

## SP<sup>+</sup> / SP<sup>+</sup> HIGH SPEED – The classic all-rounder



SP<sup>+</sup>

### Product highlights

**Max. torsional backlash** [arcmin] ≤ 1 – 6

**Various output configurations**

Smooth shaft, shaft with key, splined shaft (DIN 5480), blind hollow shaft

**High nominal speeds**

SP<sup>+</sup> HIGH SPEED version for applications in continuous operation

**Flexible drive options**

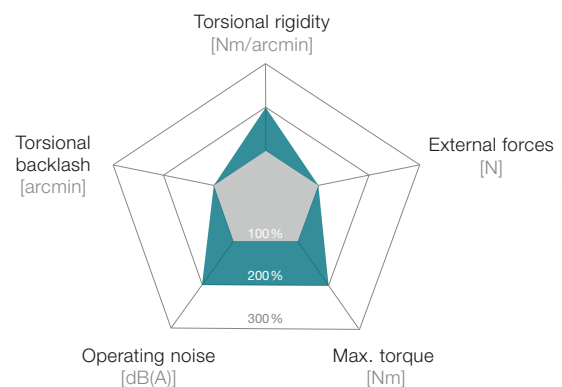
Clamping hub socket, coupling, optimized mass inertia, keyed clamping hub socket

**Other gearbox models**

Corrosion resistant design, ATEX, food-grade lubrication, low friction version

The standard version of these low-backlash planetary gearboxes with output shaft is ideally suited for high positioning accuracy and highly dynamic cyclic operation. The SP<sup>+</sup> HIGH SPEED is particularly appropriate for applications with maximum speeds during continuous operation.

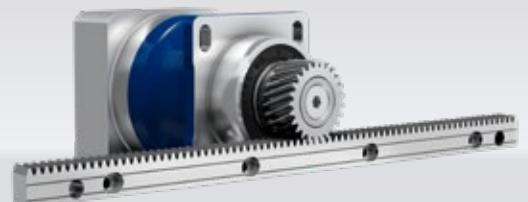
The SP<sup>+</sup> compared to the industry standard



— SP<sup>+</sup> / SP<sup>+</sup> HIGH SPEED — industry standard



SP<sup>+</sup> planetary gearbox in corrosion resistant design



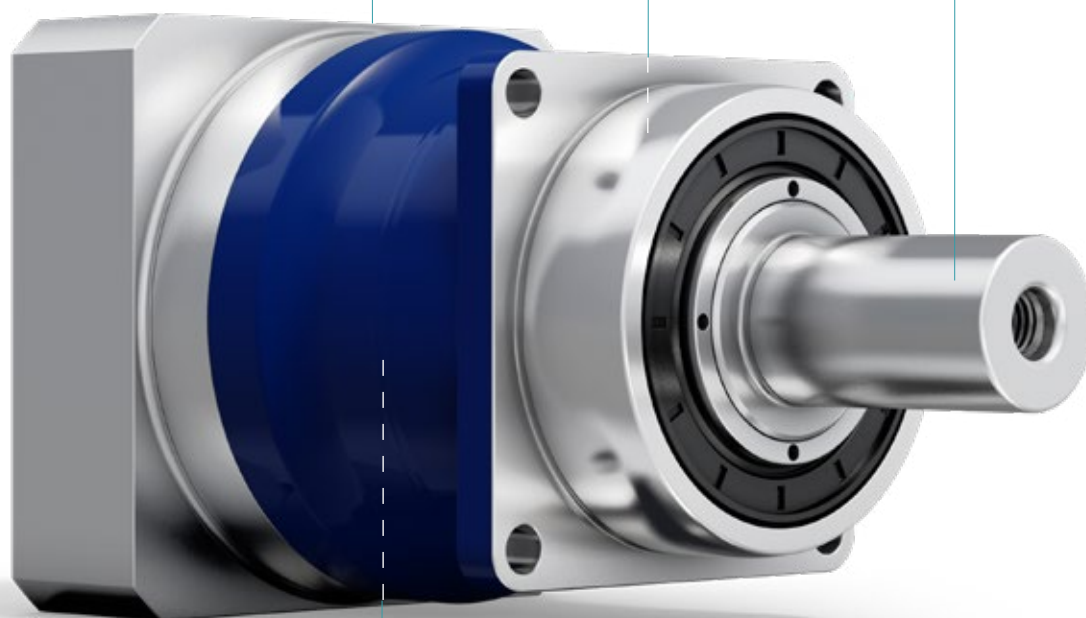
SP<sup>+</sup> with R-flange and rack and pinion

Connectivity of the motor shafts due to the large number of clamping hub diameters

Various output configurations

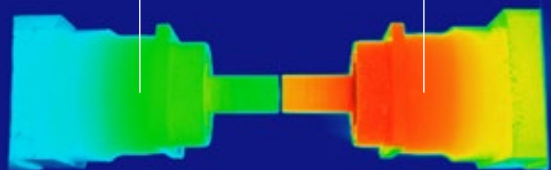
Tapered roller bearing for absorbing axial and radial forces

Extremely smooth running due to helical toothing



Heat build-up approx. 40°C

Heat build-up approx. 80°C



SP+ HIGH SPEED  
MC version

Industry standard



SP+ with metal bellows coupling

# SP<sup>+</sup> 060 MF 1-stage

|                                                                                                                                              |   |    |                           | 1-stage                                     |                               |      |      |      |      |      |
|----------------------------------------------------------------------------------------------------------------------------------------------|---|----|---------------------------|---------------------------------------------|-------------------------------|------|------|------|------|------|
| Ratio                                                                                                                                        |   |    | <i>i</i>                  |                                             | 3                             | 4    | 5    | 7    | 8    | 10   |
| Max. torque <sup>a) b) e)</sup>                                                                                                              |   |    | <i>T</i> <sub>2a</sub>    | <i>Nm</i>                                   | 48                            | 67   | 67   | 67   | 51   | 51   |
|                                                                                                                                              |   |    |                           | <i>in.lb</i>                                | 425                           | 595  | 595  | 595  | 453  | 453  |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                     |   |    | <i>T</i> <sub>2B</sub>    | <i>Nm</i>                                   | 36                            | 50   | 50   | 50   | 38   | 38   |
|                                                                                                                                              |   |    |                           | <i>in.lb</i>                                | 319                           | 443  | 443  | 443  | 336  | 336  |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                                               |   |    | <i>T</i> <sub>2N</sub>    | <i>Nm</i>                                   | 21                            | 27   | 27   | 26   | 26   | 27   |
|                                                                                                                                              |   |    |                           | <i>in.lb</i>                                | 190                           | 239  | 236  | 226  | 230  | 237  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                   |   |    | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>                                   | 96                            | 109  | 109  | 109  | 100  | 100  |
|                                                                                                                                              |   |    |                           | <i>in.lb</i>                                | 850                           | 965  | 965  | 965  | 885  | 885  |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>e)</sup>                                     |   |    | <i>n</i> <sub>1N</sub>    | <i>rpm</i>                                  | 3300                          | 3300 | 3300 | 4000 | 4000 | 4000 |
| Max. input speed                                                                                                                             |   |    | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>                                  | 7500                          | 7500 | 7500 | 7500 | 7500 | 7500 |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)                             |   |    | <i>T</i> <sub>012</sub>   | <i>Nm</i>                                   | 0.68                          | 0.52 | 0.48 | 0.34 | 0.32 | 0.32 |
|                                                                                                                                              |   |    |                           | <i>in.lb</i>                                | 6.0                           | 4.6  | 4.2  | 3.0  | 2.8  | 2.8  |
| Max. backlash                                                                                                                                |   |    | <i>j</i> <sub>t</sub>     | <i>arcmin</i>                               | Standard ≤ 4 / Reduced ≤ 2    |      |      |      |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                                             |   |    | <i>C</i> <sub>t21</sub>   | <i>Nm/arcmin</i>                            | 3.5                           |      |      |      |      |      |
|                                                                                                                                              |   |    |                           | <i>in.lb/arcmin</i>                         | 31                            |      |      |      |      |      |
| Max. axial force <sup>c)</sup>                                                                                                               |   |    | <i>F</i> <sub>2AMax</sub> | <i>N</i>                                    | 2400                          |      |      |      |      |      |
|                                                                                                                                              |   |    |                           | <i>lb<sub>f</sub></i>                       | 540                           |      |      |      |      |      |
| Max. lateral force <sup>c)</sup>                                                                                                             |   |    | <i>F</i> <sub>2QMax</sub> | <i>N</i>                                    | 2800                          |      |      |      |      |      |
|                                                                                                                                              |   |    |                           | <i>lb<sub>f</sub></i>                       | 630                           |      |      |      |      |      |
| Max. tilting moment                                                                                                                          |   |    | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>                                   | 152                           |      |      |      |      |      |
|                                                                                                                                              |   |    |                           | <i>in.lb</i>                                | 1345                          |      |      |      |      |      |
| Efficiency at full load                                                                                                                      |   |    | <i>η</i>                  | %                                           | 97                            |      |      |      |      |      |
| Service life <sup>f)</sup>                                                                                                                   |   |    | <i>L</i> <sub>h</sub>     | <i>h</i>                                    | > 20000                       |      |      |      |      |      |
| Weight<br>(incl. standard adapter plate)                                                                                                     |   |    | <i>m</i>                  | <i>kg</i>                                   | 1.9                           |      |      |      |      |      |
|                                                                                                                                              |   |    |                           | <i>lb<sub>m</sub></i>                       | 4.2                           |      |      |      |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                                   |   |    | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>                                | ≤ 58                          |      |      |      |      |      |
| Max. permitted housing temperature                                                                                                           |   |    |                           | °C                                          | +90                           |      |      |      |      |      |
|                                                                                                                                              |   |    |                           | <i>F</i>                                    | 194                           |      |      |      |      |      |
| Ambient temperature                                                                                                                          |   |    |                           | °C                                          | –15 to +40                    |      |      |      |      |      |
|                                                                                                                                              |   |    |                           | <i>F</i>                                    | 5 to 104                      |      |      |      |      |      |
| Lubrication                                                                                                                                  |   |    |                           |                                             | Lubricated for life           |      |      |      |      |      |
| Direction of rotation                                                                                                                        |   |    |                           |                                             | In- and output same direction |      |      |      |      |      |
| Protection class                                                                                                                             |   |    |                           |                                             | IP 65                         |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                           |   |    |                           |                                             | BC2-00060AA016.000-X          |      |      |      |      |      |
|                                                                                                                                              |   |    |                           | <i>mm</i>                                   | X = 012.000 - 035.000         |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br>Optimized mass inertia version<br>available on request | B | 11 | <i>J</i> <sub>i</sub>     | <i>kgcm</i> <sup>2</sup>                    | 0.21                          | 0.15 | 0.12 | 0.10 | 0.10 | 0.09 |
|                                                                                                                                              |   |    |                           | <i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup> | 0.19                          | 0.13 | 0.11 | 0.09 | 0.09 | 0.08 |
|                                                                                                                                              | C | 14 | <i>J</i> <sub>i</sub>     | <i>kgcm</i> <sup>2</sup>                    | 0.28                          | 0.22 | 0.20 | 0.18 | 0.16 | 0.16 |
|                                                                                                                                              |   |    |                           | <i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup> | 0.25                          | 0.19 | 0.18 | 0.16 | 0.14 | 0.14 |
|                                                                                                                                              | E | 19 | <i>J</i> <sub>i</sub>     | <i>kgcm</i> <sup>2</sup>                    | 0.61                          | 0.55 | 0.52 | 0.50 | 0.49 | 0.49 |
|                                                                                                                                              |   |    |                           | <i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup> | 0.54                          | 0.49 | 0.46 | 0.44 | 0.43 | 0.43 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

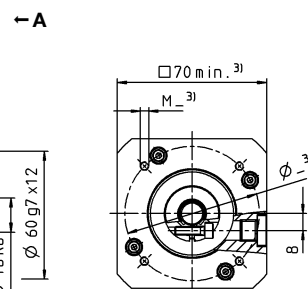
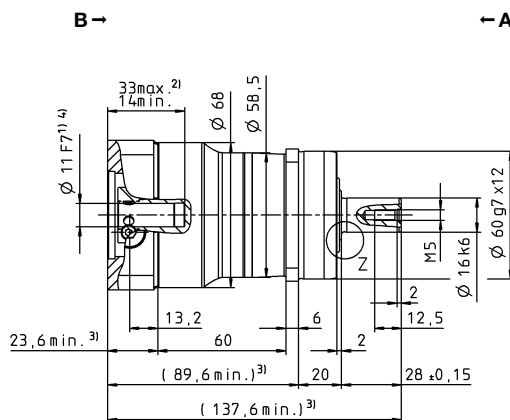
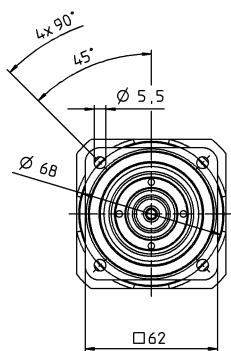
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

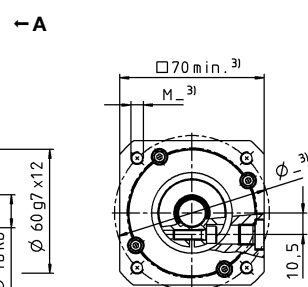
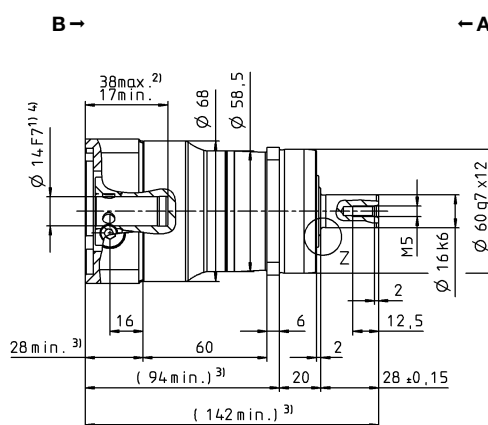
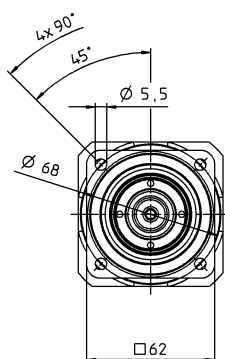
View B

# 1-stage

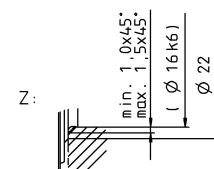
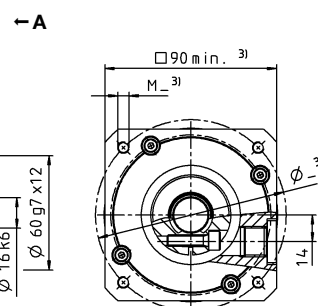
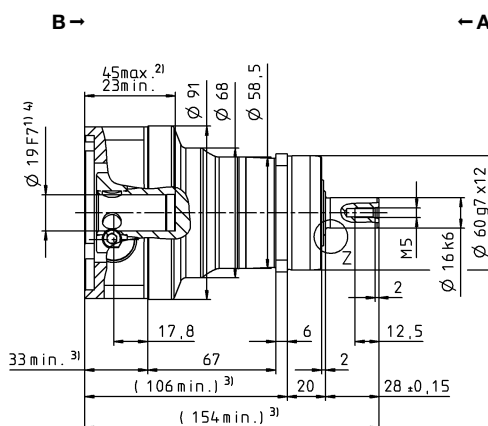
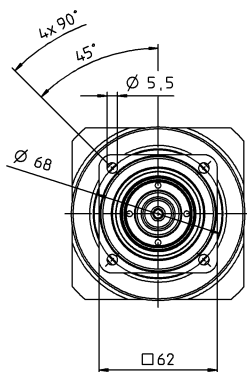
up to 11<sup>4)</sup> (B)  
clamping hub  
diameter



up to 14<sup>4)</sup> (C)<sup>5)</sup>  
clamping hub  
diameter

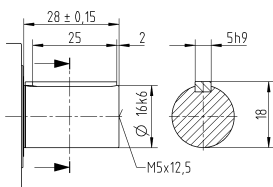


up to 19<sup>4)</sup> (E)  
clamping hub  
diameter

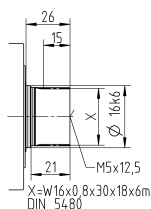


## Other output variants

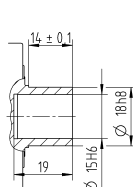
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 060 MF 2-stage

|                                                                                                                                                  |   |    |                           | 2-stage                                    |                               |       |       |       |       |       |       |       |       |       |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---------------------------|--------------------------------------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                                                                                                                                            |   |    | <i>i</i>                  |                                            | 16                            | 20    | 25    | 28    | 32    | 35    | 40    | 50    | 64    | 70    | 100   |
| Max. torque <sup>a) b) e)</sup>                                                                                                                  |   |    | <i>T</i> <sub>2a</sub>    | <i>Nm</i>                                  | 57                            | 57    | 67    | 57    | 57    | 67    | 57    | 67    | 48    | 56    | 48    |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 507                           | 507   | 595   | 507   | 507   | 595   | 507   | 595   | 423   | 499   | 423   |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                         |   |    | <i>T</i> <sub>2B</sub>    | <i>Nm</i>                                  | 50                            | 50    | 50    | 50    | 50    | 50    | 50    | 50    | 38    | 50    | 38    |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 443                           | 443   | 443   | 443   | 443   | 443   | 443   | 443   | 336   | 443   | 336   |
| Nominal torque<br>(at <i>n</i> <sub>N</sub> )                                                                                                    |   |    | <i>T</i> <sub>2N</sub>    | <i>Nm</i>                                  | 38                            | 40    | 40    | 40    | 38    | 40    | 40    | 40    | 31    | 40    | 31    |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 332                           | 354   | 351   | 357   | 333   | 357   | 357   | 357   | 270   | 357   | 272   |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                       |   |    | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>                                  | 109                           | 109   | 109   | 109   | 109   | 109   | 109   | 109   | 109   | 109   | 100   |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 965                           | 965   | 965   | 965   | 965   | 965   | 965   | 965   | 965   | 965   | 885   |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>                                         |   |    | <i>n</i> <sub>1N</sub>    | <i>rpm</i>                                 | 4400                          | 4400  | 4400  | 4400  | 4400  | 4400  | 4400  | 4800  | 4800  | 5500  | 5500  |
| Max. input speed                                                                                                                                 |   |    | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>                                 | 8500                          | 8500  | 8500  | 8500  | 8500  | 8500  | 8500  | 8500  | 8500  | 8500  | 8500  |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)                                 |   |    | <i>T</i> <sub>012</sub>   | <i>Nm</i>                                  | 0.28                          | 0.25  | 0.23  | 0.22  | 0.24  | 0.20  | 0.20  | 0.19  | 0.19  | 0.17  | 0.18  |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 2.5                           | 2.2   | 2.0   | 1.9   | 2.1   | 1.8   | 1.8   | 1.7   | 1.7   | 1.5   | 1.6   |
| Max. backlash                                                                                                                                    |   |    | <i>j</i> <sub>t</sub>     | <i>arcmin</i>                              | Standard ≤ 6 / Reduced ≤ 4    |       |       |       |       |       |       |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                                                 |   |    | <i>C</i> <sub>121</sub>   | <i>Nm/arcmin</i>                           | 3.5                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                           | <i>in.lb/arcmin</i>                        | 31                            |       |       |       |       |       |       |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                                                   |   |    | <i>F</i> <sub>2AMax</sub> | <i>N</i>                                   | 2400                          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>                      | 540                           |       |       |       |       |       |       |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                                                 |   |    | <i>F</i> <sub>2QMax</sub> | <i>N</i>                                   | 2800                          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>                      | 630                           |       |       |       |       |       |       |       |       |       |       |
| Max. tilting moment                                                                                                                              |   |    | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>                                  | 152                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 1345                          |       |       |       |       |       |       |       |       |       |       |
| Efficiency at full load                                                                                                                          |   |    | <i>η</i>                  | %                                          | 94                            |       |       |       |       |       |       |       |       |       |       |
| Service life <sup>f)</sup>                                                                                                                       |   |    | <i>L</i> <sub>h</sub>     | <i>h</i>                                   | > 20000                       |       |       |       |       |       |       |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                                                         |   |    | <i>m</i>                  | <i>kg</i>                                  | 2.0                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                           | <i>lb<sub>m</sub></i>                      | 4.4                           |       |       |       |       |       |       |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                                       |   |    | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>                               | ≤ 57                          |       |       |       |       |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                                                               |   |    |                           | °C                                         | +90                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                           | <i>F</i>                                   | 194                           |       |       |       |       |       |       |       |       |       |       |
| Ambient temperature                                                                                                                              |   |    |                           | °C                                         | –15 to +40                    |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                           | <i>F</i>                                   | 5 to 104                      |       |       |       |       |       |       |       |       |       |       |
| Lubrication                                                                                                                                      |   |    |                           |                                            | Lubricated for life           |       |       |       |       |       |       |       |       |       |       |
| Direction of rotation                                                                                                                            |   |    |                           |                                            | In- and output same direction |       |       |       |       |       |       |       |       |       |       |
| Protection class                                                                                                                                 |   |    |                           |                                            | IP 65                         |       |       |       |       |       |       |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                               |   |    |                           |                                            | BC2-00060AA016.000-X          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                           | <i>mm</i>                                  | X = 012.000 - 035.000         |       |       |       |       |       |       |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br><br>Optimized mass inertia version<br>available on request | B | 11 | <i>J</i> <sub>i</sub>     | <i>kgcm<sup>2</sup></i>                    | 0.077                         | 0.069 | 0.068 | 0.061 | 0.061 | 0.061 | 0.057 | 0.057 | 0.056 | 0.056 | 0.056 |
|                                                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 0.068                         | 0.061 | 0.060 | 0.054 | 0.054 | 0.054 | 0.050 | 0.050 | 0.050 | 0.050 | 0.050 |
|                                                                                                                                                  | C | 14 | <i>J</i> <sub>i</sub>     | <i>kgcm<sup>2</sup></i>                    | 0.17                          | 0.16  | 0.16  | 0.16  | 0.16  | 0.16  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  |
|                                                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 0.15                          | 0.14  | 0.14  | 0.14  | 0.14  | 0.14  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

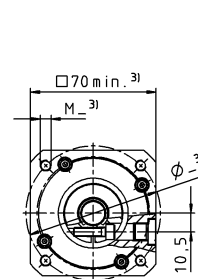
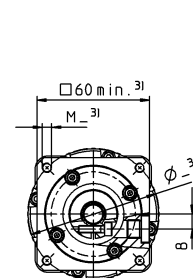
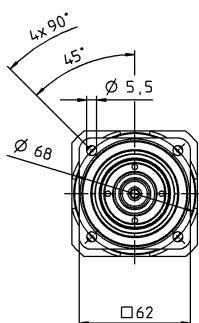
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

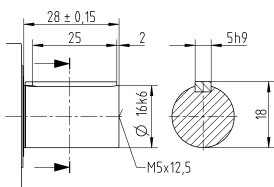
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

up to 11 <sup>4)</sup> (B) <sup>5)</sup>  
clamping hub  
diameter

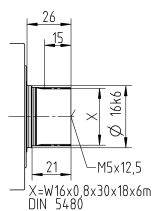
up to 14 <sup>4)</sup> (C)  
clamping hub  
diameter



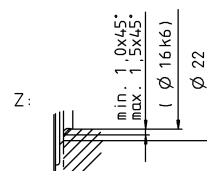
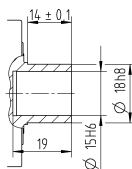
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit

