 7.50<br>12.6   | 8.30<br>14.0   | 15.3<br>26.0   | 25.5<br>43.4   | 70             | 3.28                  | 15   | 26             |
| BMS F 090 M 25 102A <div>400<br/>230</div> | 120                  | 140                  | 85              | 100             | 275             | 500             | 3.80<br>6.88   | 4.90<br>8.82   | 15.0<br>27.3   | 15.0<br>27.3   | 70             | 1.86                  | 14   | 15             |
| BMS F 090 M 25 102B <div>400<br/>230</div> | 120                  | 180                  | 168             | 180             | 280             | 500             | 7.50<br>12.6   | 8.30<br>14.0   | 16.0<br>27.2   | 28.6<br>48.6   | 70             | 3.36                  | 15   | 28             |
| BMS F 090 M 20 102B <div>400<br/>230</div> | 150                  | 225                  | 134             | 144             | 280             | 420             | 7.50<br>12.6   | 8.30<br>14.0   | 20.0<br>34.0   | 30.0<br>51.0   | 70             | 3.46                  | 15   | 31             |
| BMS F 090 M 20 102C <div>400<br/>230</div> | 150                  | 225                  | 170             | 180             | 280             | 500             | 7.80<br>13.5   | 9.70<br>17.0   | 15.5<br>27.0   | 27.7<br>48.2   | 70             | 4.76                  | 17   | 37             |
| BMS F 090 M 16 102B <div>400<br/>230</div> | 188                  | 250                  | 107             | 115             | 300             | 336             | 7.50<br>12.6   | 8.30<br>14.0   | 26.8<br>45.5   | 30.0<br>51.0   | 70             | 3.49                  | 15   | 41             |
| BMS F 090 M 16 118B <div>400<br/>230</div> | 188                  | 281                  | 152             | 163             | 300             | 480             | 10.2<br>18.3   | 12.0<br>21.0   | 25.0<br>45.6   | 40.0<br>73.0   | 70             | 7.89                  | 19   | 19             |
| BMS F 090 M 16 118C <div>400<br/>-</div>   | 188                  | 281                  | 195             | 200             | 300             | 500             | 10.9<br>-      | 14.0<br>-      | 22.6<br>-      | 37.7<br>-      | 70             | 10.0                  | 21   | 26             |
| BMS F 090 M 10 118A <div>400<br/>230</div> | 300                  | 400                  | 51              | 56              | 150             | 150             | 5.20<br>9.04   | 6.40<br>11.2   | 21.0<br>36.5   | 21.0<br>36.5   | 70             | 4.78                  | 15   | 13             |
| BMS F 090 M 10 118B <div>400<br/>230</div> | 300                  | 450                  | 95              | 102             | 170             | 300             | 10.2<br>18.3   | 12.0<br>21.0   | 22.7<br>41.4   | 40.0<br>73.0   | 70             | 8.18                  | 17   | 26             |
| BMS F 090 M 7 118B <div>400<br/>230</div>  | 429                  | 571                  | 67              | 71              | 210             | 210             | 10.2<br>18.3   | 12.0<br>21.0   | 40.0<br>73.0   | 40.0<br>73.0   | 72             | 8.35                  | 17   | 37             |
| BMS F 090 M 7 118C <div>400<br/>-</div>    | 429                  | 571                  | 85              | 98              | 250             | 273             | 10.9<br>-      | 14.0<br>-      | 43.0<br>-      | 47.0<br>-      | 72             | 10.5                  | 19   | 46             |
| BMS F 090 M 7 145B <div>400<br/>-</div>    | 429                  | 586                  | 112             | 118             | 250             | 322             | 16.4<br>-      | 19.0<br>-      | 56.7<br>-      | 73.0<br>-      | 72             | 13.4                  | 22   | 50             |
| BMS F 090 M 7 145C <div>400<br/>-</div>    | 429                  | 643                  | 134             | 154             | 250             | 413             | 18.3<br>-      | 24.0<br>-      | 48.4<br>-      | 80.0<br>-      | 72             | 18.2                  | 25   | 58             |
| BMS F 090 M 5 118B <div>400<br/>230</div>  | 500                  | 800                  | 48              | 51              | 150             | 150             | 10.2<br>18.3   | 12.0<br>21.0   | 40.0<br>73.0   | 40.0<br>73.0   | 75             | 8.67                  | 17   | 51             |
| BMS F 090 M 5 118C <div>400<br/>-</div>    | 500                  | 760                  | 61              | 70              | 195             | 195             | 10.9<br>-      | 14.0<br>-      | 47.0<br>-      | 47.0<br>-      | 75             | 10.8                  | 19   | 65             |
| BMS F 090 M 5 145B <div>400<br/>-</div>    | 500                  | 700                  | 80              | 84              | 230             | 230             | 16.4<br>-      | 19.0<br>-      | 73.0<br>-      | 73.0<br>-      | 75             | 13.7                  | 22   | 67             |
| BMS F 090 M 5 145C <div>400<br/>-</div>    | 500                  | 640                  | 96              | 110             | 280             | 295             | 18.3<br>-      | 24.0<br>-      | 75.9<br>-      | 80.0<br>-      | 75             | 18.5                  | 25   | 81             |
| BMS F 090 M 4 145B <div>400<br/>-</div>    | 625                  | 875                  | 64              | 67              | 184             | 184             | 16.4<br>-      | 19.0<br>-      | 73.0<br>-      | 73.0<br>-      | 77             | 14.0                  | 22   | 85             |
| BMS F 090 M 4 145C <div>400<br/>-</div>    | 625                  | 800                  | 77              | 88              | 236             | 236             | 18.3<br>-      | 24.0<br>-      | 80.0<br>-      | 80.0<br>-      | 77             | 18.8                  | 25   | 101            |





# BMS F 130

## DIMENSIONS AND TECHNICAL DATA



| Motor size | AC | LB2 | LB3 | LB4 | LB5 | LB6 | LB7 | ADp | ADs | AF | LLp | LLs | V8 | V9 | V10 | V11 |
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|-----|-----|
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|-----|-----|

BMS 130 - 4... 10 - 1 STAGE

|      |     |     |     |     |     |     |     |    |    |    |     |    |     |     |     |     |
|------|-----|-----|-----|-----|-----|-----|-----|----|----|----|-----|----|-----|-----|-----|-----|
| 145B | 145 | 277 | 327 | 302 | 277 | 352 | 327 | 42 | 42 | 45 | 102 | 83 | 242 | 292 | 292 | 292 |
| 145C |     | 312 | 362 | 337 | 312 | 387 | 362 | 42 | 42 | 45 | 102 | 83 | 277 | 327 | 327 | 327 |
| 170B | 170 | 304 | 379 | 342 | 304 | 417 | 379 | 62 | 42 | 90 | 129 | 83 | 277 | 352 | 352 | 352 |
| 170C |     | 358 | 433 | 396 | 358 | 471 | 433 | 62 | 42 | 90 | 129 | 83 | 331 | 406 | 406 | 406 |

BMS 130 - 16... 70 - 2 STAGE

|      |     |     |     |     |     |     |     |    |    |    |     |    |     |     |     |     |
|------|-----|-----|-----|-----|-----|-----|-----|----|----|----|-----|----|-----|-----|-----|-----|
| 118A | 118 | 286 | 336 | 311 | 286 | 361 | 336 | 42 | 42 | 50 | 102 | 83 | 251 | 301 | 301 | 301 |
| 118B |     | 317 | 367 | 342 | 317 | 392 | 367 | 42 | 42 | 50 | 102 | 83 | 282 | 332 | 332 | 332 |
| 118C |     | 350 | 400 | 375 | 350 | 425 | 400 | 42 | 42 | 50 | 102 | 83 | 315 | 365 | 365 | 365 |
| 145B | 145 | 336 | 386 | 361 | 336 | 411 | 386 | 42 | 42 | 45 | 102 | 83 | 301 | 351 | 351 | 351 |
| 145C |     | 371 | 421 | 396 | 371 | 446 | 421 | 42 | 42 | 45 | 102 | 83 | 336 | 386 | 386 | 386 |

| Gear motor stages | i        | $\psi_s$ | $\psi_r$ | $R_{2max}$ | $A_{2max}$ |
|-------------------|----------|----------|----------|------------|------------|
|                   |          | ≤        |          |            |            |
|                   |          | [arcmin] |          | [N]        | [N]        |
| 1                 | 4... 10  | 5'       | 3'       | 12000      | 8500       |
| 2                 | 16... 70 | 7'       | 5'       | 12000      | 8500       |



