

# premo<sup>®</sup> servo actuators



# premo<sup>®</sup> – the powerful servo actuator platform

**Absolute precision meets perfect motion:  
premo<sup>®</sup> combines precision with motion – more efficiently than ever.**

The central idea **behind the first fully scalable servo-actuator platform** from WITTENSTEIN alpha is uncompromising flexibility from the viewpoint of the user. Motors and gearboxes with application-related graduated performance characteristics can be configured modularly **to individual motor / gearbox units**. The result is a modular system that is significantly more versatile and more individual with regard to performance for the most diverse applications, that meets almost all the challenges of drive technology, integration and industry specification. Thanks to the **modular platform concept**, premo<sup>®</sup>-servo actuators can also be quickly manufactured and made available for the relevant task.

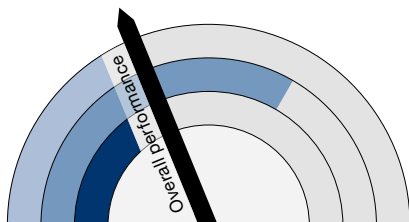
The core of the motor / gearbox unit is a **torsionally rigid precision gearbox** with low backlash and excellent torque density in combination with the equally powerful, **permanent magnet synchronous servo motor**, which

guarantees low cogging and minimal velocity ripple thanks to the split winding.

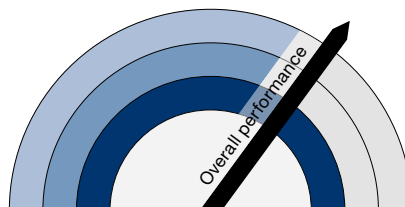
Due to the intelligent design principle implemented for the first time, premo<sup>®</sup> not only sets **completely new standards with regard to flexibility and sustainability** – the premo<sup>®</sup> servo actuator generation also opens up new dimensions in performance: **doubled power with minimal increase in size**, increased productivity and optimized energy efficiency thanks to digital, single-cable technology provide more freedom during planning, design and storage as well as lower investment costs.

All **three lines** of this innovative servo actuator generation can be equipped with **the latest digital encoder technology** and are characterized by a particularly easy-to-clean and maintenance friendly design without exposed screws.

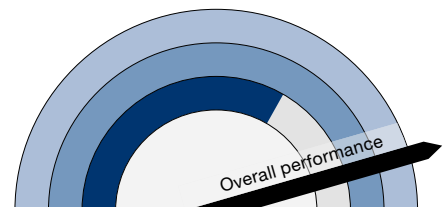
premo<sup>®</sup> SP Line



premo<sup>®</sup> TP Line



premo<sup>®</sup> XP Line



Productivity Efficiency Precision

Flexible mechanical and electrical interfaces for high scalability

### premo® SP Line – the entry level class

#### Optimum performance for all positioning tasks

- Short cycle times thanks to low backlash and extreme rigidity
- Very good positioning accuracy
- Basic configuration with smooth output shaft and resolver

### premo® TP Line – the dynamic class

#### Precision for positioning and processing tasks

- High torsional rigidity and low backlash allow high acceleration and tight control
- Basic configuration with output flange and HIPERFACE® absolute encoder singleturn, SIL 2

### premo® XP Line – the extra class

#### Versatile in almost all sectors

- Maximum power density with high torsional rigidity and radial load capacity
- Basic configuration with smooth output shaft and HIPERFACE DSL® absolute encoder singleturn, SIL 2

#### **Individual upgrading of all lines**

#### **possible due to a variety of options:**

- Analog and digital rotary encoders as well as reliable encoders according to SIL 2
- One and two-connector versions
- Permanent magnet holding brake
- Reduced backlash
- Various output types



## premo® – clearly superior in performance

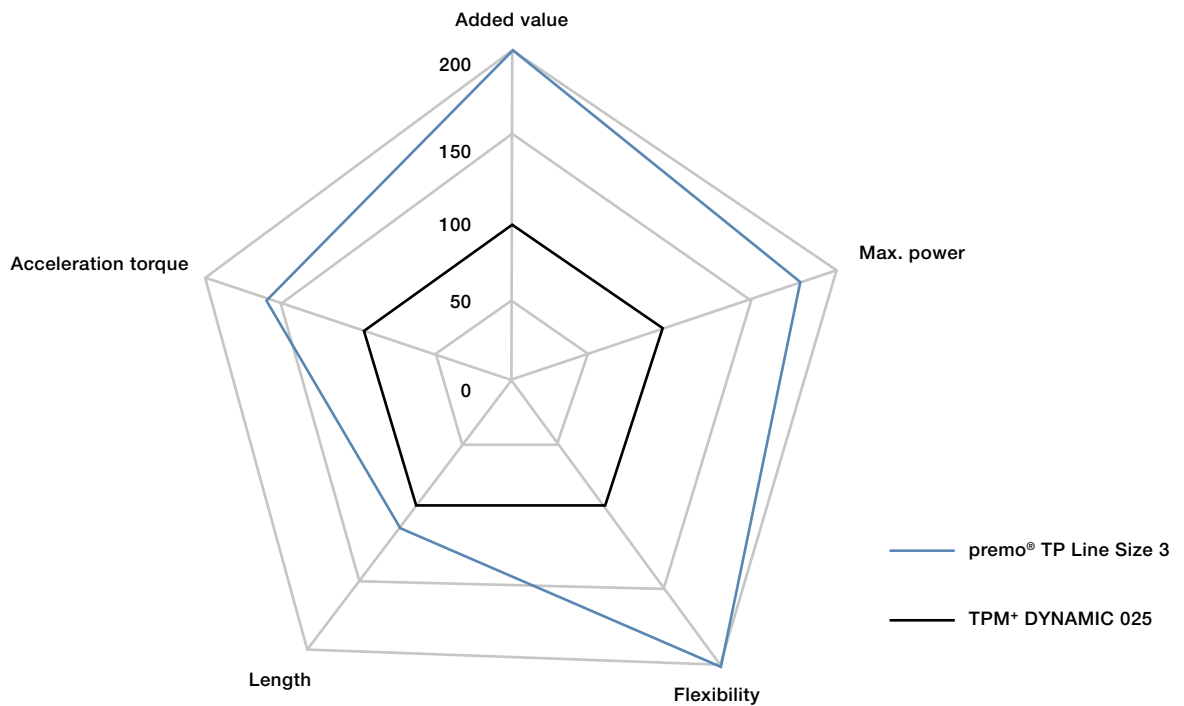
- **Higher machine performance** thanks to higher acceleration torque
- High torque density **combined with a compact design** allow for the realization of higher performance machines with significant space saving
- **Improved connectivity to next generation controllers** from leading system providers due to the use of digital encoders (EnDat 2.2, DSL, HIPERFACE DSL®, DRIVE-CLiQ) and compatibility for high operating voltage up to 750 V DC
- **Reduced wiring requirement** due to single-connector technology
- **Improved reliability and safety** thanks to the use of more powerful brakes and SIL 2 encoders
- **Use in washdown and food applications** thanks to hygienic housing design with smooth surfaces

## premo® – the new energy-efficiency class

Utilizing planetary gearboxes with a wide range of gear ratios **and an efficiency up to 97 %**, combined with servo motors with an **efficiency of up to 92 %** – the premo® platform utilizes the entire experience of WITTENSTEIN alpha in the energy-efficient design of servo actuators. The power requirement during acceleration is reduced thanks to lower inertia due to the elimination of the motor shaft coupling, as well as through a design to optimize current saturation losses.

Moreover, the digital single-cable technology for the power supply and data transmission between motor and controller requires the use of **only one** connector and connection cable. This **reduces the wiring requirement by half** and also saves weight for moving drives. This also reduces the energy consumption in the integration of premo® in robots or moving machine structures. Overall, top class energy efficiency is achieved.

# premo® – absolute flexibility in all cases



In comparison with the proven TPM+ series, the new premo® servo actuators exhibit significantly greater flexibility and performance potential. The mechanical interface to the machine can be designed in multiple versions.

The interface to the servo controller offers almost unlimited connection options through the voltage range up to 750 V DC and the wide selection of analog and digital encoders.

# Our know-how – your benefit

Flexible gearbox interface suitable for any application

B

All external surfaces with smooth, hygienic design

A

Bayonet-coupling connector for fast installation

A

Conical cover without screws

A

C

Reduced wiring requirement due to single-cable technology with digital encoders

B

C

D

Robust bearing with long service life

A

C

Brake with enhanced holding torque

C

D



| Your requirement  | Our solution   |
|---|--|
| <b>Resistant and easy-to-clean actuator surface</b>                         | High-quality design without screw heads for optimum cleaning conditions and high value stability   |
| <b>High operating voltage and absolute connectivity to system providers</b> | Enhanced performance through intermediate operating voltage up to 750 V DC, interfaces for EnDat 2.2, HIPERFACE DSL®, DRIVE-CLiQ, partly in single-cable technology for the greatest flexibility in adapting to external controllers and maximum productivity  |
| <b>Maximum individual freedom in design</b>                                 | Intelligent premo® modular system with various gearbox outputs, short lengths as optimal design basis, for example in the case of restricted installation space, simplified design for reduced interference contour even on smaller machines, savings in the drive train through improved energy efficiency and single-cable connection, a maximum of design freedom thanks to a wide choice of rotary sensors for different applications  |
| <b>Maximum machine reliability and investment protection</b>                | Intelligent, energy-efficient product concept: higher reliability through the elimination of the shaft coupling, minimized electrical component size due to low current requirements allowing reduction in size of the servo drive, cables, fuses and electrical contacts. The single-cable solution offers less wiring and smaller cable tracks while higher braking torques offer faster emergency stopping and improved reliability for vertical axes. Greater reliability thanks to the functional safety in the mechanical connection of the encoder. |

**A** Increased productivity / higher OEE\*

**B** Simplified machine design

**C** Reliability / service life

**D** Safety

\* Overall Equipment Effectiveness

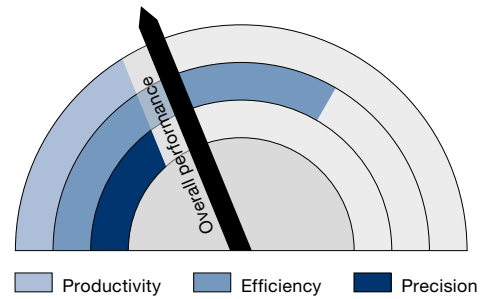


# premo<sup>®</sup> SP Line



# The entry level class

- Especially suitable for positioning tasks
- Short cycle times
- Special benefits with moving axes:  
the low weight and the short overall length
- Mechanical interface with output shaft
- Ideal for connecting couplings, toothed belt pulleys and pinions
- In addition to the smooth shaft version, key and splined shaft versions are also available
- Electric interface with resolver as standard

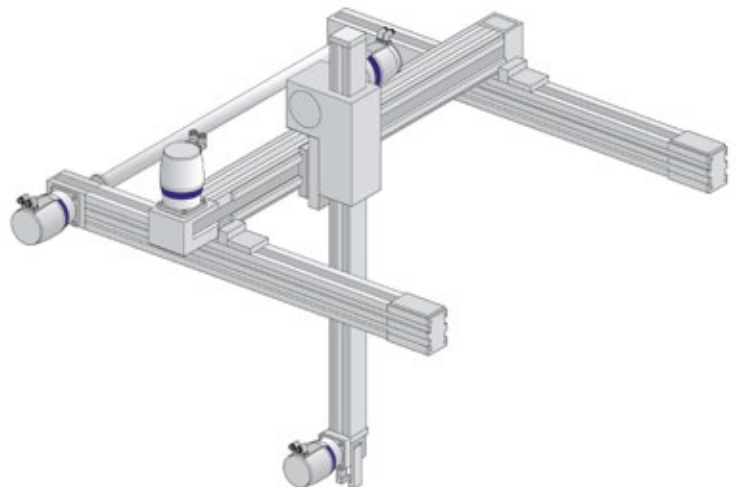


- Precision adequate for most applications
- Optionally extendable with all available encoders and connector versions

## Application example

Handling gantries are useful aids if pallets, crates, trays or similar are transported from A to B – the faster, the better.