2) Min. /Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 075 MF 1-stage

|                                                                                                                                                  |   |    |                | 1-stage                               |                 |                               |      |      |      |      |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----------------|---------------------------------------|-----------------|-------------------------------|------|------|------|------|------|
| Ratio                                                                                                                                            |   |    |                | i                                     |                 | 3                             | 4    | 5    | 7    | 8    | 10   |
| Max. torque <sup>a) b) e)</sup>                                                                                                                  |   |    |                | T <sub>2a</sub>                       | Nm              | 136                           | 176  | 176  | 176  | 152  | 152  |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 1204                          | 1558 | 1558 | 1558 | 1345 | 1345 |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                         |   |    |                | T <sub>2B</sub>                       | Nm              | 102                           | 132  | 132  | 132  | 114  | 114  |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 903                           | 1168 | 1168 | 1168 | 1009 | 1009 |
| Nominal torque<br>(at n <sub>IN</sub> )                                                                                                          |   |    |                | T <sub>2N</sub>                       | Nm              | 63                            | 81   | 81   | 81   | 80   | 81   |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 558                           | 719  | 716  | 719  | 712  | 720  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                       |   |    |                | T <sub>2Not</sub>                     | Nm              | 139                           | 185  | 250  | 250  | 250  | 250  |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 1230                          | 1640 | 2213 | 2213 | 2213 | 2213 |
| Permitted average input speed<br>(at T <sub>2N</sub> and 20 °C ambient temperature) <sup>e)</sup>                                                |   |    |                | n <sub>1N</sub>                       | rpm             | 2900                          | 2900 | 2900 | 3100 | 3100 | 3100 |
| Max. input speed                                                                                                                                 |   |    |                | n <sub>1Max</sub>                     | rpm             | 7500                          | 7500 | 7500 | 7500 | 7500 | 7500 |
| Mean no load running torque <sup>b)</sup><br>(at n <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)                                        |   |    |                | T <sub>012</sub>                      | Nm              | 1.5                           | 1.4  | 0.96 | 0.72 | 0.55 | 0.52 |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 14                            | 12   | 8.5  | 6.4  | 4.9  | 4.6  |
| Max. backlash                                                                                                                                    |   |    |                | j <sub>t</sub>                        | arcmin          | Standard ≤ 4 / Reduced ≤ 2    |      |      |      |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                                                 |   |    |                | C <sub>121</sub>                      | Nm/arcmin       | 10                            |      |      |      |      |      |
|                                                                                                                                                  |   |    |                |                                       | in.lb/arcmin    | 89                            |      |      |      |      |      |
| Max. axial force <sup>c)</sup>                                                                                                                   |   |    |                | F <sub>2AMax</sub>                    | N               | 3350                          |      |      |      |      |      |
|                                                                                                                                                  |   |    |                |                                       | lb <sub>f</sub> | 754                           |      |      |      |      |      |
| Max. lateral force <sup>c)</sup>                                                                                                                 |   |    |                | F <sub>2QMax</sub>                    | N               | 4200                          |      |      |      |      |      |
|                                                                                                                                                  |   |    |                |                                       | lb <sub>f</sub> | 945                           |      |      |      |      |      |
| Max. tilting moment                                                                                                                              |   |    |                | M <sub>2KMax</sub>                    | Nm              | 236                           |      |      |      |      |      |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 2089                          |      |      |      |      |      |
| Efficiency at full load                                                                                                                          |   |    |                | η                                     | %               | 97                            |      |      |      |      |      |
| Service life <sup>f)</sup>                                                                                                                       |   |    |                | L <sub>h</sub>                        | h               | > 20000                       |      |      |      |      |      |
| Weight<br>(incl. standard adapter plate)                                                                                                         |   |    |                | m                                     | kg              | 3.9                           |      |      |      |      |      |
|                                                                                                                                                  |   |    |                |                                       | lb <sub>m</sub> | 8.6                           |      |      |      |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                                       |   |    |                | L <sub>PA</sub>                       | dB(A)           | ≤ 59                          |      |      |      |      |      |
| Max. permitted housing temperature                                                                                                               |   |    |                |                                       | °C              | +90                           |      |      |      |      |      |
|                                                                                                                                                  |   |    |                |                                       | F               | 194                           |      |      |      |      |      |
| Ambient temperature                                                                                                                              |   |    |                |                                       | °C              | –15 to +40                    |      |      |      |      |      |
|                                                                                                                                                  |   |    |                |                                       | F               | 5 to 104                      |      |      |      |      |      |
| Lubrication                                                                                                                                      |   |    |                |                                       |                 | Lubricated for life           |      |      |      |      |      |
| Direction of rotation                                                                                                                            |   |    |                |                                       |                 | In- and output same direction |      |      |      |      |      |
| Protection class                                                                                                                                 |   |    |                |                                       |                 | IP 65                         |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                               |   |    |                |                                       |                 | BC2-00150AA022.000-X          |      |      |      |      |      |
|                                                                                                                                                  |   |    |                |                                       | mm              | X = 019.000 - 042.000         |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br><br>Optimized mass inertia version<br>available on request | C | 14 | J <sub>i</sub> | kgcm <sup>2</sup>                     | 0.86            | 0.61                          | 0.51 | 0.42 | 0.38 | 0.38 |      |
|                                                                                                                                                  |   |    |                | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.76            | 0.54                          | 0.45 | 0.37 | 0.34 | 0.34 |      |
|                                                                                                                                                  | E | 19 | J <sub>i</sub> | kgcm <sup>2</sup>                     | 1.03            | 0.78                          | 0.68 | 0.59 | 0.54 | 0.54 |      |
|                                                                                                                                                  |   |    |                | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.91            | 0.69                          | 0.60 | 0.52 | 0.48 | 0.48 |      |
|                                                                                                                                                  | G | 24 | J <sub>i</sub> | kgcm <sup>2</sup>                     | 2.40            | 2.15                          | 2.05 | 1.96 | 1.91 | 1.91 |      |
|                                                                                                                                                  |   |    |                | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 2.12            | 1.90                          | 1.81 | 1.73 | 1.69 | 1.69 |      |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

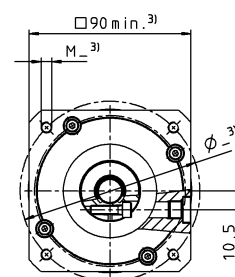
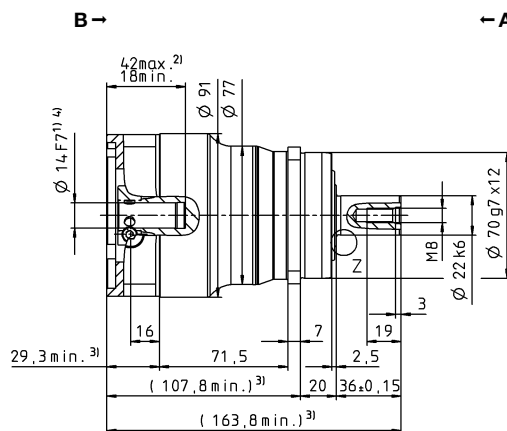
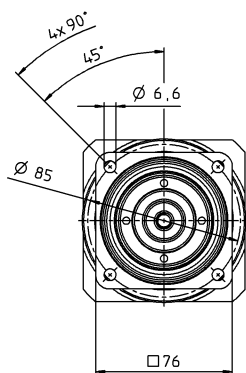
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

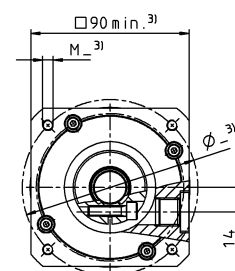
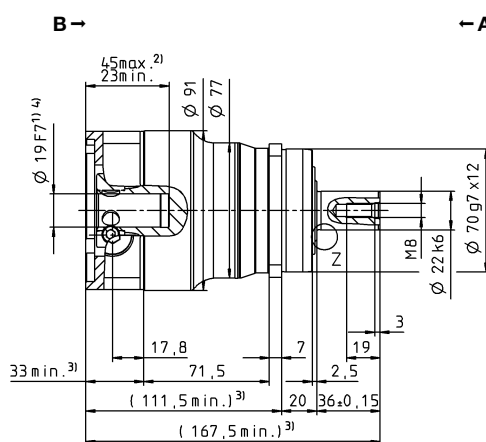
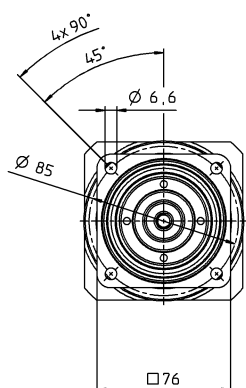
View B

# 1-stage

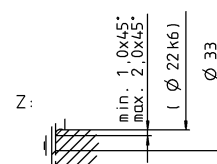
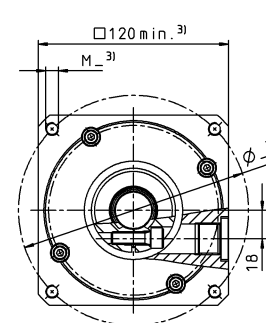
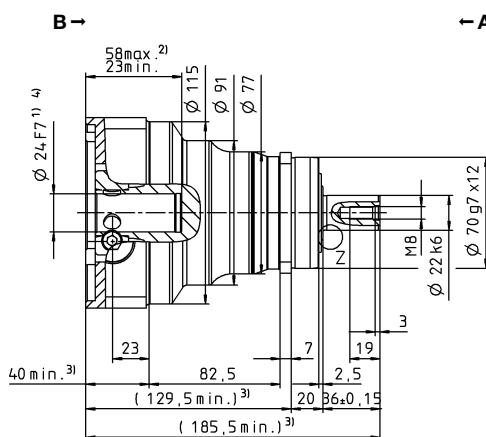
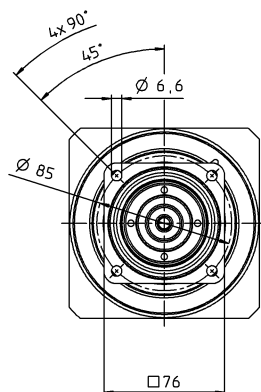
up to 14<sup>4)</sup> (C)  
clamping hub  
diameter



up to 19<sup>4)</sup> (E)<sup>5)</sup>  
clamping hub  
diameter

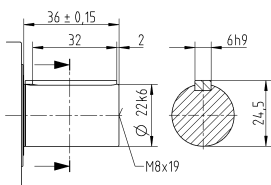


up to 24<sup>4)</sup> (G)  
clamping hub  
diameter

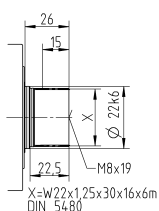


## Other output variants

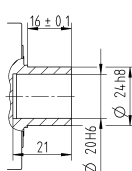
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 075 MF 2-stage

|                                                                                                                                                  |   |    |                           | 2-stage                                    |                               |      |      |      |      |      |      |      |      |      |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---------------------------|--------------------------------------------|-------------------------------|------|------|------|------|------|------|------|------|------|------|
| Ratio                                                                                                                                            |   |    | <i>i</i>                  |                                            | 16                            | 20   | 25   | 28   | 32   | 35   | 40   | 50   | 64   | 70   | 100  |
| Max. torque <sup>a) b) e)</sup>                                                                                                                  |   |    | <i>T</i> <sub>2a</sub>    | <i>Nm</i>                                  | 126                           | 126  | 158  | 126  | 126  | 158  | 126  | 158  | 105  | 113  | 105  |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 1118                          | 1118 | 1398 | 1118 | 1118 | 1398 | 1118 | 1398 | 932  | 998  | 932  |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                         |   |    | <i>T</i> <sub>2B</sub>    | <i>Nm</i>                                  | 126                           | 126  | 132  | 126  | 126  | 132  | 126  | 132  | 105  | 113  | 105  |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 1118                          | 1118 | 1168 | 1118 | 1118 | 1168 | 1118 | 1168 | 932  | 998  | 932  |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                                                   |   |    | <i>T</i> <sub>2N</sub>    | <i>Nm</i>                                  | 101                           | 101  | 106  | 101  | 101  | 106  | 101  | 106  | 84   | 90   | 84   |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 895                           | 895  | 935  | 895  | 895  | 935  | 895  | 935  | 746  | 799  | 746  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                       |   |    | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>                                  | 250                           | 250  | 250  | 250  | 250  | 250  | 250  | 250  | 250  | 250  | 250  |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 2213                          | 2213 | 2213 | 2213 | 2213 | 2213 | 2213 | 2213 | 2213 | 2213 | 2213 |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>                                         |   |    | <i>n</i> <sub>1N</sub>    | <i>rpm</i>                                 | 3500                          | 3500 | 3500 | 3500 | 3500 | 3500 | 3500 | 3800 | 3800 | 4500 | 4500 |
| Max. input speed                                                                                                                                 |   |    | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>                                 | 8500                          | 8500 | 8500 | 8500 | 8500 | 8500 | 8500 | 8500 | 8500 | 8500 | 8500 |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)                                 |   |    | <i>T</i> <sub>012</sub>   | <i>Nm</i>                                  | 0.50                          | 0.41 | 0.35 | 0.32 | 0.44 | 0.28 | 0.26 | 0.23 | 0.23 | 0.21 | 0.23 |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 4.4                           | 3.6  | 3.1  | 2.8  | 3.9  | 2.5  | 2.3  | 2.0  | 2.0  | 1.9  | 2.0  |
| Max. backlash                                                                                                                                    |   |    | <i>j</i> <sub>t</sub>     | <i>arcmin</i>                              | Standard ≤ 6 / Reduced ≤ 4    |      |      |      |      |      |      |      |      |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                                                 |   |    | <i>C</i> <sub>t21</sub>   | <i>Nm/arcmin</i>                           | 10                            |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |   |    |                           | <i>in.lb/arcmin</i>                        | 89                            |      |      |      |      |      |      |      |      |      |      |
| Max. axial force <sup>c)</sup>                                                                                                                   |   |    | <i>F</i> <sub>2AMax</sub> | <i>N</i>                                   | 3350                          |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>                      | 754                           |      |      |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>c)</sup>                                                                                                                 |   |    | <i>F</i> <sub>2QMax</sub> | <i>N</i>                                   | 4200                          |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>                      | 945                           |      |      |      |      |      |      |      |      |      |      |
| Max. tilting moment                                                                                                                              |   |    | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>                                  | 236                           |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 2089                          |      |      |      |      |      |      |      |      |      |      |
| Efficiency at full load                                                                                                                          |   |    | <i>η</i>                  | %                                          | 94                            |      |      |      |      |      |      |      |      |      |      |
| Service life <sup>f)</sup>                                                                                                                       |   |    | <i>L</i> <sub>h</sub>     | <i>h</i>                                   | > 20000                       |      |      |      |      |      |      |      |      |      |      |
| Weight<br>(incl. standard adapter plate)                                                                                                         |   |    | <i>m</i>                  | <i>kg</i>                                  | 3.6                           |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |   |    |                           | <i>lb<sub>m</sub></i>                      | 8.0                           |      |      |      |      |      |      |      |      |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                                       |   |    | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>                               | ≤ 55                          |      |      |      |      |      |      |      |      |      |      |
| Max. permitted housing temperature                                                                                                               |   |    |                           | °C                                         | +90                           |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |   |    |                           | <i>F</i>                                   | 194                           |      |      |      |      |      |      |      |      |      |      |
| Ambient temperature                                                                                                                              |   |    |                           | °C                                         | –15 to +40                    |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |   |    |                           | <i>F</i>                                   | 5 to 104                      |      |      |      |      |      |      |      |      |      |      |
| Lubrication                                                                                                                                      |   |    |                           |                                            | Lubricated for life           |      |      |      |      |      |      |      |      |      |      |
| Direction of rotation                                                                                                                            |   |    |                           |                                            | In- and output same direction |      |      |      |      |      |      |      |      |      |      |
| Protection class                                                                                                                                 |   |    |                           |                                            | IP 65                         |      |      |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                               |   |    |                           |                                            | BC2-00150AA022.000-X          |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |   |    |                           | <i>mm</i>                                  | X = 019.000 - 042.000         |      |      |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br><br>Optimized mass inertia version<br>available on request | B | 11 | <i>J</i> <sub>i</sub>     | <i>kgcm<sup>2</sup></i>                    | 0.16                          | 0.13 | 0.13 | 0.10 | 0.10 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
|                                                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 0.14                          | 0.12 | 0.12 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
|                                                                                                                                                  | C | 14 | <i>J</i> <sub>i</sub>     | <i>kgcm<sup>2</sup></i>                    | 0.23                          | 0.20 | 0.20 | 0.18 | 0.18 | 0.18 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
|                                                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 0.20                          | 0.18 | 0.18 | 0.16 | 0.16 | 0.16 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
|                                                                                                                                                  | E | 19 | <i>J</i> <sub>i</sub>     | <i>kgcm<sup>2</sup></i>                    | 0.55                          | 0.53 | 0.52 | 0.50 | 0.50 | 0.50 | 0.49 | 0.49 | 0.49 | 0.49 | 0.49 |
|                                                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 0.49                          | 0.47 | 0.46 | 0.44 | 0.44 | 0.44 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

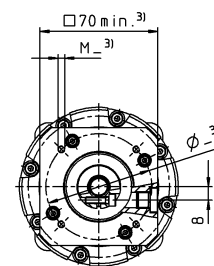
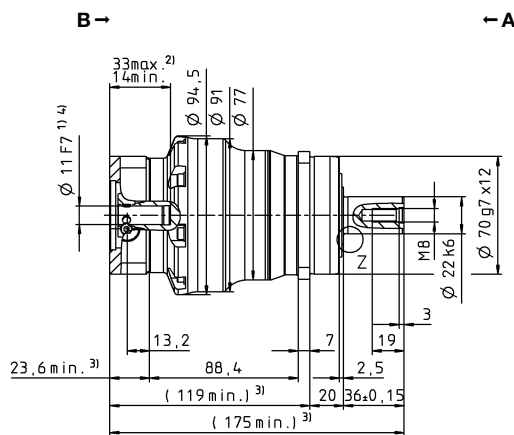
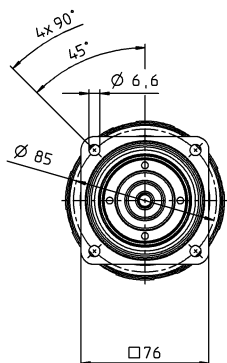
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

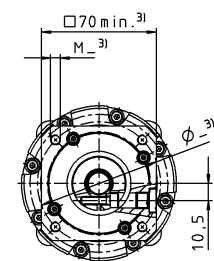
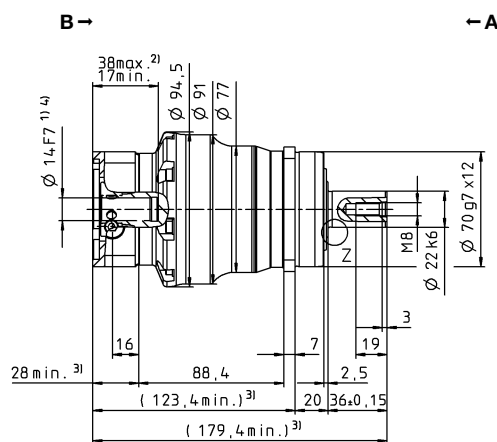
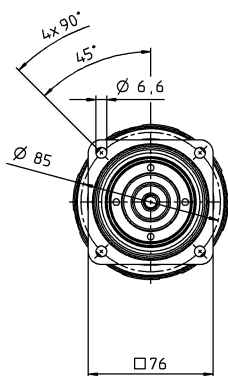
View B

# 2-stage

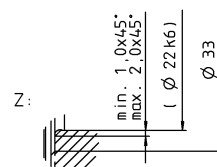
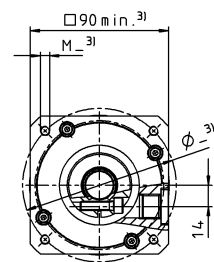
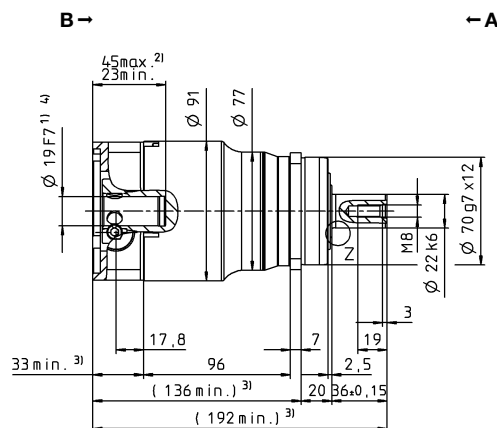
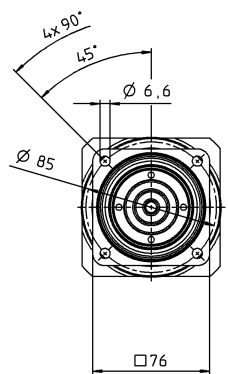
up to 11<sup>4)</sup> (B)  
clamping hub  
diameter



up to 14<sup>4)</sup> (C)<sup>5)</sup>  
clamping hub  
diameter

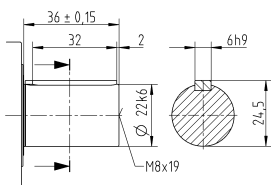


up to 19<sup>4)</sup> (E)  
clamping hub  
diameter

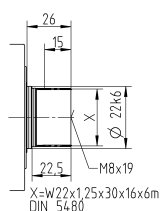


## Other output variants

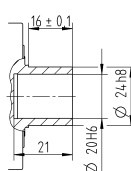
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 100 MF 1-stage

|                                                                                                                                                  |  |  |  | 1-stage                   |                       |                               |                                            |      |      |      |      |      |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|---------------------------|-----------------------|-------------------------------|--------------------------------------------|------|------|------|------|------|------|
| Ratio                                                                                                                                            |  |  |  | <i>i</i>                  |                       | 3                             | 4                                          | 5    | 7    | 8    | 10   |      |      |
| Max. torque <sup>a) b) e)</sup>                                                                                                                  |  |  |  | <i>T</i> <sub>2a</sub>    | <i>Nm</i>             | 376                           | 495                                        | 495  | 428  | 376  | 376  |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>in.lb</i>          | 3328                          | 4381                                       | 4381 | 3784 | 3328 | 3328 |      |      |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                         |  |  |  | <i>T</i> <sub>2B</sub>    | <i>Nm</i>             | 282                           | 378                                        | 378  | 378  | 282  | 282  |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>in.lb</i>          | 2496                          | 3346                                       | 3346 | 3346 | 2496 | 2496 |      |      |
| Nominal torque<br>(at <i>n</i> <sub>1N</sub> )                                                                                                   |  |  |  | <i>T</i> <sub>2N</sub>    | <i>Nm</i>             | 131                           | 171                                        | 169  | 166  | 166  | 174  |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>in.lb</i>          | 1157                          | 1510                                       | 1498 | 1473 | 1470 | 1538 |      |      |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                       |  |  |  | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>             | 500                           | 625                                        | 625  | 625  | 625  | 625  |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>in.lb</i>          | 4425                          | 5532                                       | 5532 | 5532 | 5532 | 5532 |      |      |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>e)</sup>                                         |  |  |  | <i>n</i> <sub>1N</sub>    | <i>rpm</i>            | 2500                          | 2500                                       | 2500 | 2800 | 2800 | 2800 |      |      |
| Max. input speed                                                                                                                                 |  |  |  | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>            | 5500                          | 5500                                       | 5500 | 5500 | 5500 | 5500 |      |      |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)                                 |  |  |  | <i>T</i> <sub>012</sub>   | <i>Nm</i>             | 3.1                           | 2.4                                        | 2.1  | 1.3  | 1.0  | 1.0  |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>in.lb</i>          | 28                            | 21                                         | 18   | 12   | 9.2  | 9.2  |      |      |
| Max. backlash                                                                                                                                    |  |  |  | <i>j</i> <sub>t</sub>     | <i>arcmin</i>         | Standard ≤ 3 / Reduced ≤ 1    |                                            |      |      |      |      |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                                                 |  |  |  | <i>C</i> <sub>t21</sub>   | <i>Nm/arcmin</i>      | 31                            |                                            |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>in.lb/arcmin</i>   | 274                           |                                            |      |      |      |      |      |      |
| Max. axial force <sup>c)</sup>                                                                                                                   |  |  |  | <i>F</i> <sub>2AMax</sub> | <i>N</i>              | 5650                          |                                            |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>lb<sub>f</sub></i> | 1271                          |                                            |      |      |      |      |      |      |
| Max. lateral force <sup>c)</sup>                                                                                                                 |  |  |  | <i>F</i> <sub>2QMax</sub> | <i>N</i>              | 6600                          |                                            |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>lb<sub>f</sub></i> | 1485                          |                                            |      |      |      |      |      |      |
| Max. tilting moment                                                                                                                              |  |  |  | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>             | 487                           |                                            |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>in.lb</i>          | 4310                          |                                            |      |      |      |      |      |      |
| Efficiency at full load                                                                                                                          |  |  |  | <i>η</i>                  | %                     | 97                            |                                            |      |      |      |      |      |      |
| Service life <sup>f)</sup>                                                                                                                       |  |  |  | <i>L</i> <sub>h</sub>     | <i>h</i>              | > 20000                       |                                            |      |      |      |      |      |      |
| Weight<br>(incl. standard adapter plate)                                                                                                         |  |  |  | <i>m</i>                  | <i>kg</i>             | 7.7                           |                                            |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>lb<sub>m</sub></i> | 17                            |                                            |      |      |      |      |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                                       |  |  |  | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>          | ≤ 58                          |                                            |      |      |      |      |      |      |
| Max. permitted housing temperature                                                                                                               |  |  |  |                           | °C                    | +90                           |                                            |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>F</i>              | 194                           |                                            |      |      |      |      |      |      |
| Ambient temperature                                                                                                                              |  |  |  |                           | °C                    | –15 to +40                    |                                            |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |  |                           | <i>F</i>              | 5 to 104                      |                                            |      |      |      |      |      |      |
| Lubrication                                                                                                                                      |  |  |  |                           |                       | Lubricated for life           |                                            |      |      |      |      |      |      |
| Direction of rotation                                                                                                                            |  |  |  |                           |                       | In- and output same direction |                                            |      |      |      |      |      |      |
| Protection class                                                                                                                                 |  |  |  |                           |                       | IP 65                         |                                            |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                               |  |  |  |                           |                       | BC2-00300AA032.000-X          |                                            |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |  |                           |                       |                               |                                            |      |      |      |      |      |      |
| Bore diameter of coupling on the application side                                                                                                |  |  |  |                           | <i>mm</i>             | X = 024.000 - 060.000         |                                            |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br><br>Optimized mass inertia version<br>available on request |  |  |  | E                         | 19                    | <i>J</i> <sub>1</sub>         | <i>kgcm<sup>2</sup></i>                    | 3.29 | 2.35 | 1.92 | 1.60 | 1.38 | 1.38 |
|                                                                                                                                                  |  |  |  |                           |                       |                               | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 2.91 | 2.08 | 1.70 | 1.42 | 1.22 | 1.22 |
|                                                                                                                                                  |  |  |  | G                         | 24                    | <i>J</i> <sub>1</sub>         | <i>kgcm<sup>2</sup></i>                    | 3.99 | 3.04 | 2.61 | 2.29 | 2.07 | 2.07 |
|                                                                                                                                                  |  |  |  |                           |                       |                               | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 3.53 | 2.69 | 2.31 | 2.03 | 1.83 | 1.83 |
|                                                                                                                                                  |  |  |  | H                         | 28                    | <i>J</i> <sub>1</sub>         | <i>kgcm<sup>2</sup></i>                    | 3.59 | 2.65 | 2.22 | 1.90 | 1.68 | 1.68 |
|                                                                                                                                                  |  |  |  |                           |                       |                               | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 3.18 | 2.35 | 1.96 | 1.68 | 1.49 | 1.49 |
|                                                                                                                                                  |  |  |  | K                         | 38                    | <i>J</i> <sub>1</sub>         | <i>kgcm<sup>2</sup></i>                    | 11.1 | 10.1 | 9.68 | 9.36 | 9.14 | 9.14 |
|                                                                                                                                                  |  |  |  |                           |                       |                               | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 9.82 | 8.94 | 8.57 | 8.28 | 8.09 | 8.09 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