# BMS F 130

## PERFORMANCE DATA • BASE OVERSPEED

| Designation                           | $n_{n_2}$            | $n_{a_2}$            | $M_{n_2}$ | $M_{0_2}$ | $M_{a_2}$ | $M_{p_2}$ | $I_n$        | $I_0$        | $I_a$        | $I_p$        | $C_t$       | $J_1$                 | $m$  | $K_p$ |
|---------------------------------------|----------------------|----------------------|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|-------------|-----------------------|------|-------|
|                                       | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]      | [Nm]      | [Nm]      | [Nm]      | [A]          | [A]          | [A]          | [A]          | [Nm/arcmin] | [kg cm <sup>2</sup> ] | [kg] |       |
| BMS F 130 B 70 118A $\frac{400}{230}$ | 43                   | 50                   | 357       | 392       | 550       | 950       | 3.90<br>6.64 | 4.30<br>7.30 | 7.33<br>12.5 | 12.7<br>21.6 | 180         | 3.72                  | 26   | 5.5   |
| BMS F 130 B 50 118A $\frac{400}{230}$ | 60                   | 60                   | 255       | 280       | 600       | 750       | 3.90<br>6.64 | 4.30<br>7.30 | 11.2<br>19.1 | 14.0<br>23.9 | 180         | 3.73                  | 26   | 6.3   |
| BMS F 130 B 40 118A $\frac{400}{230}$ | 75                   | 63                   | 204       | 224       | 600       | 600       | 3.90<br>6.64 | 4.30<br>7.30 | 14.0<br>23.9 | 14.0<br>23.9 | 180         | 3.75                  | 26   | 7.5   |
| BMS F 130 B 40 118B $\frac{400}{230}$ | 75                   | 95                   | 380       | 400       | 600       | 1000      | 7.90<br>13.5 | 8.00<br>14.0 | 14.0<br>24.0 | 23.3<br>40.0 | 180         | 7.15                  | 28   | 13    |
| BMS F 130 B 35 118A $\frac{400}{230}$ | 80                   | 71                   | 179       | 196       | 525       | 525       | 3.90<br>6.64 | 4.30<br>7.30 | 14.0<br>23.9 | 14.0<br>23.9 | 180         | 3.87                  | 26   | 8.3   |
| BMS F 130 B 35 118B $\frac{400}{230}$ | 80                   | 103                  | 333       | 357       | 600       | 1000      | 7.90<br>13.5 | 8.00<br>14.0 | 16.0<br>27.4 | 26.7<br>45.7 | 180         | 7.27                  | 28   | 14    |
| BMS F 130 B 28 118B $\frac{400}{230}$ | 100                  | 114                  | 266       | 286       | 600       | 840       | 7.90<br>13.5 | 8.00<br>14.0 | 20.0<br>34.3 | 28.0<br>48.0 | 180         | 7.31                  | 28   | 15    |
| BMS F 130 B 28 118C $\frac{400}{230}$ | 100                  | 121                  | 342       | 392       | 600       | 1000      | 8.40<br>14.0 | 10.0<br>16.0 | 17.6<br>29.1 | 29.3<br>48.5 | 180         | 9.41                  | 30   | 19    |
| BMS F 130 B 25 118B $\frac{400}{230}$ | 112                  | 120                  | 238       | 255       | 600       | 750       | 7.90<br>13.5 | 8.00<br>14.0 | 22.4<br>38.4 | 28.0<br>48.0 | 180         | 7.53                  | 28   | 15    |
| BMS F 130 B 25 118C $\frac{400}{230}$ | 112                  | 124                  | 305       | 350       | 600       | 975       | 8.40<br>14.0 | 10.0<br>16.0 | 19.7<br>32.6 | 32.0<br>53.0 | 180         | 9.63                  | 30   | 20    |
| BMS F 130 B 25 145B $\frac{400}{230}$ | 112                  | 136                  | 400       | 400       | 600       | 1000      | 12.5<br>21.9 | 13.0<br>23.0 | 26.1<br>45.9 | 43.5<br>76.5 | 180         | 12.5                  | 34   | 21    |
| BMS F 130 B 20 118B $\frac{400}{230}$ | 140                  | 135                  | 190       | 204       | 600       | 600       | 7.90<br>13.5 | 8.00<br>14.0 | 28.0<br>48.0 | 28.0<br>48.0 | 180         | 7.82                  | 28   | 16    |
| BMS F 130 B 20 118C $\frac{400}{230}$ | 140                  | 135                  | 244       | 280       | 600       | 780       | 8.40<br>14.0 | 10.0<br>16.0 | 24.6<br>40.8 | 32.0<br>53.0 | 180         | 9.92                  | 30   | 22    |
| BMS F 130 B 20 145B $\frac{400}{230}$ | 140                  | 155                  | 320       | 336       | 600       | 920       | 12.5<br>21.9 | 13.0<br>23.0 | 32.6<br>57.4 | 50.0<br>88.0 | 180         | 12.8                  | 34   | 23    |
| BMS F 130 B 20 145C $\frac{400}{230}$ | 140                  | 160                  | 384       | 400       | 600       | 1000      | 14.2<br>22.9 | 16.0<br>27.0 | 27.5<br>44.2 | 45.8<br>73.7 | 180         | 17.6                  | 37   | 30    |
| BMS F 130 B 16 118B $\frac{400}{230}$ | 175                  | 169                  | 152       | 163       | 480       | 480       | 7.90<br>13.5 | 8.00<br>14.0 | 28.0<br>48.0 | 28.0<br>48.0 | 180         | 7.95                  | 28   | 18    |
| BMS F 130 B 16 118C $\frac{400}{230}$ | 175                  | 150                  | 195       | 224       | 600       | 624       | 8.40<br>14.0 | 10.0<br>16.0 | 30.8<br>51.0 | 32.0<br>53.0 | 180         | 10.1                  | 30   | 24    |
| BMS F 130 B 16 145B $\frac{400}{230}$ | 175                  | 175                  | 256       | 269       | 600       | 736       | 12.5<br>21.9 | 13.0<br>23.0 | 40.8<br>71.7 | 50.0<br>88.0 | 180         | 13.0                  | 34   | 27    |
| BMS F 130 B 16 145C $\frac{400}{230}$ | 175                  | 175                  | 307       | 352       | 600       | 944       | 14.2<br>22.9 | 16.0<br>27.0 | 34.3<br>55.3 | 54.0<br>87.0 | 180         | 17.8                  | 37   | 34    |
| BMS F 130 B 10 145B $\frac{400}{230}$ | 250                  | 250                  | 160       | 168       | 420       | 460       | 12.5<br>21.9 | 13.0<br>23.0 | 45.7<br>80.3 | 50.0<br>88.0 | 180         | 14.3                  | 32   | 45    |
| BMS F 130 B 10 145C $\frac{400}{230}$ | 250                  | 250                  | 192       | 220       | 420       | 590       | 14.2<br>22.9 | 16.0<br>27.0 | 38.4<br>61.9 | 54.0<br>87.0 | 180         | 19.1                  | 32   | 54    |
| BMS F 130 B 10 170B $\frac{400}{230}$ | 250                  | 350                  | 280       | 280       | 420       | 900       | 18.6<br>32.2 | 23.0<br>40.0 | 32.7<br>56.5 | 70.0<br>121  | 180         | 29.7                  | 39   | 48    |
| BMS F 130 B 7 145B $\frac{400}{230}$  | 357                  | 343                  | 112       | 118       | 322       | 322       | 12.5<br>21.9 | 13.0<br>23.0 | 50.0<br>88.0 | 50.0<br>88.0 | 185         | 15.3                  | 29   | 65    |
| BMS F 130 B 7 145C $\frac{400}{230}$  | 357                  | 286                  | 134       | 154       | 413       | 413       | 14.2<br>22.9 | 16.0<br>27.0 | 54.0<br>87.0 | 54.0<br>87.0 | 185         | 20.1                  | 32   | 77    |
| BMS F 130 B 7 170B $\frac{400}{230}$  | 357                  | 357                  | 440       | 238       | 550       | 630       | 18.6<br>32.2 | 23.0<br>40.0 | 61.1<br>106  | 70.0<br>121  | 185         | 30.7                  | 39   | 69    |
| BMS F 130 B 7 170C $\frac{400}{-}$    | 357                  | 429                  | 252       | 315       | 550       | 875       | 24.9<br>-    | 31.0<br>-    | 60.3<br>-    | 96.0<br>-    | 185         | 50.0                  | 44   | 94    |
| BMS F 130 B 5 170B $\frac{400}{230}$  | 500                  | 500                  | 138       | 170       | 450       | 450       | 18.6<br>32.2 | 23.0<br>40.0 | 70.0<br>121  | 70.0<br>121  | 193         | 32.4                  | 39   | 97    |
| BMS F 130 B 5 170C $\frac{400}{-}$    | 500                  | 480                  | 180       | 225       | 600       | 625       | 24.9<br>-    | 31.0<br>-    | 92.2<br>-    | 96.0<br>-    | 193         | 51.7                  | 44   | 128   |
| BMS F 130 B 4 170B $\frac{400}{230}$  | 525                  | 625                  | 110       | 136       | 360       | 360       | 18.6<br>32.2 | 23.0<br>40.0 | 70.0<br>121  | 70.0<br>121  | 198         | 34.4                  | 39   | 121   |
| BMS F 130 B 4 170C $\frac{400}{-}$    | 525                  | 600                  | 144       | 180       | 500       | 500       | 24.9<br>-    | 31.0<br>-    | 96.0<br>-    | 96.0<br>-    | 198         | 53.7                  | 44   | 156   |



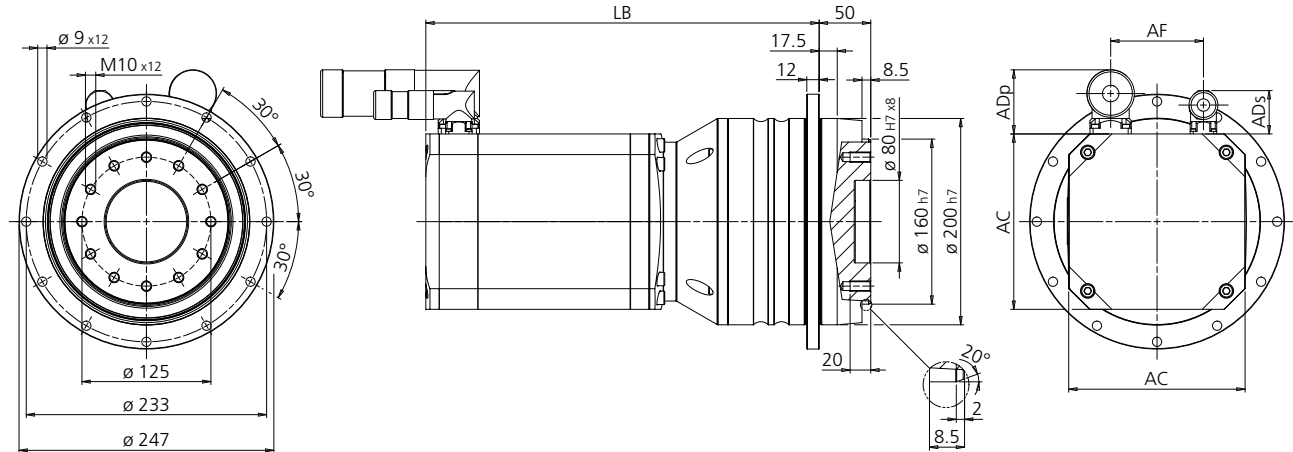
# BMS F 130

## PERFORMANCE DATA • MEDIUM OVERSPEED

| Designation                                       | n <sub>n2</sub>      | n <sub>a2</sub>      | M <sub>n2</sub> | M <sub>02</sub> | M <sub>a2</sub> | M <sub>p2</sub> | I <sub>n</sub> | I <sub>0</sub> | I <sub>a</sub> | I <sub>p</sub> | C <sub>t</sub> | J <sub>1</sub>        | m    | K <sub>p</sub> |
|---------------------------------------------------|----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|-----------------------|------|----------------|
|                                                   | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]            | [Nm]            | [Nm]            | [Nm]            | [A]            | [A]            | [A]            | [A]            | [Nm/arcmin]    | [kg cm <sup>2</sup> ] | [kg] |                |
| BMS F 130 M 70 118A <sup>400</sup> <sub>230</sub> | 50                   | 57                   | 357             | 392             | 550             | 950             | 5.20<br>9.04   | 6.40<br>11.2   | 11.0<br>19.1   | 19.0<br>33.0   | 180            | 3.72                  | 26   | 5.5            |
| BMS F 130 M 50 118A <sup>400</sup> <sub>230</sub> | 64                   | 80                   | 255             | 280             | 600             | 750             | 5.20<br>9.04   | 6.40<br>11.2   | 16.8<br>29.2   | 21.0<br>36.5   | 180            | 3.73                  | 26   | 6.3            |
| BMS F 130 M 40 118A <sup>400</sup> <sub>230</sub> | 80                   | 100                  | 204             | 224             | 600             | 600             | 5.20<br>9.04   | 6.40<br>11.2   | 21.0<br>36.5   | 21.0<br>36.5   | 180            | 3.75                  | 26   | 7.5            |
| BMS F 130 M 40 118B <sup>400</sup> <sub>230</sub> | 80                   | 100                  | 380             | 400             | 600             | 1000            | 10.2<br>18.3   | 12.0<br>21.0   | 20.0<br>36.5   | 33.3<br>60.8   | 180            | 7.15                  | 28   | 13             |
| BMS F 130 M 35 118A <sup>400</sup> <sub>230</sub> | 80                   | 114                  | 179             | 196             | 525             | 525             | 5.20<br>9.04   | 6.40<br>11.2   | 21.0<br>36.5   | 21.0<br>36.5   | 180            | 3.87                  | 26   | 8.3            |
| BMS F 130 M 35 118B <sup>400</sup> <sub>230</sub> | 80                   | 114                  | 333             | 357             | 600             | 1000            | 10.2<br>18.3   | 12.0<br>21.0   | 22.9<br>41.7   | 38.1<br>69.5   | 180            | 7.27                  | 28   | 14             |
| BMS F 130 M 28 118B <sup>400</sup> <sub>230</sub> | 100                  | 143                  | 266             | 286             | 600             | 840             | 10.2<br>18.3   | 12.0<br>21.0   | 28.6<br>52.1   | 40.0<br>73.0   | 180            | 7.31                  | 28   | 15             |
| BMS F 130 M 28 118C <sup>400</sup> <sub>-</sub>   | 100                  | 143                  | 342             | 392             | 600             | 1000            | 10.9<br>-      | 14.0<br>-      | 25.8<br>-      | 43.0<br>-      | 180            | 9.41                  | 30   | 19             |
| BMS F 130 M 25 118B <sup>400</sup> <sub>230</sub> | 112                  | 160                  | 238             | 255             | 600             | 750             | 10.2<br>18.3   | 12.0<br>21.0   | 32.0<br>58.4   | 40.0<br>73.0   | 180            | 7.53                  | 28   | 15             |
| BMS F 130 M 25 118C <sup>400</sup> <sub>-</sub>   | 112                  | 160                  | 305             | 350             | 600             | 975             | 10.9<br>-      | 14.0<br>-      | 28.9<br>-      | 47.0<br>-      | 180            | 9.63                  | 30   | 20             |
| BMS F 130 M 25 145B <sup>400</sup> <sub>-</sub>   | 112                  | 160                  | 400             | 400             | 600             | 1000            | 16.4<br>-      | 19.0<br>-      | 38.1<br>-      | 63.5<br>-      | 180            | 12.5                  | 34   | 21             |
| BMS F 130 M 20 118B <sup>400</sup> <sub>230</sub> | 140                  | 200                  | 190             | 204             | 600             | 600             | 10.2<br>18.3   | 12.0<br>21.0   | 40.0<br>73.0   | 40.0<br>73.0   | 180            | 7.82                  | 28   | 16             |
| BMS F 130 M 20 118C <sup>400</sup> <sub>-</sub>   | 140                  | 200                  | 244             | 280             | 600             | 780             | 10.9<br>-      | 14.0<br>-      | 36.2<br>-      | 47.0<br>-      | 180            | 9.92                  | 30   | 22             |
| BMS F 130 M 20 145B <sup>400</sup> <sub>-</sub>   | 140                  | 200                  | 320             | 336             | 600             | 920             | 16.4<br>-      | 19.0<br>-      | 47.6<br>-      | 73.0<br>-      | 180            | 12.8                  | 34   | 13             |
| BMS F 130 M 20 145C <sup>400</sup> <sub>-</sub>   | 140                  | 200                  | 384             | 400             | 600             | 1000            | 18.3<br>-      | 24.0<br>-      | 40.7<br>-      | 67.8<br>-      | 180            | 17.6                  | 37   | 30             |
| BMS F 130 M 16 118B <sup>400</sup> <sub>230</sub> | 175                  | 250                  | 152             | 163             | 480             | 480             | 10.2<br>18.3   | 12.0<br>21.0   | 40.0<br>73.0   | 40.0<br>73.0   | 180            | 7.95                  | 28   | 18             |
| BMS F 130 M 16 118C <sup>400</sup> <sub>-</sub>   | 175                  | 238                  | 195             | 224             | 600             | 624             | 10.9<br>-      | 14.0<br>-      | 45.2<br>-      | 47.0<br>-      | 180            | 10.1                  | 30   | 24             |
| BMS F 130 M 16 145B <sup>400</sup> <sub>-</sub>   | 175                  | 250                  | 256             | 269             | 600             | 736             | 16.4<br>-      | 19.0<br>-      | 59.5<br>-      | 73.0<br>-      | 180            | 13.0                  | 34   | 27             |
| BMS F 130 M 16 145C <sup>400</sup> <sub>-</sub>   | 175                  | 250                  | 307             | 352             | 600             | 944             | 18.3<br>-      | 24.0<br>-      | 50.8<br>-      | 80.0<br>-      | 180            | 17.8                  | 37   | 34             |
| BMS F 130 M 10 145B <sup>400</sup> <sub>-</sub>   | 250                  | 380                  | 160             | 168             | 420             | 460             | 16.4<br>-      | 19.0<br>-      | 66.7<br>-      | 73.0<br>-      | 180            | 14.3                  | 32   | 45             |
| BMS F 130 M 10 145C <sup>400</sup> <sub>-</sub>   | 250                  | 400                  | 192             | 220             | 420             | 590             | 18.3<br>-      | 24.0<br>-      | 56.9<br>-      | 80.0<br>-      | 180            | 19.1                  | 32   | 54             |
| BMS F 130 M 7 145B <sup>400</sup> <sub>-</sub>    | 357                  | 500                  | 112             | 118             | 322             | 322             | 16.4<br>-      | 19.0<br>-      | 73.0<br>-      | 73.0<br>-      | 185            | 15.3                  | 29   | 65             |
| BMS F 130 M 7 145C <sup>400</sup> <sub>-</sub>    | 357                  | 457                  | 134             | 154             | 413             | 413             | 18.3<br>-      | 24.3<br>-      | 80.0<br>-      | 80.0<br>-      | 185            | 20.1                  | 32   | 77             |