**premo® SP Line copes with this task thanks to its high power-to-weight ratio and excellent dynamics.**



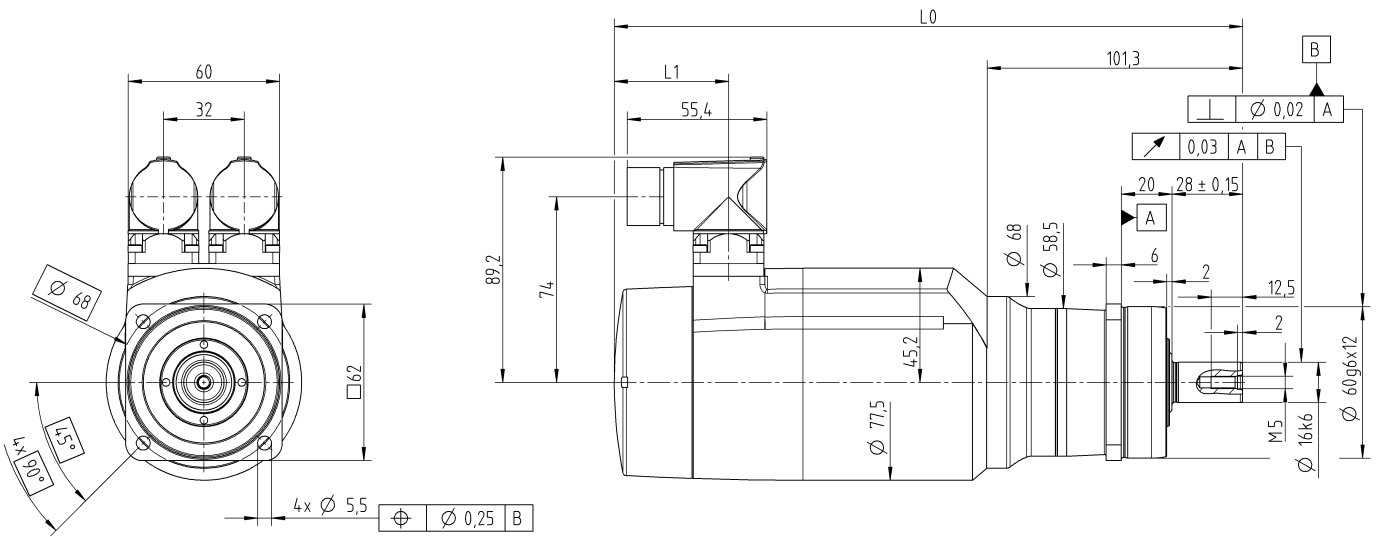
# premo® SP Line Size 1 2-stage

|  |              |                                       | 2-stage                             |      |      |      |      |      |      |      |      |
|--|--------------|---------------------------------------|-------------------------------------|------|------|------|------|------|------|------|------|
| Ratio  | i            |                                       | 16                                  | 20   | 25   | 28   | 35   | 40   | 50   | 70   | 100  |
| Operating voltage  | $U_D$        | V DC                                  | 560                                 |      |      |      |      |      |      |      |      |
| Max. acceleration torque<br>(max. 1000 cycles per hour)                            | $T_{2B}$     | Nm                                    | 41.6                                | 42   | 42   | 42   | 42   | 42   | 42   | 42   | 32   |
|  |              | in.lb                                 | 368                                 | 372  | 372  | 372  | 372  | 372  | 372  | 372  | 283  |
| Static output torque   | $T_{20}$     | Nm                                    | 16.5                                | 20.8 | 26   | 26   | 26   | 19.9 | 25   | 26   | 17   |
|  |              | in.lb                                 | 146                                 | 184  | 230  | 230  | 230  | 176  | 221  | 230  | 150  |
| Brake holding torque<br>(at 120 °C)  | $T_{2Br}$    | Nm                                    | 20.8                                | 26   | 32.5 | 36.4 | 45.5 | 20.8 | 26   | 36.4 | 52   |
|  |              | in.lb                                 | 184                                 | 230  | 288  | 322  | 403  | 184  | 230  | 322  | 460  |
| Max. speed at output   | $n_{2max}$   | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Speed limit for $T_{2B}$   | $n_{2B}$     | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Max. motor acceleration torque   | $T_{1max}$   | Nm                                    | 2.84                                | 2.84 | 2.84 | 2.84 | 2.84 | 1.4  | 1.4  | 1.4  | 1.4  |
|  |              | in.lb                                 | 25                                  | 25   | 25   | 25   | 25   | 12   | 12   | 12   | 12   |
| Max. motor acceleration current  | $I_{MaxDyn}$ | $A_{eff}$                             | 4.47                                | 4.47 | 4.47 | 4.47 | 4.47 | 2.52 | 2.52 | 2.52 | 2.52 |
| Static motor current   | $I_0$        | $A_{eff}$                             | 1.71                                | 1.71 | 1.71 | 1.71 | 1.71 | 1    | 1    | 1    | 1    |
| Max. backlash  | $j_t$        | arcmin                                | Standard ≤ 6 Reduced ≤ 4            |      |      |      |      |      |      |      |      |
| Torsional rigidity<br>(Gearbox)  | $C_{t21}$    | Nm/arcmin                             | 3.5                                 |      |      |      |      |      |      |      |      |
|  |              | in.lb/arcmin                          | 31                                  |      |      |      |      |      |      |      |      |
| Max. axial force <sup>a)</sup>   | $F_{2AMax}$  | N                                     | 2400                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 540                                 |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>a)</sup>   | $F_{2QMMax}$ | N                                     | 2800                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 630                                 |      |      |      |      |      |      |      |      |
| Max. tilting moment  | $M_{2KMMax}$ | Nm                                    | 152                                 |      |      |      |      |      |      |      |      |
|  |              | in.lb                                 | 1345                                |      |      |      |      |      |      |      |      |
| Service life <sup>b)</sup>   | $L_h$        | h                                     | > 20000                             |      |      |      |      |      |      |      |      |
| Weight<br>(without brake)  | $m$          | kg                                    | 3.2 to 3.6                          |      |      |      |      |      |      |      |      |
|  |              | lb <sub>m</sub>                       | 7.1 to 8                            |      |      |      |      |      |      |      |      |
| Ambient temperature  |              | °C                                    | 0 to +40                            |      |      |      |      |      |      |      |      |
|  |              | °F                                    | +32 to +104                         |      |      |      |      |      |      |      |      |
| Lubrication  |              |                                       | Lubricated for life                 |      |      |      |      |      |      |      |      |
| Insulating material class  |              |                                       | F                                   |      |      |      |      |      |      |      |      |
| Protection class   |              |                                       | IP 65                               |      |      |      |      |      |      |      |      |
| Paint  |              |                                       | Pearl dark grey and innovation blue |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®) |              |                                       | BC2-00060AA016.000-X                |      |      |      |      |      |      |      |      |
| Bore diameter of coupling<br>on the application side                               |              | mm                                    | X = 012.000 - 035.000               |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)                                   | $J_1$        | kgcm <sup>2</sup>                     | 0.37                                | 0.37 | 0.36 | 0.36 | 0.36 | 0.22 | 0.22 | 0.22 | 0.22 |
|  |              | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.33                                | 0.33 | 0.32 | 0.32 | 0.32 | 0.19 | 0.19 | 0.19 | 0.19 |

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> Refers to center of the output shaft or flange

<sup>b)</sup> Please contact us to discuss application-specific service lifetimes.



### without brake

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 226.6           | 22.8            |
|              | HIPERFACE® | 249.1           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 279.5           | 75.7            |
| i = 40 – 100 | Resolver   | 211.6           | 22.8            |
|              | HIPERFACE® | 234.1           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 264.5           | 75.7            |

### with brake

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 262.6           | 22.8            |
|              | HIPERFACE® | 285.1           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 315.5           | 75.7            |
| i = 40 – 100 | Resolver   | 239.1           | 22.8            |
|              | HIPERFACE® | 261.6           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 292             | 75.7            |

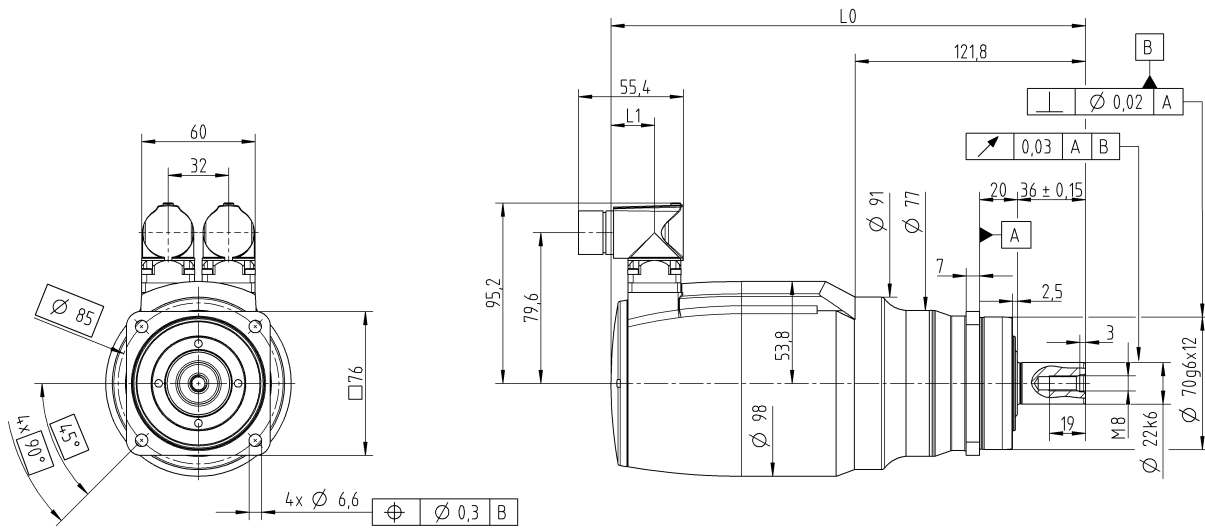
# premo® SP Line Size 2 2-stage

|  |              |                                       | 2-stage                             |      |      |      |      |      |      |      |      |
|--|--------------|---------------------------------------|-------------------------------------|------|------|------|------|------|------|------|------|
| Ratio  | i            |                                       | 16                                  | 20   | 25   | 28   | 35   | 40   | 50   | 70   | 100  |
| Operating voltage  | $U_D$        | VDC                                   | 560                                 |      |      |      |      |      |      |      |      |
| Max. acceleration torque<br>(max. 1000 cycles per hour)                            | $T_{2B}$     | Nm                                    | 81.5                                | 102  | 110  | 110  | 110  | 102  | 110  | 110  | 90   |
|  |              | in.lb                                 | 721                                 | 903  | 974  | 974  | 974  | 903  | 974  | 974  | 797  |
| Static output torque   | $T_{20}$     | Nm                                    | 30                                  | 37.9 | 47.8 | 53.7 | 67.3 | 39.1 | 49.2 | 69.2 | 52   |
|  |              | in.lb                                 | 266                                 | 335  | 423  | 475  | 596  | 346  | 435  | 612  | 460  |
| Brake holding torque<br>(at 120 °C)  | $T_{2Br}$    | Nm                                    | 37.4                                | 46.8 | 58.5 | 65.5 | 81.9 | 52   | 65   | 91   | 130  |
|  |              | in.lb                                 | 331                                 | 414  | 518  | 580  | 725  | 460  | 575  | 805  | 1151 |
| Max. speed at output   | $n_{2max}$   | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Speed limit for $T_{2B}$   | $n_{2B}$     | rpm                                   | 269                                 | 215  | 184  | 176  | 155  | 119  | 104  | 85.7 | 60   |
| Max. motor acceleration torque   | $T_{1max}$   | Nm                                    | 5.53                                | 5.53 | 5.53 | 5.53 | 5.53 | 2.76 | 2.76 | 2.76 | 2.76 |
|  |              | in.lb                                 | 49                                  | 49   | 49   | 49   | 49   | 24   | 24   | 24   | 24   |
| Max. motor acceleration current  | $I_{MaxDyn}$ | $A_{eff}$                             | 6.94                                | 6.94 | 6.94 | 6.94 | 6.94 | 4.45 | 4.45 | 4.45 | 4.45 |
| Static motor current   | $I_0$        | $A_{eff}$                             | 2.33                                | 2.33 | 2.33 | 2.33 | 2.33 | 1.58 | 1.58 | 1.58 | 1.58 |
| Max. backlash  | $j_t$        | arcmin                                | Standard ≤ 6 Reduced ≤ 4            |      |      |      |      |      |      |      |      |
| Torsional rigidity<br>(Gearbox)  | $C_{i21}$    | Nm/arcmin                             | 10                                  |      |      |      |      |      |      |      |      |
|  |              | in.lb/arcmin                          | 89                                  |      |      |      |      |      |      |      |      |
| Max. axial force <sup>a)</sup>   | $F_{2AMax}$  | N                                     | 3350                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 754                                 |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>a)</sup>   | $F_{2QMMax}$ | N                                     | 4200                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 945                                 |      |      |      |      |      |      |      |      |
| Max. tilting moment  | $M_{2KMMax}$ | Nm                                    | 236                                 |      |      |      |      |      |      |      |      |
|  |              | in.lb                                 | 2089                                |      |      |      |      |      |      |      |      |
| Service life <sup>b)</sup>   | $L_h$        | h                                     | > 20000                             |      |      |      |      |      |      |      |      |
| Weight<br>(without brake)  | m            | kg                                    | 5.1 to 5.6                          |      |      |      |      |      |      |      |      |
|  |              | lb <sub>m</sub>                       | 11 to 12                            |      |      |      |      |      |      |      |      |
| Ambient temperature  |              | °C                                    | 0 to +40                            |      |      |      |      |      |      |      |      |
|  |              | °F                                    | +32 to +104                         |      |      |      |      |      |      |      |      |
| Lubrication  |              |                                       | Lubricated for life                 |      |      |      |      |      |      |      |      |
| Insulating material class  |              |                                       | F                                   |      |      |      |      |      |      |      |      |
| Protection class   |              |                                       | IP 65                               |      |      |      |      |      |      |      |      |
| Paint  |              |                                       | Pearl dark grey and innovation blue |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®) |              |                                       | BC2-00150AA022.000-X                |      |      |      |      |      |      |      |      |
| Bore diameter of coupling<br>on the application side                               |              | mm                                    | X = 019.000 - 042.000               |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)                                   | $J_1$        | kgcm <sup>2</sup>                     | 0.9                                 | 0.87 | 0.87 | 0.85 | 0.85 | 0.47 | 0.47 | 0.47 | 0.47 |
|  |              | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.8                                 | 0.77 | 0.77 | 0.75 | 0.75 | 0.42 | 0.42 | 0.42 | 0.42 |

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> Refers to center of the output shaft or flange

<sup>b)</sup> Please contact us to discuss application-specific service lifetimes.