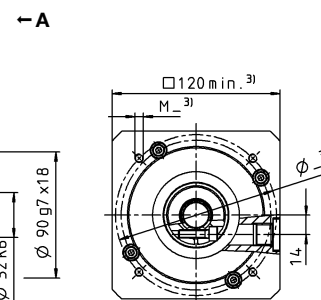
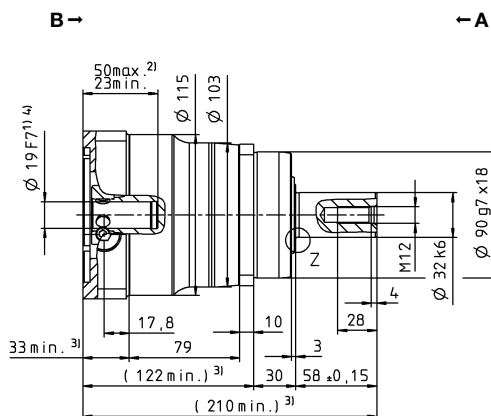
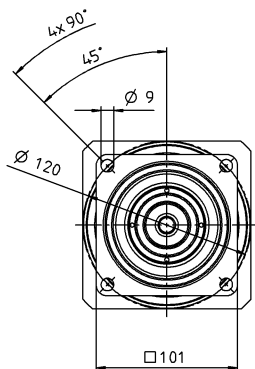
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

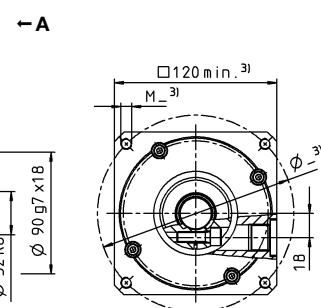
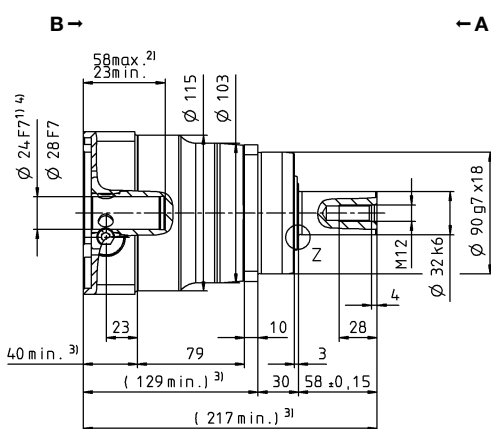
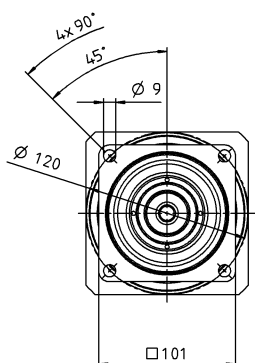
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

# 1-stage

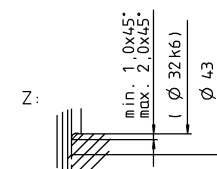
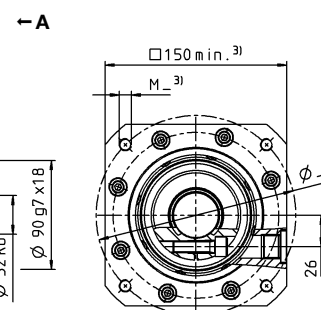
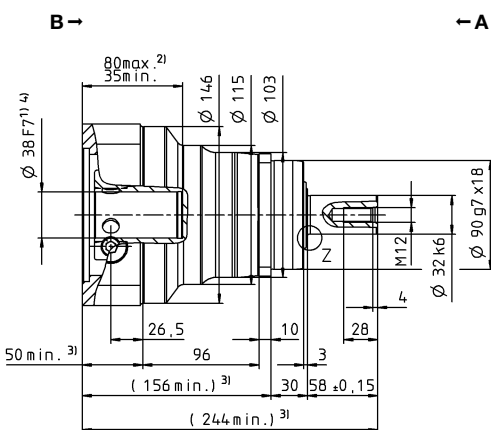
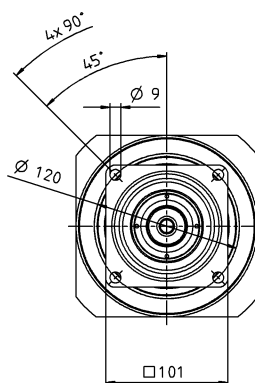
up to 19<sup>4)</sup> (E)  
clamping hub diameter



up to 24/28<sup>4)</sup>  
(G<sup>5)</sup>/H) clamping  
hub diameter

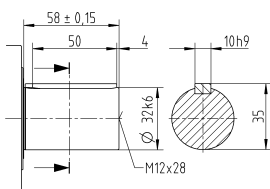


up to 38<sup>4)</sup> (K)  
clamping hub diameter

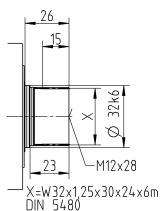


## Other output variants

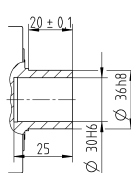
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 100 MF 2-stage

|                                                                                                                                                  |  |  |                           |                 | 2-stage                       |                                       |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------------------|-----------------|-------------------------------|---------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Ratio                                                                                                                                            |  |  | <i>i</i>                  |                 | 16                            | 20                                    | 25   | 28   | 32   | 35   | 40   | 50   | 64   | 70   | 100  |      |      |
| Max. torque <sup>a) b) e)</sup>                                                                                                                  |  |  | <i>T</i> <sub>2a</sub>    | Nm              | 347                           | 347                                   | 347  | 347  | 347  | 347  | 347  | 347  | 259  | 347  | 259  |      |      |
|                                                                                                                                                  |  |  |                           | in.lb           | 3067                          | 3067                                  | 3067 | 3067 | 3067 | 3067 | 3067 | 3067 | 2288 | 3067 | 2288 |      |      |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                         |  |  | <i>T</i> <sub>2B</sub>    | Nm              | 347                           | 347                                   | 347  | 347  | 347  | 347  | 347  | 347  | 259  | 347  | 259  |      |      |
|                                                                                                                                                  |  |  |                           | in.lb           | 3067                          | 3067                                  | 3067 | 3067 | 3067 | 3067 | 3067 | 3067 | 2288 | 3067 | 2288 |      |      |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                                                   |  |  | <i>T</i> <sub>2N</sub>    | Nm              | 243                           | 259                                   | 257  | 277  | 243  | 277  | 277  | 277  | 207  | 277  | 207  |      |      |
|                                                                                                                                                  |  |  |                           | in.lb           | 2146                          | 2295                                  | 2277 | 2453 | 2153 | 2453 | 2453 | 2453 | 1830 | 2453 | 1830 |      |      |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                       |  |  | <i>T</i> <sub>2Not</sub>  | Nm              | 625                           | 625                                   | 625  | 625  | 625  | 625  | 625  | 625  | 625  | 625  | 625  |      |      |
|                                                                                                                                                  |  |  |                           | in.lb           | 5532                          | 5532                                  | 5532 | 5532 | 5532 | 5532 | 5532 | 5532 | 5532 | 5532 | 5532 |      |      |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>                                         |  |  | <i>n</i> <sub>1N</sub>    | rpm             | 3100                          | 3100                                  | 3100 | 3100 | 3100 | 3100 | 3100 | 3500 | 3500 | 4200 | 4200 |      |      |
| Max. input speed                                                                                                                                 |  |  | <i>n</i> <sub>1Max</sub>  | rpm             | 6500                          | 6500                                  | 6500 | 6500 | 6500 | 6500 | 6500 | 6500 | 6500 | 6500 | 6500 |      |      |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)                                 |  |  | <i>T</i> <sub>012</sub>   | Nm              | 1.0                           | 0.93                                  | 0.85 | 0.77 | 0.86 | 0.54 | 0.54 | 0.46 | 0.46 | 0.39 | 0.37 |      |      |
|                                                                                                                                                  |  |  |                           | in.lb           | 9.2                           | 8.2                                   | 7.5  | 6.8  | 7.6  | 4.8  | 4.8  | 4.1  | 4.1  | 3.5  | 3.3  |      |      |
| Max. backlash                                                                                                                                    |  |  | <i>j</i> <sub>t</sub>     | arcmin          | Standard ≤ 5 / Reduced ≤ 3    |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                                                 |  |  | <i>C</i> <sub>t21</sub>   | Nm/arcmin       | 31                            |                                       |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |                           | in.lb/arcmin    | 274                           |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Max. axial force <sup>c)</sup>                                                                                                                   |  |  | <i>F</i> <sub>2AMax</sub> | N               | 5650                          |                                       |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |                           | lb <sub>f</sub> | 1271                          |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>c)</sup>                                                                                                                 |  |  | <i>F</i> <sub>2QMax</sub> | N               | 6600                          |                                       |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |                           | lb <sub>f</sub> | 1485                          |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Max. tilting moment                                                                                                                              |  |  | <i>M</i> <sub>2KMax</sub> | Nm              | 487                           |                                       |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |                           | in.lb           | 4310                          |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Efficiency at full load                                                                                                                          |  |  | <i>η</i>                  | %               | 94                            |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Service life <sup>f)</sup>                                                                                                                       |  |  | <i>L</i> <sub>h</sub>     | h               | > 20000                       |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Weight<br>(incl. standard adapter plate)                                                                                                         |  |  | <i>m</i>                  | kg              | 7.9                           |                                       |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |                           | lb <sub>m</sub> | 17.5                          |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                                       |  |  | <i>L</i> <sub>PA</sub>    | dB(A)           | ≤ 56                          |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Max. permitted housing temperature                                                                                                               |  |  |                           | °C              | +90                           |                                       |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |                           | F               | 194                           |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Ambient temperature                                                                                                                              |  |  |                           | °C              | –15 to +40                    |                                       |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |                           | F               | 5 to 104                      |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Lubrication                                                                                                                                      |  |  |                           |                 | Lubricated for life           |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Direction of rotation                                                                                                                            |  |  |                           |                 | In- and output same direction |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Protection class                                                                                                                                 |  |  |                           |                 | IP 65                         |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                               |  |  |                           |                 | BC2-00300AA032.000-X          |                                       |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                                                  |  |  |                           | mm              | X = 024.000 - 060.000         |                                       |      |      |      |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br><br>Optimized mass inertia version<br>available on request |  |  | C                         | 14              | <i>J</i> <sub>1</sub>         | kgcm <sup>2</sup>                     | 0.64 | 0.54 | 0.52 | 0.43 | 0.43 | 0.43 | 0.38 | 0.38 | 0.54 | 0.37 | 0.37 |
|                                                                                                                                                  |  |  |                           |                 |                               | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.57 | 0.48 | 0.46 | 0.38 | 0.38 | 0.38 | 0.34 | 0.34 | 0.48 | 0.33 | 0.33 |
|                                                                                                                                                  |  |  | E                         | 19              | <i>J</i> <sub>1</sub>         | kgcm <sup>2</sup>                     | 0.81 | 0.70 | 0.68 | 0.60 | 0.60 | 0.59 | 0.55 | 0.54 | 0.38 | 0.54 | 0.54 |
|                                                                                                                                                  |  |  |                           |                 |                               | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.72 | 0.62 | 0.60 | 0.53 | 0.53 | 0.52 | 0.49 | 0.48 | 0.34 | 0.48 | 0.48 |
|                                                                                                                                                  |  |  | G                         | 24              | <i>J</i> <sub>1</sub>         | kgcm <sup>2</sup>                     | 2.18 | 2.07 | 2.05 | 1.97 | 1.97 | 1.96 | 1.92 | 1.91 | 1.91 | 1.91 | 1.91 |
|                                                                                                                                                  |  |  |                           |                 |                               | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 1.93 | 1.83 | 1.81 | 1.74 | 1.74 | 1.73 | 1.70 | 1.69 | 1.69 | 1.69 | 1.69 |
|                                                                                                                                                  |  |  | H                         | 28              | <i>J</i> <sub>1</sub>         | kgcm <sup>2</sup>                     | 1.98 | 1.90 | 1.88 | 1.81 | 1.81 | 1.80 | 1.76 | 1.75 | 1.75 | 1.75 | 1.75 |
|                                                                                                                                                  |  |  |                           |                 |                               | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 1.75 | 1.68 | 1.66 | 1.60 | 1.60 | 1.59 | 1.56 | 1.55 | 1.55 | 1.55 | 1.55 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

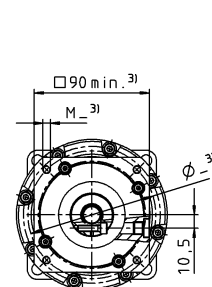
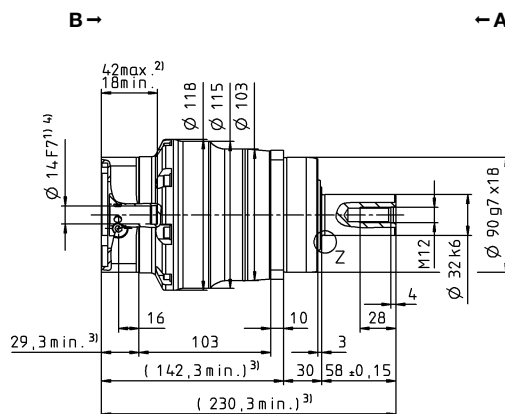
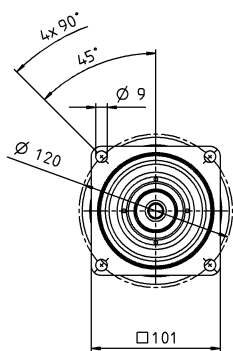
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

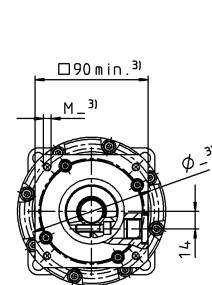
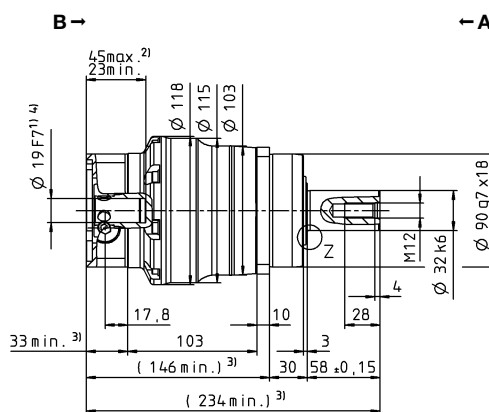
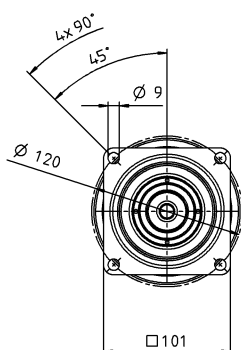
<sup>e)</sup> Smooth shaft

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

up to 14 <sup>4)</sup> (C)  
clamping hub  
diameter

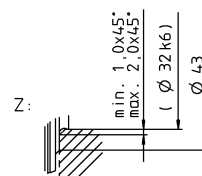
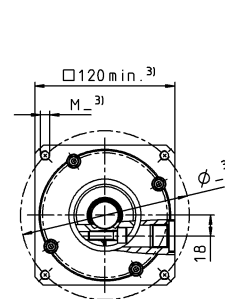
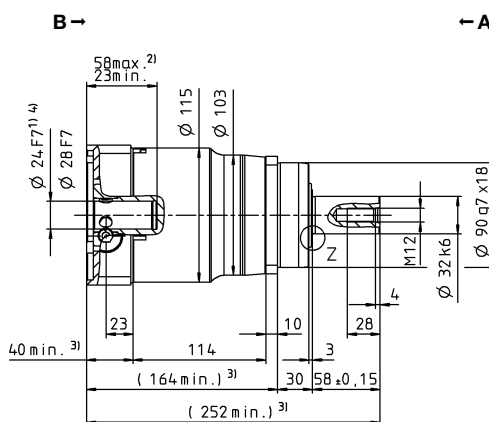
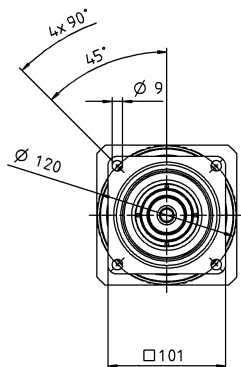


up to 19<sup>4)</sup> (E) <sup>5)</sup>  
clamping hub  
diameter



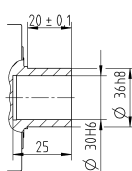
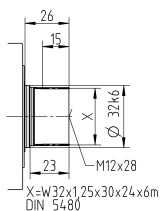
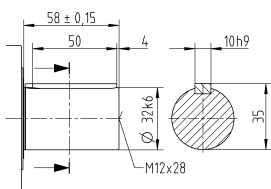
Motor shaft diameter [mm]

up to 24/28 <sup>4)</sup>  
(G/H) clamping  
hub diameter



## Other output variants

Shaft mounted

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 140 MF 1-stage

|                                                                                                                                                  |   |                           |                       | 1-stage                                    |       |       |       |       |       |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------|-----------------------|--------------------------------------------|-------|-------|-------|-------|-------|------|
| Ratio                                                                                                                                            |   | <i>i</i>                  |                       | 3                                          | 4     | 5     | 7     | 8     | 10    |      |
| Max. torque <sup>a) b) e)</sup>                                                                                                                  |   | <i>T</i> <sub>2a</sub>    | <i>Nm</i>             | 624                                        | 1056  | 1056  | 825   | 720   | 720   |      |
|                                                                                                                                                  |   |                           | <i>in.lb</i>          | 5523                                       | 9346  | 9346  | 7302  | 6373  | 6373  |      |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                         |   | <i>T</i> <sub>2B</sub>    | <i>Nm</i>             | 468                                        | 792   | 792   | 792   | 636   | 636   |      |
|                                                                                                                                                  |   |                           | <i>in.lb</i>          | 4142                                       | 7010  | 7010  | 7010  | 5629  | 5629  |      |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                                                   |   | <i>T</i> <sub>2N</sub>    | <i>Nm</i>             | 202                                        | 335   | 333   | 319   | 312   | 327   |      |
|                                                                                                                                                  |   |                           | <i>in.lb</i>          | 1786                                       | 2962  | 2944  | 2820  | 2763  | 2894  |      |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                       |   | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>             | 1250                                       | 1350  | 1350  | 1350  | 1250  | 1250  |      |
|                                                                                                                                                  |   |                           | <i>in.lb</i>          | 11064                                      | 11949 | 11949 | 11949 | 11064 | 11064 |      |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>                                         |   | <i>n</i> <sub>1N</sub>    | <i>rpm</i>            | 2100                                       | 2100  | 2100  | 2600  | 2600  | 2600  |      |
| Max. input speed                                                                                                                                 |   | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>            | 5000                                       | 5000  | 5000  | 5000  | 5000  | 5000  |      |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)                                 |   | <i>T</i> <sub>012</sub>   | <i>Nm</i>             | 6.7                                        | 5.4   | 4.4   | 3.0   | 2.5   | 2.2   |      |
|                                                                                                                                                  |   |                           | <i>in.lb</i>          | 60                                         | 47    | 39    | 27    | 23    | 19    |      |
| Max. backlash                                                                                                                                    |   | <i>j</i> <sub>t</sub>     | <i>arcmin</i>         | Standard ≤ 3 / Reduced ≤ 1                 |       |       |       |       |       |      |
| Torsional rigidity <sup>b)</sup>                                                                                                                 |   | <i>C</i> <sub>t21</sub>   | <i>Nm/arcmin</i>      | 53                                         |       |       |       |       |       |      |
|                                                                                                                                                  |   |                           | <i>in.lb/arcmin</i>   | 469                                        |       |       |       |       |       |      |
| Max. axial force <sup>c)</sup>                                                                                                                   |   | <i>F</i> <sub>2AMax</sub> | <i>N</i>              | 9870                                       |       |       |       |       |       |      |
|                                                                                                                                                  |   |                           | <i>lb<sub>f</sub></i> | 2221                                       |       |       |       |       |       |      |
| Max. lateral force <sup>c)</sup>                                                                                                                 |   | <i>F</i> <sub>2QMax</sub> | <i>N</i>              | 9900                                       |       |       |       |       |       |      |
|                                                                                                                                                  |   |                           | <i>lb<sub>f</sub></i> | 2228                                       |       |       |       |       |       |      |
| Max. tilting moment                                                                                                                              |   | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>             | 952                                        |       |       |       |       |       |      |
|                                                                                                                                                  |   |                           | <i>in.lb</i>          | 8426                                       |       |       |       |       |       |      |
| Efficiency at full load                                                                                                                          |   | <i>η</i>                  | %                     | 97                                         |       |       |       |       |       |      |
| Service life <sup>f)</sup>                                                                                                                       |   | <i>L</i> <sub>h</sub>     | <i>h</i>              | > 20000                                    |       |       |       |       |       |      |
| Weight<br>(incl. standard adapter plate)                                                                                                         |   | <i>m</i>                  | <i>kg</i>             | 17.2                                       |       |       |       |       |       |      |
|                                                                                                                                                  |   |                           | <i>lb<sub>m</sub></i> | 38                                         |       |       |       |       |       |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                                       |   | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>          | ≤ 59                                       |       |       |       |       |       |      |
| Max. permitted housing temperature                                                                                                               |   |                           | °C                    | +90                                        |       |       |       |       |       |      |
|                                                                                                                                                  |   |                           | <i>F</i>              | 194                                        |       |       |       |       |       |      |
| Ambient temperature                                                                                                                              |   |                           | °C                    | –15 to +40                                 |       |       |       |       |       |      |
|                                                                                                                                                  |   |                           | <i>F</i>              | 5 to 104                                   |       |       |       |       |       |      |
| Lubrication                                                                                                                                      |   |                           |                       | Lubricated for life                        |       |       |       |       |       |      |
| Direction of rotation                                                                                                                            |   |                           |                       | In- and output same direction              |       |       |       |       |       |      |
| Protection class                                                                                                                                 |   |                           |                       | IP 65                                      |       |       |       |       |       |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                               |   |                           |                       | BC2-00800AA040.000-X                       |       |       |       |       |       |      |
|                                                                                                                                                  |   |                           | <i>mm</i>             | X = 040.000 - 075.000                      |       |       |       |       |       |      |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br><br>Optimized mass inertia version<br>available on request | G | 24                        | <i>J</i> <sub>1</sub> | <i>kgcm<sup>2</sup></i>                    | 10.7  | 7.82  | 6.79  | 5.84  | 5.28  | 5.28 |
|                                                                                                                                                  |   |                           |                       | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 9.47  | 6.92  | 6.01  | 5.17  | 4.67  | 4.67 |
|                                                                                                                                                  | I | 32                        | <i>J</i> <sub>1</sub> | <i>kgcm<sup>2</sup></i>                    | 13.8  | 11.0  | 9.95  | 9.00  | 8.44  | 8.44 |
|                                                                                                                                                  |   |                           |                       | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 12.2  | 9.74  | 8.81  | 7.97  | 7.47  | 7.47 |
|                                                                                                                                                  | K | 38                        | <i>J</i> <sub>1</sub> | <i>kgcm<sup>2</sup></i>                    | 14.9  | 12.1  | 11.0  | 10.1  | 9.51  | 9.51 |
|                                                                                                                                                  |   |                           |                       | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 13.2  | 10.7  | 9.74  | 8.94  | 8.42  | 8.42 |
|                                                                                                                                                  | M | 48                        | <i>J</i> <sub>1</sub> | <i>kgcm<sup>2</sup></i>                    | 29.5  | 26.7  | 25.6  | 24.7  | 24.2  | 24.2 |
|                                                                                                                                                  |   |                           |                       | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 26.1  | 23.6  | 22.7  | 21.9  | 21.4  | 21.4 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

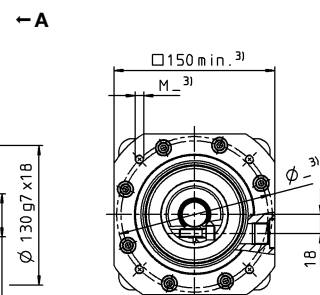
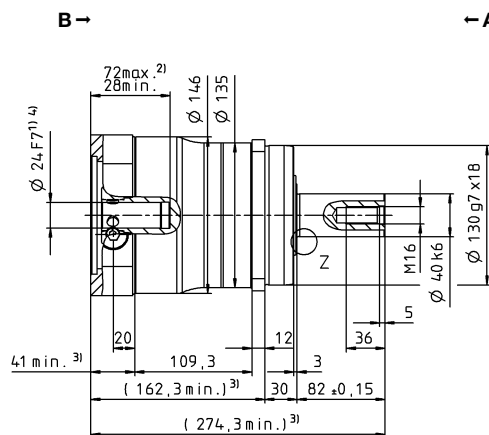
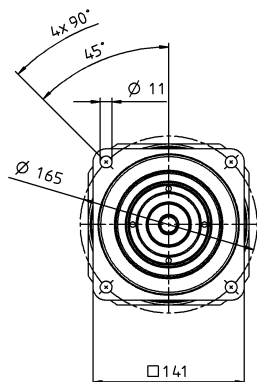
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