# BMS F 160

## DIMENSIONS AND TECHNICAL DATA



### DIMENSION LB

#### Variants

|     |             |          |
|-----|-------------|----------|
| LB2 | RES1 / RES2 |          |
| LB3 | RES1 / RES2 | F24 / F1 |
| LB4 | ENB1 / ENB2 |          |
| LB5 | ENB3...ENB6 |          |
| LB6 | ENB1 / ENB2 | F24 / F1 |
| LB7 | ENB3...ENB6 | F24 / F1 |

### DIMENSION V

#### Variants

|     |                            |          |
|-----|----------------------------|----------|
| V8  | RES1 / RES2<br>ENB1...ENB6 |          |
| V9  | RES1 / RES2                | F24 / F1 |
| V10 | ENB1 / ENB2                | F24 / F1 |
| V11 | ENB5...ENB6                | F24 / F1 |

| Motor size                           | AC  | LB2 | LB3 | LB4 | LB5 | LB6 | LB7 | ADp | ADs | AF | LLp | LLs | V8  | V9  | V10 | V11 |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|
| <b>BMS 160 - 16 ... 50 - 2 STAGE</b> |     |     |     |     |     |     |     |     |     |    |     |     |     |     |     |     |
| 145B                                 | 145 | 355 | 405 | 380 | 355 | 430 | 405 | 42  | 42  | 45 | 102 | 83  | 320 | 370 | 370 | 370 |
| 145C                                 |     | 390 | 440 | 415 | 390 | 465 | 440 | 42  | 42  | 45 | 102 | 83  | 355 | 405 | 405 | 405 |
| 170B                                 | 170 | 382 | 457 | 420 | 382 | 495 | 457 | 62  | 42  | 90 | 129 | 83  | 355 | 430 | 430 | 430 |
| 170C                                 |     | 436 | 511 | 474 | 436 | 549 | 511 | 62  | 42  | 90 | 129 | 83  | 409 | 484 | 484 | 484 |

| Gear motor stages | i        | $\psi_s$ | $\leq$   | $\psi_r$ | $R_{2max}$ | $A_{2max}$ |
|-------------------|----------|----------|----------|----------|------------|------------|
|                   |          |          | [arcmin] |          | [N]        | [N]        |
| 2                 | 16... 50 | 7'       |          | 5'       | 29000      | 16000      |

# BMS F 160

## PERFORMANCE DATA • BASE OVERSPEED

| Designation         |     | n <sub>n2</sub>      | n <sub>a2</sub>      | M <sub>n2</sub> | M <sub>02</sub> | M <sub>a2</sub> | M <sub>p2</sub> | I <sub>n</sub> | I <sub>0</sub> | I <sub>a</sub> | I <sub>p</sub> | C <sub>t</sub> | J <sub>1</sub> | m    | K <sub>p</sub> |
|---------------------|-----|----------------------|----------------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|------|----------------|
|                     |     | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]            | [Nm]            | [Nm]            | [Nm]            | [A]            | [A]            | [A]            | [A]            | [Nm/arcmin]    | [kg cm²]       | [kg] |                |
| BMS F 160 B 50 145B | 400 | 56                   | 68                   | 800             | 800             | 1200            | 2000            | 12.5           | 13.0           | 26.1           | 43.5           | 500            | 12             | 67   | 28             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 21.9           | 23.0           | 46.2           | 76.5           |                |                |      |                |
| BMS F 160 B 40 145B | 400 | 70                   | 78                   | 640             | 672             | 1200            | 1840            | 12.5           | 13.0           | 32.6           | 50.0           | 500            | 13             | 67   | 31             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 21.9           | 23.0           | 57.7           | 88.0           |                |                |      |                |
| BMS F 160 B 40 145C | 400 | 70                   | 80                   | 768             | 800             | 1200            | 2000            | 14.2           | 16.0           | 27.5           | 45.8           | 500            | 17             | 70   | 36             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 22.9           | 27.0           | 44.1           | 73.7           |                |                |      |                |
| BMS F 160 B 35 145B | 400 | 80                   | 86                   | 560             | 588             | 1200            | 1610            | 12.5           | 13.0           | 37.3           | 50.0           | 500            | 13             | 67   | 33             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 21.9           | 23.0           | 65.9           | 88.0           |                |                |      |                |
| BMS F 160 B 35 145C | 400 | 80                   | 86                   | 672             | 770             | 1200            | 2000            | 14.2           | 16.0           | 31.5           | 52.3           | 500            | 18             | 70   | 39             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 22.9           | 27.0           | 50.4           | 84.3           |                |                |      |                |
| BMS F 160 B 28 145B | 400 | 100                  | 89                   | 448             | 470             | 1200            | 1288            | 12.5           | 13.0           | 46.6           | 50.0           | 500            | 13             | 67   | 37             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 21.9           | 23.0           | 82.4           | 88.0           |                |                |      |                |
| BMS F 160 B 28 145C | 400 | 100                  | 89                   | 538             | 616             | 1200            | 1652            | 14.2           | 16.0           | 39.3           | 54.0           | 500            | 18             | 70   | 43             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 22.9           | 27.0           | 63.0           | 87.0           |                |                |      |                |
| BMS F 160 B 25 145B | 400 | 112                  | 96                   | 400             | 420             | 1150            | 1150            | 12.5           | 13.0           | 50.0           | 50.0           | 500            | 15             | 67   | 39             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 21.9           | 23.0           | 88.5           | 88.0           |                |                |      |                |
| BMS F 160 B 25 145C | 400 | 112                  | 88                   | 480             | 550             | 1200            | 1475            | 14.2           | 16.0           | 44.0           | 54.0           | 500            | 19             | 70   | 46             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 22.9           | 27.0           | 70.6           | 87.0           |                |                |      |                |
| BMS F 160 B 25 170B | 400 | 112                  | 140                  | 688             | 800             | 1200            | 2000            | 18.6           | 23.0           | 37.2           | 62.2           | 500            | 30             | 82   | 37             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 32.2           | 40.0           | 64.9           | 108            |                |                |      |                |
| BMS F 160 B 20 145B | 400 | 140                  | 120                  | 320             | 336             | 920             | 920             | 12.5           | 13.0           | 50.0           | 50.0           | 500            | 16             | 67   | 43             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 21.9           | 23.0           | 88.5           | 88.0           |                |                |      |                |
| BMS F 160 B 20 145C | 400 | 140                  | 100                  | 384             | 440             | 1180            | 1180            | 14.2           | 16.0           | 54.1           | 54.0           | 500            | 21             | 70   | 51             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 22.9           | 27.0           | 86.8           | 87.0           |                |                |      |                |
| BMS F 160 B 20 170B | 400 | 140                  | 160                  | 550             | 680             | 1200            | 1800            | 18.6           | 23.0           | 46.5           | 70.0           | 500            | 31             | 77   | 41             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 32.2           | 40.0           | 81.1           | 121            |                |                |      |                |
| BMS F 160 B 20 170C | 400 | 140                  | 160                  | 720             | 800             | 1200            | 2000            | 24.9           | 31.0           | 46.2           | 76.8           | 500            | 51             | 82   | 55             |
|                     | -   |                      |                      |                 |                 |                 |                 | -              | -              | -              | -              |                |                |      |                |
| BMS F 160 B 16 145B | 400 | 175                  | 150                  | 256             | 269             | 736             | 736             | 12.5           | 13.0           | 50.0           | 50.0           | 500            | 17             | 67   | 48             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 21.9           | 23.0           | 88.5           | 88.0           |                |                |      |                |
| BMS F 160 B 16 145C | 400 | 175                  | 125                  | 307             | 352             | 944             | 944             | 14.2           | 16.0           | 54.1           | 54.0           | 500            | 21             | 70   | 57             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 22.9           | 27.0           | 86.8           | 87.0           |                |                |      |                |
| BMS F 160 B 16 170B | 400 | 175                  | 175                  | 440             | 544             | 1200            | 1440            | 18.6           | 23.0           | 58.1           | 70.0           | 500            | 32             | 77   | 49             |
|                     | 230 |                      |                      |                 |                 |                 |                 | 32.2           | 40.0           | 101            | 121            |                |                |      |                |
| BMS F 160 B 16 170C | 400 | 175                  | 188                  | 576             | 720             | 1200            | 2000            | 24.9           | 31.0           | 57.7           | 96.0           | 500            | 51             | 82   | 63             |
|                     | -   |                      |                      |                 |                 |                 |                 | -              | -              | -              | -              |                |                |      |                |

# BMS F 160

## PERFORMANCE DATA • MEDIUM OVERSPEED

| Designation                         | $n_{n2}$             | $n_{a2}$             | $M_{n2}$ | $M_{02}$ | $M_{a2}$ | $M_{p2}$ | $I_n$ | $I_0$ | $I_a$ | $I_p$ | $C_t$       | $J_1$                 | $m$  | $K_p$ |
|-------------------------------------|----------------------|----------------------|----------|----------|----------|----------|-------|-------|-------|-------|-------------|-----------------------|------|-------|
|                                     | [min <sup>-1</sup> ] | [min <sup>-1</sup> ] | [Nm]     | [Nm]     | [Nm]     | [Nm]     | [A]   | [A]   | [A]   | [A]   | [Nm/arcmin] | [kg cm <sup>2</sup> ] | [kg] |       |
| BMS F 160 M 50 145B $\frac{400}{-}$ | 56                   | 70                   | 800      | 800      | 1200     | 2000     | 16.4  | 19.0  | 38.1  | 63.5  | 500         | 12                    | 67   | 28    |
| BMS F 160 M 40 145B $\frac{400}{-}$ | 70                   | 88                   | 640      | 672      | 1200     | 1840     | 16.4  | 19.0  | 47.6  | 73.0  | 500         | 13                    | 67   | 31    |
| BMS F 160 M 40 145C $\frac{400}{-}$ | 70                   | 88                   | 768      | 800      | 1200     | 2000     | 18.3  | 24.0  | 40.7  | 67.8  | 500         | 17                    | 70   | 36    |
| BMS F 160 M 35 145B $\frac{400}{-}$ | 80                   | 100                  | 560      | 588      | 1200     | 1610     | 16.4  | 19.0  | 54.4  | 73.0  | 500         | 13                    | 67   | 33    |
| BMS F 160 M 35 145C $\frac{400}{-}$ | 80                   | 100                  | 672      | 770      | 1200     | 2000     | 18.3  | 24.0  | 46.5  | 77.5  | 500         | 18                    | 70   | 39    |
| BMS F 160 M 28 145B $\frac{400}{-}$ | 100                  | 125                  | 448      | 470      | 1200     | 1288     | 16.4  | 19.0  | 68.0  | 73.0  | 500         | 13                    | 67   | 37    |
| BMS F 160 M 28 145C $\frac{400}{-}$ | 100                  | 125                  | 538      | 616      | 1200     | 1652     | 18.3  | 24.0  | 58.1  | 80.0  | 500         | 18                    | 70   | 43    |
| BMS F 160 M 25 145B $\frac{400}{-}$ | 112                  | 140                  | 400      | 420      | 1150     | 1150     | 16.4  | 19.0  | 73.0  | 73.0  | 500         | 15                    | 67   | 39    |
| BMS F 160 M 25 145C $\frac{400}{-}$ | 112                  | 140                  | 480      | 550      | 1200     | 1475     | 18.3  | 24.0  | 65.1  | 80.0  | 500         | 19                    | 70   | 46    |
| BMS F 160 M 20 145B $\frac{400}{-}$ | 140                  | 175                  | 320      | 336      | 920      | 920      | 16.4  | 19.0  | 73.0  | 73.0  | 500         | 16                    | 67   | 43    |
| BMS F 160 M 20 145C $\frac{400}{-}$ | 140                  | 175                  | 384      | 440      | 1180     | 1180     | 18.3  | 24.0  | 80.0  | 80.0  | 500         | 21                    | 70   | 51    |
| BMS F 160 M 16 145B $\frac{400}{-}$ | 175                  | 219                  | 256      | 269      | 736      | 736      | 16.4  | 19.0  | 73.0  | 73.0  | 500         | 17                    | 67   | 48    |
| BMS F 160 M 16 145C $\frac{400}{-}$ | 175                  | 219                  | 307      | 352      | 944      | 944      | 18.3  | 24.0  | 80.0  | 80.0  | 500         | 21                    | 70   | 57    |