**without brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 250.8           | 23              |
|              | HIPERFACE® | 273.1           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 303.3           | 75.5            |
| i = 40 – 100 | Resolver   | 235.8           | 23              |
|              | HIPERFACE® | 258.1           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 288.3           | 75.5            |

**with brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 289.8           | 23              |
|              | HIPERFACE® | 312.1           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 342.3           | 75.5            |
| i = 40 – 100 | Resolver   | 251.6           | 23              |
|              | HIPERFACE® | 273.9           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 304.1           | 75.5            |

premo®

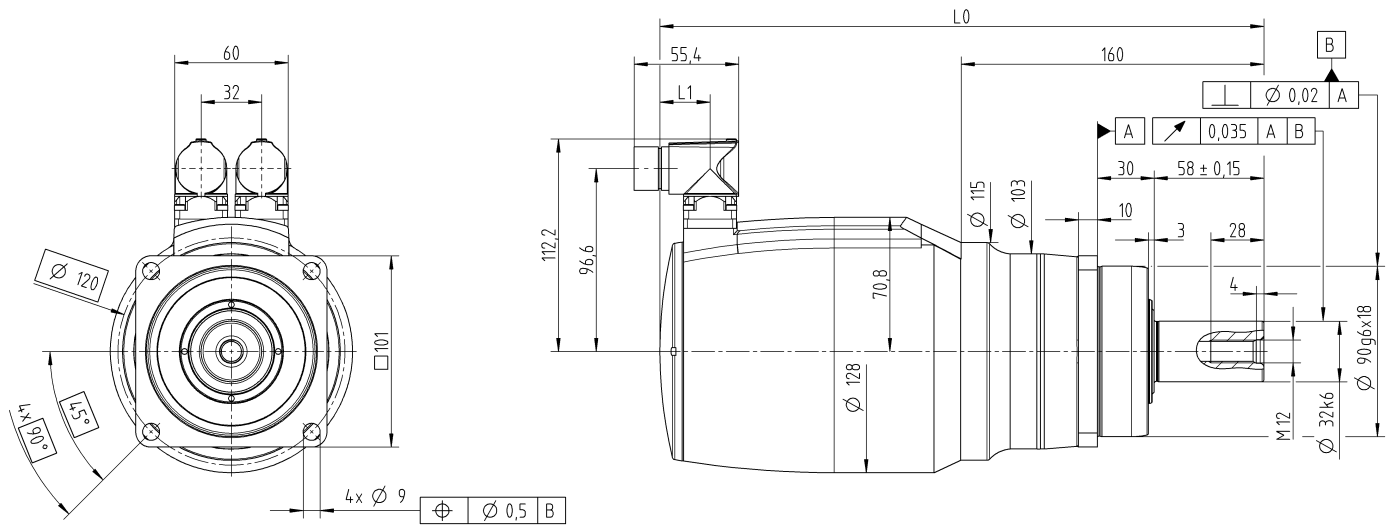
# premo® SP Line Size 3 2-stage

|  |              |                                       | 2-stage                             |      |      |      |      |      |      |      |      |
|--|--------------|---------------------------------------|-------------------------------------|------|------|------|------|------|------|------|------|
| Ratio  | i            |                                       | 16                                  | 20   | 25   | 28   | 35   | 40   | 50   | 70   | 100  |
| Operating voltage  | $U_D$        | VDC                                   | 560                                 |      |      |      |      |      |      |      |      |
| Max. acceleration torque<br>(max. 1000 cycles per hour)                            | $T_{2B}$     | Nm                                    | 248                                 | 310  | 315  | 315  | 315  | 226  | 283  | 315  | 235  |
|  |              | in.lb                                 | 2195                                | 2744 | 2788 | 2788 | 2788 | 2000 | 2505 | 2788 | 2080 |
| Static output torque   | $T_{20}$     | Nm                                    | 93                                  | 117  | 146  | 164  | 175  | 89.4 | 112  | 158  | 120  |
|  |              | in.lb                                 | 823                                 | 1036 | 1292 | 1452 | 1549 | 791  | 991  | 1398 | 1062 |
| Brake holding torque<br>(at 120 °C)  | $T_{2Br}$    | Nm                                    | 116                                 | 146  | 182  | 204  | 255  | 93.6 | 117  | 164  | 234  |
|  |              | in.lb                                 | 1027                                | 1292 | 1611 | 1806 | 2257 | 828  | 1036 | 1452 | 2071 |
| Max. speed at output   | $n_{2max}$   | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Speed limit for $T_{2B}$   | $n_{2B}$     | rpm                                   | 322                                 | 257  | 220  | 205  | 171  | 108  | 86.4 | 70   | 60   |
| Max. motor acceleration torque   | $T_{1max}$   | Nm                                    | 16.7                                | 16.7 | 16.7 | 16.7 | 16.7 | 6.09 | 6.09 | 6.09 | 6.09 |
|  |              | in.lb                                 | 148                                 | 148  | 148  | 148  | 148  | 54   | 54   | 54   | 54   |
| Max. motor acceleration current  | $I_{MaxDyn}$ | $A_{eff}$                             | 19.8                                | 19.8 | 19.8 | 19.8 | 19.8 | 7.7  | 7.7  | 7.7  | 7.7  |
| Static motor current   | $I_0$        | $A_{eff}$                             | 7.05                                | 7.05 | 7.05 | 7.05 | 7.05 | 2.77 | 2.77 | 2.77 | 2.77 |
| Max. backlash  | $j_t$        | arcmin                                | Standard ≤ 5 Reduced ≤ 3            |      |      |      |      |      |      |      |      |
| Torsional rigidity<br>(Gearbox)  | $C_{i21}$    | Nm/arcmin                             | 31                                  |      |      |      |      |      |      |      |      |
|  |              | in.lb/arcmin                          | 274                                 |      |      |      |      |      |      |      |      |
| Max. axial force <sup>a)</sup>   | $F_{2AMax}$  | N                                     | 5650                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 1271                                |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>a)</sup>   | $F_{2QMMax}$ | N                                     | 6600                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 1485                                |      |      |      |      |      |      |      |      |
| Max. tilting moment  | $M_{2KMMax}$ | Nm                                    | 487                                 |      |      |      |      |      |      |      |      |
|  |              | in.lb                                 | 4310                                |      |      |      |      |      |      |      |      |
| Service life <sup>b)</sup>   | $L_h$        | h                                     | > 20000                             |      |      |      |      |      |      |      |      |
| Weight<br>(without brake)  | $m$          | kg                                    | 10 to 11.7                          |      |      |      |      |      |      |      |      |
|  |              | lb <sub>m</sub>                       | 22 to 26                            |      |      |      |      |      |      |      |      |
| Ambient temperature  |              | °C                                    | 0 to +40                            |      |      |      |      |      |      |      |      |
|  |              | °F                                    | +32 to +104                         |      |      |      |      |      |      |      |      |
| Lubrication  |              |                                       | Lubricated for life                 |      |      |      |      |      |      |      |      |
| Insulating material class  |              |                                       | F                                   |      |      |      |      |      |      |      |      |
| Protection class   |              |                                       | IP 65                               |      |      |      |      |      |      |      |      |
| Paint  |              |                                       | Pearl dark grey and innovation blue |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®) |              |                                       | BC2-00300AA032.000-X                |      |      |      |      |      |      |      |      |
| Bore diameter of coupling<br>on the application side                               |              | mm                                    | X = 024.000 - 060.000               |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)                                   | $J_1$        | kgcm <sup>2</sup>                     | 4.42                                | 4.32 | 4.31 | 4.23 | 4.22 | 1.62 | 1.61 | 1.61 | 1.61 |
|  |              | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 3.9                                 | 3.8  | 3.8  | 3.7  | 3.7  | 1.4  | 1.4  | 1.4  | 1.4  |

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> Refers to center of the output shaft or flange

<sup>b)</sup> Please contact us to discuss application-specific service lifetimes.



#### without brake

| Ratio        | Encoder    | Length L0<br>in mm | Length L1<br>in mm |
|--------------|------------|--------------------|--------------------|
| i = 16 - 35  | Resolver   | 319.2              | 26.5               |
|              | HIPERFACE® |                    |                    |
|              | EnDat      | 351.2              | 58.5               |
|              | DRIVE-CLiQ |                    |                    |
| i = 40 - 100 | Resolver   | 295.1              | 26.5               |
|              | HIPERFACE® |                    |                    |
|              | EnDat      | 327.1              | 58.5               |
|              | DRIVE-CLiQ |                    |                    |

#### with brake

| Ratio        | Encoder    | Length L0<br>in mm | Length L1<br>in mm |
|--------------|------------|--------------------|--------------------|
| i = 16 - 35  | Resolver   | 364.7              | 26.5               |
|              | HIPERFACE® |                    |                    |
|              | EnDat      | 396.7              | 58.5               |
|              | DRIVE-CLiQ |                    |                    |
| i = 40 - 100 | Resolver   | 319.1              | 26.5               |
|              | HIPERFACE® |                    |                    |
|              | EnDat      | 351.1              | 58.5               |
|              | DRIVE-CLiQ |                    |                    |

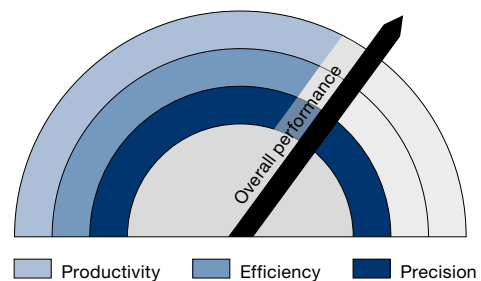


# premo<sup>®</sup> TP Line



# The dynamic class

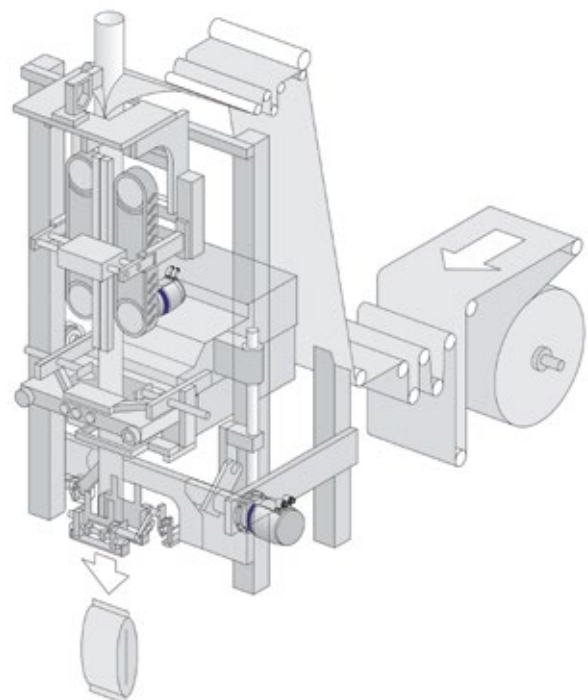
- Ideal for challenging positioning and processing tasks
- Minimal backlash and maximum torsional rigidity allow for the shortest cycle times and excellent surface finish
- Mechanical interface with output flange
- Ideal for connecting lever arms or pinions
- Electric interface with absolute encoder HIPERFACE® singleturn for high positioning accuracy as standard
- Optionally extendable with all available encoders and connector versions



## Application example

Tubular bag machines continuously package bulk material of all types – including foodstuffs such as chips or candy. The aim here is to achieve maximum throughput. It is particularly important that all the bags are clean and tightly sealed.