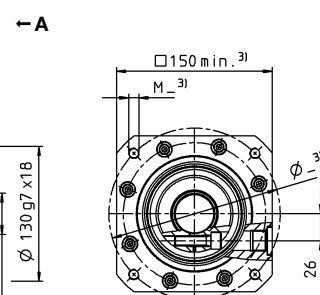
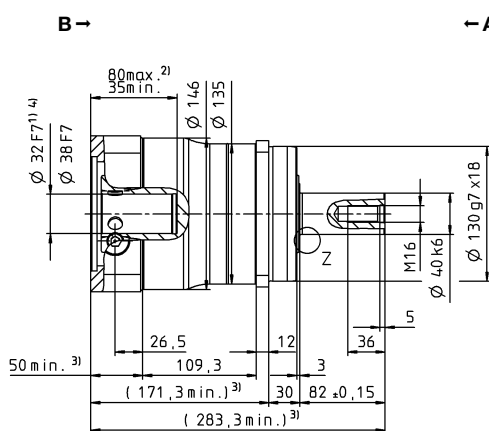
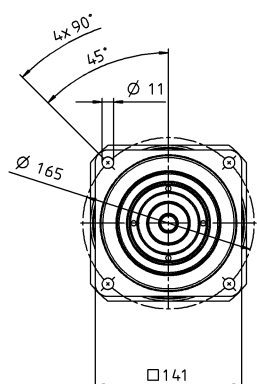
View B

# 1-stage

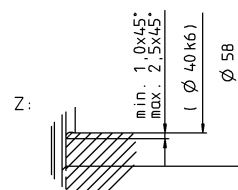
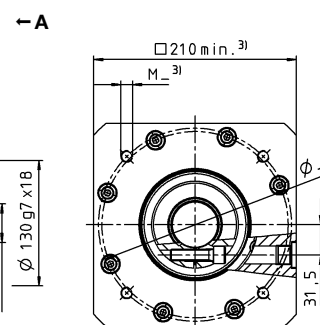
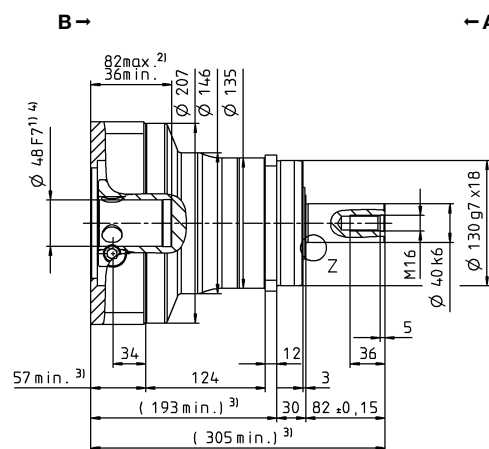
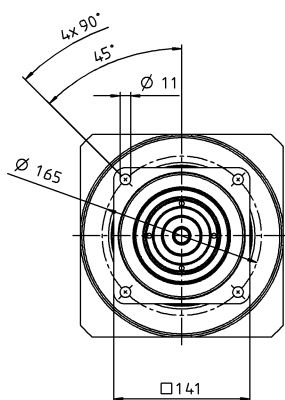
up to 24<sup>4)</sup> (G)  
clamping hub diameter



up to 32/38<sup>4)</sup>  
(I/K<sup>5)</sup>) clamping  
hub diameter

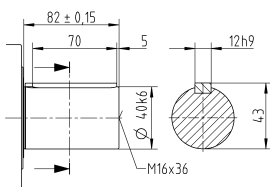


up to 48<sup>4)</sup> (M)  
clamping hub diameter

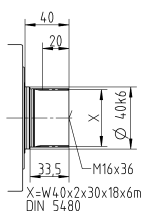


## Other output variants

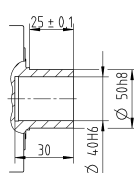
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 140 MF 2-stage

|                                                                                                                                                  |   |    |                | 2-stage                               |                 |                               |       |       |       |       |       |       |       |       |       |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----------------|---------------------------------------|-----------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                                                                                                                                            |   |    |                | i                                     |                 | 16                            | 20    | 25    | 28    | 32    | 35    | 40    | 50    | 64    | 70    | 100   |
| Max. torque <sup>a) b) e)</sup>                                                                                                                  |   |    |                | T <sub>2a</sub>                       | Nm              | 726                           | 726   | 670   | 726   | 726   | 670   | 726   | 670   | 583   | 726   | 583   |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 6426                          | 6426  | 5934  | 6426  | 6426  | 5934  | 6426  | 5934  | 5160  | 6426  | 5160  |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                         |   |    |                | T <sub>2B</sub>                       | Nm              | 726                           | 726   | 670   | 726   | 726   | 670   | 726   | 670   | 583   | 726   | 583   |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 6426                          | 6426  | 5934  | 6426  | 6426  | 5934  | 6426  | 5930  | 5164  | 6426  | 5160  |
| Nominal torque<br>(at n <sub>IN</sub> )                                                                                                          |   |    |                | T <sub>2N</sub>                       | Nm              | 461                           | 493   | 489   | 545   | 464   | 536   | 581   | 536   | 466   | 581   | 466   |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 4078                          | 4361  | 4332  | 4824  | 4104  | 4747  | 5141  | 4747  | 4128  | 5141  | 4128  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                       |   |    |                | T <sub>2Not</sub>                     | Nm              | 1350                          | 1350  | 1350  | 1350  | 1350  | 1350  | 1350  | 1350  | 1350  | 1350  | 1250  |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 11949                         | 11949 | 11949 | 11949 | 11949 | 11949 | 11949 | 11949 | 11949 | 11949 | 11064 |
| Permitted average input speed<br>(at T <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>                                                |   |    |                | n <sub>1N</sub>                       | rpm             | 2900                          | 2900  | 2900  | 2900  | 2900  | 2900  | 2900  | 3200  | 3200  | 3200  | 3900  |
| Max. input speed                                                                                                                                 |   |    |                | n <sub>1Max</sub>                     | rpm             | 6000                          | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  |
| Mean no load running torque <sup>b)</sup><br>(at n <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)                                        |   |    |                | T <sub>012</sub>                      | Nm              | 2.4                           | 2.1   | 2.0   | 1.8   | 1.6   | 1.2   | 1.2   | 1.1   | 1.1   | 0.88  | 0.80  |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 21                            | 19    | 17    | 16    | 14    | 11    | 11    | 9.4   | 9.4   | 7.8   | 7.1   |
| Max. backlash                                                                                                                                    |   |    |                | j <sub>t</sub>                        | arcmin          | Standard ≤ 5 / Reduced ≤ 3    |       |       |       |       |       |       |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                                                 |   |    |                | C <sub>121</sub>                      | Nm/arcmin       | 53                            |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                |                                       | in.lb/arcmin    | 469                           |       |       |       |       |       |       |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                                                   |   |    |                | F <sub>2AMax</sub>                    | N               | 9870                          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                |                                       | lb <sub>f</sub> | 2221                          |       |       |       |       |       |       |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                                                 |   |    |                | F <sub>2QMax</sub>                    | N               | 9900                          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                |                                       | lb <sub>f</sub> | 2228                          |       |       |       |       |       |       |       |       |       |       |
| Max. tilting moment                                                                                                                              |   |    |                | M <sub>2KMax</sub>                    | Nm              | 952                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                |                                       | in.lb           | 8426                          |       |       |       |       |       |       |       |       |       |       |
| Efficiency at full load                                                                                                                          |   |    |                | η                                     | %               | 94                            |       |       |       |       |       |       |       |       |       |       |
| Service life <sup>f)</sup>                                                                                                                       |   |    |                | L <sub>n</sub>                        | h               | > 20000                       |       |       |       |       |       |       |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                                                         |   |    |                | m                                     | kg              | 17                            |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                |                                       | lb <sub>m</sub> | 37.6                          |       |       |       |       |       |       |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex <sup>®</sup> )                          |   |    |                | L <sub>PA</sub>                       | dB(A)           | ≤ 59                          |       |       |       |       |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                                                               |   |    |                |                                       | °C              | +90                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                |                                       | F               | 194                           |       |       |       |       |       |       |       |       |       |       |
| Ambient temperature                                                                                                                              |   |    |                |                                       | °C              | –15 to +40                    |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                |                                       | F               | 5 to 104                      |       |       |       |       |       |       |       |       |       |       |
| Lubrication                                                                                                                                      |   |    |                |                                       |                 | Lubricated for life           |       |       |       |       |       |       |       |       |       |       |
| Direction of rotation                                                                                                                            |   |    |                |                                       |                 | In- and output same direction |       |       |       |       |       |       |       |       |       |       |
| Protection class                                                                                                                                 |   |    |                |                                       |                 | IP 65                         |       |       |       |       |       |       |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex <sup>®</sup> )                                                  |   |    |                |                                       |                 | BC2-00800AA040.000-X          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                                  |   |    |                |                                       | mm              | X = 040.000 - 075.000         |       |       |       |       |       |       |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br><br>Optimized mass inertia version<br>available on request | E | 19 | J <sub>i</sub> | kgcm <sup>2</sup>                     | 2.50            | 2.01                          | 1.97  | 1.65  | 1.65  | 1.63  | 1.40  | 1.39  | 1.39  | 1.38  | 1.38  |       |
|                                                                                                                                                  |   |    |                | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 2.21            | 1.78                          | 1.74  | 1.46  | 1.46  | 1.44  | 1.24  | 1.23  | 1.23  | 1.22  | 1.22  |       |
|                                                                                                                                                  | G | 24 | J <sub>i</sub> | kgcm <sup>2</sup>                     | 3.19            | 2.71                          | 2.67  | 2.34  | 2.34  | 2.32  | 2.10  | 2.08  | 2.08  | 2.08  | 2.07  |       |
|                                                                                                                                                  |   |    |                | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 2.82            | 2.40                          | 2.36  | 2.07  | 2.07  | 2.05  | 1.86  | 1.84  | 1.84  | 1.84  | 1.83  |       |
|                                                                                                                                                  | K | 38 | J <sub>i</sub> | kgcm <sup>2</sup>                     | 10.3            | 9.77                          | 9.73  | 9.41  | 9.41  | 9.39  | 9.16  | 9.15  | 9.15  | 9.14  | 9.14  |       |
|                                                                                                                                                  |   |    |                | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 9.07            | 8.65                          | 8.61  | 8.33  | 8.33  | 8.31  | 8.11  | 8.10  | 8.10  | 8.09  | 8.09  |       |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

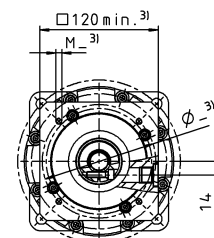
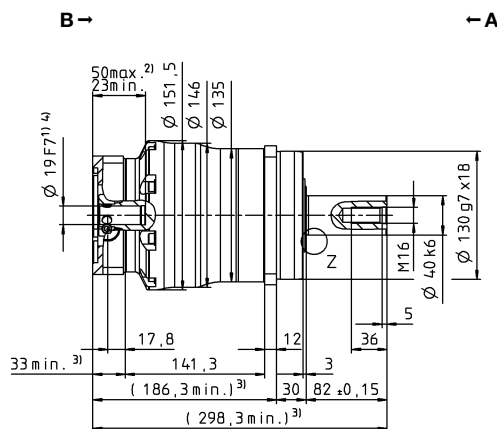
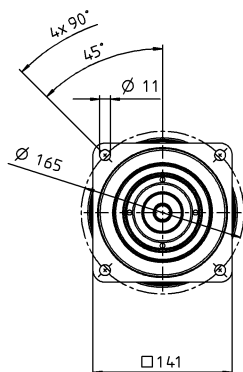
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

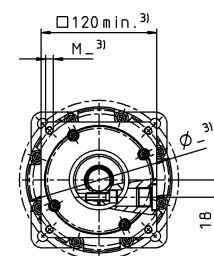
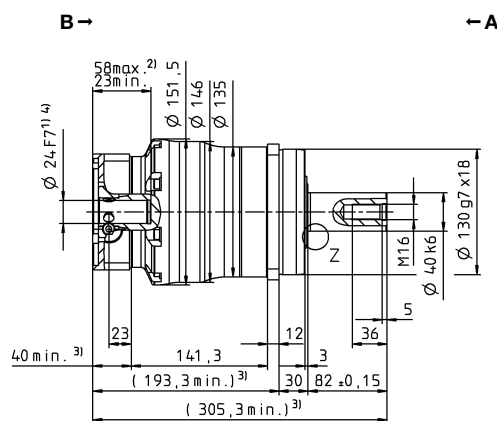
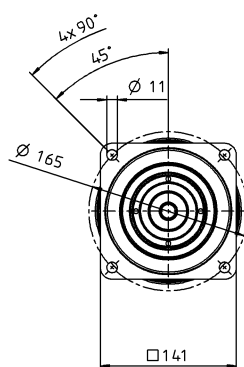
View B

# 2-stage

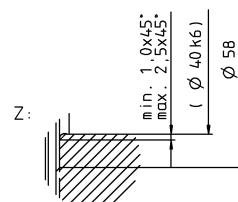
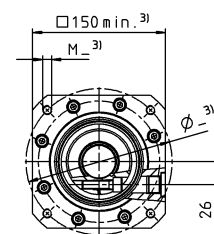
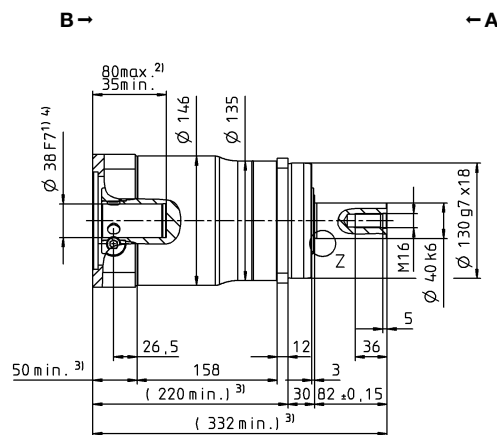
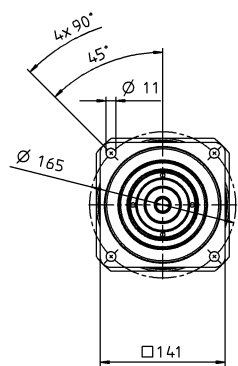
up to 19<sup>4)</sup> (E)  
clamping hub  
diameter



up to 24<sup>4)</sup> (G)<sup>5)</sup>  
clamping hub  
diameter

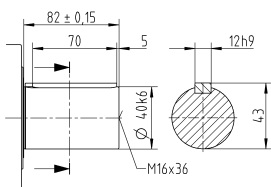


up to 38<sup>4)</sup> (K)  
clamping hub  
diameter

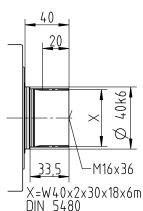


## Other output variants

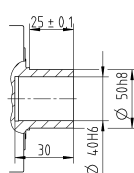
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 180 MF 1-stage

|                                                                                                                                                  |  |   |                           | 1-stage               |                                             |       |       |       |       |       |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--|---|---------------------------|-----------------------|---------------------------------------------|-------|-------|-------|-------|-------|------|
| Ratio                                                                                                                                            |  |   | <i>i</i>                  |                       | 3                                           | 4     | 5     | 7     | 8     | 10    |      |
| Max. torque <sup>a) b) e)</sup>                                                                                                                  |  |   | <i>T</i> <sub>2a</sub>    | <i>Nm</i>             | 1552                                        | 1936  | 1936  | 1936  | 1552  | 1552  |      |
|                                                                                                                                                  |  |   |                           | <i>in.lb</i>          | 13736                                       | 17135 | 17135 | 17135 | 13736 | 13736 |      |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                         |  |   | <i>T</i> <sub>2B</sub>    | <i>Nm</i>             | 1164                                        | 1452  | 1452  | 1452  | 1164  | 1164  |      |
|                                                                                                                                                  |  |   |                           | <i>in.lb</i>          | 10302                                       | 12851 | 12851 | 12851 | 10302 | 10302 |      |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                                                   |  |   | <i>T</i> <sub>2N</sub>    | <i>Nm</i>             | 513                                         | 927   | 919   | 825   | 825   | 864   |      |
|                                                                                                                                                  |  |   |                           | <i>in.lb</i>          | 4544                                        | 8203  | 8134  | 7305  | 7305  | 7644  |      |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                       |  |   | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>             | 2750                                        | 2750  | 2750  | 2750  | 2750  | 2750  |      |
|                                                                                                                                                  |  |   |                           | <i>in.lb</i>          | 24340                                       | 24340 | 24340 | 24340 | 24340 | 24340 |      |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>                                         |  |   | <i>n</i> <sub>1N</sub>    | <i>rpm</i>            | 1500                                        | 1500  | 1500  | 2300  | 2300  | 2300  |      |
| Max. input speed                                                                                                                                 |  |   | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>            | 4500                                        | 4500  | 4500  | 4500  | 4500  | 4500  |      |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature)                                 |  |   | <i>T</i> <sub>012</sub>   | <i>Nm</i>             | 15                                          | 12    | 8.0   | 5.6   | 5.6   | 3.8   |      |
|                                                                                                                                                  |  |   |                           | <i>in.lb</i>          | 135                                         | 103   | 71    | 50    | 50    | 34    |      |
| Max. backlash                                                                                                                                    |  |   | <i>j</i> <sub>t</sub>     | <i>arcmin</i>         | Standard ≤ 3 / Reduced ≤ 1                  |       |       |       |       |       |      |
| Torsional rigidity <sup>b)</sup>                                                                                                                 |  |   | <i>C</i> <sub>t21</sub>   | <i>Nm/arcmin</i>      | 175                                         |       |       |       |       |       |      |
|                                                                                                                                                  |  |   |                           | <i>in.lb/arcmin</i>   | 1549                                        |       |       |       |       |       |      |
| Max. axial force <sup>c)</sup>                                                                                                                   |  |   | <i>F</i> <sub>2AMax</sub> | <i>N</i>              | 15570                                       |       |       |       |       |       |      |
|                                                                                                                                                  |  |   |                           | <i>lb<sub>f</sub></i> | 3503                                        |       |       |       |       |       |      |
| Max. lateral force <sup>c)</sup>                                                                                                                 |  |   | <i>F</i> <sub>2QMax</sub> | <i>N</i>              | 15400                                       |       |       |       |       |       |      |
|                                                                                                                                                  |  |   |                           | <i>lb<sub>f</sub></i> | 3465                                        |       |       |       |       |       |      |
| Max. tilting moment                                                                                                                              |  |   | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>             | 1600                                        |       |       |       |       |       |      |
|                                                                                                                                                  |  |   |                           | <i>in.lb</i>          | 14161                                       |       |       |       |       |       |      |
| Efficiency at full load                                                                                                                          |  |   | <i>η</i>                  | %                     | 97                                          |       |       |       |       |       |      |
| Service life <sup>f)</sup>                                                                                                                       |  |   | <i>L</i> <sub>h</sub>     | <i>h</i>              | > 20000                                     |       |       |       |       |       |      |
| Weight<br>(incl. standard adapter plate)                                                                                                         |  |   | <i>m</i>                  | <i>kg</i>             | 34                                          |       |       |       |       |       |      |
|                                                                                                                                                  |  |   |                           | <i>lb<sub>m</sub></i> | 75.1                                        |       |       |       |       |       |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                                       |  |   | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>          | ≤ 62                                        |       |       |       |       |       |      |
| Max. permitted housing temperature                                                                                                               |  |   |                           | °C                    | +90                                         |       |       |       |       |       |      |
|                                                                                                                                                  |  |   |                           | <i>F</i>              | 194                                         |       |       |       |       |       |      |
| Ambient temperature                                                                                                                              |  |   |                           | °C                    | –15 to +40                                  |       |       |       |       |       |      |
|                                                                                                                                                  |  |   |                           | <i>F</i>              | 5 to 104                                    |       |       |       |       |       |      |
| Lubrication                                                                                                                                      |  |   |                           |                       | Lubricated for life                         |       |       |       |       |       |      |
| Direction of rotation                                                                                                                            |  |   |                           |                       | In- and output same direction               |       |       |       |       |       |      |
| Protection class                                                                                                                                 |  |   |                           |                       | IP 65                                       |       |       |       |       |       |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                               |  |   |                           |                       | BC2-01500AA055.000-X                        |       |       |       |       |       |      |
|                                                                                                                                                  |  |   |                           | <i>mm</i>             | X = 050.000 - 080.000                       |       |       |       |       |       |      |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br><br>Optimized mass inertia version<br>available on request |  | K | 38                        | <i>J</i> <sub>i</sub> | <i>kgcm</i> <sup>2</sup>                    | 50.8  | 33.9  | 27.9  | 22.2  | 22.2  | 19.2 |
|                                                                                                                                                  |  |   |                           |                       | <i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup> | 45.0  | 30.0  | 24.7  | 19.7  | 19.7  | 17.0 |
|                                                                                                                                                  |  | M | 48                        | <i>J</i> <sub>i</sub> | <i>kgcm</i> <sup>2</sup>                    | 58.2  | 41.2  | 35.3  | 29.6  | 29.6  | 26.5 |
|                                                                                                                                                  |  |   |                           |                       | <i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup> | 51.5  | 36.5  | 31.2  | 26.2  | 26.2  | 23.5 |
|                                                                                                                                                  |  | N | 55                        | <i>J</i> <sub>i</sub> | <i>kgcm</i> <sup>2</sup>                    | 65.7  | 49.7  | 44.0  | 38.5  | 38.5  | 35.4 |
|                                                                                                                                                  |  |   |                           |                       | <i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup> | 58.1  | 44.0  | 38.9  | 34.1  | 34.1  | 31.3 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

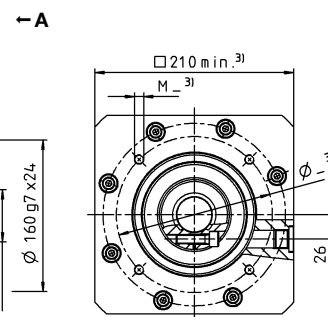
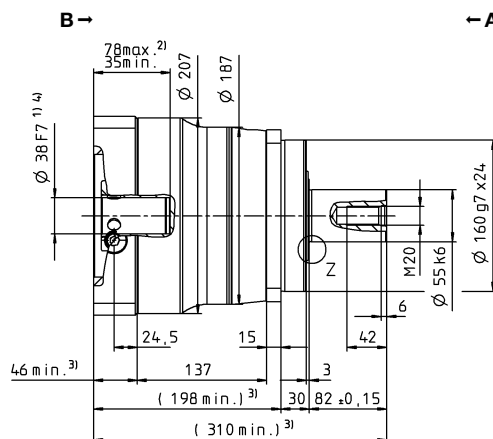
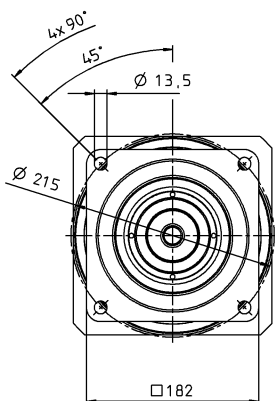
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

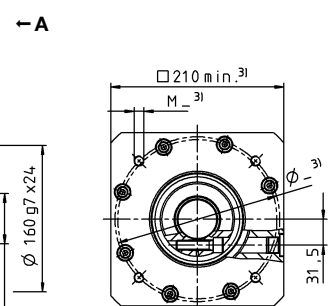
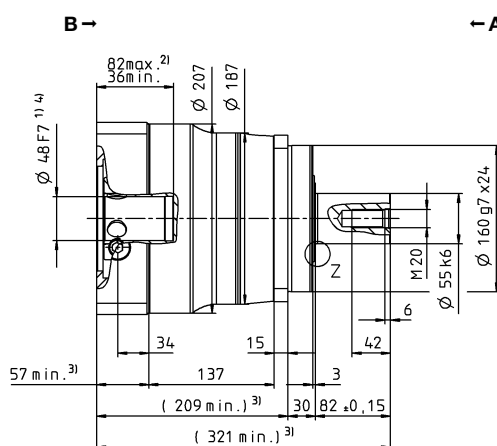
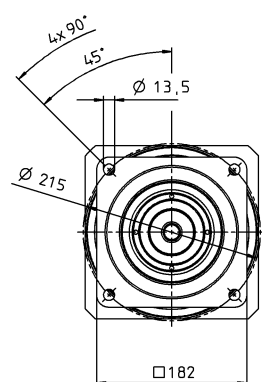
View B