# MOTOR DATA SET

|        | n                    | f <sub>n</sub> | 2 <sub>p</sub> | P <sub>n</sub> | V <sub>n</sub>     | I <sub>n</sub> | I <sub>0</sub> | K <sub>e</sub>          | R <sub>pp</sub>     | L <sub>pp</sub> |
|--------|----------------------|----------------|----------------|----------------|--------------------|----------------|----------------|-------------------------|---------------------|-----------------|
|        | [min <sup>-1</sup> ] | [Hz]           | [-]            | [kW]           | [V <sub>AC</sub> ] | [A]            | [A]            | [mV/min <sup>-1</sup> ] | [Ω <sub>20°</sub> ] | [mH]            |
| B 065A | 400                  | 3000           | 200            | 0.25           | 295                | 0.72           | 0.76           | 76                      | 50.0                | 150             |
|        | 230                  |                |                |                | 181                | 1.16           | 1.23           | 47                      | 19.2                | 57.5            |
| M 065A | 400                  | 4500           | 300            | 0.36           | 331                | 0.88           | 0.98           | 59                      | 30.3                | 90.7            |
|        | 230                  |                |                |                | 172                | 1.74           | 1.93           | 30                      | 7.75                | 23.2            |
| H 065A | 400                  | 6000           | 400            | 0.46           | 306                | 1.21           | 1.38           | 42                      | 15.1                | 45.2            |
|        | 230                  |                |                |                | 177                | 2.09           | 2.39           | 24                      | 5.04                | 15.1            |
| B 065B | 400                  | 3000           | 200            | 0.50           | 311                | 1.33           | 1.35           | 83                      | 26.3                | 79.5            |
|        | 230                  |                |                |                | 180                | 2.30           | 2.34           | 48                      | 8.79                | 26.4            |
| M 065B | 400                  | 4500           | 300            | 0.72           | 308                | 1.85           | 1.98           | 57                      | 12.2                | 37.0            |
|        | 230                  |                |                |                | 180                | 3.20           | 3.40           | 33                      | 4.19                | 12.6            |
| H 065B | 400                  | 6000           | 400            | 0.91           | 300                | 2.43           | 2.68           | 42                      | 6.65                | 20.1            |
|        | 230                  |                |                |                | 171                | 4.20           | 4.70           | 24                      | 2.20                | 6.60            |
| B 082B | 400                  | 3000           | 200            | 0.94           | 315                | 2.50           | 2.60           | 85                      | 9.75                | 55.2            |
|        | 230                  |                |                |                | 181                | 4.30           | 4.50           | 49                      | 3.23                | 18.3            |
| M 082B | 400                  | 4500           | 300            | 1.32           | 312                | 3.40           | 3.90           | 57                      | 4.42                | 25.0            |
|        | 230                  |                |                |                | 200                | 5.30           | 6.00           | 37                      | 1.81                | 10.3            |
| H 082B | 400                  | 6000           | 400            | 1.57           | 308                | 4.30           | 5.20           | 43                      | 2.47                | 14.0            |
|        | 230                  |                |                |                | 176                | 7.60           | 9.00           | 24                      | 0.81                | 4.6             |
| B 082C | 400                  | 3000           | 200            | 1.19           | 323                | 2.90           | 3.30           | 92                      | 6.77                | 38.3            |
|        | 230                  |                |                |                | 184                | 5.10           | 5.80           | 52                      | 2.19                | 12.4            |
| M 082C | 400                  | 4500           | 300            | 1.67           | 328                | 3.90           | 4.80           | 63                      | 3.21                | 18.1            |
|        | 230                  |                |                |                | 188                | 6.80           | 8.40           | 36                      | 1.05                | 6.00            |
| H 082C | 400                  | 6000           | 400            | 2.00           | 335                | 4.50           | 6.20           | 49                      | 1.92                | 10.8            |
|        | 230                  |                |                |                | 197                | 7.60           | 10.6           | 29                      | 0.66                | 3.70            |
| B 102A | 400                  | 3000           | 200            | 1.10           | 305                | 2.80           | 3.30           | 86                      | 7.05                | 59.3            |
|        | 230                  |                |                |                | 177                | 4.82           | 5.68           | 50                      | 2.39                | 20.1            |
| M 102A | 400                  | 4500           | 300            | 1.50           | 303                | 3.80           | 4.90           | 58                      | 3.27                | 27.5            |
|        | 230                  |                |                |                | 169                | 6.88           | 8.82           | 32                      | 1.02                | 8.58            |
| H 102A | 400                  | 6000           | 400            | 1.80           | 314                | 4.60           | 6.30           | 45                      | 2.00                | 16.8            |
|        | 230                  |                |                |                | 174                | 8.29           | 11.4           | 25                      | 0.59                | 4.96            |
| B 102B | 400                  | 3000           | 200            | 2.10           | 311                | 5.40           | 5.50           | 86                      | 2.53                | 21.3            |
|        | 230                  |                |                |                | 177                | 9.50           | 9.70           | 49                      | 0.82                | 6.90            |
| M 102B | 400                  | 4500           | 300            | 2.83           | 305                | 7.50           | 8.30           | 57                      | 1.11                | 9.40            |
|        | 230                  |                |                |                | 182                | 12.6           | 13.9           | 34                      | 0.40                | 3.30            |
| H 102B | 400                  | 6000           | 400            | 3.50           | 305                | 9.30           | 11.0           | 43                      | 0.63                | 5.30            |
|        | 230                  |                |                |                | 185                | 15.4           | 18.2           | 26                      | 0.23                | 1.90            |
| B 102C | 400                  | 3000           | 200            | 2.70           | 324                | 5.80           | 6.50           | 99                      | 2.11                | 17.7            |
|        | 230                  |                |                |                | 184                | 10.2           | 11.5           | 56                      | 0.68                | 5.70            |
| M 102C | 400                  | 4500           | 300            | 3.60           | 323                | 7.80           | 9.70           | 66                      | 0.95                | 8.00            |
|        | 230                  |                |                |                | 187                | 13.5           | 16.8           | 38                      | 0.32                | 2.70            |
| H 102C | 400                  | 6000           | 400            | 4.10           | 333                | 8.40           | 12.4           | 52                      | 0.58                | 4.80            |
|        | 230                  |                |                |                | 190                | 14.8           | 21.8           | 30                      | 0.19                | 1.60            |
| B 118A | 400                  | 3000           | 200            | 1.60           | 315                | 3.90           | 4.30           | 88                      | 3.76                | 50.5            |
|        | 230                  |                |                |                | 185                | 6.64           | 7.33           | 52                      | 1.29                | 17.1            |
| M 118A | 400                  | 4500           | 300            | 2.20           | 316                | 5.20           | 6.40           | 59                      | 1.76                | 23.4            |
|        | 230                  |                |                |                | 180                | 9.04           | 11.2           | 34                      | 0.56                | 7.40            |
| H 118A | 400                  | 6000           | 400            | 2.50           | 324                | 5.50           | 8.20           | 46                      | 1.04                | 13.8            |
|        | 230                  |                |                |                | 171                | 10.3           | 15.6           | 24                      | 0.28                | 3.72            |
| B 118B | 400                  | 3000           | 200            | 3.00           | 305                | 7.90           | 8.00           | 86                      | 1.27                | 16.7            |
|        | 230                  |                |                |                | 178                | 13.5           | 13.7           | 50                      | 0.43                | 5.7             |
| M 118B | 400                  | 4500           | 300            | 4.00           | 314                | 10.2           | 11.6           | 60                      | 0.61                | 8.00            |
|        | 230                  |                |                |                | 174                | 18.3           | 20.8           | 33                      | 0.19                | 2.50            |
| H 118B | 400                  | 6000           | 400            | 4.70           | 306                | 11.4           | 15.8           | 44                      | 0.33                | 4.30            |
|        | -                    |                |                |                | -                  | -              | -              | -                       | -                   | -               |
| B 118C | 400                  | 3000           | 200            | 3.80           | 320                | 8.40           | 9.80           | 98                      | 1.04                | 13.7            |
|        | 230                  |                |                |                | 192                | 14.0           | 16.3           | 59                      | 0.37                | 4.90            |
| M 118C | 400                  | 4500           | 300            | 5.00           | 325                | 10.9           | 14.4           | 67                      | 0.48                | 6.30            |
|        | -                    |                |                |                | -                  | -              | -              | -                       | -                   | -               |
| H 118C | 400                  | 6000           | 400            | 5.30           | 329                | 11.8           | 18.9           | 51                      | 0.28                | 3.70            |
|        | -                    |                |                |                | -                  | -              | -              | -                       | -                   | -               |
| B 145B | 400                  | 3000           | 200            | 5.00           | 308                | 12.5           | 13.0           | 83                      | 0.72                | 11.5            |
|        | 230                  |                |                |                | 176                | 21.9           | 22.8           | 47                      | 0.24                | 3.80            |
| M 145B | 400                  | 4500           | 300            | 6.60           | 314                | 16.4           | 19.0           | 57                      | 0.34                | 5.40            |
|        | -                    |                |                |                | -                  | -              | -              | -                       | -                   | -               |
| B 145C | 400                  | 3000           | 200            | 6.00           | 321                | 14.2           | 16.4           | 96                      | 0.59                | 9.40            |
|        | 230                  |                |                |                | 202                | 22.9           | 26.5           | 60                      | 0.23                | 3.60            |
| M 145C | 400                  | 4500           | 300            | 8.00           | 323                | 18.3           | 24.3           | 65                      | 0.27                | 4.30            |
|        | -                    |                |                |                | -                  | -              | -              | -                       | -                   | -               |
| B 170B | 400                  | 3000           | 200            | 8.60           | 315                | 18.6           | 23.3           | 93                      | 0.26                | 5.10            |
|        | 230                  |                |                |                | 182                | 32.2           | 40.4           | 54                      | 0.09                | 1.70            |
| B 170C | 400                  | 3000           | 200            | 11.3           | 314                | 24.9           | 31.0           | 101                     | 0.17                | 3.30            |
|        | -                    |                |                |                | -                  | -              | -              | -                       | -                   | -               |

# FEEDBACK DEVICES

Bonfiglioli BMS Compact Servo Gearmotor series is available with different feedback devices. Available feedback devices are resolver and absolute single-turn and multi-turn encoders. All available feedback devices are supported by Bonfiglioli Vectron frequency inverter - Active Cube series.

The resolver is a passive wound device consisting of a stator and rotor elements excited from an external source. It produces two output signals that correspond to the sine and cosine angle of the motor shaft. This is a robust and accurate absolute device, capable of withstanding high temperatures and high levels of vibration. Positional information is absolute within one turn.

Available absolute encoders use a high precision optical disc or a capacitive measuring principle to provide the absolute rotor position. The high resolution performed is based on a combination of absolute data, transmitted with a serial link, and incremental sine/cosine signals. The single-turn absolute encoder has an absolute positional information only within one turn while the multi turn absolute encoder is provided of extra gear wheels that account for several shaft revolution.