**premo® TP Line solves this challenge thanks to its exceptional precision and power density.**



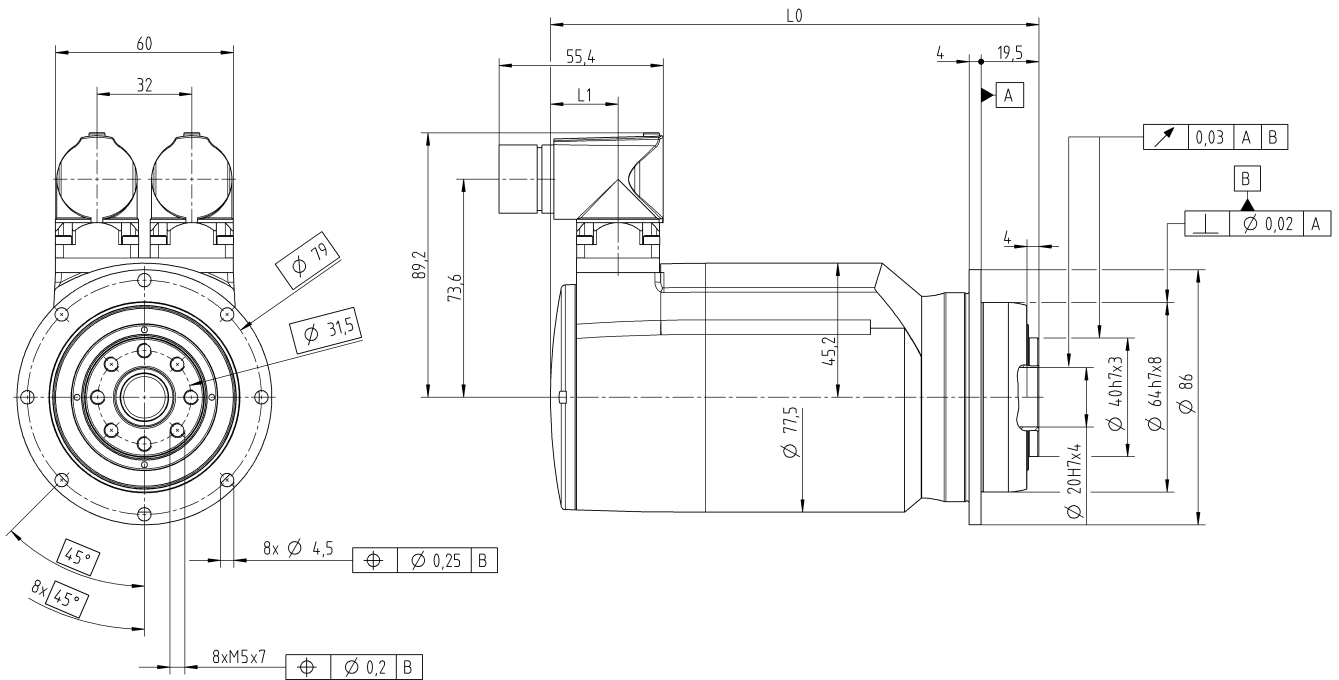
# premo<sup>®</sup> TP Line Size 1 2-stage

|   |              |                                       | 2-stage                             |      |      |      |      |      |      |      |      |
|---|--------------|---------------------------------------|-------------------------------------|------|------|------|------|------|------|------|------|
| Ratio   | i            |                                       | 16                                  | 20   | 25   | 28   | 35   | 40   | 50   | 70   | 100  |
| Operating voltage   | $U_D$        | VDC                                   | 560                                 |      |      |      |      |      |      |      |      |
| Max. acceleration torque<br>(max. 1000 cycles per hour)   | $T_{2B}$     | Nm                                    | 41.6                                | 52.3 | 55   | 55   | 55   | 50.2 | 55   | 55   | 35   |
|   |              | in.lb                                 | 368                                 | 463  | 487  | 487  | 487  | 444  | 487  | 487  | 310  |
| Static output torque  | $T_{20}$     | Nm                                    | 16.5                                | 20.9 | 26.2 | 29.3 | 37   | 20.1 | 25.3 | 35.5 | 18   |
|   |              | in.lb                                 | 146                                 | 185  | 232  | 259  | 327  | 178  | 224  | 314  | 159  |
| Brake holding torque<br>(at 120 °C)   | $T_{2Br}$    | Nm                                    | 20.8                                | 26   | 32.5 | 36.4 | 45.5 | 20.8 | 26   | 36.4 | 52   |
|   |              | in.lb                                 | 184                                 | 230  | 288  | 322  | 403  | 184  | 230  | 322  | 460  |
| Max. speed at output  | $n_{2max}$   | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Speed limit for $T_{2B}$  | $n_{2B}$     | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Max. motor acceleration torque  | $T_{1max}$   | Nm                                    | 2.84                                | 2.84 | 2.84 | 2.84 | 2.84 | 1.4  | 1.4  | 1.4  | 1.4  |
|   |              | in.lb                                 | 25                                  | 25   | 25   | 25   | 25   | 12   | 12   | 12   | 12   |
| Max. motor acceleration current   | $I_{MaxDyn}$ | $A_{eff}$                             | 4.47                                | 4.47 | 4.47 | 4.47 | 4.47 | 2.52 | 2.52 | 2.52 | 2.52 |
| Static motor current  | $I_0$        | $A_{eff}$                             | 1.71                                | 1.71 | 1.71 | 1.71 | 1.71 | 1    | 1    | 1    | 1    |
| Max. backlash   | $j_t$        | arcmin                                | Standard $\leq 4$ Reduced $\leq 2$  |      |      |      |      |      |      |      |      |
| Torsional rigidity<br>(Gearbox)   | $C_{i21}$    | Nm/arcmin                             | 12                                  | 12   | 12   | 12   | 12   | 11   | 12   | 11   | 8    |
|   |              | in.lb/arcmin                          | 106                                 | 106  | 106  | 106  | 106  | 97   | 106  | 97   | 71   |
| Tilting rigidity  | $C_{2K}$     | Nm/arcmin                             | 85                                  |      |      |      |      |      |      |      |      |
|   |              | in.lb/arcmin                          | 752                                 |      |      |      |      |      |      |      |      |
| Max. axial force <sup>a)</sup>  | $F_{2AMax}$  | N                                     | 1630                                |      |      |      |      |      |      |      |      |
|   |              | lb <sub>f</sub>                       | 367                                 |      |      |      |      |      |      |      |      |
| Max. tilting moment   | $M_{2KMax}$  | Nm                                    | 110                                 |      |      |      |      |      |      |      |      |
|   |              | in.lb                                 | 974                                 |      |      |      |      |      |      |      |      |
| Service life <sup>b)</sup>  | $L_h$        | h                                     | > 20000                             |      |      |      |      |      |      |      |      |
| Weight<br>(without brake)   | $m$          | kg                                    | 2.7 to 3.1                          |      |      |      |      |      |      |      |      |
|   |              | lb <sub>m</sub>                       | 6 to 6.9                            |      |      |      |      |      |      |      |      |
| Ambient temperature   |              | °C                                    | 0 to +40                            |      |      |      |      |      |      |      |      |
|   |              | °F                                    | +32 to +104                         |      |      |      |      |      |      |      |      |
| Lubrication   |              |                                       | Lubricated for life                 |      |      |      |      |      |      |      |      |
| Insulating material class   |              |                                       | F                                   |      |      |      |      |      |      |      |      |
| Protection class  |              |                                       | IP 65                               |      |      |      |      |      |      |      |      |
| Paint   |              |                                       | Pearl dark grey and innovation blue |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex <sup>®</sup> ) |              |                                       | BCT-00015AAX-031.500                |      |      |      |      |      |      |      |      |
| Bore diameter of coupling<br>on the application side  |              | mm                                    | X = 012.000 - 028.000               |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)  | $J_1$        | kgcm <sup>2</sup>                     | 0.37                                | 0.37 | 0.36 | 0.36 | 0.36 | 0.22 | 0.22 | 0.22 | 0.22 |
|   |              | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.33                                | 0.33 | 0.32 | 0.32 | 0.32 | 0.19 | 0.19 | 0.19 | 0.19 |

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> Refers to center of the output shaft or flange

<sup>b)</sup> Please contact us to discuss application-specific service lifetimes.



**without brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 164.8           | 22.8            |
|              | HIPERFACE® | 187.3           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 217.7           | 75.7            |
| i = 40 – 100 | Resolver   | 149.8           | 22.8            |
|              | HIPERFACE® | 172.3           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 202.7           | 75.7            |

**with brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 200.8           | 22.8            |
|              | HIPERFACE® | 223.3           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 253.7           | 75.7            |
| i = 40 – 100 | Resolver   | 177.3           | 22.8            |
|              | HIPERFACE® | 199.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 230.2           | 75.7            |

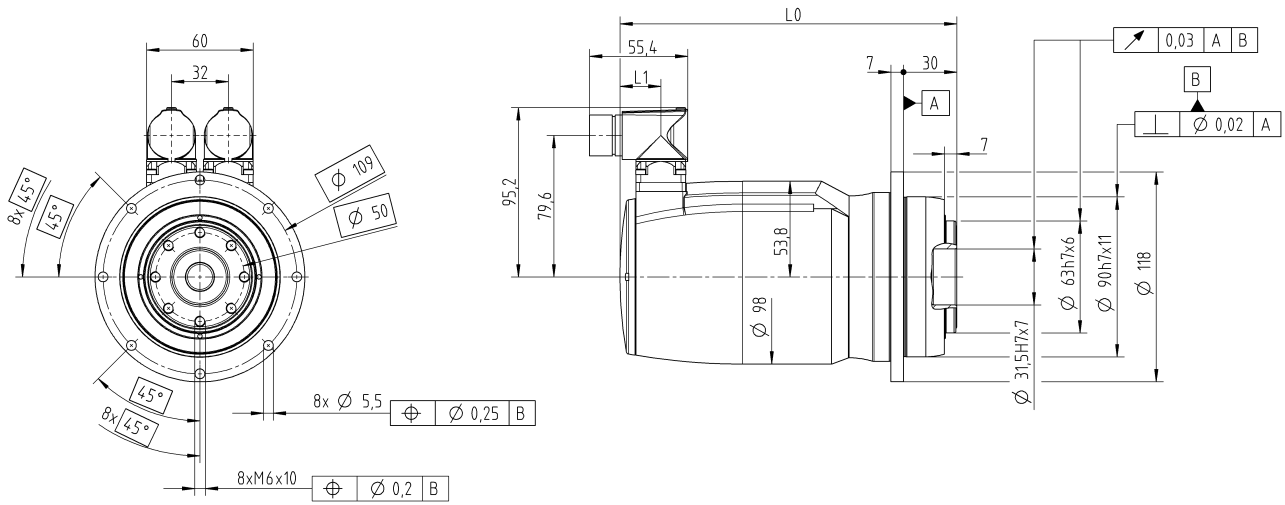
# premo® TP Line Size 2 2-stage

|  |              |                                       | 2-stage                             |      |      |      |      |      |      |      |      |
|--|--------------|---------------------------------------|-------------------------------------|------|------|------|------|------|------|------|------|
| Ratio  | i            |                                       | 16                                  | 20   | 25   | 28   | 35   | 40   | 50   | 70   | 100  |
| Operating voltage  | $U_D$        | VDC                                   | 560                                 |      |      |      |      |      |      |      |      |
| Max. acceleration torque<br>(max. 1000 cycles per hour)                            | $T_{2B}$     | Nm                                    | 81.3                                | 102  | 128  | 143  | 143  | 102  | 127  | 143  | 105  |
|  |              | in.lb                                 | 720                                 | 903  | 1133 | 1266 | 1266 | 903  | 1124 | 1266 | 929  |
| Static output torque   | $T_{20}$     | Nm                                    | 29.9                                | 37.7 | 47.3 | 53.2 | 67.3 | 38.7 | 48.4 | 68.8 | 60   |
|  |              | in.lb                                 | 265                                 | 334  | 419  | 471  | 596  | 343  | 428  | 609  | 531  |
| Brake holding torque<br>(at 120 °C)  | $T_{2Br}$    | Nm                                    | 37.4                                | 46.8 | 58.5 | 65.5 | 81.9 | 52   | 65   | 91   | 130  |
|  |              | in.lb                                 | 331                                 | 414  | 518  | 580  | 725  | 460  | 575  | 805  | 1151 |
| Max. speed at output   | $n_{2max}$   | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Speed limit for $T_{2B}$   | $n_{2B}$     | rpm                                   | 269                                 | 215  | 172  | 154  | 138  | 119  | 95.2 | 78   | 60   |
| Max. motor acceleration torque   | $T_{1max}$   | Nm                                    | 5.53                                | 5.53 | 5.53 | 5.53 | 5.53 | 2.76 | 2.76 | 2.76 | 2.76 |
|  |              | in.lb                                 | 49                                  | 49   | 49   | 49   | 49   | 24   | 24   | 24   | 24   |
| Max. motor acceleration current  | $I_{MaxDyn}$ | $A_{eff}$                             | 6.94                                | 6.94 | 6.94 | 6.94 | 6.94 | 4.45 | 4.45 | 4.45 | 4.45 |
| Static motor current   | $I_0$        | $A_{eff}$                             | 2.33                                | 2.33 | 2.33 | 2.33 | 2.33 | 1.58 | 1.58 | 1.58 | 1.58 |
| Max. backlash  | $j_t$        | arcmin                                | Standard $\leq 3$ Reduced $\leq 1$  |      |      |      |      |      |      |      |      |
| Torsional rigidity<br>(Gearbox)  | $C_{i21}$    | Nm/arcmin                             | 32                                  | 32   | 32   | 31   | 32   | 30   | 30   | 28   | 22   |
|  |              | in.lb/arcmin                          | 283                                 | 283  | 283  | 274  | 283  | 266  | 266  | 248  | 195  |
| Tilting rigidity   | $C_{2K}$     | Nm/arcmin                             | 225                                 |      |      |      |      |      |      |      |      |
|  |              | in.lb/arcmin                          | 1991                                |      |      |      |      |      |      |      |      |
| Max. axial force <sup>a)</sup>   | $F_{2AMax}$  | N                                     | 2150                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 484                                 |      |      |      |      |      |      |      |      |
| Max. tilting moment  | $M_{2KMax}$  | Nm                                    | 270                                 |      |      |      |      |      |      |      |      |
|  |              | in.lb                                 | 2390                                |      |      |      |      |      |      |      |      |
| Service life <sup>b)</sup>   | $L_h$        | h                                     | > 20000                             |      |      |      |      |      |      |      |      |
| Weight<br>(without brake)  | m            | kg                                    | 5.1 to 5.6                          |      |      |      |      |      |      |      |      |
|  |              | lb <sub>m</sub>                       | 11 to 12                            |      |      |      |      |      |      |      |      |
| Ambient temperature  |              | °C                                    | 0 to +40                            |      |      |      |      |      |      |      |      |
|  |              | °F                                    | +32 to +104                         |      |      |      |      |      |      |      |      |
| Lubrication  |              |                                       | Lubricated for life                 |      |      |      |      |      |      |      |      |
| Insulating material class  |              |                                       | F                                   |      |      |      |      |      |      |      |      |
| Protection class   |              |                                       | IP 65                               |      |      |      |      |      |      |      |      |
| Paint  |              |                                       | Pearl dark grey and innovation blue |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®) |              |                                       | BCT-00060AAX-050.000                |      |      |      |      |      |      |      |      |
| Bore diameter of coupling<br>on the application side                               |              | mm                                    | X = 014.000 - 035.000               |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)                                   | $J_1$        | kgcm <sup>2</sup>                     | 0.91                                | 0.88 | 0.87 | 0.85 | 0.85 | 0.48 | 0.47 | 0.47 | 0.47 |
|  |              | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.81                                | 0.78 | 0.77 | 0.75 | 0.75 | 0.42 | 0.42 | 0.42 | 0.42 |