# 1-stage

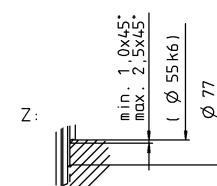
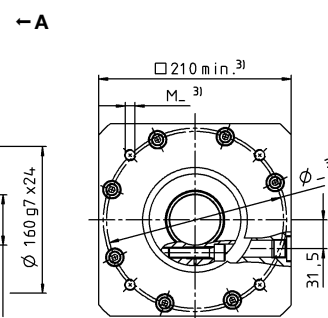
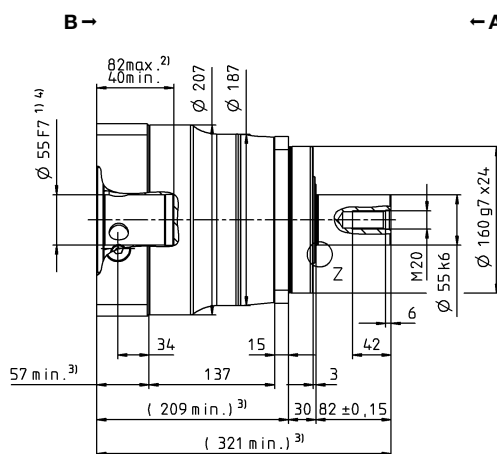
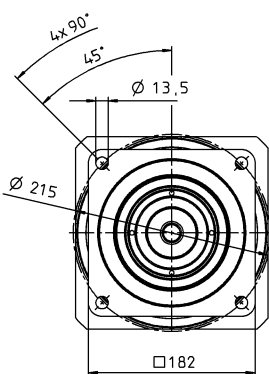
up to 38<sup>4)</sup> (K)  
clamping hub  
diameter



up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub  
diameter

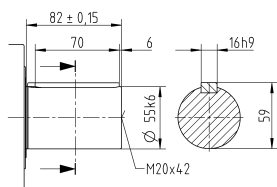


up to 55<sup>4)</sup> (N)<sup>5)</sup>  
clamping hub  
diameter

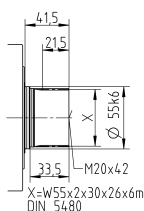


## Other output variants

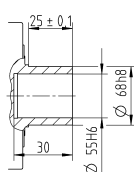
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 180 MF 2-stage

|                                                                                                                                                  |  |  |  | 2-stage                                           |                       |                               |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|---------------------------------------------------|-----------------------|-------------------------------|--------------------------------------------|-----------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| Ratio                                                                                                                                            |  |  |  | <i>i</i>                                          |                       | 16                            | 20                                         | 25        | 28                    | 32    | 35    | 40    | 50    | 64    | 70    | 100   |       |      |      |
| Max. torque <sup>a) b) e)</sup>                                                                                                                  |  |  |  | <i>T</i> <sub>2a</sub>                            | <i>Nm</i>             | 1485                          | 1485                                       | 1857      | 1485                  | 1485  | 1857  | 1485  | 1857  | 1238  | 1356  | 1238  |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>in.lb</i>          | 13146                         | 13146                                      | 16432     | 13146                 | 13146 | 16432 | 13146 | 16432 | 10955 | 12000 | 10955 |       |      |      |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                         |  |  |  | <i>T</i> <sub>2B</sub>                            | <i>Nm</i>             | 1452                          | 1452                                       | 1452      | 1452                  | 1452  | 1452  | 1452  | 1452  | 1164  | 1356  | 1164  |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>in.lb</i>          | 12851                         | 12851                                      | 12851     | 12851                 | 12851 | 12851 | 12851 | 12851 | 10302 | 12002 | 10302 |       |      |      |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                                                   |  |  |  | <i>T</i> <sub>2N</sub>                            | <i>Nm</i>             | 1162                          | 1162                                       | 1162      | 1162                  | 1162  | 1162  | 1162  | 1162  | 931   | 1085  | 931   |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>in.lb</i>          | 10281                         | 10281                                      | 10281     | 10281                 | 10281 | 10281 | 10281 | 10281 | 10281 | 8242  | 9600  | 8242  |      |      |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                                       |  |  |  | <i>T</i> <sub>2Not</sub>                          | <i>Nm</i>             | 2750                          | 2750                                       | 2750      | 2750                  | 2750  | 2750  | 2750  | 2750  | 2750  | 2750  | 2750  |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>in.lb</i>          | 24340                         | 24340                                      | 24340     | 24340                 | 24340 | 24340 | 24340 | 24340 | 24340 | 24340 | 24340 | 24340 |      |      |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>e)</sup>                                         |  |  |  | <i>n</i> <sub>1N</sub>                            | <i>rpm</i>            | 2700                          | 2700                                       | 2700      | 2700                  | 2700  | 2700  | 2700  | 2900  | 2900  | 3200  | 3400  |       |      |      |
| Max. input speed                                                                                                                                 |  |  |  | <i>n</i> <sub>1Max</sub>                          | <i>rpm</i>            | 5000                          | 5000                                       | 5000      | 5000                  | 5000  | 5000  | 5000  | 5000  | 5000  | 5000  | 5000  |       |      |      |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature)                                 |  |  |  | <i>T</i> <sub>012</sub>                           | <i>Nm</i>             | 4.7                           | 3.9                                        | 3.6       | 3.3                   | 3.3   | 2.8   | 2.2   | 1.9   | 2.2   | 1.8   | 1.8   |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>in.lb</i>          | 42                            | 35                                         | 32        | 29                    | 29    | 25    | 20    | 17    | 20    | 16    | 16    |       |      |      |
| Max. backlash                                                                                                                                    |  |  |  | <i>j</i> <sub>t</sub>                             | <i>arcmin</i>         | Standard ≤ 5 / Reduced ≤ 3    |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                                                 |  |  |  | <i>C</i> <sub>t21</sub>                           | <i>Nm/arcmin</i>      | 175                           |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>in.lb/arcmin</i>   | 1549                          |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Max. axial force <sup>c)</sup>                                                                                                                   |  |  |  | <i>F</i> <sub>2AMax</sub>                         | <i>N</i>              | 15570                         |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>lb<sub>f</sub></i> | 3503                          |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Max. lateral force <sup>c)</sup>                                                                                                                 |  |  |  | <i>F</i> <sub>2QMax</sub>                         | <i>N</i>              | 15400                         |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>lb<sub>f</sub></i> | 3465                          |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Max. tilting moment                                                                                                                              |  |  |  | <i>M</i> <sub>2KMax</sub>                         | <i>Nm</i>             | 1600                          |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>in.lb</i>          | 14161                         |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Efficiency at full load                                                                                                                          |  |  |  | <i>η</i>                                          | %                     | 94                            |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Service life <sup>f)</sup>                                                                                                                       |  |  |  | <i>L</i> <sub>h</sub>                             | <i>h</i>              | > 20000                       |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Weight<br>(incl. standard adapter plate)                                                                                                         |  |  |  | <i>m</i>                                          | <i>kg</i>             | 36.4                          |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>lb<sub>m</sub></i> | 80.4                          |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex <sup>®</sup> )                          |  |  |  | <i>L</i> <sub>PA</sub>                            | <i>dB(A)</i>          | ≤ 58                          |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Max. permitted housing temperature                                                                                                               |  |  |  |                                                   | °C                    | +90                           |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>F</i>              | 194                           |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Ambient temperature                                                                                                                              |  |  |  |                                                   | °C                    | −15 to +40                    |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
|                                                                                                                                                  |  |  |  |                                                   | <i>F</i>              | 5 to 104                      |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Lubrication                                                                                                                                      |  |  |  |                                                   |                       | Lubricated for life           |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Direction of rotation                                                                                                                            |  |  |  |                                                   |                       | In- and output same direction |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Protection class                                                                                                                                 |  |  |  |                                                   |                       | IP 65                         |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex <sup>®</sup> )                                                  |  |  |  |                                                   |                       | BC2-01500AA055.000-X          |                                            |           |                       |       |       |       |       |       |       |       |       |      |      |
|                                                                                                                                                  |  |  |  | Bore diameter of coupling on the application side |                       |                               |                                            | <i>mm</i> | X = 050.000 - 080.000 |       |       |       |       |       |       |       |       |      |      |
| Mass moment of inertia<br>(relates to the drive)<br><br>Clamping hub diameter [mm]<br><br>Optimized mass inertia version<br>available on request |  |  |  | G                                                 | 24                    | <i>J</i> <sub>t</sub>         | <i>kgcm<sup>2</sup></i>                    | 9.27      | 7.72                  | 7.48  | 6.32  | 6.32  | 6.20  | 5.51  | 5.45  | 5.45  | 5.39  | 5.36 |      |
|                                                                                                                                                  |  |  |  |                                                   |                       |                               | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 8.20      | 6.83                  | 6.62  | 5.59  | 5.59  | 5.49  | 4.88  | 4.82  | 4.82  | 4.77  | 4.74 |      |
|                                                                                                                                                  |  |  |  | I                                                 | 32                    | <i>J</i> <sub>t</sub>         | <i>kgcm<sup>2</sup></i>                    | 12.4      | 10.9                  | 10.6  | 9.48  | 9.48  | 9.36  | 8.67  | 9.68  | 8.55  | 8.55  | 8.52 |      |
|                                                                                                                                                  |  |  |  |                                                   |                       |                               | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 11.0      | 9.63                  | 9.42  | 8.39  | 8.39  | 8.28  | 7.67  | 8.57  | 7.57  | 7.54  |      |      |
|                                                                                                                                                  |  |  |  | K                                                 | 38                    | <i>J</i> <sub>t</sub>         | <i>kgcm<sup>2</sup></i>                    | 13.5      | 12.0                  | 11.7  | 10.6  | 10.6  | 10.4  | 9.74  | 9.68  | 9.68  | 9.63  | 9.60 |      |
|                                                                                                                                                  |  |  |  |                                                   |                       |                               | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 12.0      | 10.6                  | 10.4  | 9.34  | 9.34  | 9.23  | 8.62  | 8.57  | 8.57  | 8.52  | 8.50 |      |
|                                                                                                                                                  |  |  |  | M                                                 | 48                    | <i>J</i> <sub>t</sub>         | <i>kgcm<sup>2</sup></i>                    | 28.1      | 26.6                  | 26.3  | 25.2  | 25.2  | 25.1  | 24.4  | 24.3  | 24.3  | 24.3  | 24.3 | 24.3 |
|                                                                                                                                                  |  |  |  |                                                   |                       |                               | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 24.9      | 23.5                  | 23.3  | 22.3  | 22.3  | 22.2  | 21.6  | 21.5  | 21.5  | 21.5  | 21.5 |      |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

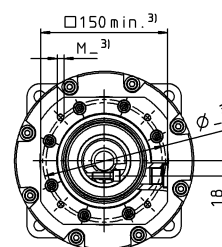
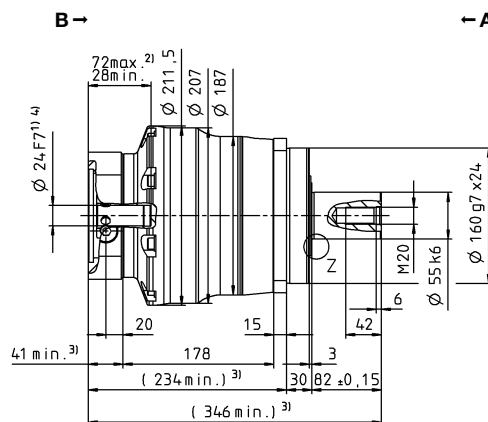
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

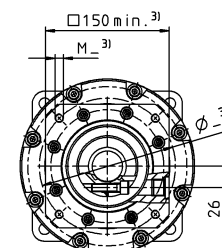
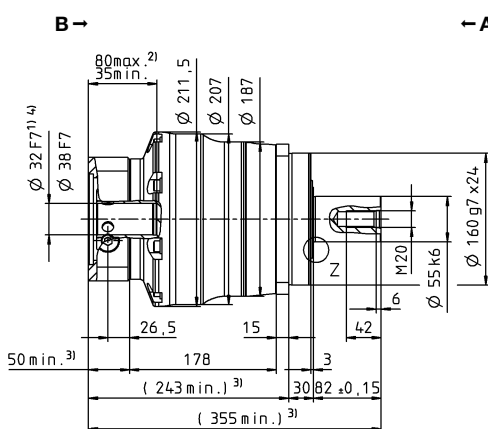
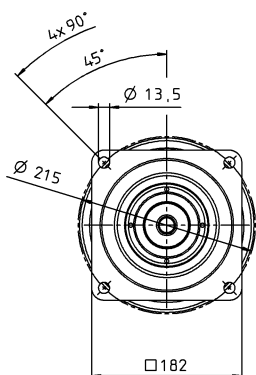
<sup>e)</sup> Smooth shaft

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

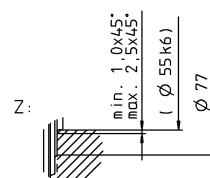
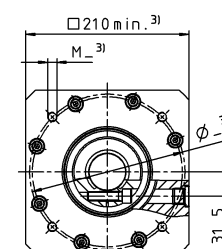
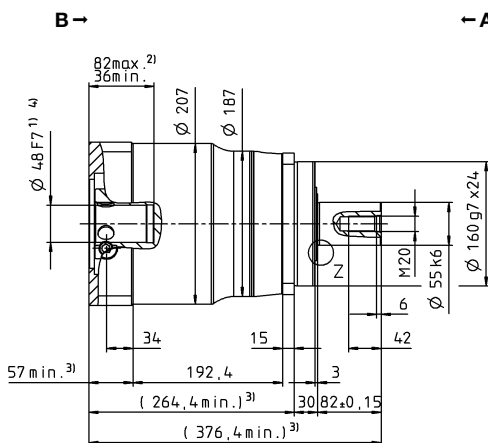
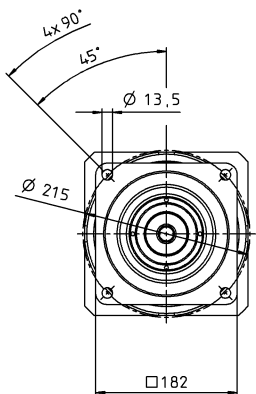
up to 24 <sup>4)</sup> (G)  
clamping hub  
diameter



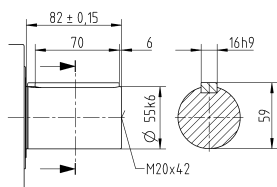
up to 32/38 <sup>4)</sup>  
(I/K <sup>5)</sup>) clamping  
hub diameter



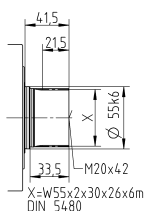
up to 48 <sup>4)</sup> (M)  
clamping hub  
diameter



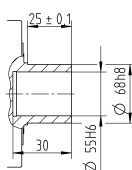
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit

2) Min. /Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 210 MF 1-stage

|                                                                                                                                          |             |                                       | 1-stage                              |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------|--------------------------------------|-------|-------|-------|-------|
| Ratio                                                                                                                                    | <i>i</i>    |                                       | 4                                    | 5     | 7     | 8     | 10    |
| Max. torque <sup>a) b) e)</sup>                                                                                                          | $T_{2a}$    | Nm                                    | 4000                                 | 4000  | 3840  | 2800  | 2800  |
|                                                                                                                                          |             | in.lb                                 | 35403                                | 35403 | 33987 | 24782 | 24782 |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                 | $T_{2B}$    | Nm                                    | 3000                                 | 3000  | 2880  | 2280  | 2280  |
|                                                                                                                                          |             | in.lb                                 | 26552                                | 26552 | 25490 | 20180 | 20180 |
| Nominal torque<br>(at $n_{IN}$ )                                                                                                         | $T_{2N}$    | Nm                                    | 1895                                 | 1767  | 1731  | 1631  | 1708  |
|                                                                                                                                          |             | in.lb                                 | 16772                                | 15641 | 15323 | 14432 | 15122 |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                               | $T_{2Not}$  | Nm                                    | 5900                                 | 5900  | 5900  | 5900  | 5900  |
|                                                                                                                                          |             | in.lb                                 | 52220                                | 52220 | 52220 | 52220 | 52220 |
| Permitted average input speed<br>(at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>                                               | $n_{1N}$    | rpm                                   | 1200                                 | 1500  | 1700  | 2000  | 2000  |
| Max. input speed                                                                                                                         | $n_{1Max}$  | rpm                                   | 3000                                 | 3000  | 3000  | 3000  | 3000  |
| Mean no load running torque <sup>b)</sup><br>(at $n_1 = 2000$ rpm and 20 °C gearbox temperature)                                         | $T_{012}$   | Nm                                    | 19                                   | 15    | 8.8   | 8.8   | 6.4   |
|                                                                                                                                          |             | in.lb                                 | 164                                  | 129   | 78    | 78    | 57    |
| Max. backlash                                                                                                                            | $j_t$       | arcmin                                | Standard $\leq 3$ / Reduced $\leq 1$ |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                                         | $C_{121}$   | Nm/arcmin                             | 400                                  |       |       |       |       |
|                                                                                                                                          |             | in.lb/arcmin                          | 3540                                 |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                                           | $F_{2AMax}$ | N                                     | 30000                                |       |       |       |       |
|                                                                                                                                          |             | lb <sub>f</sub>                       | 6750                                 |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                                         | $F_{2QMax}$ | N                                     | 21000                                |       |       |       |       |
|                                                                                                                                          |             | lb <sub>f</sub>                       | 4725                                 |       |       |       |       |
| Max. tilting moment                                                                                                                      | $M_{2KMax}$ | Nm                                    | 3100                                 |       |       |       |       |
|                                                                                                                                          |             | in.lb                                 | 27437                                |       |       |       |       |
| Efficiency at full load                                                                                                                  | $\eta$      | %                                     | 97                                   |       |       |       |       |
| Service life <sup>f)</sup>                                                                                                               | $L_h$       | h                                     | > 20000                              |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                                                 | $m$         | kg                                    | 56                                   |       |       |       |       |
|                                                                                                                                          |             | lb <sub>m</sub>                       | 123.8                                |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex <sup>®</sup> )                  | $L_{PA}$    | dB(A)                                 | $\leq 64$                            |       |       |       |       |
| Max. permitted housing temperature                                                                                                       |             | °C                                    | +90                                  |       |       |       |       |
|                                                                                                                                          |             | F                                     | 194                                  |       |       |       |       |
| Ambient temperature                                                                                                                      |             | °C                                    | -15 to +40                           |       |       |       |       |
|                                                                                                                                          |             | F                                     | 5 to 104                             |       |       |       |       |
| Lubrication                                                                                                                              |             |                                       | Lubricated for life                  |       |       |       |       |
| Direction of rotation                                                                                                                    |             |                                       | In- and output same direction        |       |       |       |       |
| Protection class                                                                                                                         |             |                                       | IP 65                                |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex <sup>®</sup> )                                          |             |                                       | BC2-04000AA075.000-X                 |       |       |       |       |
| Bore diameter of coupling on the application side                                                                                        |             | mm                                    | X = 050.000 - 090.000                |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]<br>Optimized mass inertia version<br>available on request | N 55 $J_1$  | kgcm <sup>2</sup>                     | 94.3                                 | 76.9  | 61.5  | 61.5  | 53.1  |
|                                                                                                                                          |             | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 83.5                                 | 68.1  | 54.4  | 54.4  | 47.0  |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

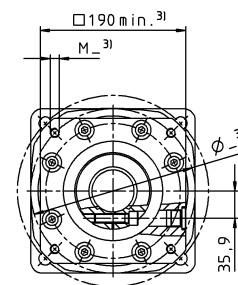
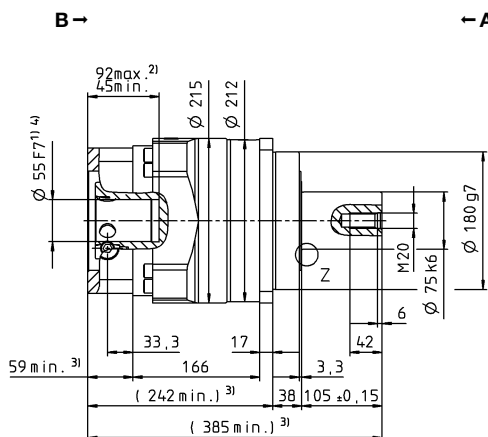
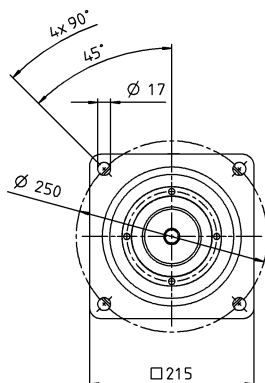
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

1-stage

up to 55 <sup>4)</sup> (N) <sup>5)</sup>  
clamping hub diameter


Planetary gearboxes

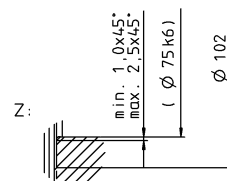
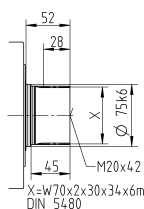
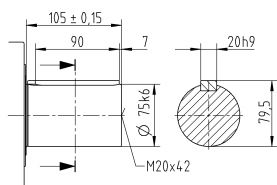
SP

MF

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 210 MF 2-stage

|                                                                                                                                          |   |    |                       | 2-stage                         |                                                   |                               |                       |       |       |       |       |       |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------|---|----|-----------------------|---------------------------------|---------------------------------------------------|-------------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                                                                                                                                    |   |    |                       | <i>i</i>                        |                                                   | 16                            | 20                    | 25    | 28    | 32    | 35    | 40    | 50    | 64    | 70    | 100   |
| Max. torque <sup>a) b) e)</sup>                                                                                                          |   |    |                       | <i>T</i> <sub>2a</sub>          | <i>Nm</i>                                         | 3159                          | 3159                  | 3949  | 3159  | 3159  | 3840  | 2880  | 3600  | 2043  | 2457  | 2043  |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>                                      | 27958                         | 27958                 | 34947 | 27958 | 27958 | 33987 | 25490 | 31863 | 18081 | 21745 | 18081 |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                 |   |    |                       | <i>T</i> <sub>2B</sub>          | <i>Nm</i>                                         | 2880                          | 3000                  | 3000  | 2880  | 2880  | 2880  | 2840  | 2880  | 2043  | 2457  | 2043  |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>                                      | 25490                         | 26552                 | 26552 | 25490 | 25490 | 25490 | 25136 | 25490 | 18081 | 21745 | 18081 |
| Nominal torque<br>(at <i>n</i> <sub>N</sub> )                                                                                            |   |    |                       | <i>T</i> <sub>2N</sub>          | <i>Nm</i>                                         | 1274                          | 1266                  | 1567  | 1294  | 2200  | 1599  | 1358  | 1679  | 1634  | 1965  | 1634  |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>                                      | 11277                         | 11205                 | 13873 | 11452 | 19474 | 14150 | 12019 | 14861 | 14465 | 17396 | 14465 |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                               |   |    |                       | <i>T</i> <sub>2Not</sub>        | <i>Nm</i>                                         | 5900                          | 5900                  | 5900  | 5900  | 5900  | 5900  | 5900  | 5900  | 5900  | 5900  | 5900  |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>                                      | 52220                         | 52220                 | 52220 | 52220 | 52220 | 52220 | 52220 | 52220 | 52220 | 52220 | 52220 |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>                                 |   |    |                       | <i>n</i> <sub>1N</sub>          | <i>rpm</i>                                        | 2500                          | 2500                  | 2500  | 2500  | 2500  | 2500  | 2500  | 2500  | 2500  | 3000  | 3000  |
| Max. input speed                                                                                                                         |   |    |                       | <i>n</i> <sub>1Max</sub>        | <i>rpm</i>                                        | 4500                          | 4500                  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature)                         |   |    |                       | <i>T</i> <sub>012</sub>         | <i>Nm</i>                                         | 5.6                           | 5.2                   | 4.8   | 4.5   | 4.5   | 3.6   | 3.4   | 3.0   | 3.0   | 2.6   | 2.4   |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>                                      | 50                            | 46                    | 43    | 39    | 39    | 32    | 30    | 27    | 27    | 23    | 21    |
| Max. backlash                                                                                                                            |   |    |                       | <i>j</i> <sub>t</sub>           | <i>arcmin</i>                                     | Standard ≤ 5 / Reduced ≤ 3    |                       |       |       |       |       |       |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                                         |   |    |                       | <i>C</i> <sub>121</sub>         | <i>Nm/arcmin</i>                                  | 400                           |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb/arcmin</i>                               | 3540                          |                       |       |       |       |       |       |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                                           |   |    |                       | <i>F</i> <sub>2AMax</sub>       | <i>N</i>                                          | 30000                         |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>lb<sub>f</sub></i>                             | 6750                          |                       |       |       |       |       |       |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                                         |   |    |                       | <i>F</i> <sub>2QMax</sub>       | <i>N</i>                                          | 21000                         |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>lb<sub>f</sub></i>                             | 4725                          |                       |       |       |       |       |       |       |       |       |       |
| Max. tilting moment                                                                                                                      |   |    |                       | <i>M</i> <sub>2KMax</sub>       | <i>Nm</i>                                         | 3100                          |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>                                      | 27437                         |                       |       |       |       |       |       |       |       |       |       |
| Efficiency at full load                                                                                                                  |   |    |                       | <i>η</i>                        | %                                                 | 94                            |                       |       |       |       |       |       |       |       |       |       |
| Service life <sup>f)</sup>                                                                                                               |   |    |                       | <i>L</i> <sub>n</sub>           | <i>h</i>                                          | > 20000                       |                       |       |       |       |       |       |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                                                 |   |    |                       | <i>m</i>                        | <i>kg</i>                                         | 53                            |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>lb<sub>m</sub></i>                             | 117                           |                       |       |       |       |       |       |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                               |   |    |                       | <i>L</i> <sub>PA</sub>          | <i>dB(A)</i>                                      | ≤ 57                          |                       |       |       |       |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                                                       |   |    |                       |                                 | °C                                                | +90                           |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>F</i>                                          | 194                           |                       |       |       |       |       |       |       |       |       |       |
| Ambient temperature                                                                                                                      |   |    |                       |                                 | °C                                                | –15 to +40                    |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>F</i>                                          | 5 to 104                      |                       |       |       |       |       |       |       |       |       |       |
| Lubrication                                                                                                                              |   |    |                       |                                 |                                                   | Lubricated for life           |                       |       |       |       |       |       |       |       |       |       |
| Direction of rotation                                                                                                                    |   |    |                       |                                 |                                                   | In- and output same direction |                       |       |       |       |       |       |       |       |       |       |
| Protection class                                                                                                                         |   |    |                       |                                 |                                                   | IP 65                         |                       |       |       |       |       |       |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                       |   |    |                       |                                 |                                                   | BC2-04000AA075.000-X          |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | Bore diameter of coupling on the application side | <i>mm</i>                     | X = 050.000 - 090.000 |       |       |       |       |       |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]<br>Optimized mass inertia version<br>available on request | M | 48 | <i>J</i> <sub>i</sub> | <i>kgcm²</i>                    | 34.5                                              | 31.5                          | 30.8                  | 30.0  | 30.0  | 29.7  | 28.5  | 28.3  | 28.3  | 28.1  | 28.0  |       |
|                                                                                                                                          |   |    |                       | <i>10<sup>-3</sup> in.lb.s²</i> | 30.5                                              | 27.9                          | 27.3                  | 26.6  | 26.6  | 26.3  | 25.2  | 25.0  | 25.0  | 24.9  | 24.8  |       |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