## Resolver data sheet

| Item                                                 | MOTOR SIZE         |                                    |                    |
|------------------------------------------------------|--------------------|------------------------------------|--------------------|
|                                                      | 065A... 065B       | 082B... 170C                       |                    |
|                                                      | RES2               | RES1                               | RES2               |
| Poles number                                         | 2                  | 2                                  | 2                  |
| Transformation ratio                                 | 0.5 ±5%            | 0.5 <sup>+15%</sup> <sub>-5%</sub> | 0.5 ±5%            |
| Input voltage [Vac <sub>rms</sub> ]                  | 7                  | 11                                 | 5.5                |
| Input current [mA]                                   | 65                 | 57                                 | 61                 |
| Input frequency [kHz]                                | 10                 | 8                                  | 10                 |
| Phase shift                                          | 0°                 | -11°                               | -12°               |
| Input impedance Zro ( )                              | 70 + j100          | 75 + j185                          | 43 + j79           |
| Output impedance Zss (Ω)                             | 175 + j275         | 135 + j265                         | 62 + j112          |
| Electrical error                                     | ±10'               | ±10'                               | ±10'               |
| Accuracy ripple                                      | 1'max              | 1'max                              | 1'max              |
| Operating temperature                                | -55 °C... + 155 °C | -55 °C... + 155 °C                 | -55 °C... + 155 °C |
| Max Speed [min <sup>-1</sup> ]                       | 10000              | 20000                              | 10000              |
| Mass [kg]                                            | 0.065              | 0.28                               | 0.28               |
| Rotor Inertia [kgm <sup>2</sup> x 10 <sup>-6</sup> ] | 3.0                | 5.0                                | 5.0                |



## Encoder data sheet

| Item                                                 | MOTOR SIZE                           |                |                                      |                |
|------------------------------------------------------|--------------------------------------|----------------|--------------------------------------|----------------|
|                                                      | 065A... 065B                         |                | 082B... 170C                         |                |
|                                                      | ENB1                                 | ENB2           | ENB1                                 | ENB2           |
| Manufacturer                                         | Dr. JOHANNES HEIDENHAIN GmbH         |                |                                      |                |
| Data interface                                       | EnDat                                |                | EnDat                                |                |
| Model                                                | ECN1113                              | EQN1125        | ECN1313                              | EQN1325        |
| Type                                                 | Single turn                          | Multi turn     | Single turn                          | Multi turn     |
| Measuring principle                                  | Optical                              |                | Optical                              |                |
| Power supply                                         | 3.6 VDC... 14 VDC                    |                | 3.6 VDC... 14 VDC                    |                |
| Current consumption                                  | 85 mA (5V)                           | 105 mA (5V)    | 85 mA (5V)                           | 105 mA (5V)    |
| Periods per revolution                               | 512                                  | 512            | 2048                                 | 2048           |
| Position per revolution                              | 8192 (13 bits)                       | 8192 (13 bits) | 8192 (13 bits)                       | 8192 (13 bits) |
| Revolutions                                          | -                                    | 4096 (12 bits) | -                                    | 4096 (12 bits) |
| Operating temperature                                | -40 °C... +115 °C                    |                | -40 °C... +115 °C                    |                |
| Max Speed [min <sup>-1</sup> ]                       | 12000                                |                | 12000                                |                |
| Resistance to shocks                                 | 1000 m/s <sup>2</sup> - 6 ms         |                | 2000 m/s <sup>2</sup> - 6 ms         |                |
| Resistance to vibrations                             | 200 m/s <sup>2</sup> - 55... 2000 Hz |                | 300 m/s <sup>2</sup> - 55... 2000 Hz |                |
| Mass [kg]                                            | 0.10                                 |                | 0.25                                 |                |
| Rotor Inertia [kgm <sup>2</sup> x 10 <sup>-6</sup> ] | 0.40                                 |                | 2.60                                 |                |

| Item                                                 | MOTOR SIZE           |                |                      |                |                      |                   |
|------------------------------------------------------|----------------------|----------------|----------------------|----------------|----------------------|-------------------|
|                                                      | 065A... 065B         |                | 082B... 170C         |                | 065A... 170C         |                   |
|                                                      | ENB3                 | ENB4           | ENB3                 | ENB4           | ENB5                 | ENB6              |
| Manufacturer                                         | SICK AG              |                |                      |                |                      |                   |
| Data interface                                       | Hiperface            |                | Hiperface            |                | Hiperface            |                   |
| Model                                                | SKS36                | SKM36          | SRS50                | SRM50          | SEK37                | SEL37             |
| Type                                                 | Single turn          | Multi turn     | Single turn          | Multi turn     | Single turn          | Multi turn        |
| Measuring principle                                  | Optical              |                | Optical              |                | Capacitive           |                   |
| Power supply                                         | 7 VDC... 12 VDC      |                | 7 VDC... 12 VDC      |                | 7 VDC... 12 VDC      |                   |
| Current consumption                                  | 60 mA                | 60 mA          | 80 mA                | 80 mA          | 50 mA                | 50 mA             |
| Periods per revolution                               | 128                  | 128            | 1024                 | 1024           | 16                   | 16                |
| Position per revolution                              | 4096 (12 bits)       | 4096 (12 bits) | 32768 (15 bit)       | 32768 (15 bit) | 512 (9 bits)         | 512 (9 bits)      |
| Revolutions                                          | -                    | 4096 (12 bits) | -                    | 4096 (12 bits) | -                    | 4096 (12 bits)    |
| Operating temperature                                | -20 °C... +110 °C    |                | -30 °C... +115 °C    |                | -40 °C... +115 °C    | -20 °C... +115 °C |
| Max Speed [min <sup>-1</sup> ]                       | 10000                |                | 12000                |                | 120000               |                   |
| Resistance to shocks                                 | 100 g / 6 ms         |                | 100 g / 6 ms         |                | 100 g / 10 ms        |                   |
| Resistance to vibrations                             | 50 g / 10... 2000 Hz |                | 20 g / 10... 2000 Hz |                | 50 g / 10... 2000 Hz |                   |
| Mass [kg]                                            | 0.07                 |                | 0.20                 |                | 0.04                 |                   |
| Rotor Inertia [kgm <sup>2</sup> x 10 <sup>-6</sup> ] | 0.45                 |                | 1.00                 |                | 0.10                 |                   |

# THERMAL PROTECTION

BMS compact gear motors are equipped with a thermal protector to avoid windings temperature exceeding the limit of F insulation class (155 °C). The thermal protectors have a double insulation level. Available thermal protectors:

## **PTC variant**

A PTC thermistor rated 150 °C is placed into the motor winding. The PTC thermistor resistance curve is in accordance with DIN 44081-82.

## **KTY variant**

A KTY silicon semi-conductor resistance sensor (KTY84-130 type) is placed into the motor winding. The working temperature range is -40 °C... +260 °C.

## **TC1 variant**

A Platinum resistance temperature sensor (PT1000 type) is placed into the motor winding. The PT1000 characteristic is in accordance with IEC 60751: 2008, tolerance class B. The working temperature range is -40 °C... +250 °C.

# ELECTROMECHANICAL HOLDING BRAKE

The BMS gear motor is available also with an electromagnetic holding brake. The brake is for use as an holding brake with motor shaft stationary. Do not use it as a dynamic brake, except for emergencies as main supply failure. The brake variant increases both length and weight of the gear motor. Please note that the brake variant is not available when the F1 flywheel/additional inertia variant is selected.

Data of the available brake for each gear motor size are summarized in the following table. The braking torque  $M_b$  refers to the motor shaft and has to be multiplied by the gearbox ratio  $i$ .

$$M_{b2} = M_b \cdot i$$

| Motor size | M <sub>b 20 °C</sub> | M <sub>b 100 °C</sub> | V <sub>b</sub> | I <sub>b</sub> | P <sub>b 20 °C</sub> | J <sub>b</sub> | Δm <sub>b</sub> | t <sub>1</sub> | t <sub>2</sub> |
|------------|----------------------|-----------------------|----------------|----------------|----------------------|----------------|-----------------|----------------|----------------|
|            | Nm                   | Nm                    | Vdc            | A              | W                    | Kg cm²         | kg              | ms             | ms             |
| 065A       | 2.0                  | 1.8                   | 24             | 0.46           | 11                   | 0.07           | 0.2             | 6              | 25             |
| 065B       |                      |                       |                |                |                      |                |                 |                |                |
| 082A       | 4.5                  | 4.0                   |                | 0.50           | 12                   | 0.18           | 0.6             | 7              | 35             |
| 082B       |                      |                       |                |                |                      |                |                 |                |                |
| 102A       | 9.0                  | 8.0                   |                | 0.75           | 18                   | 0.54           | 1.1             | 7              | 40             |
| 102B       |                      |                       |                |                |                      |                |                 |                |                |
| 102C       |                      |                       |                |                |                      |                |                 |                |                |
| 118A       | 18                   | 15                    |                | 1.0            | 24                   | 1.66           | 2.2             | 10             | 50             |
| 118B       |                      |                       |                |                |                      |                |                 |                |                |
| 118C       |                      |                       |                |                |                      |                |                 |                |                |
| 145B       | 18                   | 15                    |                | 1.0            | 24                   | 1.66           | 2.6             | 10             | 50             |
| 145C       |                      |                       |                |                |                      |                |                 |                |                |
| 170B       | 36                   | 32                    |                | 1.1            | 26                   | 5.56           | 4.5             | 22             | 90             |
| 170C       |                      |                       |                |                |                      |                |                 |                |                |

## Additional flywheel / inertia

BMS compact servo gear motor series is provided optionally with additional flywheel / inertia (F1 variant).

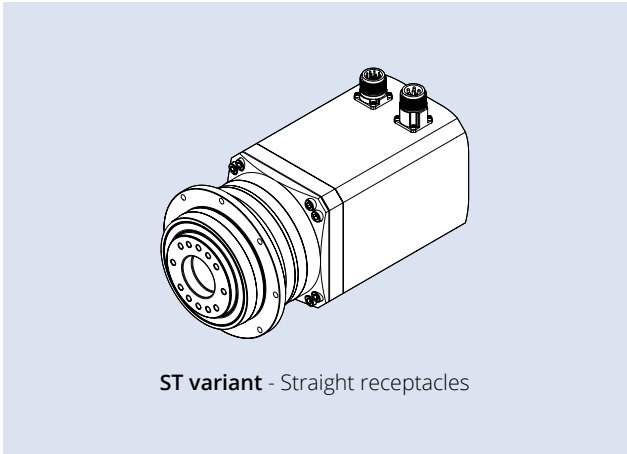
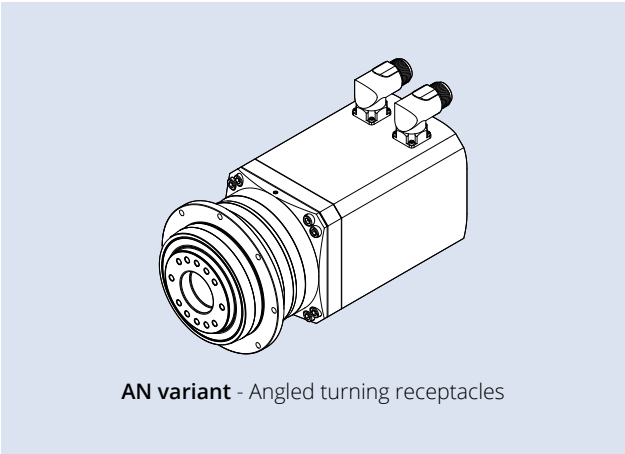
The additional flywheel / inertia variant increases both length and weight of the gear motor.

| Motor size | $J_f$              | $\Delta m_f$ |
|------------|--------------------|--------------|
|            | Kg cm <sup>2</sup> | kg           |
| 065A       | 0.5                | 0.4          |
| 065B       |                    |              |
| 082B       | 3.0                | 1.0          |
| 082C       |                    |              |
| 102A       | 7.5                | 1.7          |
| 102B       |                    |              |
| 102C       |                    |              |
| 118A       | 16                 | 3.5          |
| 118B       |                    |              |
| 118C       |                    |              |
| 145B       | 36                 | 5.0          |
| 145C       |                    |              |
| 170B       | 70                 | 8.2          |
| 170C       |                    |              |



# CONNECTIONS

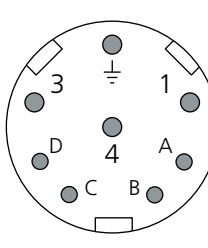
The power and feedback device connections of the BMS compact gear motor are provided by means of separate metal circular receptacles. The available circular connectors are angled turning receptacles (AN variant) or straight receptacles (ST variant).