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> Refers to center of the output shaft or flange

<sup>b)</sup> Please contact us to discuss application-specific service lifetimes.



#### without brake

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 189.5           | 23              |
|              | HIPERFACE® | 211.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 242             | 75.5            |
| i = 40 – 100 | Resolver   | 174.5           | 23              |
|              | HIPERFACE® | 196.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 227             | 75.5            |

#### with brake

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 228.5           | 23              |
|              | HIPERFACE® | 250.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 281             | 75.5            |
| i = 40 – 100 | Resolver   | 190.3           | 23              |
|              | HIPERFACE® | 212.6           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 242.8           | 75.5            |

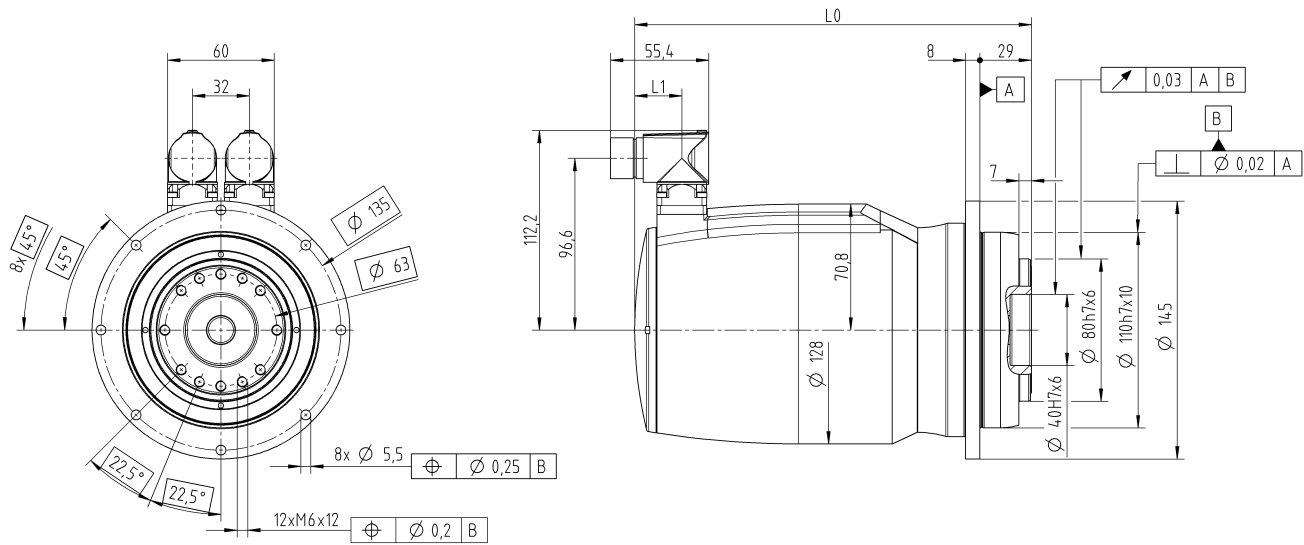
# premo<sup>®</sup> TP Line Size 3 2-stage

|   |              |                                       | 2-stage                             |      |      |      |      |      |      |      |      |
|---|--------------|---------------------------------------|-------------------------------------|------|------|------|------|------|------|------|------|
| Ratio   | i            |                                       | 16                                  | 20   | 25   | 28   | 35   | 40   | 50   | 70   | 100  |
| Operating voltage   | $U_D$        | VDC                                   | 560                                 |      |      |      |      |      |      |      |      |
| Max. acceleration torque<br>(max. 1000 cycles per hour)   | $T_{2B}$     | Nm                                    | 247                                 | 310  | 380  | 350  | 380  | 226  | 283  | 330  | 265  |
|   |              | in.lb                                 | 2186                                | 2744 | 3363 | 3098 | 3363 | 2000 | 2505 | 2921 | 2345 |
| Static output torque  | $T_{20}$     | Nm                                    | 92.6                                | 116  | 146  | 164  | 206  | 89.1 | 112  | 158  | 120  |
|   |              | in.lb                                 | 820                                 | 1027 | 1292 | 1452 | 1823 | 789  | 991  | 1398 | 1062 |
| Brake holding torque<br>(at 120 °C)   | $T_{2Br}$    | Nm                                    | 116                                 | 146  | 182  | 204  | 255  | 93.6 | 117  | 164  | 234  |
|   |              | in.lb                                 | 1027                                | 1292 | 1611 | 1806 | 2257 | 828  | 1036 | 1452 | 2071 |
| Max. speed at output  | $n_{2max}$   | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Speed limit for $T_{2B}$  | $n_{2B}$     | rpm                                   | 322                                 | 257  | 206  | 197  | 166  | 108  | 86.4 | 68   | 60   |
| Max. motor acceleration torque  | $T_{1max}$   | Nm                                    | 16.7                                | 16.7 | 16.7 | 16.7 | 16.7 | 6.09 | 6.09 | 6.09 | 6.09 |
|   |              | in.lb                                 | 148                                 | 148  | 148  | 148  | 148  | 54   | 54   | 54   | 54   |
| Max. motor acceleration current   | $I_{MaxDyn}$ | $A_{eff}$                             | 19.8                                | 19.8 | 19.8 | 19.8 | 19.8 | 7.7  | 7.7  | 7.7  | 7.7  |
| Static motor current  | $I_0$        | $A_{eff}$                             | 7.05                                | 7.05 | 7.05 | 7.05 | 7.05 | 2.77 | 2.77 | 2.77 | 2.77 |
| Max. backlash   | $j_t$        | arcmin                                | Standard $\leq 3$ Reduced $\leq 1$  |      |      |      |      |      |      |      |      |
| Torsional rigidity<br>(Gearbox)   | $C_{i21}$    | Nm/arcmin                             | 81                                  | 81   | 83   | 80   | 82   | 76   | 80   | 71   | 60   |
|   |              | in.lb/arcmin                          | 717                                 | 717  | 735  | 708  | 726  | 673  | 708  | 628  | 531  |
| Tilting rigidity  | $C_{2K}$     | Nm/arcmin                             | 550                                 |      |      |      |      |      |      |      |      |
|   |              | in.lb/arcmin                          | 4868                                |      |      |      |      |      |      |      |      |
| Max. axial force <sup>a)</sup>  | $F_{2AMax}$  | N                                     | 4150                                |      |      |      |      |      |      |      |      |
|   |              | lb <sub>f</sub>                       | 934                                 |      |      |      |      |      |      |      |      |
| Max. tilting moment   | $M_{2KMax}$  | Nm                                    | 440                                 |      |      |      |      |      |      |      |      |
|   |              | in.lb                                 | 3894                                |      |      |      |      |      |      |      |      |
| Service life <sup>b)</sup>  | $L_h$        | h                                     | > 20000                             |      |      |      |      |      |      |      |      |
| Weight<br>(without brake)   | $m$          | kg                                    | 8.8 to 10.5                         |      |      |      |      |      |      |      |      |
|   |              | lb <sub>m</sub>                       | 19 to 23                            |      |      |      |      |      |      |      |      |
| Ambient temperature   |              | °C                                    | 0 to +40                            |      |      |      |      |      |      |      |      |
|   |              | °F                                    | +32 to +104                         |      |      |      |      |      |      |      |      |
| Lubrication   |              |                                       | Lubricated for life                 |      |      |      |      |      |      |      |      |
| Insulating material class   |              |                                       | F                                   |      |      |      |      |      |      |      |      |
| Protection class  |              |                                       | IP 65                               |      |      |      |      |      |      |      |      |
| Paint   |              |                                       | Pearl dark grey and innovation blue |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex <sup>®</sup> ) |              |                                       | BCT-00150AAX-063.000                |      |      |      |      |      |      |      |      |
| Bore diameter of coupling<br>on the application side  |              | mm                                    | X = 019.000 - 042.000               |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)  | $J_1$        | kgcm <sup>2</sup>                     | 4.46                                | 4.35 | 4.33 | 4.24 | 4.23 | 1.62 | 1.62 | 1.61 | 1.61 |
|   |              | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 3.9                                 | 3.8  | 3.8  | 3.8  | 3.7  | 1.4  | 1.4  | 1.4  | 1.4  |

Please use our sizing software cymex<sup>®</sup> for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> Refers to center of the output shaft or flange

<sup>b)</sup> Please contact us to discuss application-specific service lifetimes.



**without brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 223.2           | 26.5            |
|              | HIPERFACE® |                 |                 |
|              | EnDat      | 255.2           | 58.5            |
|              | DRIVE-CLiQ |                 |                 |
| i = 40 – 100 | Resolver   | 199.1           | 26.5            |
|              | HIPERFACE® |                 |                 |
|              | EnDat      | 231.1           | 58.5            |
|              | DRIVE-CLiQ |                 |                 |

**with brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 268.7           | 26.5            |
|              | HIPERFACE® |                 |                 |
|              | EnDat      | 300.7           | 58.5            |
|              | DRIVE-CLiQ |                 |                 |
| i = 40 – 100 | Resolver   | 223.1           | 26.5            |
|              | HIPERFACE® |                 |                 |
|              | EnDat      | 255.1           | 58.5            |
|              | DRIVE-CLiQ |                 |                 |

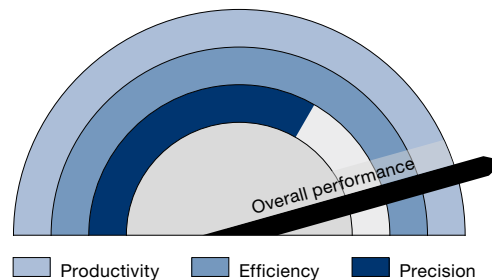


# premo<sup>®</sup> XP Line



# The extra class

- Particularly high power density and load capacity
- Extremely low backlash, high torsional rigidity and maximum load capacity of the output bearing enable a highly compact servo actuator platform for enhanced machine performance
- Mechanical interface with output shaft, ideal for connecting couplings or pinions
- In addition to the smooth shaft version, key and splined shaft versions are also available
- Electric interface with absolute encoder HIPERFACE DSL®, singleturn as standard incl. functional safety and single-cable connection

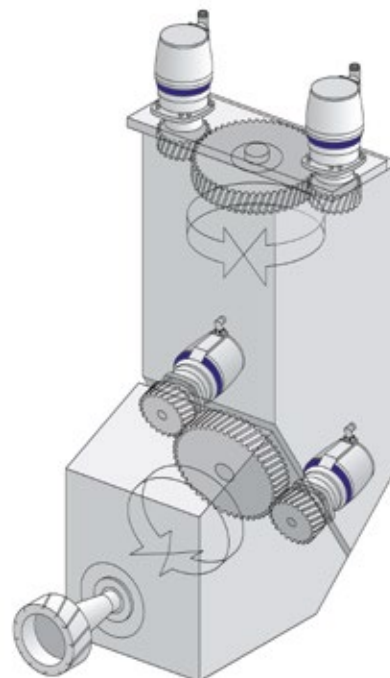


- Safety requirements are united with the latest connection technology
- Optionally extendable with all available encoders and connector versions

## Application example

Especially in the milling head of a machining center, high disturbing forces occur due to the material processing.