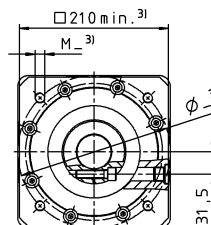
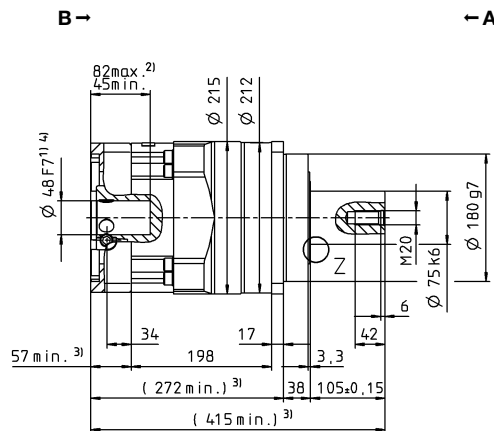
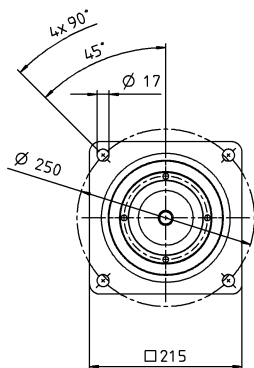
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

2-stage

up to 48<sup>4)</sup> (M)<sup>5)</sup>  
clamping hub  
diameter


Planetary gearboxes

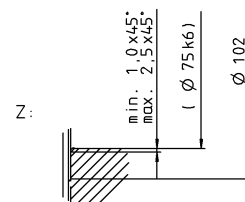
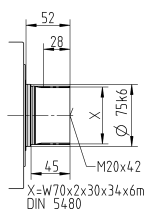
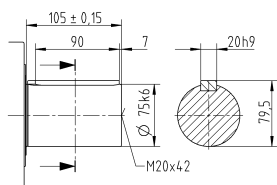
SP<sup>+</sup>

MF

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP+ 240 MF 1-stage

|                                                                                                                                          |             |                                       | 1-stage                              |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------|--------------------------------------|-------|-------|-------|-------|
| Ratio                                                                                                                                    | <i>i</i>    |                                       | 4                                    | 5     | 7     | 8     | 10    |
| Max. torque <sup>a) b) e)</sup>                                                                                                          | $T_{2a}$    | Nm                                    | 5700                                 | 5700  | 5700  | 4000  | 4000  |
|                                                                                                                                          |             | in.lb                                 | 50450                                | 50450 | 50450 | 35403 | 35403 |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                 | $T_{2B}$    | Nm                                    | 5400                                 | 5400  | 5160  | 4000  | 4000  |
|                                                                                                                                          |             | in.lb                                 | 47794                                | 47794 | 45670 | 35403 | 35403 |
| Nominal torque<br>(at $n_{IN}$ )                                                                                                         | $T_{2N}$    | Nm                                    | 3038                                 | 2872  | 2737  | 2611  | 2735  |
|                                                                                                                                          |             | in.lb                                 | 26885                                | 25418 | 24223 | 23111 | 24208 |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                               | $T_{2Not}$  | Nm                                    | 8500                                 | 8500  | 8500  | 6850  | 6850  |
|                                                                                                                                          |             | in.lb                                 | 75232                                | 75232 | 75232 | 60628 | 60628 |
| Permitted average input speed<br>(at $T_{2N}$ and 20 °C ambient temperature) <sup>d)</sup>                                               | $n_{1N}$    | rpm                                   | 1000                                 | 1200  | 1500  | 1700  | 1700  |
| Max. input speed                                                                                                                         | $n_{1Max}$  | rpm                                   | 3000                                 | 3000  | 3000  | 3000  | 3000  |
| Mean no load running torque <sup>b)</sup><br>(at $n_1 = 2000$ rpm and 20 °C gearbox temperature)                                         | $T_{012}$   | Nm                                    | 24                                   | 19    | 12    | 12    | 10    |
|                                                                                                                                          |             | in.lb                                 | 212                                  | 164   | 106   | 106   | 89    |
| Max. backlash                                                                                                                            | $j_t$       | arcmin                                | Standard $\leq 3$ / Reduced $\leq 1$ |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                                         | $C_{121}$   | Nm/arcmin                             | 550                                  |       |       |       |       |
|                                                                                                                                          |             | in.lb/arcmin                          | 4868                                 |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                                           | $F_{2AMax}$ | N                                     | 33000                                |       |       |       |       |
|                                                                                                                                          |             | lb <sub>f</sub>                       | 7425                                 |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                                         | $F_{2QMax}$ | N                                     | 30000                                |       |       |       |       |
|                                                                                                                                          |             | lb <sub>f</sub>                       | 6750                                 |       |       |       |       |
| Max. tilting moment                                                                                                                      | $M_{2KMax}$ | Nm                                    | 5000                                 |       |       |       |       |
|                                                                                                                                          |             | in.lb                                 | 44254                                |       |       |       |       |
| Efficiency at full load                                                                                                                  | $\eta$      | %                                     | 97                                   |       |       |       |       |
| Service life <sup>f)</sup>                                                                                                               | $L_h$       | h                                     | > 20000                              |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                                                 | $m$         | kg                                    | 77                                   |       |       |       |       |
|                                                                                                                                          |             | lb <sub>m</sub>                       | 170.2                                |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex <sup>®</sup> )                  | $L_{PA}$    | dB(A)                                 | ≤ 66                                 |       |       |       |       |
| Max. permitted housing temperature                                                                                                       |             | °C                                    | +90                                  |       |       |       |       |
|                                                                                                                                          |             | F                                     | 194                                  |       |       |       |       |
| Ambient temperature                                                                                                                      |             | °C                                    | -15 to +40                           |       |       |       |       |
|                                                                                                                                          |             | F                                     | 5 to 104                             |       |       |       |       |
| Lubrication                                                                                                                              |             |                                       | Lubricated for life                  |       |       |       |       |
| Direction of rotation                                                                                                                    |             |                                       | In- and output same direction        |       |       |       |       |
| Protection class                                                                                                                         |             |                                       | IP 65                                |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex <sup>®</sup> )                                          |             |                                       | BC2-06000AA085.000-X                 |       |       |       |       |
| Bore diameter of coupling on the application side                                                                                        |             | mm                                    | X = 060.000 - 140.000                |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]<br>Optimized mass inertia version<br>available on request | O 60 $J_1$  | kgcm <sup>2</sup>                     | 198                                  | 163   | 138   | 138   | 125   |
|                                                                                                                                          |             | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 175                                  | 144   | 122   | 122   | 110   |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

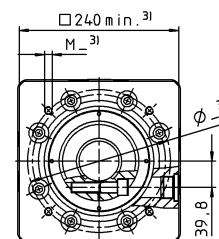
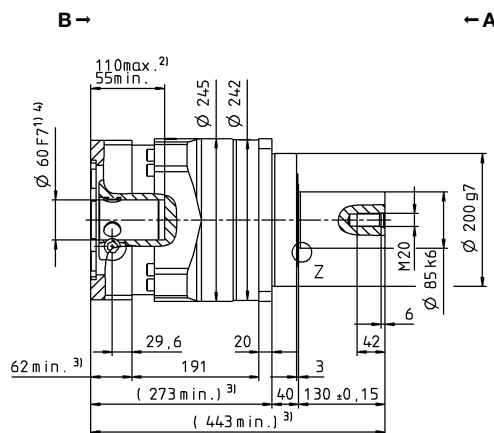
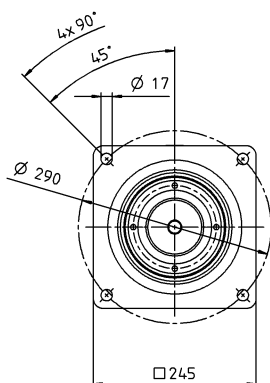
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

1-stage

up to 60<sup>4)</sup> (O)<sup>5)</sup>  
clamping hub  
diameter


Planetary gearboxes

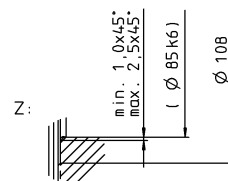
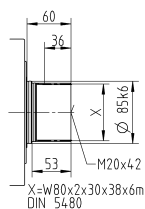
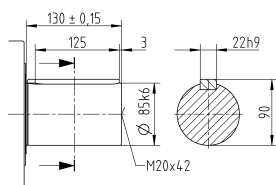
SP+

MF

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 240 MF 2-stage

|                                                                                                                                          |   |    |                       | 2-stage                         |                       |                               |       |       |       |       |       |       |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------|---|----|-----------------------|---------------------------------|-----------------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                                                                                                                                    |   |    |                       | <i>i</i>                        |                       | 16                            | 20    | 25    | 28    | 32    | 35    | 40    | 50    | 64    | 70    | 100   |
| Max. torque <sup>a) b) e)</sup>                                                                                                          |   |    |                       | <i>T</i> <sub>2a</sub>          | <i>Nm</i>             | 5446                          | 5446  | 5700  | 5446  | 5446  | 5700  | 5446  | 5700  | 3642  | 5700  | 3642  |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>          | 48202                         | 48202 | 50450 | 48202 | 48202 | 50450 | 48202 | 50450 | 32236 | 50450 | 32236 |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                                                 |   |    |                       | <i>T</i> <sub>2B</sub>          | <i>Nm</i>             | 5400                          | 5400  | 5400  | 5400  | 5400  | 5400  | 4400  | 5160  | 3642  | 4730  | 3642  |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>          | 47794                         | 47794 | 47794 | 47794 | 47794 | 47794 | 38944 | 45670 | 32236 | 41864 | 32236 |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                                           |   |    |                       | <i>T</i> <sub>2N</sub>          | <i>Nm</i>             | 2658                          | 2596  | 3198  | 2667  | 3754  | 3283  | 2803  | 3457  | 2914  | 3784  | 2914  |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>          | 23524                         | 22976 | 28308 | 23607 | 33222 | 29060 | 24811 | 30600 | 25789 | 33491 | 25789 |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)                               |   |    |                       | <i>T</i> <sub>2Not</sub>        | <i>Nm</i>             | 8500                          | 8500  | 8500  | 8500  | 8500  | 8500  | 8500  | 8500  | 6850  | 8500  | 6850  |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>          | 75232                         | 75232 | 75232 | 75232 | 75232 | 75232 | 75232 | 75232 | 60628 | 75232 | 60628 |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>                                 |   |    |                       | <i>n</i> <sub>1N</sub>          | <i>rpm</i>            | 2300                          | 2500  | 2500  | 2500  | 2500  | 2500  | 2500  | 2500  | 2500  | 2800  | 2800  |
| Max. input speed                                                                                                                         |   |    |                       | <i>n</i> <sub>1Max</sub>        | <i>rpm</i>            | 4500                          | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>1</sub> = 2000 rpm and 20 °C gearbox temperature)                         |   |    |                       | <i>T</i> <sub>012</sub>         | <i>Nm</i>             | 8.4                           | 7.1   | 6.5   | 5.9   | 5.9   | 4.5   | 4.1   | 3.5   | 3.5   | 3.0   | 3.0   |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>          | 74                            | 63    | 58    | 52    | 52    | 40    | 36    | 31    | 31    | 26    | 26    |
| Max. backlash                                                                                                                            |   |    |                       | <i>j</i> <sub>t</sub>           | <i>arcmin</i>         | Standard ≤ 5 / Reduced ≤ 3    |       |       |       |       |       |       |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                                         |   |    |                       | <i>C</i> <sub>121</sub>         | <i>Nm/arcmin</i>      | 550                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb/arcmin</i>   | 4868                          |       |       |       |       |       |       |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                                           |   |    |                       | <i>F</i> <sub>2AMax</sub>       | <i>N</i>              | 33000                         |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>lb<sub>f</sub></i> | 7425                          |       |       |       |       |       |       |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                                         |   |    |                       | <i>F</i> <sub>2QMax</sub>       | <i>N</i>              | 30000                         |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>lb<sub>f</sub></i> | 6750                          |       |       |       |       |       |       |       |       |       |       |
| Max. tilting moment                                                                                                                      |   |    |                       | <i>M</i> <sub>2KMax</sub>       | <i>Nm</i>             | 5000                          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>in.lb</i>          | 44254                         |       |       |       |       |       |       |       |       |       |       |
| Efficiency at full load                                                                                                                  |   |    |                       | <i>η</i>                        | %                     | 94                            |       |       |       |       |       |       |       |       |       |       |
| Service life <sup>f)</sup>                                                                                                               |   |    |                       | <i>L</i> <sub>h</sub>           | <i>h</i>              | > 20000                       |       |       |       |       |       |       |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                                                 |   |    |                       | <i>m</i>                        | <i>kg</i>             | 76                            |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>lb<sub>m</sub></i> | 168                           |       |       |       |       |       |       |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)                               |   |    |                       | <i>L</i> <sub>PA</sub>          | <i>dB(A)</i>          | ≤ 58                          |       |       |       |       |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                                                       |   |    |                       |                                 | °C                    | +90                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>F</i>              | 194                           |       |       |       |       |       |       |       |       |       |       |
| Ambient temperature                                                                                                                      |   |    |                       |                                 | °C                    | –15 to +40                    |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 | <i>F</i>              | 5 to 104                      |       |       |       |       |       |       |       |       |       |       |
| Lubrication                                                                                                                              |   |    |                       |                                 |                       | Lubricated for life           |       |       |       |       |       |       |       |       |       |       |
| Direction of rotation                                                                                                                    |   |    |                       |                                 |                       | In- and output same direction |       |       |       |       |       |       |       |       |       |       |
| Protection class                                                                                                                         |   |    |                       |                                 |                       | IP 65                         |       |       |       |       |       |       |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                                                       |   |    |                       |                                 |                       | BC2-06000AA085.000-X          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                                          |   |    |                       |                                 |                       | X = 060.000 - 140.000         |       |       |       |       |       |       |       |       |       |       |
| Bore diameter of coupling on the application side                                                                                        |   |    |                       |                                 | <i>mm</i>             | X = 060.000 - 140.000         |       |       |       |       |       |       |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]<br>Optimized mass inertia version<br>available on request | M | 48 | <i>J</i> <sub>i</sub> | <i>kgcm²</i>                    | 39.2                  | 34.6                          | 33.2  | 30.5  | 30.5  | 29.7  | 28.2  | 27.9  | 27.6  | 27.6  | 27.5  |       |
|                                                                                                                                          |   |    |                       | <i>10<sup>-3</sup> in.lb.s²</i> | 34.7                  | 30.6                          | 29.4  | 27.0  | 27.0  | 26.3  | 25.0  | 24.7  | 24.4  | 24.4  | 24.3  |       |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

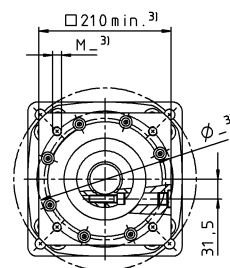
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

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

View B

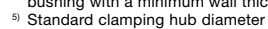
up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter



MF

Technical drawing of a square plate with the following dimensions and specifications:

- Overall width: 60
- Inner width: 36
- Overall height: 85 ± 6
- Inner height: X
- Bottom flange width: 53
- Material: M20x42
- Material specification: X=W80x2x30x38x6m
- Standard: DIN 5480



# SP<sup>+</sup> 075 MC 1-stage

|                                                                                                                  |   |    |                                                   | 1-stage                                      |                               |      |      |      |      |      |
|------------------------------------------------------------------------------------------------------------------|---|----|---------------------------------------------------|----------------------------------------------|-------------------------------|------|------|------|------|------|
| Ratio                                                                                                            |   |    | <i>i</i>                                          |                                              | 3                             | 4    | 5    | 7    | 8    | 10   |
| Max. torque <sup>a) b) e)</sup>                                                                                  |   |    | <i>T</i> <sub>2a</sub>                            | <i>Nm</i>                                    | 68                            | 90   | 90   | 90   | 70   | 70   |
|                                                                                                                  |   |    |                                                   | <i>in.lb</i>                                 | 602                           | 797  | 797  | 797  | 620  | 620  |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |   |    | <i>T</i> <sub>2B</sub>                            | <i>Nm</i>                                    | 68                            | 90   | 90   | 90   | 70   | 70   |
|                                                                                                                  |   |    |                                                   | <i>in.lb</i>                                 | 602                           | 797  | 797  | 797  | 620  | 620  |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                   |   |    | <i>T</i> <sub>2N</sub>                            | <i>Nm</i>                                    | 41                            | 51   | 51   | 52   | 50   | 53   |
|                                                                                                                  |   |    |                                                   | <i>in.lb</i>                                 | 362                           | 448  | 447  | 459  | 441  | 468  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |   |    | <i>T</i> <sub>2Not</sub>                          | <i>Nm</i>                                    | 139                           | 185  | 250  | 250  | 213  | 213  |
|                                                                                                                  |   |    |                                                   | <i>in.lb</i>                                 | 1230                          | 1640 | 2213 | 2213 | 1885 | 1885 |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>         |   |    | <i>n</i> <sub>1N</sub>                            | <i>rpm</i>                                   | 4500                          | 4500 | 4500 | 4500 | 4500 | 4500 |
| Max. input speed                                                                                                 |   |    | <i>n</i> <sub>1Max</sub>                          | <i>rpm</i>                                   | 6000                          | 6000 | 6000 | 6000 | 6000 | 6000 |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature) |   |    | <i>T</i> <sub>012</sub>                           | <i>Nm</i>                                    | 1.1                           | 0.88 | 0.72 | 0.49 | 0.42 | 0.40 |
|                                                                                                                  |   |    |                                                   | <i>in.lb</i>                                 | 9.9                           | 7.8  | 6.4  | 4.3  | 3.7  | 3.5  |
| Max. backlash                                                                                                    |   |    | <i>j</i> <sub>t</sub>                             | <i>arcmin</i>                                | Standard ≤ 6 / Reduced ≤ 4    |      |      |      |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                 |   |    | <i>C</i> <sub>121</sub>                           | <i>Nm/arcmin</i>                             | 10                            |      |      |      |      |      |
|                                                                                                                  |   |    |                                                   | <i>in.lb/arcmin</i>                          | 89                            |      |      |      |      |      |
| Max. axial force <sup>c)</sup>                                                                                   |   |    | <i>F</i> <sub>2AMax</sub>                         | <i>N</i>                                     | 3350                          |      |      |      |      |      |
|                                                                                                                  |   |    |                                                   | <i>lb<sub>f</sub></i>                        | 754                           |      |      |      |      |      |
| Max. lateral force <sup>c)</sup>                                                                                 |   |    | <i>F</i> <sub>2QMax</sub>                         | <i>N</i>                                     | 4200                          |      |      |      |      |      |
|                                                                                                                  |   |    |                                                   | <i>lb<sub>f</sub></i>                        | 945                           |      |      |      |      |      |
| Max. tilting moment                                                                                              |   |    | <i>M</i> <sub>2KMax</sub>                         | <i>Nm</i>                                    | 236                           |      |      |      |      |      |
|                                                                                                                  |   |    |                                                   | <i>in.lb</i>                                 | 2089                          |      |      |      |      |      |
| Efficiency at full load                                                                                          |   |    | <i>η</i>                                          | %                                            | 98.5                          |      |      |      |      |      |
| Service life <sup>f)</sup>                                                                                       |   |    | <i>L</i> <sub>h</sub>                             | <i>h</i>                                     | > 30000                       |      |      |      |      |      |
| Weight<br>(incl. standard adapter plate)                                                                         |   |    | <i>m</i>                                          | <i>kg</i>                                    | 3.9                           |      |      |      |      |      |
|                                                                                                                  |   |    |                                                   | <i>lb<sub>m</sub></i>                        | 8.6                           |      |      |      |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)       |   |    | <i>L</i> <sub>PA</sub>                            | <i>dB(A)</i>                                 | ≤ 59                          |      |      |      |      |      |
| Max. permitted housing temperature                                                                               |   |    |                                                   | °C                                           | +90                           |      |      |      |      |      |
|                                                                                                                  |   |    |                                                   | <i>F</i>                                     | 194                           |      |      |      |      |      |
| Ambient temperature                                                                                              |   |    |                                                   | °C                                           | –15 to +40                    |      |      |      |      |      |
|                                                                                                                  |   |    |                                                   | <i>F</i>                                     | 5 to 104                      |      |      |      |      |      |
| Lubrication                                                                                                      |   |    |                                                   |                                              | Lubricated for life           |      |      |      |      |      |
| Direction of rotation                                                                                            |   |    |                                                   |                                              | In- and output same direction |      |      |      |      |      |
| Protection class                                                                                                 |   |    |                                                   |                                              | IP 65                         |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |   |    |                                                   |                                              | BC2-00080AA022.000-X          |      |      |      |      |      |
|                                                                                                                  |   |    | Bore diameter of coupling on the application side | <i>mm</i>                                    | X = 014.000 - 042.000         |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   | E | 19 | <i>J</i> <sub>i</sub>                             | <i>kgcm</i> <sup>2</sup>                     | 1.03                          | 0.78 | 0.68 | 0.59 | 0.54 | 0.54 |
|                                                                                                                  |   |    |                                                   | 10 <sup>-3</sup> <i>in.lb.s</i> <sup>2</sup> | 0.91                          | 0.69 | 0.60 | 0.52 | 0.48 | 0.48 |
|                                                                                                                  | G | 24 | <i>J</i> <sub>i</sub>                             | <i>kgcm</i> <sup>2</sup>                     | 2.40                          | 2.15 | 2.05 | 1.96 | 1.91 | 1.91 |
|                                                                                                                  |   |    |                                                   | 10 <sup>-3</sup> <i>in.lb.s</i> <sup>2</sup> | 2.12                          | 1.90 | 1.81 | 1.73 | 1.69 | 1.69 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

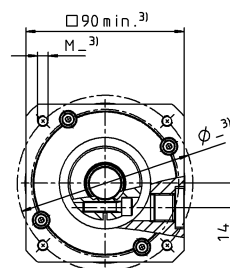
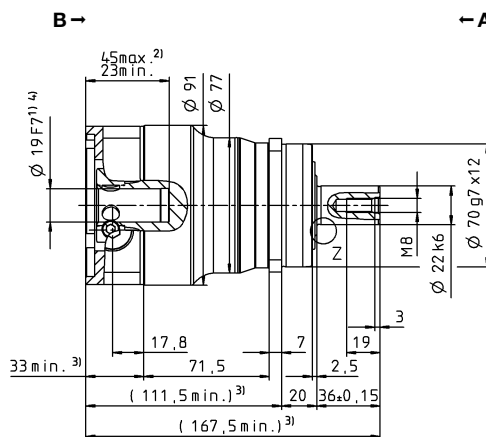
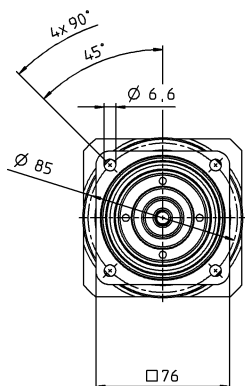
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

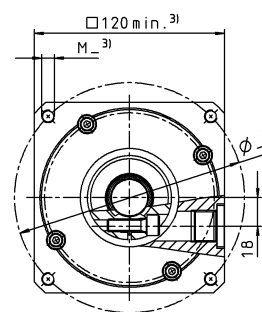
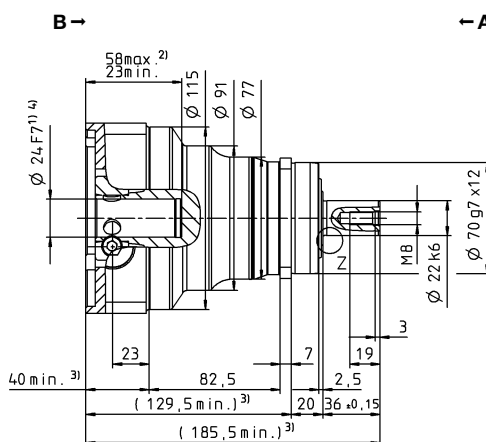
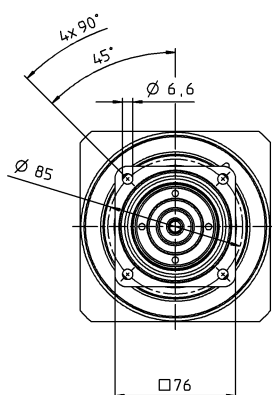
# 1-stage

up to 19 <sup>4)</sup> (E) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 24 <sup>4)</sup> (G)  
clamping hub  
diameter