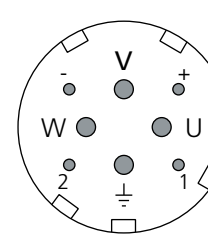
## Power connections

The 8-pin power connector includes the pins of the motor supply and the ones for the brake supply (if provided).

| MOTOR SIZE - 065A... 145C |             |
|---------------------------|-------------|
| Power connector layout    |             |
| CONNECTOR PIN NUMBER      | DESCRIPTION |
| 1                         | Phase U     |
| $\perp$                   | Earth - SL  |
| 3                         | Phase W     |
| 4                         | Phase V     |
| A                         | -           |
| B                         | -           |
| C                         | Brake +     |
| D                         | Brake -     |



| MOTOR SIZE - 170B... 170C |             |
|---------------------------|-------------|
| Power connector layout    |             |
| CONNECTOR PIN NUMBER      | DESCRIPTION |
| U                         | Phase U     |
| V                         | Phase V     |
| W                         | Phase W     |
| $\perp$                   | Earth - SL  |
| 1                         | -           |
| 2                         | -           |
| +                         | Brake +     |
| -                         | Brake -     |



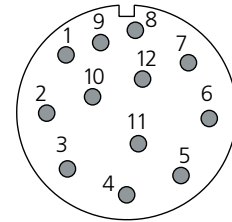

## Signal connections

The signal connector gathers the feedback device signals and the thermal protection terminals. Each feedback device, resolver or encoder has a proper signal connector layout.

### RESOLVER (RES1/RES2)

#### Signal connector layout

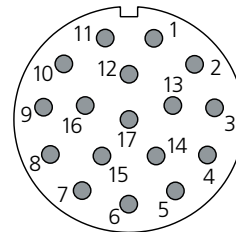
| CONNECTOR PIN NUMBER | DESCRIPTION          |
|----------------------|----------------------|
| 1                    | Sin -                |
| 2                    | Sin +                |
| 3                    | n.c.                 |
| 4                    | Shield cable         |
| 5                    | n.c.                 |
| 6                    | n.c.                 |
| 7                    | Exct -               |
| 8                    | PTC / KTY / PT1000 - |
| 9                    | PTC / KTY / PT1000 + |
| 10                   | Exct +               |
| 11                   | Cos +                |
| 12                   | Cos -                |



### ENCODER WITH ENDAT INTERFACE (ENB1/ENB2)

#### Signal connector layout

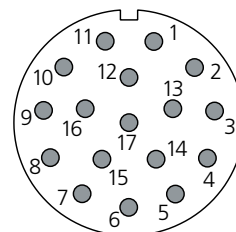
| CONNECTOR PIN NUMBER | DESCRIPTION          |
|----------------------|----------------------|
| 1                    | UP SENSOR            |
| 2                    | n.c.                 |
| 3                    | n.c.                 |
| 4                    | 0V SENSOR            |
| 5                    | PTC / KTY / PT1000 - |
| 6                    | PTC / KTY / PT1000 + |
| 7                    | UP                   |
| 8                    | Clock +              |
| 9                    | Clock -              |
| 10                   | 0V                   |
| 11                   | Shield cable         |
| 12                   | B +                  |
| 13                   | B -                  |
| 14                   | DATA +               |
| 15                   | A +                  |
| 16                   | A -                  |
| 17                   | DATA -               |



### ENCODER WITH HIPERFACE INTERFACE (ENB3/ENB4/ENB5/ENB6)

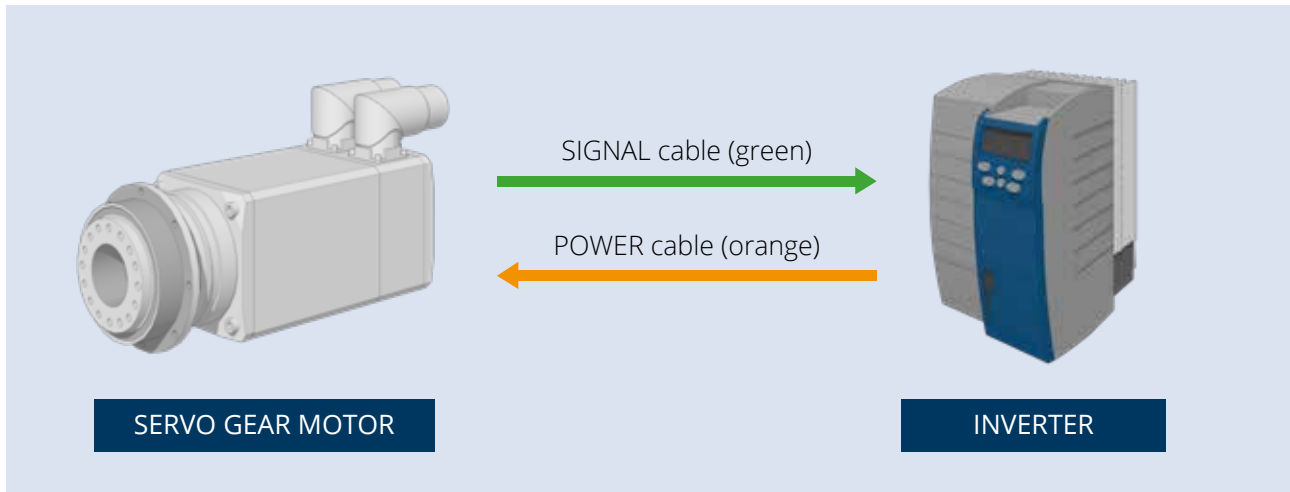
#### Signal connector layout

| CONNECTOR PIN NUMBER | DESCRIPTION    |
|----------------------|----------------|
| 1                    | Sin +          |
| 2                    | Sin -          |
| 3                    | RS485 +        |
| 4                    | n.c.           |
| 5                    | Shield cable   |
| 6                    | n.c.           |
| 7                    | GND (0V)       |
| 8                    | PTC / PT1000 - |
| 9                    | PTC / PT1000 + |
| 10                   | + Vdc          |
| 11                   | Cos +          |
| 12                   | Cos -          |
| 13                   | RS485 -        |
| 14                   | n.c.           |
| 15                   | n.c.           |
| 16                   | n.c.           |
| 17                   | n.c.           |



# CABLES

Cables for power supply and feedback device complete the offer of the BMS compact servo gear motor. Three standard cable lengths available (3m, 5m and 10 m). Custom lengths on request.



## Power cables

Power cables can be recognized by the orange colour according to Desina standard. The conductors cross-section depends on the motor nominal current.

The power cable terminates on the inverter side with flying leads covered by ferrules for connections with screw terminals. On the motor side, the power cable is equipped with a metal circular plug with bayonet technology for an easy and sure connection.



*Inverter side*

*Motor side*

### The power cables fulfil the following technical requirements:

| Technical Data           |                                                                     |
|--------------------------|---------------------------------------------------------------------|
| Properties               | Oil resistant shielded cable for dynamic laying                     |
| Conductor                | Tinned Stranded Cu wire complying with IEC 60228 Cl 5 / 6           |
| Outer Sheath             | PUR or equivalent thermoplastic material<br>Colour: orange RAL 2003 |
| Inner Sheath             | PP or TPE                                                           |
| Tinned Cu braided Shield | Coverage overall screen > 80%                                       |

| Electrical Data             |                   |
|-----------------------------|-------------------|
| Nom. Volt. Power cores      | $U_0/U$ 600/1000V |
| Nom. Volt. Control cores    | $U_0/U$ 300/500V  |
| AC Test Volt. Power cores   | 4 kV              |
| AC Test Volt. Control cores | 1 kV              |
| Insulation Resistance       | > 5 MOhm/km       |

| Mechanical Data        |                            |
|------------------------|----------------------------|
| Service Temperature    | -15 / +80 °C               |
| Minimum Bending Radius | 10 x Cable diameter        |
| N° bending cycles      | $\geq 10^6$                |
| Max Speed              | $\geq 180$ m/min           |
| Max Acceleration       | $\geq 15$ m/s <sup>2</sup> |

## Standard and Certifications

UL/CSA, RoHS, DESINA

The cable ordering code comprises five fields as follows:

| MPC | 3                                                                       | 15                                                                                                                                                             | NB                                                                               | C3                                                                                                                                                            |
|-----|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                         |                                                                                                                                                                |                                                                                  | <b>Connector size and type</b><br><b>C3</b> 8-pin connector, motor with feedback, sizes 65... 145<br><b>C4</b> 8-pin connector, motor with feedback, size 170 |
|     |                                                                         |                                                                                                                                                                | <b>Brake wires</b><br><b>NB</b> Without brake wires<br><b>B</b> With brake wires |                                                                                                                                                               |
|     |                                                                         | <b>Phase wire section</b><br><b>015</b> 1.5 mm <sup>2</sup><br><b>025</b> 2.5 mm <sup>2</sup><br><b>040</b> 4 mm <sup>2</sup><br><b>100</b> 10 mm <sup>2</sup> |                                                                                  |                                                                                                                                                               |
|     | <b>Cable length</b><br><b>03</b> 3 m<br><b>05</b> 5 m<br><b>10</b> 10 m |                                                                                                                                                                |                                                                                  |                                                                                                                                                               |

The following table shows the suggested combination of power cable designation and motor size according to the selected overspeed and nominal voltage supply. Field XX refers to the cable length (03, 05, 10), while field YY refers to the brake variant (NB, B): see previous page for fields description.

| MOTOR SIZE | 400V NOMINAL VOLTAGE OVERSPEED |               |                  | 230V NOMINAL VOLTAGE OVERSPEED |               |      |
|------------|--------------------------------|---------------|------------------|--------------------------------|---------------|------|
|            | BASE                           | MEDIUM        | HIGH             | BASE                           | MEDIUM        | HIGH |
| 065A       | MPC XX 015 YY C3               |               |                  | MPC XX 015 YY C3               |               |      |
| 065B       |                                |               |                  |                                |               |      |
| 082B       |                                |               |                  |                                |               |      |
| 082C       |                                |               |                  |                                |               |      |
| 102A       |                                |               |                  |                                |               |      |
| 102B       |                                |               |                  |                                |               |      |
| 102C       |                                |               |                  |                                |               |      |
| 118A       | MPC XX 025 YY C3               |               |                  | MPC XX 025 YY C3               |               |      |
| 118B       |                                |               |                  |                                |               |      |
| 118C       | MPC XX 025 YY C3               |               | MPC XX 025 YY C3 | MPC XX 040 YY C3               |               |      |
| 145B       | MPC XX 040 YY C3               |               | MPC XX 040 YY C3 |                                |               |      |
| 145C       | MPC XX 040 YY C3               |               |                  | MPC XX 040 YY C3               |               |      |
| 170B       | MPC XX 040 YY C4               | Not available |                  | MPC XX 100 YY C4               | Not available |      |
| 170C       | MPC XX 100 YY C4               |               |                  |                                |               |      |



# CABLES

## Signal cables

Signal cables are recognizable by the green colour according to Desina standard. The conductors number, their cross-section and their terminal type depend on the transducer typology supported by the cable.

Cables are available for connection for every feedback option. On the motor side, the power cable is equipped with a metal circular plug with bayonet technology for an easy and sure connection.

On the inverter side, the cable end can be executed with two different terminations:

- with SUB-D male connector for connection with corresponding SUB-D female of the module interface.
- with ferrules for connection to screw terminals of the module interface.

Connections layouts are dedicated to Bonfiglioli Vectron interface modules.