**Due to the restricted installation space, actuators with the highest power density and load capacity are required here. premo® XP Line offers the ideal solution.**



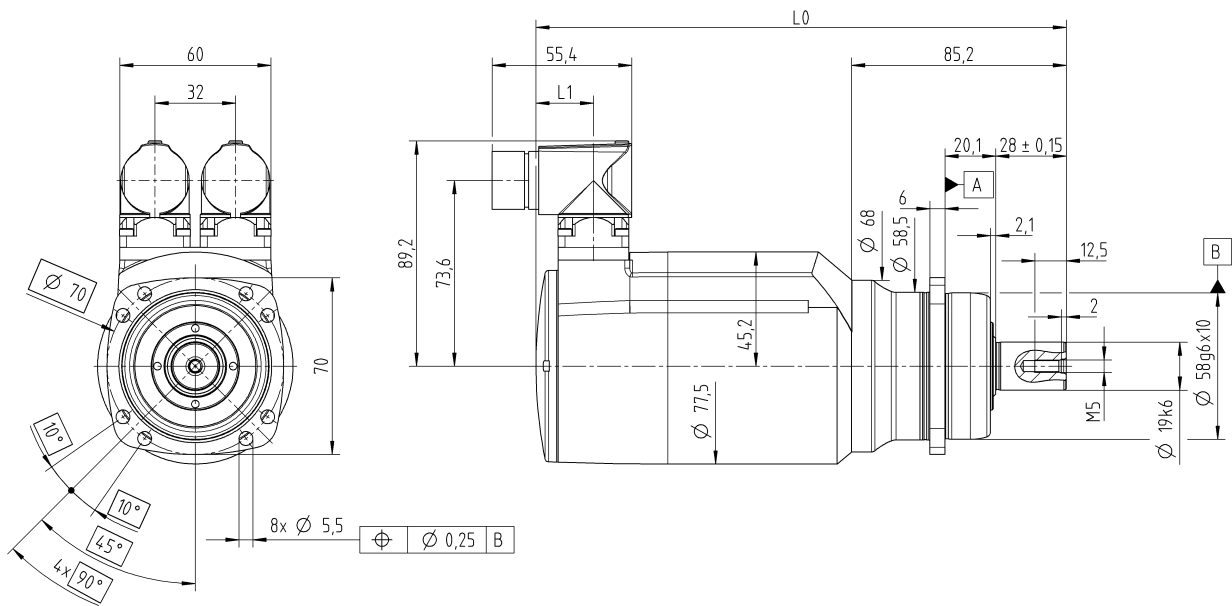
# premo® XP Line Size 1 2-stage

|  |              |                                       | 2-stage                             |      |      |      |      |      |      |      |      |
|--|--------------|---------------------------------------|-------------------------------------|------|------|------|------|------|------|------|------|
| Ratio  | i            |                                       | 16                                  | 20   | 25   | 28   | 35   | 40   | 50   | 70   | 100  |
| Operating voltage  | $U_D$        | VDC                                   | 560                                 |      |      |      |      |      |      |      |      |
| Max. acceleration torque<br>(max. 1000 cycles per hour)                            | $T_{2B}$     | Nm                                    | 41.8                                | 52.3 | 65.3 | 73.4 | 80   | 50.3 | 62.9 | 60   | 35   |
|  |              | in.lb                                 | 370                                 | 463  | 578  | 650  | 708  | 445  | 557  | 531  | 310  |
| Static output torque   | $T_{20}$     | Nm                                    | 16.6                                | 20.9 | 26   | 29.4 | 36.9 | 20.3 | 25.3 | 35.5 | 20   |
|  |              | in.lb                                 | 147                                 | 185  | 230  | 260  | 327  | 180  | 224  | 314  | 177  |
| Brake holding torque<br>(at 120 °C)  | $T_{2Br}$    | Nm                                    | 20.8                                | 26   | 32.5 | 36.4 | 45.5 | 20.8 | 26   | 36.4 | 52   |
|  |              | in.lb                                 | 184                                 | 230  | 288  | 322  | 403  | 184  | 230  | 322  | 460  |
| Max. speed at output   | $n_{2max}$   | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Speed limit for $T_{2B}$   | $n_{2B}$     | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Max. motor acceleration torque   | $T_{1max}$   | Nm                                    | 2.84                                | 2.84 | 2.84 | 2.84 | 2.84 | 1.4  | 1.4  | 1.4  | 1.4  |
|  |              | in.lb                                 | 25                                  | 25   | 25   | 25   | 25   | 12   | 12   | 12   | 12   |
| Max. motor acceleration current  | $I_{MaxDyn}$ | $A_{eff}$                             | 4.47                                | 4.47 | 4.47 | 4.47 | 4.47 | 2.52 | 2.52 | 2.52 | 2.52 |
| Static motor current   | $I_0$        | $A_{eff}$                             | 1.71                                | 1.71 | 1.71 | 1.71 | 1.71 | 1    | 1    | 1    | 1    |
| Max. backlash  | $j_t$        | arcmin                                | Standard $\leq 5$ Reduced $\leq 3$  |      |      |      |      |      |      |      |      |
| Torsional rigidity<br>(Gearbox)  | $C_{i21}$    | Nm/arcmin                             | 6.5                                 | 6.5  | 6.5  | 6.5  | 6.5  | 6.5  | 6.5  | 6.5  | 5    |
|  |              | in.lb/arcmin                          | 58                                  | 58   | 58   | 58   | 58   | 58   | 58   | 58   | 44   |
| Max. axial force <sup>a)</sup>   | $F_{2AMax}$  | N                                     | 3600                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 810                                 |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>a)</sup>   | $F_{2QMMax}$ | N                                     | 3800                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 855                                 |      |      |      |      |      |      |      |      |
| Max. tilting moment  | $M_{2KMMax}$ | Nm                                    | 339                                 |      |      |      |      |      |      |      |      |
|  |              | in.lb                                 | 3000                                |      |      |      |      |      |      |      |      |
| Service life <sup>b)</sup>   | $L_h$        | h                                     | > 20000                             |      |      |      |      |      |      |      |      |
| Weight<br>(without brake)  | m            | kg                                    | 2.9 to 3.3                          |      |      |      |      |      |      |      |      |
|  |              | lb <sub>m</sub>                       | 6.4 to 7.3                          |      |      |      |      |      |      |      |      |
| Ambient temperature  |              | °C                                    | 0 to +40                            |      |      |      |      |      |      |      |      |
|  |              | °F                                    | +32 to +104                         |      |      |      |      |      |      |      |      |
| Lubrication  |              |                                       | Lubricated for life                 |      |      |      |      |      |      |      |      |
| Insulating material class  |              |                                       | F                                   |      |      |      |      |      |      |      |      |
| Protection class   |              |                                       | IP 65                               |      |      |      |      |      |      |      |      |
| Paint  |              |                                       | Pearl dark grey and innovation blue |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®) |              |                                       | BC3-00150AA019.000-X                |      |      |      |      |      |      |      |      |
| Bore diameter of coupling<br>on the application side                               |              | mm                                    | X = 015.000 - 038.000               |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)                                   | $J_1$        | kgcm <sup>2</sup>                     | 0.38                                | 0.37 | 0.37 | 0.36 | 0.36 | 0.22 | 0.22 | 0.22 | 0.22 |
|  |              | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.34                                | 0.33 | 0.33 | 0.32 | 0.32 | 0.19 | 0.19 | 0.19 | 0.19 |

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> Refers to center of the output shaft or flange

<sup>b)</sup> Please contact us to discuss application-specific service lifetimes.



**without brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 210.3           | 22.8            |
|              | HIPERFACE® | 232.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 263.2           | 75.7            |
| i = 40 – 100 | Resolver   | 195.3           | 22.8            |
|              | HIPERFACE® | 217.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 248.2           | 75.7            |

**with brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 246.3           | 22.8            |
|              | HIPERFACE® | 268.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 299.2           | 75.7            |
| i = 40 – 100 | Resolver   | 222.8           | 22.8            |
|              | HIPERFACE® | 245.3           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 275.7           | 75.7            |