Planetary gearboxes

SP<sup>+</sup>

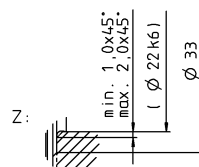
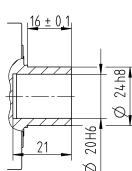
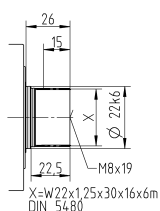
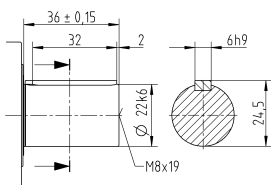
MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)

Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 075 MC 2-stage

|                                                                                                                  |   |                                                   |                       | 2-stage                               |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------|-----------------------|---------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Ratio                                                                                                            |   | <i>i</i>                                          |                       | 16                                    | 20   | 25   | 28   | 32   | 35   | 40   | 50   | 64   | 70   | 100  |      |
| Max. torque <sup>a) b) e)</sup>                                                                                  |   | <i>T</i> <sub>2a</sub>                            | Nm                    | 90                                    | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 70   | 90   | 70   |      |
|                                                                                                                  |   |                                                   | in.lb                 | 797                                   | 797  | 797  | 797  | 797  | 797  | 797  | 797  | 797  | 620  | 797  | 620  |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |   | <i>T</i> <sub>2B</sub>                            | Nm                    | 90                                    | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 70   | 90   | 70   |      |
|                                                                                                                  |   |                                                   | in.lb                 | 797                                   | 797  | 797  | 797  | 797  | 797  | 797  | 797  | 797  | 620  | 797  | 620  |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                   |   | <i>T</i> <sub>2N</sub>                            | Nm                    | 62                                    | 62   | 72   | 65   | 72   | 72   | 65   | 72   | 56   | 72   | 56   |      |
|                                                                                                                  |   |                                                   | in.lb                 | 552                                   | 553  | 637  | 572  | 637  | 637  | 574  | 637  | 496  | 637  | 496  |      |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |   | <i>T</i> <sub>2Not</sub>                          | Nm                    | 250                                   | 250  | 250  | 250  | 250  | 250  | 250  | 250  | 213  | 250  | 213  |      |
|                                                                                                                  |   |                                                   | in.lb                 | 2213                                  | 2213 | 2213 | 2213 | 2213 | 2213 | 2213 | 2213 | 1885 | 2213 | 1885 |      |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>         |   | <i>n</i> <sub>1N</sub>                            | rpm                   | 4500                                  | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 |      |
| Max. input speed                                                                                                 |   | <i>n</i> <sub>1Max</sub>                          | rpm                   | 6000                                  | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 |      |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>l</sub> = 3000 rpm and 20 °C gearbox temperature) |   | <i>T</i> <sub>012</sub>                           | Nm                    | 0.36                                  | 0.24 | 0.18 | 0.18 | 0.17 | 0.16 | 0.16 | 0.16 | 0.16 | 0.15 | 0.14 |      |
|                                                                                                                  |   |                                                   | in.lb                 | 3.2                                   | 2.1  | 1.6  | 1.6  | 1.5  | 1.4  | 1.4  | 1.4  | 1.4  | 1.3  | 1.2  |      |
| Max. backlash                                                                                                    |   | <i>j</i> <sub>t</sub>                             | arcmin                | Standard ≤ 8 / Reduced ≤ 6            |      |      |      |      |      |      |      |      |      |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                 |   | <i>C</i> <sub>121</sub>                           | Nm/arcmin             | 10                                    |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |                                                   | in.lb/arcmin          | 89                                    |      |      |      |      |      |      |      |      |      |      |      |
| Max. axial force <sup>c)</sup>                                                                                   |   | <i>F</i> <sub>2AMax</sub>                         | N                     | 3350                                  |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |                                                   | lb <sub>f</sub>       | 754                                   |      |      |      |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>c)</sup>                                                                                 |   | <i>F</i> <sub>2QMax</sub>                         | N                     | 4200                                  |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |                                                   | lb <sub>f</sub>       | 945                                   |      |      |      |      |      |      |      |      |      |      |      |
| Max. tilting moment                                                                                              |   | <i>M</i> <sub>2KMax</sub>                         | Nm                    | 236                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |                                                   | in.lb                 | 2089                                  |      |      |      |      |      |      |      |      |      |      |      |
| Efficiency at full load                                                                                          |   | <i>η</i>                                          | %                     | 96.5                                  |      |      |      |      |      |      |      |      |      |      |      |
| Service life <sup>f)</sup>                                                                                       |   | <i>L</i> <sub>h</sub>                             | h                     | > 30000                               |      |      |      |      |      |      |      |      |      |      |      |
| Weight<br>(incl. standard adapter plate)                                                                         |   | <i>m</i>                                          | kg                    | 3.6                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |                                                   | lb <sub>m</sub>       | 8.0                                   |      |      |      |      |      |      |      |      |      |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)       |   | <i>L</i> <sub>PA</sub>                            | dB(A)                 | ≤ 55                                  |      |      |      |      |      |      |      |      |      |      |      |
| Max. permitted housing temperature                                                                               |   |                                                   | °C                    | +90                                   |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |                                                   | <i>F</i>              | 194                                   |      |      |      |      |      |      |      |      |      |      |      |
| Ambient temperature                                                                                              |   |                                                   | °C                    | -15 to +40                            |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |                                                   | <i>F</i>              | 5 to 104                              |      |      |      |      |      |      |      |      |      |      |      |
| Lubrication                                                                                                      |   |                                                   |                       | Lubricated for life                   |      |      |      |      |      |      |      |      |      |      |      |
| Direction of rotation                                                                                            |   |                                                   |                       | In- and output same direction         |      |      |      |      |      |      |      |      |      |      |      |
| Protection class                                                                                                 |   |                                                   |                       | IP 65                                 |      |      |      |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |   |                                                   |                       | BC2-00080AA022.000-X                  |      |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   | Bore diameter of coupling on the application side | mm                    | X = 014.000 - 042.000                 |      |      |      |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   | C | 14                                                | <i>J</i> <sub>l</sub> | kgcm <sup>2</sup>                     | 0.23 | 0.20 | 0.20 | 0.18 | 0.18 | 0.18 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
|                                                                                                                  |   |                                                   |                       | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.20 | 0.18 | 0.18 | 0.16 | 0.16 | 0.16 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
|                                                                                                                  | E | 19                                                | <i>J</i> <sub>l</sub> | kgcm <sup>2</sup>                     | 0.55 | 0.53 | 0.52 | 0.50 | 0.50 | 0.50 | 0.49 | 0.49 | 0.49 | 0.49 | 0.49 |
|                                                                                                                  |   |                                                   |                       | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.49 | 0.47 | 0.46 | 0.44 | 0.44 | 0.44 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

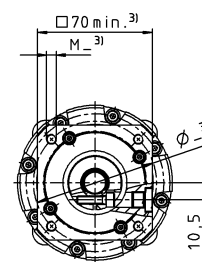
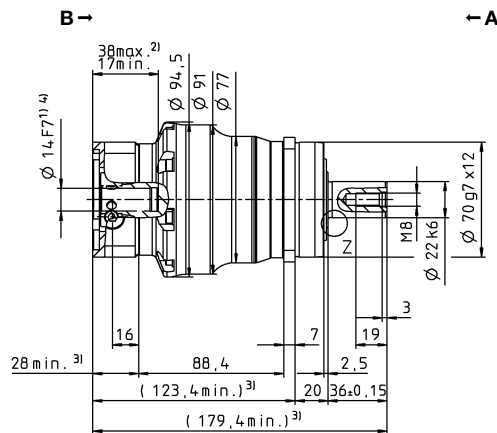
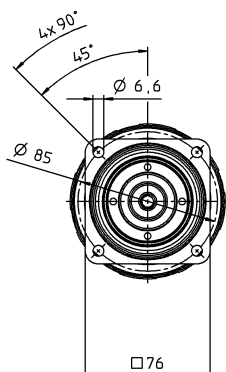
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

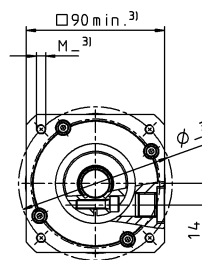
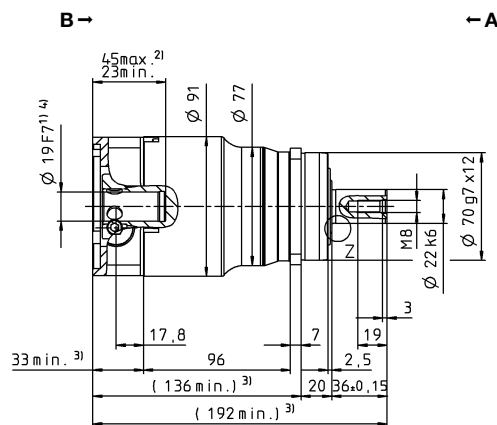
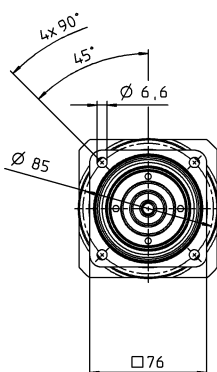
# 2-stage

up to 14 <sup>4)</sup> (C) <sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 19 <sup>4)</sup> (E)  
clamping hub  
diameter



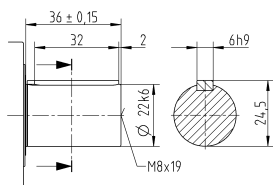
SP

MC

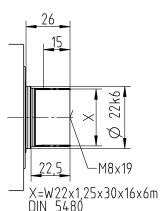
Planetary gearboxes

## Other output variants

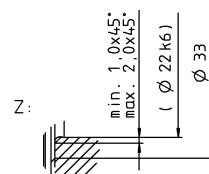
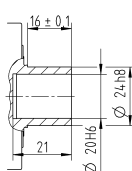
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 100 MC 1-stage

|                                                                                                                  |   |    |                           | Standard version MC             |                               |      |      |      |      | Friction optimized version L |       |      |      |      |      |      |
|------------------------------------------------------------------------------------------------------------------|---|----|---------------------------|---------------------------------|-------------------------------|------|------|------|------|------------------------------|-------|------|------|------|------|------|
| Ratio                                                                                                            |   |    | <i>i</i>                  |                                 | 3                             | 4    | 5    | 7    | 8    | 10                           | 3     | 4    | 5    | 7    | 8    | 10   |
| Max. torque <sup>a) b) e)</sup>                                                                                  |   |    | <i>T</i> <sub>2a</sub>    | <i>Nm</i>                       | 180                           | 240  | 240  | 240  | 180  | 180                          | 180   | 240  | 240  | 240  | 180  | 180  |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                    | 1593                          | 2124 | 2124 | 2124 | 1593 | 1593                         | 1593  | 2124 | 2124 | 2124 | 1593 | 1593 |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |   |    | <i>T</i> <sub>2B</sub>    | <i>Nm</i>                       | 180                           | 240  | 240  | 240  | 180  | 180                          | 180   | 240  | 240  | 240  | 180  | 180  |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                    | 1593                          | 2124 | 2124 | 2124 | 1593 | 1593                         | 1593  | 2124 | 2124 | 2124 | 1593 | 1593 |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                   |   |    | <i>T</i> <sub>2N</sub>    | <i>Nm</i>                       | 76                            | 95   | 91   | 93   | 93   | 97                           | 76    | 95   | 91   | 93   | 93   | 97   |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                    | 677                           | 838  | 806  | 823  | 821  | 861                          | 677   | 838  | 806  | 823  | 821  | 861  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |   |    | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>                       | 454                           | 625  | 625  | 625  | 599  | 599                          | 454   | 625  | 625  | 625  | 599  | 599  |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                    | 4016                          | 5532 | 5532 | 5532 | 5302 | 5302                         | 4016  | 5532 | 5532 | 5532 | 5302 | 5302 |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>         |   |    | <i>n</i> <sub>1N</sub>    | <i>rpm</i>                      | 3500                          | 4000 | 4500 | 4500 | 4500 | 4500                         | 3500  | 4000 | 4500 | 4500 | 4500 | 4500 |
| Max. input speed                                                                                                 |   |    | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>                      | 6000                          | 6000 | 6000 | 6000 | 6000 | 6000                         | 6000  | 6000 | 6000 | 6000 | 6000 | 6000 |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature) |   |    | <i>T</i> <sub>012</sub>   | <i>Nm</i>                       | 2.0                           | 1.8  | 1.4  | 0.84 | 0.78 | 0.64                         | 0.9   | 0.8  | 0.6  | 0.5  | 0.4  | 0.4  |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                    | 17                            | 16   | 12   | 7.4  | 6.9  | 5.7                          | 8.0   | 7.1  | 5.3  | 4.4  | 3.5  | 3.5  |
| Max. backlash                                                                                                    |   |    | <i>j</i> <sub>t</sub>     | <i>arcmin</i>                   | Standard ≤ 4 / Reduced ≤ 2    |      |      |      |      |                              |       |      |      |      |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                 |   |    | <i>C</i> <sub>121</sub>   | <i>Nm/arcmin</i>                | 31                            |      |      |      |      |                              |       |      |      |      |      |      |
|                                                                                                                  |   |    |                           | <i>in.lb/arcmin</i>             | 274                           |      |      |      |      |                              |       |      |      |      |      |      |
| Max. axial force <sup>c)</sup>                                                                                   |   |    | <i>F</i> <sub>2AMax</sub> | <i>N</i>                        | 5650                          |      |      |      |      |                              | 2000  |      |      |      |      |      |
|                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>           | 1271                          |      |      |      |      |                              | 450   |      |      |      |      |      |
| Max. lateral force <sup>c)</sup>                                                                                 |   |    | <i>F</i> <sub>2QMax</sub> | <i>N</i>                        | 6600                          |      |      |      |      |                              | 1000  |      |      |      |      |      |
|                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>           | 1485                          |      |      |      |      |                              | 225   |      |      |      |      |      |
| Max. tilting moment                                                                                              |   |    | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>                       | 487                           |      |      |      |      |                              | 72    |      |      |      |      |      |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                    | 4310                          |      |      |      |      |                              | 637   |      |      |      |      |      |
| Efficiency at full load                                                                                          |   |    | <i>η</i>                  | %                               | 98.5                          |      |      |      |      |                              | 99    |      |      |      |      |      |
| Service life <sup>f)</sup>                                                                                       |   |    | <i>L</i> <sub>h</sub>     | <i>h</i>                        | > 30000                       |      |      |      |      |                              |       |      |      |      |      |      |
| Weight<br>(incl. standard adapter plate)                                                                         |   |    | <i>m</i>                  | <i>kg</i>                       | 7.7                           |      |      |      |      |                              |       |      |      |      |      |      |
|                                                                                                                  |   |    |                           | <i>lb<sub>m</sub></i>           | 17                            |      |      |      |      |                              |       |      |      |      |      |      |
| Operating noise<br>(at reference ratio and reference speed – ratio-specific values available in cymex®)          |   |    | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>                    | ≤ 58                          |      |      |      |      |                              |       |      |      |      |      |      |
| Max. permitted housing temperature                                                                               |   |    |                           | °C                              | +90                           |      |      |      |      |                              |       |      |      |      |      |      |
|                                                                                                                  |   |    |                           | <i>F</i>                        | 194                           |      |      |      |      |                              |       |      |      |      |      |      |
| Ambient temperature                                                                                              |   |    |                           | °C                              | −15 to +40                    |      |      |      |      |                              |       |      |      |      |      |      |
|                                                                                                                  |   |    |                           | <i>F</i>                        | 5 to 104                      |      |      |      |      |                              |       |      |      |      |      |      |
| Lubrication                                                                                                      |   |    |                           |                                 | Lubricated for life           |      |      |      |      |                              |       |      |      |      |      |      |
| Direction of rotation                                                                                            |   |    |                           |                                 | In- and output same direction |      |      |      |      |                              |       |      |      |      |      |      |
| Protection class                                                                                                 |   |    |                           |                                 | IP 65                         |      |      |      |      |                              | IP 52 |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |   |    |                           |                                 | BC2-00300AA032.000-X          |      |      |      |      |                              |       |      |      |      |      |      |
|                                                                                                                  |   |    |                           | <i>mm</i>                       | X = 024.000 - 060.000         |      |      |      |      |                              |       |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   | G | 24 | <i>J</i> <sub>i</sub>     | <i>kgcm²</i>                    | 3.99                          | 3.04 | 2.61 | 2.29 | 2.26 | 2.07                         | 3.99  | 3.04 | 2.61 | 2.29 | 2.26 | 2.07 |
|                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s²</i> | 3.53                          | 2.69 | 2.31 | 2.03 | 2.00 | 1.83                         | 3.53  | 2.69 | 2.31 | 2.03 | 2.00 | 1.83 |
|                                                                                                                  | K | 38 | <i>J</i> <sub>i</sub>     | <i>kgcm²</i>                    | 11.1                          | 10.1 | 9.68 | 9.36 | 9.55 | 9.14                         | 11.1  | 10.1 | 9.68 | 9.36 | 9.55 | 9.14 |
|                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s²</i> | 9.82                          | 8.94 | 8.57 | 8.28 | 8.45 | 8.09                         | 9.82  | 8.94 | 8.57 | 8.28 | 8.45 | 8.09 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

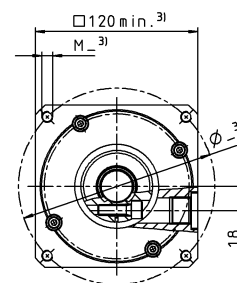
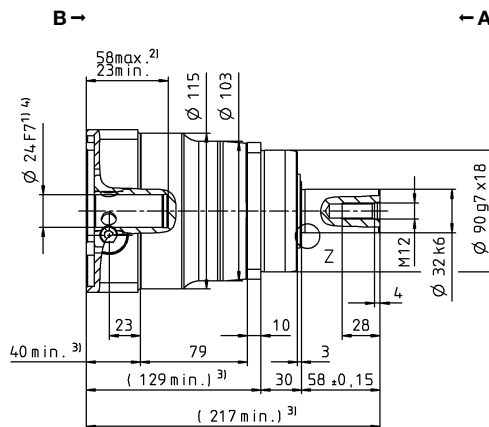
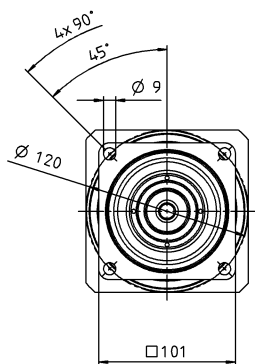
<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

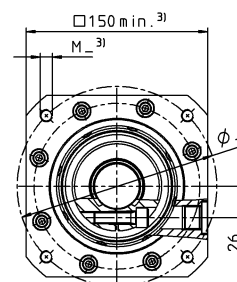
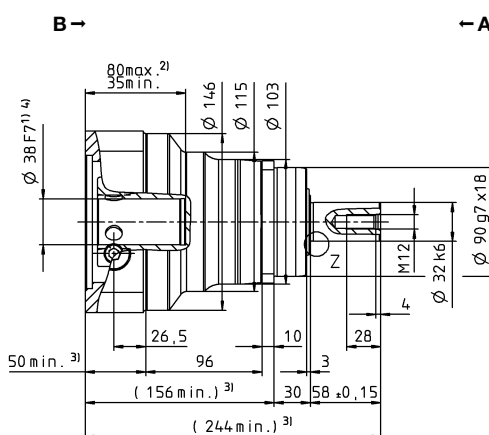
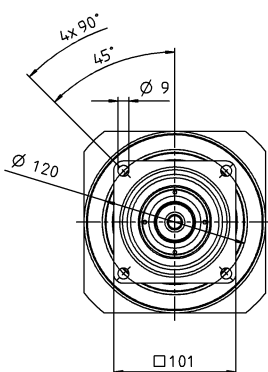
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

# 1-stage

up to 24 <sup>4)</sup> (G) <sup>5)</sup>  
clamping hub  
diameter



up to 38 <sup>4)</sup> (K)  
clamping hub  
diameter



Planetary gearboxes

SP

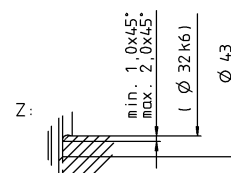
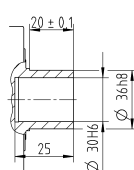
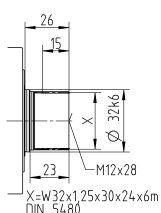
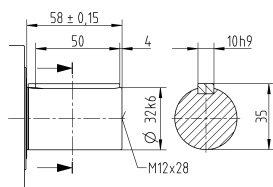
MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)

Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 100 MC 2-stage

|                                                                                                                  |   |    |                           | 2-stage                               |                               |      |      |      |      |      |      |      |      |      |      |
|------------------------------------------------------------------------------------------------------------------|---|----|---------------------------|---------------------------------------|-------------------------------|------|------|------|------|------|------|------|------|------|------|
| Ratio                                                                                                            |   |    | <i>i</i>                  |                                       | 16                            | 20   | 25   | 28   | 32   | 35   | 40   | 50   | 64   | 70   | 100  |
| Max. torque <sup>a) b) e)</sup>                                                                                  |   |    | <i>T</i> <sub>2a</sub>    | Nm                                    | 240                           | 240  | 240  | 240  | 240  | 240  | 240  | 240  | 180  | 240  | 180  |
|                                                                                                                  |   |    |                           | in.lb                                 | 2124                          | 2124 | 2124 | 2124 | 2124 | 2124 | 2124 | 2124 | 1593 | 2124 | 1593 |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |   |    | <i>T</i> <sub>2B</sub>    | Nm                                    | 240                           | 240  | 240  | 240  | 240  | 240  | 240  | 240  | 180  | 240  | 180  |
|                                                                                                                  |   |    |                           | in.lb                                 | 2124                          | 2124 | 2124 | 2124 | 2124 | 2124 | 2124 | 2124 | 1593 | 2124 | 1593 |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                   |   |    | <i>T</i> <sub>2N</sub>    | Nm                                    | 138                           | 148  | 149  | 164  | 141  | 164  | 183  | 182  | 144  | 189  | 144  |
|                                                                                                                  |   |    |                           | in.lb                                 | 1221                          | 1313 | 1322 | 1453 | 1251 | 1450 | 1617 | 1614 | 1275 | 1673 | 1275 |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |   |    | <i>T</i> <sub>2Not</sub>  | Nm                                    | 625                           | 625  | 625  | 625  | 625  | 625  | 625  | 625  | 599  | 625  | 599  |
|                                                                                                                  |   |    |                           | in.lb                                 | 5532                          | 5532 | 5532 | 5532 | 5532 | 5532 | 5532 | 5532 | 5302 | 5532 | 5302 |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>         |   |    | <i>n</i> <sub>1N</sub>    | rpm                                   | 4500                          | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 | 4500 |
| Max. input speed                                                                                                 |   |    | <i>n</i> <sub>1Max</sub>  | rpm                                   | 6000                          | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 | 6000 |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>l</sub> = 3000 rpm and 20 °C gearbox temperature) |   |    | <i>T</i> <sub>012</sub>   | Nm                                    | 0.52                          | 0.53 | 0.48 | 0.43 | 0.38 | 0.28 | 0.40 | 0.25 | 0.25 | 0.20 | 0.19 |
|                                                                                                                  |   |    |                           | in.lb                                 | 4.6                           | 4.7  | 4.2  | 3.8  | 3.4  | 2.5  | 3.5  | 2.2  | 2.2  | 1.8  | 1.7  |
| Max. backlash                                                                                                    |   |    | <i>j</i> <sub>t</sub>     | arcmin                                | Standard ≤ 6 / Reduced ≤ 4    |      |      |      |      |      |      |      |      |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                 |   |    | <i>C</i> <sub>121</sub>   | Nm/arcmin                             | 31                            |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |    |                           | in.lb/arcmin                          | 274                           |      |      |      |      |      |      |      |      |      |      |
| Max. axial force <sup>c)</sup>                                                                                   |   |    | <i>F</i> <sub>2AMax</sub> | N                                     | 5650                          |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |    |                           | lb <sub>f</sub>                       | 1271                          |      |      |      |      |      |      |      |      |      |      |
| Max. lateral force <sup>c)</sup>                                                                                 |   |    | <i>F</i> <sub>2QMax</sub> | N                                     | 6600                          |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |    |                           | lb <sub>f</sub>                       | 1485                          |      |      |      |      |      |      |      |      |      |      |
| Max. tilting moment                                                                                              |   |    | <i>M</i> <sub>2KMax</sub> | Nm                                    | 487                           |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |    |                           | in.lb                                 | 4310                          |      |      |      |      |      |      |      |      |      |      |
| Efficiency at full load                                                                                          |   |    | <i>η</i>                  | %                                     | 96.5                          |      |      |      |      |      |      |      |      |      |      |
| Service life <sup>f)</sup>                                                                                       |   |    | <i>L</i> <sub>h</sub>     | h                                     | > 30000                       |      |      |      |      |      |      |      |      |      |      |
| Weight<br>(incl. standard adapter plate)                                                                         |   |    | <i>m</i>                  | kg                                    | 7.9                           |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |    |                           | lb <sub>m</sub>                       | 17.5                          |      |      |      |      |      |      |      |      |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)       |   |    | <i>L</i> <sub>PA</sub>    | dB(A)                                 | ≤ 56                          |      |      |      |      |      |      |      |      |      |      |
| Max. permitted housing temperature                                                                               |   |    |                           | °C                                    | +90                           |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |    |                           | F                                     | 194                           |      |      |      |      |      |      |      |      |      |      |
| Ambient temperature                                                                                              |   |    |                           | °C                                    | -15 to +40                    |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |    |                           | F                                     | 5 to 104                      |      |      |      |      |      |      |      |      |      |      |
| Lubrication                                                                                                      |   |    |                           |                                       | Lubricated for life           |      |      |      |      |      |      |      |      |      |      |
| Direction of rotation                                                                                            |   |    |                           |                                       | In- and output same direction |      |      |      |      |      |      |      |      |      |      |
| Protection class                                                                                                 |   |    |                           |                                       | IP 65                         |      |      |      |      |      |      |      |      |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |   |    |                           |                                       | BC2-00300AA032.000-X          |      |      |      |      |      |      |      |      |      |      |
|                                                                                                                  |   |    |                           | mm                                    | X = 024.000 - 060.000         |      |      |      |      |      |      |      |      |      |      |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   | E | 19 | <i>J</i> <sub>l</sub>     | kgcm <sup>2</sup>                     | 0.81                          | 0.70 | 0.68 | 0.60 | 0.43 | 0.59 | 0.55 | 0.54 | 0.38 | 0.54 | 0.54 |
|                                                                                                                  |   |    |                           | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 0.72                          | 0.62 | 0.60 | 0.53 | 0.38 | 0.52 | 0.49 | 0.48 | 0.34 | 0.48 | 0.48 |
|                                                                                                                  | G | 24 | <i>J</i> <sub>l</sub>     | kgcm <sup>2</sup>                     | 2.18                          | 2.07 | 2.05 | 1.97 | 2.06 | 1.96 | 1.92 | 1.91 | 1.91 | 1.91 | 1.91 |
|                                                                                                                  |   |    |                           | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 1.93                          | 1.83 | 1.81 | 1.74 | 1.82 | 1.73 | 1.70 | 1.69 | 1.69 | 1.69 | 1.69 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