Inverter side

Motor side

### The signal cables fulfil the following technical requirements:

| Technical Data           |                                                                    |
|--------------------------|--------------------------------------------------------------------|
| Properties               | Oil resistant shielded cable for dynamic laying                    |
| Conductor                | Tinned Stranded Cu wire complying with IEC 60228 Cl 5 / 6          |
| Outer Sheath             | PUR or equivalent thermoplastic material<br>Colour: green RAL 6018 |
| Inner Sheath             | PP or TPE                                                          |
| Tinned Cu braided Shield | Coverage overall screen > 80%                                      |

| Electrical Data           |              |
|---------------------------|--------------|
| Nominal Voltage           | 30 V         |
| AC Test Voltage           | 1500 V       |
| Insulation Resistance     | > 10 MOhm/km |
| Capacitance strand/strand | < 150 pF/m   |

| Mechanical Data        |                       |
|------------------------|-----------------------|
| Service Temperature    | -20 / +80 °C          |
| Minimum Bending Radius | 10 x Cable diameter   |
| N° bending cycles      | ≥ 10 <sup>6</sup>     |
| Max Speed              | ≥ 180 m/min           |
| Max Acceleration       | ≥ 15 m/s <sup>2</sup> |

### Standard and Certifications

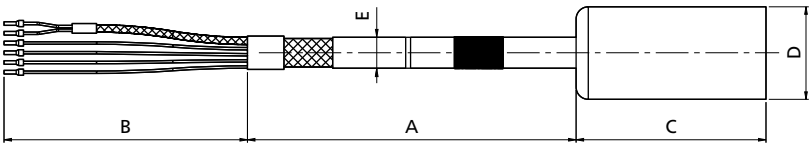
UL/CSA, RoHS, DESINA

### The ordering codes of the signal cables are described in the following table:

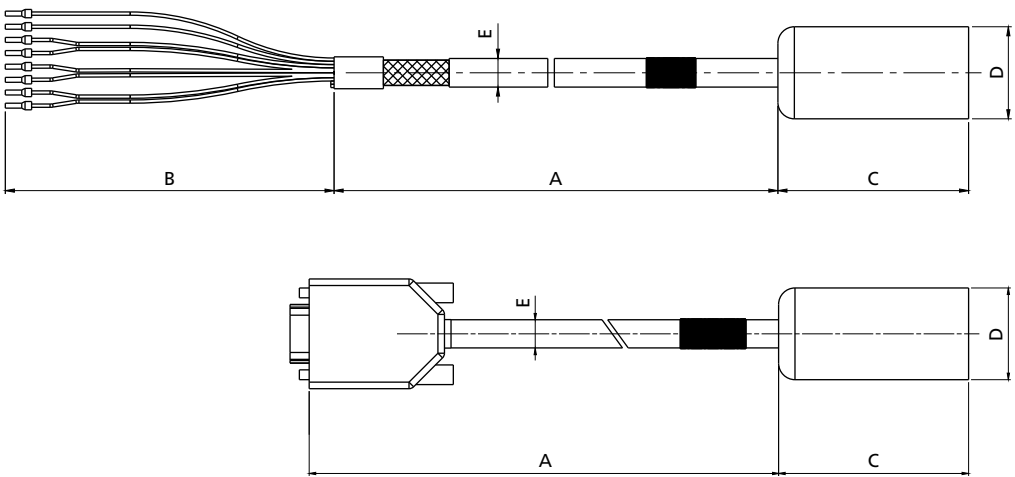
| Feedback device            | Inverter side termination | Inverter feedback module     | Cable length  |               |               |
|----------------------------|---------------------------|------------------------------|---------------|---------------|---------------|
|                            |                           |                              | 3 m           | 5m            | 10 m          |
| RES1 / RES2                | Flying leads              | EM-RES-01/02<br>EM-AUT-01/04 | MSC 03 RES FW | MSC 05 RES FW | MSC 10 RES FW |
|                            | SUB-D9                    | EM-RES-03                    | MSC 03 RES SC | MSC 05 RES SC | MSC 10 RES SC |
| ENB1 / ENB2                | HD SUB-D15                | EM-ABS-01<br>EM-AUT-01       | MSC 03 EN1 SC | MSC 05 EN1 SC | MSC 10 EN1 SC |
|                            | Flying leads              | -                            | MSC 03 EN1 FW | MSC 05 EN1 FW | MSC 10 EN1 FW |
| ENB3 / ENB4<br>ENB5 / ENB6 | SUB-D15                   | EM-ABS-01<br>EM-AUT-01       | MSC 03 EN3 SC | MSC 05 EN3 SC | MSC 10 EN3 SC |
|                            | Flying leads              | -                            | MSC 03 EN3 FW | MSC 05 EN3 FW | MSC 10 EN3 FW |



# Power cable layout



# Signal cable layout



| Connector size |    | A                                         | B    | C    | D    |
|----------------|----|-------------------------------------------|------|------|------|
|                |    | [m]                                       | [mm] | [mm] | [mm] |
| Power Cable    | C3 | 3 - 5 - 10<br>according to<br>designation | 150  | 76   | 28   |
|                | C4 |                                           |      | 93   | 46   |
| Signal Cable   | -  | 3 - 5 - 10<br>according to<br>designation | 150  | 76   | 28   |

| Wire section |     | Brake option | E <sub>max</sub> |
|--------------|-----|--------------|------------------|
| [mm²]        |     |              | [mm]             |
| Power Cable  | 1.5 | NB           | 11.6             |
|              |     | B            | 12.8             |
|              | 2.5 | NB           | 13               |
|              |     | B            | 14.2             |
|              | 4   | NB           | 14.7             |
|              |     | B            | 16.3             |
|              | 10  | NB           | 19.7             |
|              |     | B            | 21.8             |

| Feedback designation |     | E    |
|----------------------|-----|------|
|                      |     | [mm] |
| Signal Cable         | RES | 8.6  |
|                      | EN1 | 8.7  |
|                      | EN3 | 8.6  |

Power and signal cable marking follows the label and wire colours indicated at page 50 and 51.



# CABLES

## Plugs

| Cable designation                    | Plug order code | Description                                                                                                                                   | Manufacturer code            |
|--------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| MPC XX 015 YY C3<br>MPC XX 025 YY C3 | 712692074       | TE CONNECTIVITY 923 Series - M23 8-pin power connector<br>Pin crimping range: 4 x (0.35-2.5 mm <sup>2</sup> ) + 4 x (0.14-1 mm <sup>2</sup> ) | B ST A 078 FR 48 48 0100 000 |
| MPC XX 040 YY C3                     | 712692081       | TE CONNECTIVITY 923 Series - M23 8-pin power connector<br>Pin crimping range: 4 x (2.5-4 mm <sup>2</sup> ) + 4 x (0.14-1 mm <sup>2</sup> )    | B ST A 078 FR 45 59 0100 000 |
| MPC XX 100 YY C4                     | 712692080       | TE CONNECTIVITY 940 Series - M40 8-pin power connector<br>Pin crimping range: 4 x (1.5-10 mm <sup>2</sup> ) + 4 x (0.35-2.5 mm <sup>2</sup> ) | C ST A 264 FR 48 45 0020 000 |
| MSC XX RES YY                        | 712692053       | TE CONNECTIVITY 623 Series - M23 12-pin signal connector<br>Pin crimping range: 12 x (0.14-1 mm <sup>2</sup> )                                | A ST A 021 FR 11 41 0100 000 |
| MSC XX EN1 YY<br>MSC XX EN3 YY       | 712692063       | TE CONNECTIVITY 623 Series - M23 17-pin signal connector<br>Pin crimping range: 17 x (0.14-1 mm <sup>2</sup> )                                | A ST A 035 FR 11 41 0100 000 |

See previous pages for descriptions of XX and YY fields. Plugs are provided with a complete set of pins.

# COMBINATIONS BMS -> INVERTER

Suggested combinations of BMS gear motor and Bonfiglioli Vectron Active Cube Inverter.