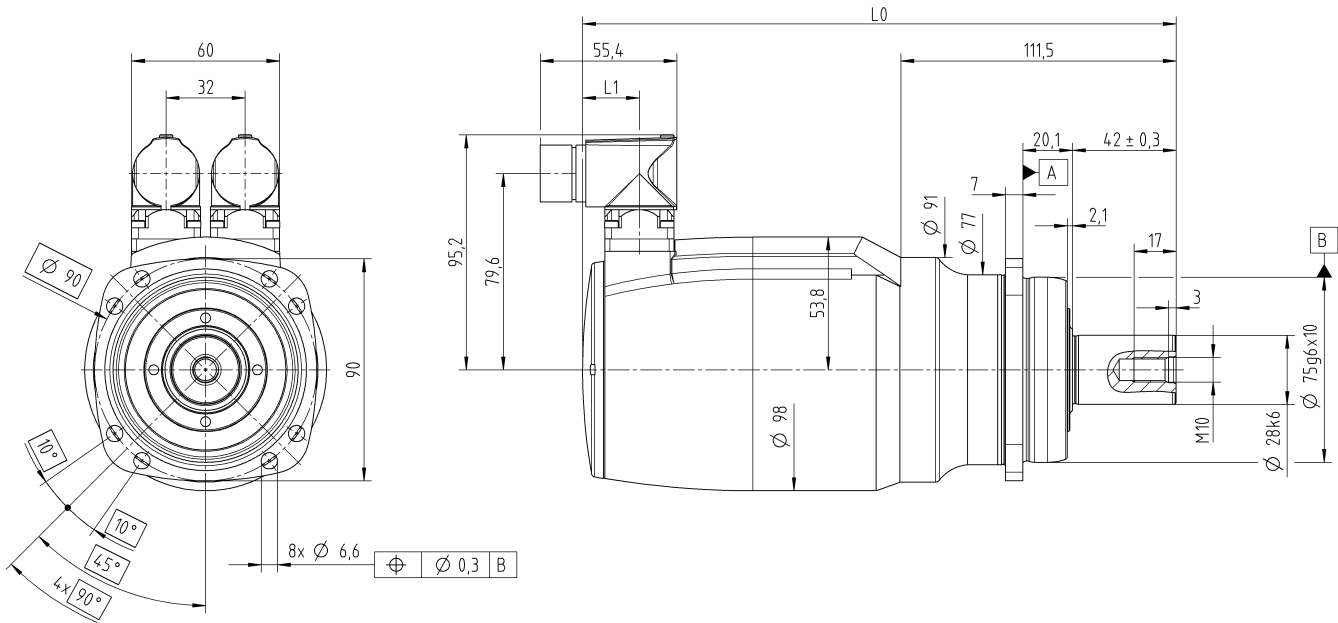
# premo® XP Line Size 2 2-stage

|  |              |                                       | 2-stage                             |      |      |      |      |      |      |      |      |
|--|--------------|---------------------------------------|-------------------------------------|------|------|------|------|------|------|------|------|
| Ratio  | i            |                                       | 16                                  | 20   | 25   | 28   | 35   | 40   | 50   | 70   | 100  |
| Operating voltage  | $U_D$        | VDC                                   | 560                                 |      |      |      |      |      |      |      |      |
| Max. acceleration torque<br>(max. 1000 cycles per hour)                            | $T_{2B}$     | Nm                                    | 81.9                                | 103  | 128  | 144  | 180  | 102  | 128  | 165  | 105  |
|  |              | in.lb                                 | 725                                 | 912  | 1133 | 1275 | 1593 | 903  | 1133 | 1460 | 929  |
| Static output torque   | $T_{20}$     | Nm                                    | 30.5                                | 38.4 | 47.8 | 54   | 67.5 | 39.1 | 49   | 68.8 | 60   |
|  |              | in.lb                                 | 270                                 | 340  | 423  | 478  | 597  | 346  | 434  | 609  | 531  |
| Brake holding torque<br>(at 120 °C)  | $T_{2Br}$    | Nm                                    | 37.4                                | 46.8 | 58.5 | 65.5 | 81.9 | 52   | 65   | 91   | 130  |
|  |              | in.lb                                 | 331                                 | 414  | 518  | 580  | 725  | 460  | 575  | 805  | 1151 |
| Max. speed at output   | $n_{2max}$   | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Speed limit for $T_{2B}$   | $n_{2B}$     | rpm                                   | 269                                 | 215  | 172  | 154  | 123  | 119  | 95.2 | 70.1 | 60   |
| Max. motor acceleration torque   | $T_{1max}$   | Nm                                    | 5.53                                | 5.53 | 5.53 | 5.53 | 5.53 | 2.76 | 2.76 | 2.76 | 2.76 |
|  |              | in.lb                                 | 49                                  | 49   | 49   | 49   | 49   | 24   | 24   | 24   | 24   |
| Max. motor acceleration current  | $I_{MaxDyn}$ | $A_{eff}$                             | 6.94                                | 6.94 | 6.94 | 6.94 | 6.94 | 4.45 | 4.45 | 4.45 | 4.45 |
| Static motor current   | $I_0$        | $A_{eff}$                             | 2.33                                | 2.33 | 2.33 | 2.33 | 2.33 | 1.58 | 1.58 | 1.58 | 1.58 |
| Max. backlash  | $j_t$        | arcmin                                | Standard $\leq 4$ Reduced $\leq 2$  |      |      |      |      |      |      |      |      |
| Torsional rigidity<br>(Gearbox)  | $C_{i21}$    | Nm/arcmin                             | 19.5                                | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 19.5 | 18   | 15   |
|  |              | in.lb/arcmin                          | 173                                 | 173  | 173  | 173  | 173  | 173  | 173  | 159  | 133  |
| Max. axial force <sup>a)</sup>   | $F_{2AMax}$  | N                                     | 4000                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 900                                 |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>a)</sup>   | $F_{2QMMax}$ | N                                     | 6000                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 1350                                |      |      |      |      |      |      |      |      |
| Max. tilting moment  | $M_{2KMMax}$ | Nm                                    | 675                                 |      |      |      |      |      |      |      |      |
|  |              | in.lb                                 | 5974                                |      |      |      |      |      |      |      |      |
| Service life <sup>b)</sup>   | $L_h$        | h                                     | > 20000                             |      |      |      |      |      |      |      |      |
| Weight<br>(without brake)  | m            | kg                                    | 5 to 5.5                            |      |      |      |      |      |      |      |      |
|  |              | lb <sub>m</sub>                       | 11 to 12                            |      |      |      |      |      |      |      |      |
| Ambient temperature  |              | °C                                    | 0 to +40                            |      |      |      |      |      |      |      |      |
|  |              | °F                                    | +32 to +104                         |      |      |      |      |      |      |      |      |
| Lubrication  |              |                                       | Lubricated for life                 |      |      |      |      |      |      |      |      |
| Insulating material class  |              |                                       | F                                   |      |      |      |      |      |      |      |      |
| Protection class   |              |                                       | IP 65                               |      |      |      |      |      |      |      |      |
| Paint  |              |                                       | Pearl dark grey and innovation blue |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®) |              |                                       | BC3-00300AA028.000-X                |      |      |      |      |      |      |      |      |
| Bore diameter of coupling<br>on the application side                               |              | mm                                    | X = 024.000 - 056.000               |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)                                   | $J_1$        | kgcm <sup>2</sup>                     | 0.91                                | 0.88 | 0.87 | 0.85 | 0.85 | 0.48 | 0.47 | 0.47 | 0.47 |
|  |              | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.81                                | 0.78 | 0.77 | 0.75 | 0.75 | 0.42 | 0.42 | 0.42 | 0.42 |

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> Refers to center of the output shaft or flange

<sup>b)</sup> Please contact us to discuss application-specific service lifetimes.



**without brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 240.5           | 23              |
|              | HIPERFACE® | 262.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 293             | 75.5            |
| i = 40 – 100 | Resolver   | 225.5           | 23              |
|              | HIPERFACE® | 247.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 278             | 75.5            |

**with brake**

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 279.5           | 23              |
|              | HIPERFACE® | 301.8           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 332             | 75.5            |
| i = 40 – 100 | Resolver   | 241.3           | 23              |
|              | HIPERFACE® | 263.6           | 45.3            |
|              | EnDat      |                 |                 |
|              | DRIVE-CLiQ | 293.8           | 75.5            |

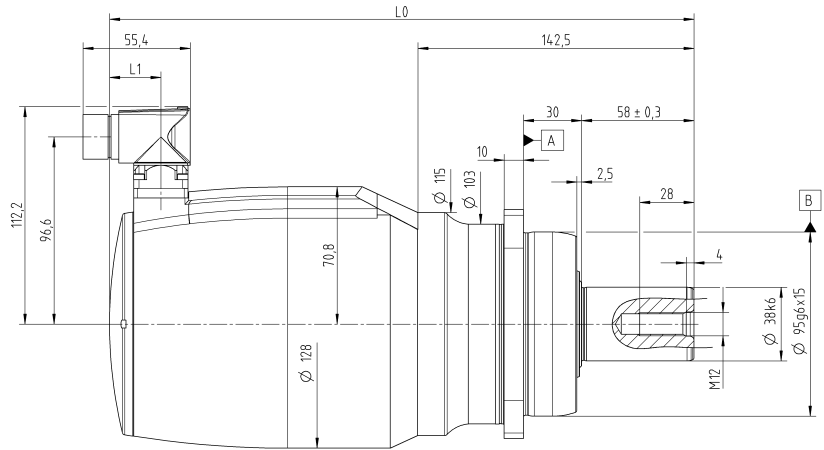
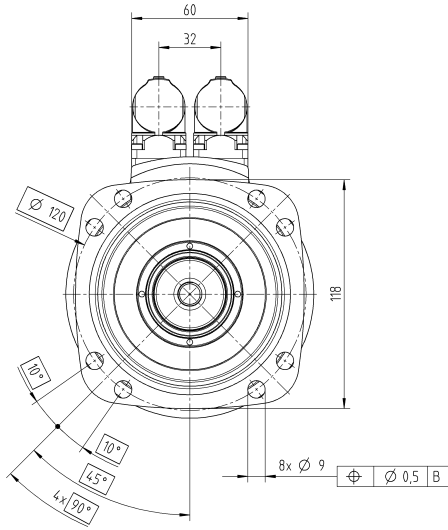
# premo® XP Line Size 3 2-stage

|  |              |                                       | 2-stage                             |      |      |      |      |      |      |      |      |
|--|--------------|---------------------------------------|-------------------------------------|------|------|------|------|------|------|------|------|
| Ratio  | i            |                                       | 16                                  | 20   | 25   | 28   | 35   | 40   | 50   | 70   | 100  |
| Operating voltage  | $U_D$        | VDC                                   | 560                                 |      |      |      |      |      |      |      |      |
| Max. acceleration torque<br>(max. 1000 cycles per hour)                            | $T_{2B}$     | Nm                                    | 248                                 | 310  | 388  | 435  | 450  | 226  | 283  | 350  | 275  |
|  |              | in.lb                                 | 2195                                | 2744 | 3434 | 3850 | 3983 | 2000 | 2505 | 3098 | 2434 |
| Static output torque   | $T_{20}$     | Nm                                    | 93.3                                | 117  | 147  | 164  | 206  | 89.3 | 112  | 158  | 130  |
|  |              | in.lb                                 | 826                                 | 1036 | 1301 | 1452 | 1823 | 790  | 991  | 1398 | 1151 |
| Brake holding torque<br>(at 120 °C)  | $T_{2Br}$    | Nm                                    | 116                                 | 146  | 182  | 204  | 255  | 93.6 | 117  | 164  | 234  |
|  |              | in.lb                                 | 1027                                | 1292 | 1611 | 1806 | 2257 | 828  | 1036 | 1452 | 2071 |
| Max. speed at output   | $n_{2max}$   | rpm                                   | 375                                 | 300  | 240  | 214  | 171  | 150  | 120  | 85.7 | 60   |
| Speed limit for $T_{2B}$   | $n_{2B}$     | rpm                                   | 322                                 | 257  | 206  | 184  | 157  | 108  | 86.4 | 65.7 | 60   |
| Max. motor acceleration torque   | $T_{1max}$   | Nm                                    | 16.7                                | 16.7 | 16.7 | 16.7 | 16.7 | 6.09 | 6.09 | 6.09 | 6.09 |
|  |              | in.lb                                 | 148                                 | 148  | 148  | 148  | 148  | 54   | 54   | 54   | 54   |
| Max. motor acceleration current  | $I_{MaxDyn}$ | $A_{eff}$                             | 19.8                                | 19.8 | 19.8 | 19.8 | 19.8 | 7.7  | 7.7  | 7.7  | 7.7  |
| Static motor current   | $I_0$        | $A_{eff}$                             | 7.05                                | 7.05 | 7.05 | 7.05 | 7.05 | 2.77 | 2.77 | 2.77 | 2.77 |
| Max. backlash  | $j_1$        | arcmin                                | Standard $\leq 4$ Reduced $\leq 2$  |      |      |      |      |      |      |      |      |
| Torsional rigidity<br>(Gearbox)  | $C_{i21}$    | Nm/arcmin                             | 45                                  | 45   | 45   | 45   | 45   | 45   | 45   | 42   | 35   |
|  |              | in.lb/arcmin                          | 398                                 | 398  | 398  | 398  | 398  | 398  | 398  | 372  | 310  |
| Max. axial force <sup>a)</sup>   | $F_{2AMax}$  | N                                     | 5700                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 1283                                |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>a)</sup>   | $F_{2QMMax}$ | N                                     | 9000                                |      |      |      |      |      |      |      |      |
|  |              | lb <sub>f</sub>                       | 2025                                |      |      |      |      |      |      |      |      |
| Max. tilting moment  | $M_{2KMMax}$ | Nm                                    | 1296                                |      |      |      |      |      |      |      |      |
|  |              | in.lb                                 | 11471                               |      |      |      |      |      |      |      |      |
| Service life <sup>b)</sup>   | $L_h$        | h                                     | > 20000                             |      |      |      |      |      |      |      |      |
| Weight<br>(without brake)  | m            | kg                                    | 9.7 to 11.4                         |      |      |      |      |      |      |      |      |
|  |              | lb <sub>m</sub>                       | 21 to 25                            |      |      |      |      |      |      |      |      |
| Ambient temperature  |              | °C                                    | 0 to +40                            |      |      |      |      |      |      |      |      |
|  |              | °F                                    | +32 to +104                         |      |      |      |      |      |      |      |      |
| Lubrication  |              |                                       | Lubricated for life                 |      |      |      |      |      |      |      |      |
| Insulating material class  |              |                                       | F                                   |      |      |      |      |      |      |      |      |
| Protection class   |              |                                       | IP 65                               |      |      |      |      |      |      |      |      |
| Paint  |              |                                       | Pearl dark grey and innovation blue |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®) |              |                                       | BC3-00500AA038.000-X                |      |      |      |      |      |      |      |      |
| Bore diameter of coupling<br>on the application side                               |              | mm                                    | X = 024.000 - 056.000               |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)                                   | $J_1$        | kgcm <sup>2</sup>                     | 4.46                                | 4.35 | 4.33 | 4.24 | 4.23 | 1.62 | 1.62 | 1.61 | 1.61 |
|  |              | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 3.9                                 | 3.8  | 3.8  | 3.8  | 3.7  | 1.4  | 1.4  | 1.4  | 1.4  |

Please use our sizing software cymex® for a detailed sizing – [www.wittenstein-cymex.com](http://www.wittenstein-cymex.com)

<sup>a)</sup> Refers to center of the output shaft or flange

<sup>b)</sup> Please contact us to discuss application-specific service lifetimes.



### without brake

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 301.7           | 26.5            |
|              | HIPERFACE® |                 |                 |
|              | EnDat      | 333.7           | 58.5            |
|              | DRIVE-CLiQ |                 |                 |
| i = 40 – 100 | Resolver   | 277.6           | 26.5            |
|              | HIPERFACE® |                 |                 |
|              | EnDat      | 309.6           | 58.5            |
|              | DRIVE-CLiQ |                 |                 |

### with brake

| Ratio        | Encoder    | Length L0 in mm | Length L1 in mm |
|--------------|------------|-----------------|-----------------|
| i = 16 – 35  | Resolver   | 347.2           | 26.5            |
|              | HIPERFACE® |                 |                 |
|              | EnDat      | 379.2           | 58.5            |
|              | DRIVE-CLiQ |                 |                 |
| i = 40 – 100 | Resolver   | 301.6           | 26.5            |
|              | HIPERFACE® |                 |                 |
|              | EnDat      | 333.6           | 58.5            |
|              | DRIVE-CLiQ |                 |                 |





**premo<sup>®</sup>**  
**options**

### Electrical connection

Straight or right-angled version, alignment of outlets to gearbox flange (XP Line) and single-cable connection for DSL protocol and EnDAT 2.2 available.

### Encoder

In addition to the standard version in the respective product line, optional encoder systems with the protocols EnDat 2.1, EnDat 2.2, HIPERFACE®, HIPERFACE DSL® and DRIVE-CLiQ are available.

### Pin assignment

For a number of servo controllers, we offer special pin assignments for power and signal.

### Temperature sensor

PTC / PT1000

### Operating voltage

Depending on the application and servo controller, windings for 320 and 560 V DC are available.