| BMS Gear Motor |            |                   |       |           |       | Not Overload Applications       |                                       |                                                       | Overload Applications |                                       |  |
|----------------|------------|-------------------|-------|-----------|-------|---------------------------------|---------------------------------------|-------------------------------------------------------|-----------------------|---------------------------------------|--|
| Variants       |            | Motor parameters  |       |           |       | Motor<br>$I_0$                  | Inverter<br>$I_n$                     | Selection Criteria                                    |                       |                                       |  |
|                |            |                   |       |           |       |                                 |                                       | Motor<br>$I_0$<br>$I_{max}$                           | and                   | Inverter<br>$I_n$<br>$I_{pk}$         |  |
| Overspeed      | Motor size | Supply AC voltage | $P_m$ | $I_{max}$ | $I_0$ | Inverter Rated Current<br>$I_n$ | Bonfiglioli Vectron ACU Inverter Size | Inverter Long-Term Overload Current (60s)<br>$I_{pk}$ |                       | Bonfiglioli Vectron ACU Inverter Size |  |
|                |            | [V]               | [kW]  | [A]       | [A]   | [A]                             |                                       | [A]                                                   |                       |                                       |  |
| B              | 065A       | 400               | 0.25  | 2.43      | 0.76  | 1                               | ACU 410 01                            | 3.2                                                   |                       | ACU 410 03                            |  |
|                |            | 230               |       | 3.9       | 1.23  | 1.6                             | ACU 210 01                            | 5                                                     |                       | ACU 210 03                            |  |
| M              | 065A       | 400               | 0.36  | 3.1       | 0.98  | 1                               | ACU 410 01                            | 3.2                                                   |                       | ACU 410 03                            |  |
|                |            | 230               |       | 6.2       | 1.93  | 2.5                             | ACU 210 03                            | 7.3                                                   |                       | ACU 210 09                            |  |
| H              | 065A       | 400               | 0.46  | 4.4       | 1.38  | 1.6                             | ACU 410 03                            | 4.8                                                   |                       | ACU 410 09                            |  |
|                |            | 230               |       | 7.7       | 2.39  | 2.5                             | ACU 210 03                            | 10.5                                                  |                       | ACU 210 11                            |  |
| B              | 065B       | 400               | 0.5   | 4.6       | 1.35  | 1.6                             | ACU 410 03                            | 4.8                                                   |                       | ACU 410 09                            |  |
|                |            | 230               |       | 8.0       | 2.34  | 2.5                             | ACU 210 03                            | 10.5                                                  |                       | ACU 210 11                            |  |
| M              | 065B       | 400               | 0.72  | 6.7       | 1.98  | 2.4                             | ACU 410 07                            | 8.7                                                   |                       | ACU 410 13                            |  |
|                |            | 230               |       | 11.5      | 3.4   | 4                               | ACU 210 07                            | 14.3                                                  |                       | ACU 210 13                            |  |
| H              | 065B       | 400               | 0.91  | 9.1       | 2.68  | 3.2                             | ACU 410 09                            | 11.7                                                  |                       | ACU 410 15                            |  |
|                |            | 230               |       | 15.9      | 4.7   | 5.5                             | ACU 210 09                            | 16.2                                                  |                       | ACU 210 15                            |  |
| B              | 082B       | 400               | 0.94  | 8.9       | 2.6   | 3.2                             | ACU 410 09                            | 11.7                                                  |                       | ACU 410 15                            |  |
|                |            | 230               |       | 15.5      | 4.5   | 5.5                             | ACU 210 09                            | 16.2                                                  |                       | ACU 210 15                            |  |
| M              | 082B       | 400               | 1.32  | 13.2      | 3.9   | 4.2                             | ACU 410 12                            | 13.5                                                  |                       | ACU 410 18                            |  |
|                |            | 230               |       | 20.6      | 6.0   | 7                               | ACU 210 11                            | 26.2                                                  |                       | ACU 210 18                            |  |
| H              | 082B       | 400               | 1.57  | 17.7      | 5.2   | 5.8                             | ACU 410 13                            | 21                                                    |                       | ACU 410 19                            |  |
|                |            | 230               |       | 31        | 9     | 9.5                             | ACU 210 13                            | 44.5                                                  |                       | ACU 210 21                            |  |
| B              | 082C       | 400               | 1.19  | 9.9       | 3.3   | 3.8                             | ACU 410 11                            | 11.7                                                  |                       | ACU 410 15                            |  |
|                |            | 230               |       | 17.4      | 5.8   | 7                               | ACU 210 11                            | 26.2                                                  |                       | ACU 210 18                            |  |
| M              | 082C       | 400               | 1.67  | 14.4      | 4.8   | 5.8                             | ACU 410 13                            | 21                                                    |                       | ACU 410 19                            |  |
|                |            | 230               |       | 25.1      | 8.4   | 9.5                             | ACU 210 13                            | 26.2                                                  |                       | ACU 210 18                            |  |
| H              | 082C       | 400               | 2     | 18.6      | 6.2   | 7.8                             | ACU 410 15                            | 21                                                    |                       | ACU 410 19                            |  |
|                |            | 230               |       | 32        | 10.6  | 12.5                            | ACU 210 15                            | 44.5                                                  |                       | ACU 210 21                            |  |
| B              | 102A       | 400               | 1.1   | 10.2      | 3.3   | 3.8                             | ACU 410 11                            | 11.7                                                  |                       | ACU 410 15                            |  |
|                |            | 230               |       | 17.6      | 5.68  | 7                               | ACU 210 11                            | 26.2                                                  |                       | ACU 210 18                            |  |
| M              | 102A       | 400               | 1.5   | 15        | 4.9   | 5.8                             | ACU 410 13                            | 21                                                    |                       | ACU 410 19                            |  |
|                |            | 230               |       | 27.3      | 8.82  | 9.5                             | ACU 210 13                            | 30.3                                                  |                       | ACU 210 19                            |  |
| H              | 102A       | 400               | 1.8   | 19        | 6.3   | 7.8                             | ACU 410 15                            | 21                                                    |                       | ACU 410 19                            |  |
|                |            | 230               |       | 35.1      | 11.4  | 12.5                            | ACU 210 15                            | 44.5                                                  |                       | ACU 210 21                            |  |
| B              | 102B       | 400               | 2.1   | 20        | 5.5   | 5.8                             | ACU 410 13                            | 21                                                    |                       | ACU 410 19                            |  |
|                |            | 230               |       | 35        | 9.7   | 12.5                            | ACU 210 15                            | 44.5                                                  |                       | ACU 210 21                            |  |
| M              | 102B       | 400               | 2.83  | 30        | 8.3   | 9                               | ACU 410 18                            | 30.3                                                  |                       | ACU 410 22                            |  |
|                |            | 230               |       | 51        | 13.9  | 18                              | ACU 210 18                            | 51.5                                                  |                       | ACU 210 22                            |  |
| H              | 102B       | 400               | 3.5   | 40        | 11    | 14                              | ACU 410 19                            | 44.5                                                  |                       | ACU 410 25                            |  |
|                |            | 230               |       | 66        | 18.2  | 22                              | ACU 210 19                            | -                                                     |                       | -                                     |  |
| B              | 102C       | 400               | 2.7   | 21        | 6.5   | 7.8                             | ACU 410 15                            | 21                                                    |                       | ACU 410 19                            |  |
|                |            | 230               |       | 37        | 11.5  | 12.5                            | ACU 210 15                            | 44.5                                                  |                       | ACU 210 21                            |  |
| M              | 102C       | 400               | 3.6   | 31        | 9.7   | 14                              | ACU 410 19                            | 37.5                                                  |                       | ACU 410 23                            |  |
|                |            | 230               |       | 54        | 16.8  | 18                              | ACU 210 18                            | -                                                     |                       | -                                     |  |
| H              | 102C       | 400               | 4.1   | 40        | 12.4  | 14                              | ACU 410 19                            | 44.5                                                  |                       | ACU 410 25                            |  |
|                |            | 230               |       | 70        | 21.8  | 22                              | ACU 210 19                            | -                                                     |                       | -                                     |  |
| B              | 118A       | 400               | 1.6   | 14        | 4.3   | 5.8                             | ACU 410 13                            | 21                                                    |                       | ACU 410 19                            |  |
|                |            | 230               |       | 23.9      | 7.33  | 9.5                             | ACU 210 13                            | 26.2                                                  |                       | ACU 210 18                            |  |
| M              | 118A       | 400               | 2.2   | 21        | 6.4   | 7.8                             | ACU 410 15                            | 21                                                    |                       | ACU 410 19                            |  |
|                |            | 230               |       | 36.5      | 11.2  | 12.5                            | ACU 210 15                            | 44.5                                                  |                       | ACU 210 21                            |  |
| H              | 118A       | 400               | 2.5   | 27        | 8.2   | 9                               | ACU 410 18                            | 30.3                                                  |                       | ACU 410 22                            |  |
|                |            | 230               |       | 50.8      | 15.62 | 18                              | ACU 210 18                            | 51.5                                                  |                       | ACU 210 22                            |  |
| B              | 118B       | 400               | 3     | 28        | 8     | 9                               | ACU 410 18                            | 30.3                                                  |                       | ACU 410 22                            |  |
|                |            | 230               |       | 48        | 13.7  | 18                              | ACU 210 18                            | 51.5                                                  |                       | ACU 210 22                            |  |
| M              | 118B       | 400               | 4     | 40        | 11.6  | 14                              | ACU 410 19                            | 44.5                                                  |                       | ACU 410 25                            |  |
|                |            | 230               |       | 73        | 20.8  | 22                              | ACU 210 19                            | -                                                     |                       | -                                     |  |
| H              | 118B       | 400               | 4.7   | 55        | 15.8  | 18                              | ACU 410 21                            | 60                                                    |                       | ACU 410 27                            |  |
|                |            | -                 |       | -         | -     | -                               | -                                     | -                                                     |                       | -                                     |  |
| B              | 118C       | 400               | 3.8   | 32        | 9.8   | 14                              | ACU 410 19                            | 37.5                                                  |                       | ACU 410 23                            |  |
|                |            | 230               |       | 53        | 16.3  | 18                              | ACU 210 18                            | -                                                     |                       | -                                     |  |
| M              | 118C       | 400               | 5     | 47        | 14.4  | 18                              | ACU 410 21                            | 60                                                    |                       | ACU 410 27                            |  |
|                |            | -                 |       | -         | -     | -                               | -                                     | -                                                     |                       | -                                     |  |
| H              | 118C       | 400               | 5.3   | 62        | 18.9  | 22                              | ACU 410 22                            | 67.5                                                  |                       | ACU 410 29                            |  |
|                |            | -                 |       | -         | -     | -                               | -                                     | -                                                     |                       | -                                     |  |
| B              | 145B       | 400               | 5     | 50        | 13    | 14                              | ACU 410 19                            | 60                                                    |                       | ACU 410 27                            |  |
|                |            | 230               |       | 88        | 22.8  | 32                              | ACU 210 21                            | -                                                     |                       | -                                     |  |
| M              | 145B       | 400               | 6.6   | 73        | 19    | 22                              | ACU 410 22                            | 90                                                    |                       | ACU 410 31                            |  |
|                |            | -                 |       | -         | -     | -                               | -                                     | -                                                     |                       | -                                     |  |
| B              | 145C       | 400               | 6     | 54        | 16.4  | 18                              | ACU 410 21                            | 60                                                    |                       | ACU 410 27                            |  |
|                |            | 230               |       | 87        | 26.5  | 32                              | ACU 210 21                            | -                                                     |                       | -                                     |  |
| M              | 145C       | 400               | 8     | 80        | 24.3  | 25                              | ACU 410 23                            | 90                                                    |                       | ACU 410 31                            |  |
|                |            | -                 |       | -         | -     | -                               | -                                     | -                                                     |                       | -                                     |  |
| B              | 170B       | 400               | 8.6   | 70        | 23.3  | 25                              | ACU 410 23                            | 90                                                    |                       | ACU 410 31                            |  |
|                |            | 230               |       | 121       | 40.4  | -                               | -                                     | -                                                     |                       | -                                     |  |
| B              | 170C       | 400               | 11.3  | 96        | 31    | 32                              | ACU 410 25                            | 112.5                                                 |                       | ACU 410 33                            |  |
|                |            | -                 |       | -         | -     | -                               | -                                     | -                                                     |                       | -                                     |  |



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Thanks to an international network of closely interconnected commercial and production sites, we can guarantee the same high standards of Bonfiglioli quality anywhere at any given time. We know that our direct presence in local markets is the key to long-lasting success, so our family includes 18 production sites, 23 commercial sites and more than 550 distributors around the world.

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**18**

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## AUSTRALIA

**Bonfiglioli Transmission (Aust.) Pty Ltd**  
2, Cox Place Glendenning NSW 2761  
Locked Bag 1000 Plumpton NSW 2761  
Tel. +61 2 8811 8000



## BRAZIL

**Bonfiglioli Redutores do Brasil Ltda**  
Av. Osvaldo Fregonezi, 171, cjs 31 e 44  
CEP 09851-015 - São Bernardo do Campo  
São Paulo  
Tel. +55 11 4344 2322



## CHINA

**Bonfiglioli Drives (Shanghai) Co. Ltd.**  
#68, Hui-Lian Road, QingPu District,  
201707 Shanghai  
Tel. +86 21 6700 2000



### Industry & Automation Solutions

#568, Longpan Road, Jiading District,  
201707 Shanghai



### Bonfiglioli Trading (Shanghai) Co. Ltd.

Room 423, 4<sup>th</sup> Floor, #38, Yinglun Road,  
China (Shanghai) Pilot Free Trade Zone,  
Shanghai



### Selcom Electronics (Shanghai) Co., Ltd

A7, No.5399, Waiqingsong Road, QingPu  
District,  
201707 Shanghai  
Tel. +86 21 6010 8100



A24, No.5399, Waiqingsong Road, QingPu  
District,  
201707 Shanghai  
Tel. +86 21 6010 8100



## FRANCE

### Bonfiglioli Transmission S.A.S.

14 Rue Eugène Pottier  
Zone Industrielle de Moimont II  
95670 Marly la Ville  
Tel. +33 1 34474510



## GERMANY

### Bonfiglioli Deutschland GmbH

Sperberweg 12 - 41468 Neuss  
Tel. +49 0 2131 2988 0



### Bonfiglioli Vectron GmbH

Europark Fichtenhain B6 - 47807 Krefeld  
Tel. +49 0 2151 8396 0



### O&K Antriebstechnik GmbH

Ruhrallee 8-12 - 45525 Hattingen  
Tel. +49 0 2324 2050 1



## INDIA

### Bonfiglioli Transmission Pvt. Ltd.

#### Mobility & Wind Industries

AC 7 - 11, SIDCO Industrial Estate,  
Thirumudivakkam  
Kancheepuram - 600132 - Tamil Nadu  
Tel. +91 844 844 8649



#### Industry & Automation Solutions

Survey No. 528/1, Perambakkam High Road  
Mannur Village, Sriperumbudur Taluk  
Kancheepuram - 602 105 - Tamil Nadu  
Tel. +91 844 844 8649



#### Industry & Automation Solutions

Plot No E-5/2, Badhalwadi  
Talegaon MIDC Phase II,  
Pune - 410 507 - Maharashtra  
Tel. +91 844 844 8649



### Bonfiglioli Drive Systems Pvt. Ltd.

#### Industry & Automation Solutions

No 50, Pappambakkam Road,  
Mannur Village, Sriperumbudur Taluk,  
Kancheepuram - 602105 - Tamil Nadu  
Tel. +91 844 844 8649



## ITALY

### Bonfiglioli Riduttori S.p.A.

#### Industry & Automation Solutions

Via Cav. Clementino Bonfiglioli, 1  
40012 Calderara di Reno  
Tel. +39 051 6473111



#### Industry & Automation Solutions

Via Sandro Pertini, lotto 7b  
20080 Carpiano  
Tel. +39 02985081



#### Industry & Automation Solutions

Via Saliceto, 15 - 40010 Bentivoglio



#### Mobility & Wind Industries

Via Enrico Mattei, 12 Z.I. Villa Selva  
47122 Forlì  
Tel. +39 0543 789111



#### Industry & Automation Solutions

Via Unione, 49 - 38068 Rovereto  
Tel. +39 0464 443435/36



### Selcom Group S.p.A.

Via Achille Grandi, 5  
40013 Castel Maggiore (BO)  
Tel. +39 051 6387111



Via Marino Serenari, 18  
40013 Castel Maggiore (BO)  
Tel. +39 051 6387111



Via Cadriano, 19  
40057 Cadriano (BO)  
Tel. +39 051 6387111



## NEW ZEALAND

### Bonfiglioli Transmission (Aust.) Pty Ltd

88 Hastie Avenue, Mangere Bridge,  
2022 Auckland  
PO Box 11795, Ellerslie  
Tel. +64 09 634 6441



## SINGAPORE

### Bonfiglioli South East Asia Pte Ltd

8 Boon Lay Way, #04-09,  
8@ Tadehub 21, Singapore 609964  
Tel. +65 6268 9869



## SLOVAKIA

### Bonfiglioli Slovakia s.r.o.

Robotnícka 2129  
Považská Bystrica, 01701 Slovakia  
Tel. +421 42 430 75 64



## SOUTH AFRICA

### Bonfiglioli South Africa Pty Ltd.

55 Galaxy Avenue, Linbro Business Park,  
Sandton, Johannesburg  
2090 South Africa  
Tel. +27 11 608 2030



## SPAIN

### Tecnotrans Bonfiglioli S.A

Avinguda del Ferrocarril, n° 14,  
Polígono Industrial Can Estapé  
08755 Castellbisbal - Barcelona  
Tel. +34 93 447 84 00



## TURKEY

### Bonfiglioli Turkey Jsc

Atatürk Organize Sanayi Bölgesi,  
10007 Sk. No. 30  
Atatürk Organize Sanayi Bölgesi,  
35620 Çiğli - İzmir  
Tel. +90 0 232 328 22 77



## UNITED KINGDOM

### Bonfiglioli UK Ltd.

Unit 1 Calver Quay, Calver Road, Winwick  
Warrington, Cheshire - WA2 8UD  
Tel. +44 1925 852667



## USA

### Bonfiglioli USA Inc.

3541 Hargrave Drive  
Hebron, Kentucky 41048  
Tel. +1 859 334 3333



## VIETNAM

### Bonfiglioli Vietnam Ltd.

Lot C-9D-CN My Phuoc Industrial Park 3  
Ben Cat - Binh Duong Province  
Tel. +84 650 3577411





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#### **HEADQUARTERS**

##### **Bonfiglioli S.p.A**

Via Cav. Clementino Bonfiglioli, 1  
40012 Calderara di Reno - Bologna (Italy)  
Tel. +39 051 6473111