### Holding brake

A suitable permanent-magnet holding brake adapted to the motor power is available.

### Lubrication

Select from the standard lubrication with oil or grease as well as food-grade grease and oil.

### Backlash

To improve precision, the gearbox backlash can be reduced.

### Multiple output configurations for greater flexibility

Smooth shaft, Shaft with key, Splined shaft (DIN 5480), Flange, System output



## Gearbox model

Several mechanical interface versions are available:

| Version | SP Line   | TP Line   | XP Line   |
|---------|---|---|---|
| Output  | <ul style="list-style-type: none"> <li>- Smooth shaft (standard)</li> <li>- Key (option)</li> <li>- Splined (option)</li> </ul> | <ul style="list-style-type: none"> <li>- Flange (standard)</li> <li>- System output (option)</li> </ul> | <ul style="list-style-type: none"> <li>- Smooth shaft (standard)</li> <li>- Key (option)</li> <li>- Splined (option)</li> <li>- System output (option)</li> </ul> |
| Housing | Round through bore (standard)   | Round through bore (standard)   | <ul style="list-style-type: none"> <li>- Round through bore (standard)</li> <li>- Slotted through bore (option)</li> </ul>  |

## Lubrication

Depending on the application, the requirements regarding the lubricant in the gearbox change.

The following lubricants are available for our servo actuators:

- Oil lubricant (Standard)
- Grease lubricant  
(Reduction of output torque by up to 20 %)
- Food-grade oil lubricant  
(Reduction of output torque by up to 20 %)
- Food-grade grease lubricant  
(Reduction of output torque by up to 40 %)

## Operating voltage

The premo<sup>®</sup> servo actuators are available for operating voltages of 320 V and 560 V. The dielectric strength goes up to 750 V, so the use with servo controllers with the appropriate operating voltage is possible.

## Temperature sensor

Different sensors are available to protect the motor coil from overheating.

- PTC resistor, type STM 160 according to DIN 44081/82
- PT1000

## Encoder

Connectivity is the magic word. Here, WITTENSTEIN alpha offers its customers maximum flexibility.

**A large selection of encoder systems is available for positioning and speed measurement.**

### Resolver

- 2 poles, one sine/ cosine cycle per revolution  
(standard SP Line)

### HIPERFACE<sup>®</sup> absolute encoder, safety acc. to SIL 2

- Singleturn, resolution 4096 positions per revolution, 128 sine/cosine (standard TP Line)
- Multiturn, resolution 4096 positions per revolution, 128 sine/cosine, 4096 revolutions

### HIPERFACE DSL<sup>®</sup> absolute encoder, safety acc. to SIL 2

- Singleturn, resolution 20 bits per revolution, (standard XP Line)
- Multiturn, resolution 20 bits per revolution, 4096 revolutions

### EnDat 2.1, absolute encoder

- Singleturn, resolution 8192 positions per revolution, 512 sine/cosine
- Multiturn, resolution 8192 positions per revolution, 512 sine/cosine, 4096 revolutions

### EnDat 2.2, absolute encoder, safety acc. to SIL 2

- Singleturn, resolution 23 bits per revolution
- Multiturn, resolution 23 bits per revolution, 4096 revolutions

### DRIVE-CLiQ, absolute encoder, safety acc. to SIL 2

- Singleturn, resolution 24 bits per revolution
- Multiturn, resolution 24 bits per revolution, 4096 revolutions

## Holding brake

A compact permanent magnet brake is fitted to secure the motor shaft when the actuator is disconnected from the power. Characteristics include no torsional backlash, no residual torque when the brake is released and unlimited duty cycles at zero speed.

| Ratio   |      | Size 1  |          | Size 2  |          | Size 3  |          |
|---|------|---------|----------|---------|----------|---------|----------|
|   |      | 16 – 35 | 40 – 100 | 16 – 35 | 40 – 100 | 16 – 35 | 40 – 100 |
| <b>Static holding torque at 120 °C<sup>1)</sup></b> | Nm   | 1.3     | 0.52     | 2.34    | 1.3      | 7.28    | 2.34     |
| <b>Supply voltage</b>                               | V DC | 24      | 24       | 24      | 24       | 24      | 24       |
| <b>Current at nominal voltage and 20 °C</b>         | A DC | 0.46    | 0.42     | 0.5     | 0.46     | 0.71    | 0.5      |
| <b>Connection time</b>                              | ms   | ≤ 8     | ≤ 10     | ≤ 20    | ≤ 8      | –       | ≤ 20     |
| <b>Separation time</b>                              | ms   | ≤ 35    | ≤ 18     | ≤ 50    | ≤ 35     | ≤ 60    | ≤ 50     |

<sup>1)</sup>Please refer to our project planning note on the brake.

For the precise holding torques at the output, please refer to the relevant data tables for the servo actuators, e.g. premo® TP Line Size 3. In the case of transmission ratios in which the holding torque at the output is above  $T_{2B}$ , the brake can be used max. 1000 times on the rotating motor.

## Electrical connection

In addition to the conventional connection via two integral sockets for power and signal, a version for a single-cable connection in conjunction with EnDat 2.2 or HIPERFACE DSL® is available.

Integral sockets used:

|                                |                  |   |
|--------------------------------|------------------|---|
| <b>Single-cable connection</b> | Power and signal | Integral power socket M23<br>Bayonet coupling, 13/9-pin     |
| <b>Two-cable connection</b>    | Power            | Integral power socket M23<br>Bayonet coupling, 6/9-pin      |
|                                | Signal           | Integral signal socket M23<br>Bayonet coupling, 9/12/17-pin |

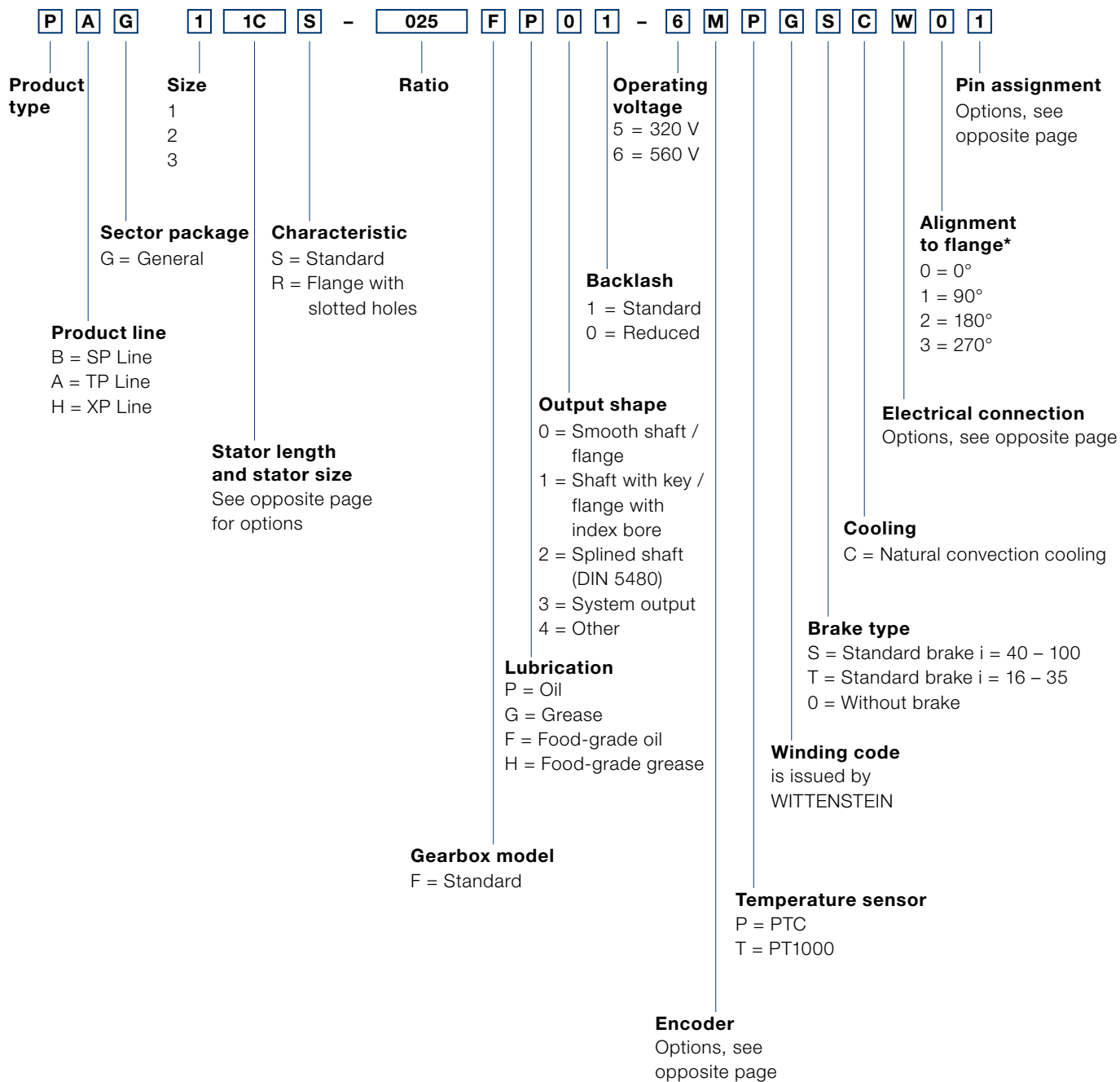
## Pin assignment

The great flexibility of the new premo® servo actuator platform is also demonstrated by the pin assignments. In addition to two standard WITTENSTEIN pin assignments, a number of compatible connections are available for various servo controller suppliers.

|                  |  |
|------------------|--|
| Pin assignment 1 | WITTENSTEIN alpha-Standard,<br>temperature sensor in signal cable<br>Resolver, DRIVE-CLiQ            |
| Pin assignment 2 | Siemens-compatible (except DRIVE-CLiQ),<br>temperature sensor in signal cable<br>Resolver, EnDat 2.1 |
| Pin assignment 4 | WITTENSTEIN alpha-Standard,<br>temperature sensor in power cable<br>HIPERFACE®, EnDat 2.2            |
| Pin assignment 5 | Rockwell compatible<br>HIPERFACE®, HIPERFACE DSL® (single-cable)                                     |

|                  |  |
|------------------|--|
| Pin assignment 6 | B&R compatible<br>Resolver, EnDat 2.2 (single-cable) |
| Pin assignment 8 | Schneider compatible<br>HIPERFACE®                   |
| Pin assignment 9 | Beckhoff compatible<br>HIPERFACE DSL® (single-cable) |

# premo<sup>®</sup> Ordering code



\* The position of the electrical connection with respect to the flange is relevant for XP Line with characteristic R (flange with slotted holes). This information relates to the offset of the integral sockets to the slotted holes as seen on the servo actuator from the rear.

**Electrical connection options**

|          |                                 |
|----------|---------------------------------|
| <b>R</b> | Angled integral socket, 1-cab   |
| <b>W</b> | Angled integral socket, 2-cab   |
| <b>S</b> | Straight integral socket, 1-cab |
| <b>G</b> | Straight integral socket, 2-cab |

**Pin assignment options**

|          |   |
|----------|---|
| <b>1</b> | WITTENSTEIN alpha Standard with temperature sensor in signal line |
| <b>2</b> | Siemens compatible w/o DRIVE-CLiQ                                 |
| <b>4</b> | WITTENSTEIN alpha Standard with temperature sensor in power cable |
| <b>5</b> | Rockwell compatible   |
| <b>6</b> | B&R compatible  |
| <b>8</b> | Schneider compatible  |
| <b>9</b> | Beckhoff compatible   |

**Encoder options**

|          |                                     |
|----------|-------------------------------------|
| <b>R</b> | Resolver, 2 poles                   |
| <b>S</b> | EnDat 2.1 absolute, singleturn      |
| <b>M</b> | EnDat 2.1 absolute, multiturn       |
| <b>F</b> | EnDat 2.2 absolute, singleturn      |
| <b>W</b> | EnDat 2.2 absolute, multiturn       |
| <b>N</b> | HIPERFACE® absolute, singleturn     |
| <b>K</b> | HIPERFACE® absolute, multiturn      |
| <b>G</b> | HIPERFACE DSL® absolute, singleturn |
| <b>H</b> | HIPERFACE DSL® absolute, multiturn  |
| <b>L</b> | DRIVE-CLiQ absolute, singleturn     |
| <b>D</b> | DRIVE-CLiQ absolute, multiturn      |
| <b>E</b> | Rockwell absolute, singleturn       |
| <b>V</b> | Rockwell absolute, multiturn        |
| <b>J</b> | Rockwell DSL absolute, singleturn   |
| <b>P</b> | Rockwell DSL absolute, multiturn    |

**Stator length and stator size options**

|               | <b>Ratio 16 to 35</b> | <b>Ratio 40 to 100</b> |
|---------------|-----------------------|------------------------|
| <b>Size 1</b> | 2C                    | 1C                     |
| <b>Size 2</b> | 2D                    | 1D                     |
| <b>Size 3</b> | 3F                    | 1F                     |