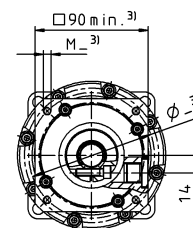
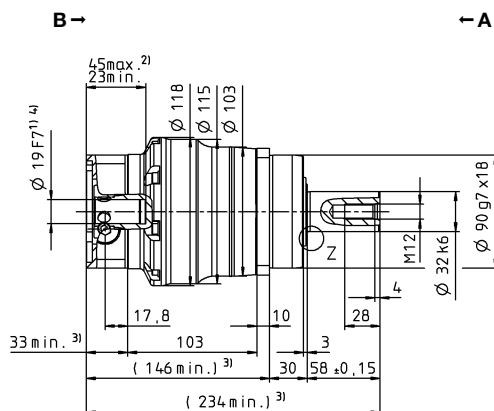
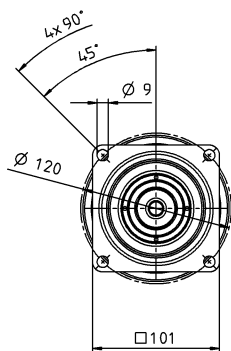
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

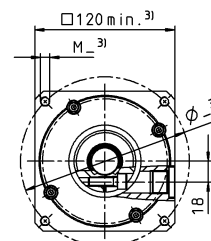
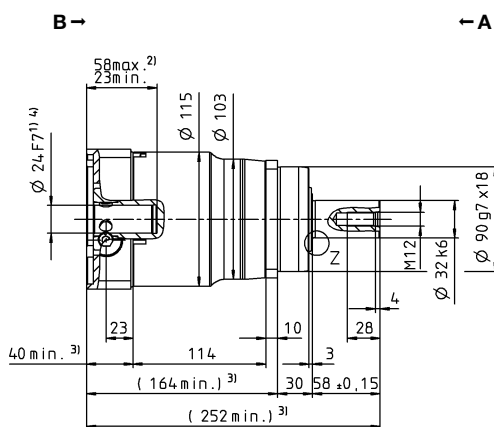
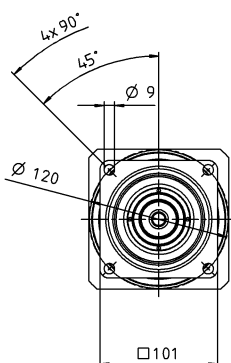
# 2-stage

up to 19<sup>4)</sup> (E)<sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 24<sup>4)</sup> (G)  
clamping hub  
diameter



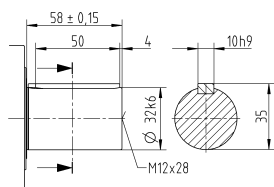
Planetary gearboxes

SP

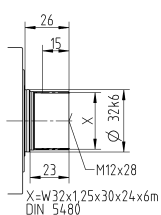
MC

## Other output variants

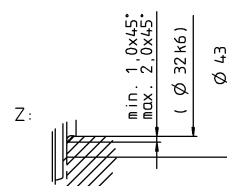
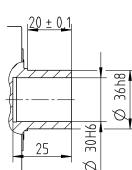
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 140 MC 1-stage

|                                                                                                                  |   |    |                           | Standard version MC                        |                               |       |       |       |       | Friction optimized version L |       |       |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------|---|----|---------------------------|--------------------------------------------|-------------------------------|-------|-------|-------|-------|------------------------------|-------|-------|-------|-------|-------|-------|
| Ratio                                                                                                            |   |    | <i>i</i>                  |                                            | 3                             | 4     | 5     | 7     | 8     | 10                           | 3     | 4     | 5     | 7     | 8     | 10    |
| Max. torque <sup>a) b) e)</sup>                                                                                  |   |    | <i>T</i> <sub>2a</sub>    | <i>Nm</i>                                  | 310                           | 480   | 480   | 480   | 380   | 380                          | 310   | 480   | 480   | 480   | 380   | 380   |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 2744                          | 4248  | 4248  | 4248  | 3363  | 3363                         | 2744  | 4248  | 4248  | 4248  | 3363  | 3363  |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |   |    | <i>T</i> <sub>2B</sub>    | <i>Nm</i>                                  | 310                           | 480   | 480   | 480   | 380   | 380                          | 310   | 480   | 480   | 480   | 380   | 380   |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 2744                          | 4248  | 4248  | 4248  | 3363  | 3363                         | 2744  | 4248  | 4248  | 4248  | 3363  | 3363  |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                   |   |    | <i>T</i> <sub>2N</sub>    | <i>Nm</i>                                  | 127                           | 195   | 182   | 187   | 186   | 195                          | 127   | 195   | 182   | 187   | 186   | 195   |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 1122                          | 1730  | 1612  | 1656  | 1644  | 1727                         | 1122  | 1730  | 1612  | 1656  | 1644  | 1727  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |   |    | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>                                  | 1250                          | 1350  | 1350  | 1350  | 1250  | 1250                         | 1250  | 1350  | 1350  | 1350  | 1250  | 1250  |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 11064                         | 11949 | 11949 | 11949 | 11064 | 11064                        | 11064 | 11949 | 11949 | 11949 | 11064 | 11064 |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>         |   |    | <i>n</i> <sub>1N</sub>    | <i>rpm</i>                                 | 3000                          | 3500  | 4500  | 4500  | 4500  | 4500                         | 3000  | 3500  | 4500  | 4500  | 4500  | 4500  |
| Max. input speed                                                                                                 |   |    | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>                                 | 6000                          | 6000  | 6000  | 6000  | 6000  | 6000                         | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature) |   |    | <i>T</i> <sub>012</sub>   | <i>Nm</i>                                  | 4.1                           | 3.5   | 3.0   | 2.2   | 1.8   | 1.7                          | 2.0   | 1.5   | 1.2   | 1.0   | 0.9   | 0.9   |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 36                            | 31    | 27    | 20    | 16    | 15                           | 18    | 13    | 11    | 8.9   | 8.0   | 8.0   |
| Max. backlash                                                                                                    |   |    | <i>j</i> <sub>t</sub>     | <i>arcmin</i>                              | Standard ≤ 4 / Reduced ≤ 2    |       |       |       |       |                              |       |       |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                 |   |    | <i>C</i> <sub>121</sub>   | <i>Nm/arcmin</i>                           | 53                            |       |       |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>in.lb/arcmin</i>                        | 469                           |       |       |       |       |                              |       |       |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                   |   |    | <i>F</i> <sub>2AMax</sub> | <i>N</i>                                   | 9870                          |       |       |       |       |                              | 3000  |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>                      | 2221                          |       |       |       |       |                              | 675   |       |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                 |   |    | <i>F</i> <sub>2QMax</sub> | <i>N</i>                                   | 9900                          |       |       |       |       |                              | 1200  |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>                      | 2228                          |       |       |       |       |                              | 270   |       |       |       |       |       |
| Max. tilting moment                                                                                              |   |    | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>                                  | 952                           |       |       |       |       |                              | 110   |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                               | 8426                          |       |       |       |       |                              | 974   |       |       |       |       |       |
| Efficiency at full load                                                                                          |   |    | <i>η</i>                  | %                                          | 98.5                          |       |       |       |       |                              | 99    |       |       |       |       |       |
| Service life <sup>f)</sup>                                                                                       |   |    | <i>L</i> <sub>h</sub>     | <i>h</i>                                   | > 30000                       |       |       |       |       |                              |       |       |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                         |   |    | <i>m</i>                  | <i>kg</i>                                  | 17.2                          |       |       |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>lb<sub>m</sub></i>                      | 38                            |       |       |       |       |                              |       |       |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed – ratio-specific values available in cymex®)          |   |    | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>                               | ≤ 59                          |       |       |       |       |                              |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                               |   |    |                           | °C                                         | +90                           |       |       |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>F</i>                                   | 194                           |       |       |       |       |                              |       |       |       |       |       |       |
| Ambient temperature                                                                                              |   |    |                           | °C                                         | –15 to +40                    |       |       |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>F</i>                                   | 5 to 104                      |       |       |       |       |                              |       |       |       |       |       |       |
| Lubrication                                                                                                      |   |    |                           |                                            | Lubricated for life           |       |       |       |       |                              |       |       |       |       |       |       |
| Direction of rotation                                                                                            |   |    |                           |                                            | In- and output same direction |       |       |       |       |                              |       |       |       |       |       |       |
| Protection class                                                                                                 |   |    |                           |                                            | IP 65                         |       |       |       |       |                              | IP 52 |       |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |   |    |                           |                                            | BC2-00500AA040.000-X          |       |       |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>mm</i>                                  | X = 035.000 - 060.000         |       |       |       |       |                              |       |       |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   | K | 38 | <i>J</i> <sub>i</sub>     | <i>kgcm<sup>2</sup></i>                    | 14.9                          | 12.1  | 11.0  | 10.1  | 10.1  | 9.5                          | 14.9  | 12.1  | 11.0  | 10.1  | 10.1  | 9.5   |
|                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 13.2                          | 10.7  | 9.7   | 8.9   | 8.9   | 8.4                          | 13.2  | 10.7  | 9.7   | 8.9   | 8.9   | 8.4   |
|                                                                                                                  | M | 48 | <i>J</i> <sub>i</sub>     | <i>kgcm<sup>2</sup></i>                    | 29.5                          | 26.7  | 25.6  | 24.7  | 24.7  | 24.2                         | 29.5  | 26.7  | 25.6  | 24.7  | 24.7  | 24.2  |
|                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 26.1                          | 23.6  | 22.7  | 21.9  | 21.9  | 21.4                         | 26.1  | 23.6  | 22.7  | 21.9  | 21.9  | 21.4  |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

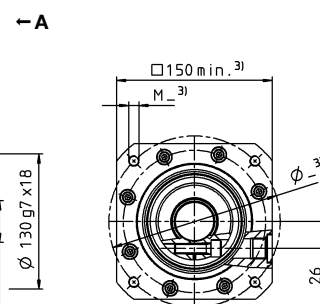
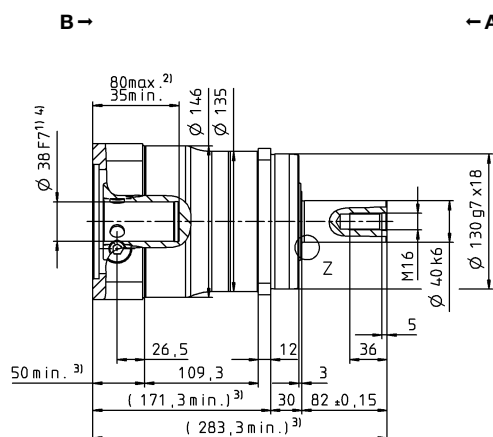
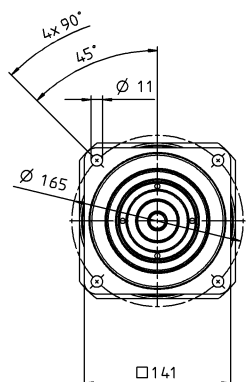
<sup>f)</sup> Please contact us to discuss  
application-specific service lifetimes

View A

View B

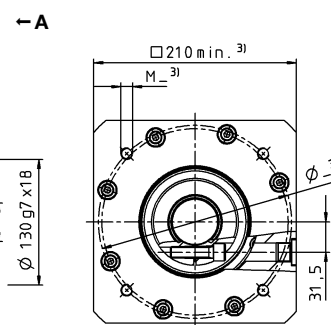
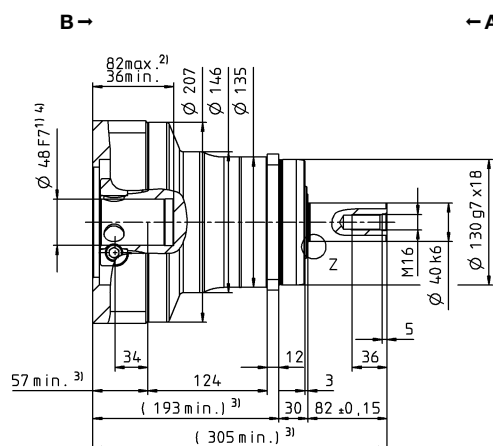
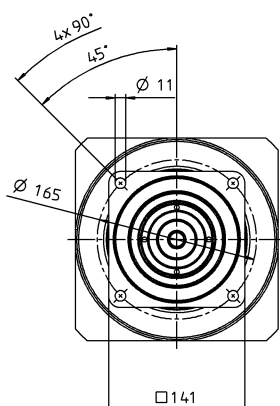
# 1-stage

up to 38<sup>4)</sup> (K)<sup>5)</sup>  
clamping hub  
diameter



Motor shaft diameter [mm]

up to 48<sup>4)</sup> (M)  
clamping hub  
diameter

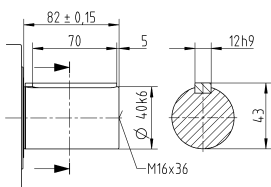

SP<sup>1)</sup>

MC

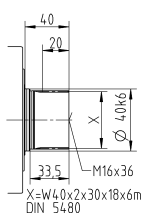
Planetary gearboxes

## Other output variants

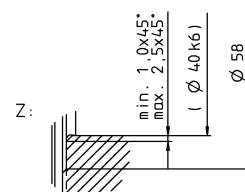
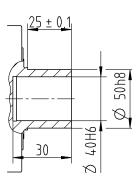
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 140 MC 2-stage

|                                                                                                                  |   |    |                           | 2-stage                                           |                               |                       |       |       |       |       |       |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------|---|----|---------------------------|---------------------------------------------------|-------------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                                                                                                            |   |    | <i>i</i>                  |                                                   | 16                            | 20                    | 25    | 28    | 32    | 35    | 40    | 50    | 64    | 70    | 100   |
| Max. torque <sup>a) b) e)</sup>                                                                                  |   |    | <i>T</i> <sub>2a</sub>    | <i>Nm</i>                                         | 480                           | 480                   | 480   | 480   | 480   | 480   | 480   | 480   | 380   | 480   | 380   |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                                      | 4248                          | 4248                  | 4248  | 4248  | 4248  | 4248  | 4248  | 4248  | 3363  | 4248  | 3363  |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |   |    | <i>T</i> <sub>2B</sub>    | <i>Nm</i>                                         | 480                           | 480                   | 480   | 480   | 480   | 480   | 480   | 480   | 380   | 480   | 380   |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                                      | 4248                          | 4248                  | 4248  | 4248  | 4248  | 4248  | 4248  | 4248  | 3363  | 4248  | 3363  |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                   |   |    | <i>T</i> <sub>2N</sub>    | <i>Nm</i>                                         | 277                           | 297                   | 298   | 328   | 287   | 329   | 364   | 367   | 304   | 304   | 304   |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                                      | 2447                          | 2629                  | 2636  | 2900  | 2544  | 2915  | 3219  | 3250  | 2691  | 2690  | 2691  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |   |    | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>                                         | 1350                          | 1350                  | 1350  | 1350  | 1350  | 1350  | 1350  | 1350  | 1250  | 1350  | 1250  |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                                      | 11949                         | 11949                 | 11949 | 11949 | 11949 | 11949 | 11949 | 11949 | 11064 | 11949 | 11064 |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>         |   |    | <i>n</i> <sub>1N</sub>    | <i>rpm</i>                                        | 4500                          | 4500                  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  |
| Max. input speed                                                                                                 |   |    | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>                                        | 6000                          | 6000                  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature) |   |    | <i>T</i> <sub>012</sub>   | <i>Nm</i>                                         | 1.1                           | 1.0                   | 0.96  | 0.80  | 0.72  | 0.60  | 0.55  | 0.45  | 0.45  | 0.40  | 0.40  |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                                      | 9.7                           | 9.2                   | 8.5   | 7.1   | 6.4   | 5.3   | 4.9   | 4.0   | 4.0   | 3.5   | 3.5   |
| Max. backlash                                                                                                    |   |    | <i>j</i> <sub>t</sub>     | <i>arcmin</i>                                     | Standard ≤ 6 / Reduced ≤ 4    |                       |       |       |       |       |       |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                 |   |    | <i>C</i> <sub>121</sub>   | <i>Nm/arcmin</i>                                  | 53                            |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>in.lb/arcmin</i>                               | 469                           |                       |       |       |       |       |       |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                   |   |    | <i>F</i> <sub>2AMax</sub> | <i>N</i>                                          | 9870                          |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>                             | 2221                          |                       |       |       |       |       |       |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                 |   |    | <i>F</i> <sub>2QMax</sub> | <i>N</i>                                          | 9900                          |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>lb<sub>f</sub></i>                             | 2228                          |                       |       |       |       |       |       |       |       |       |       |
| Max. tilting moment                                                                                              |   |    | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>                                         | 952                           |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>in.lb</i>                                      | 8426                          |                       |       |       |       |       |       |       |       |       |       |
| Efficiency at full load                                                                                          |   |    | <i>η</i>                  | %                                                 | 96.5                          |                       |       |       |       |       |       |       |       |       |       |
| Service life <sup>f)</sup>                                                                                       |   |    | <i>L</i> <sub>h</sub>     | <i>h</i>                                          | > 30000                       |                       |       |       |       |       |       |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                         |   |    | <i>m</i>                  | <i>kg</i>                                         | 17                            |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>lb<sub>m</sub></i>                             | 37.6                          |                       |       |       |       |       |       |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)       |   |    | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>                                      | ≤ 59                          |                       |       |       |       |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                               |   |    |                           | °C                                                | +90                           |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>F</i>                                          | 194                           |                       |       |       |       |       |       |       |       |       |       |
| Ambient temperature                                                                                              |   |    |                           | °C                                                | –15 to +40                    |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | <i>F</i>                                          | 5 to 104                      |                       |       |       |       |       |       |       |       |       |       |
| Lubrication                                                                                                      |   |    |                           |                                                   | Lubricated for life           |                       |       |       |       |       |       |       |       |       |       |
| Direction of rotation                                                                                            |   |    |                           |                                                   | In- and output same direction |                       |       |       |       |       |       |       |       |       |       |
| Protection class                                                                                                 |   |    |                           |                                                   | IP 65                         |                       |       |       |       |       |       |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |   |    |                           |                                                   | BC2-00500AA040.000-X          |                       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |   |    |                           | Bore diameter of coupling on the application side | <i>mm</i>                     | X = 035.000 - 060.000 |       |       |       |       |       |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   | G | 24 | <i>J</i> <sub>i</sub>     | <i>kgcm²</i>                                      | 3.19                          | 2.71                  | 2.67  | 2.34  | 1.65  | 2.32  | 2.10  | 2.08  | 2.08  | 2.08  | 2.07  |
|                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s²</i>                   | 2.82                          | 2.40                  | 2.36  | 2.07  | 1.46  | 2.05  | 1.86  | 1.84  | 1.84  | 1.84  | 1.83  |
|                                                                                                                  | K | 38 | <i>J</i> <sub>i</sub>     | <i>kgcm²</i>                                      | 10.3                          | 9.77                  | 9.73  | 9.41  | 2.34  | 9.39  | 9.16  | 9.15  | 1.39  | 9.14  | 9.14  |
|                                                                                                                  |   |    |                           | <i>10<sup>-3</sup> in.lb.s²</i>                   | 9.07                          | 8.65                  | 8.61  | 8.33  | 2.07  | 8.31  | 8.11  | 8.10  | 1.23  | 8.09  | 8.09  |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

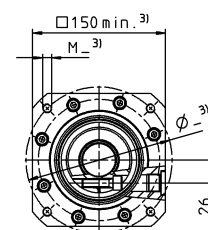
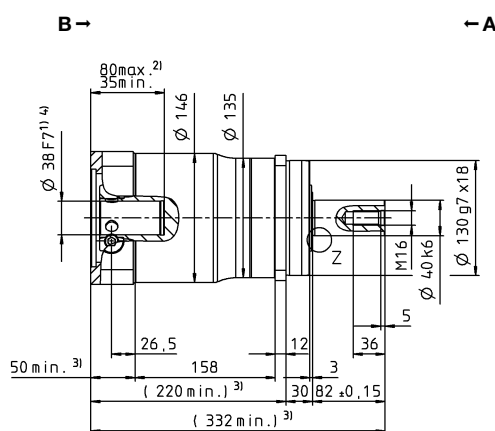
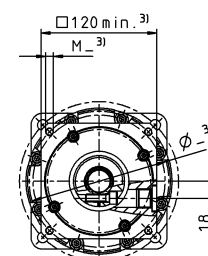
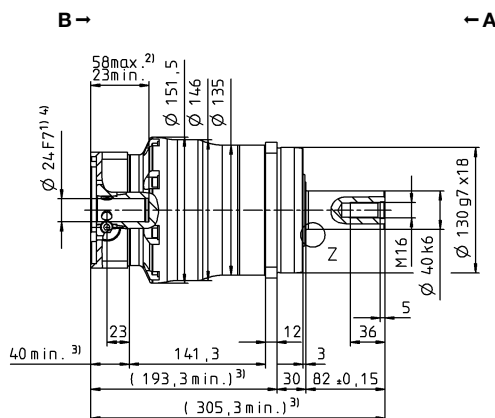
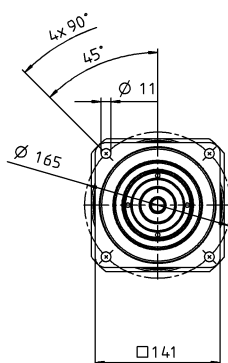
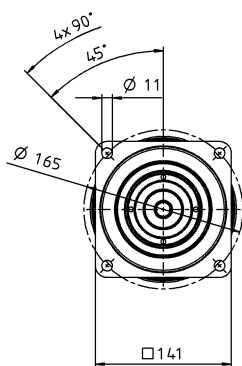
<sup>e)</sup> Smooth shaft

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

up to 24 <sup>4)</sup> (G) <sup>5)</sup>  
clamping hub  
diameter

Motor shaft diameter [mm]

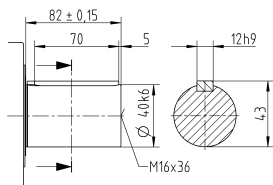
up to 38<sup>4)</sup> (K)  
clamping hub  
diameter

 $\dot{S}^+$ 

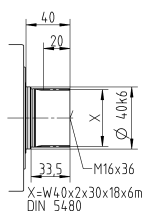
MC

## Other output variants

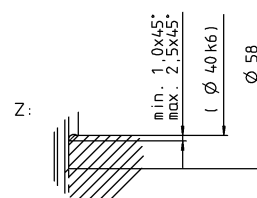
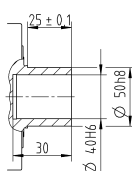
Shaft with key



Splined shaft (DIN 5480)



Shaft mounted



Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit

2) Min. /Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 180 MC 1-stage

|                                                                                                                  |  |                                                   |                       | Standard version MC           |                                 |       |       |       |       | Friction optimized version L |       |       |       |       |       |      |      |
|------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------|-----------------------|-------------------------------|---------------------------------|-------|-------|-------|-------|------------------------------|-------|-------|-------|-------|-------|------|------|
| Ratio                                                                                                            |  | <i>i</i>                                          |                       | 3                             | 4                               | 5     | 7     | 8     | 10    | 3                            | 4     | 5     | 7     | 8     | 10    |      |      |
| Max. torque <sup>a) b) e)</sup>                                                                                  |  | <i>T</i> <sub>2a</sub>                            | <i>Nm</i>             | 700                           | 880                             | 880   | 880   | 700   | 700   | 700                          | 880   | 880   | 880   | 700   | 700   |      |      |
|                                                                                                                  |  |                                                   | <i>in.lb</i>          | 6196                          | 7789                            | 7789  | 7789  | 6196  | 6196  | 6196                         | 7789  | 7789  | 7789  | 6196  | 6196  |      |      |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |  | <i>T</i> <sub>2B</sub>                            | <i>Nm</i>             | 700                           | 880                             | 880   | 880   | 700   | 700   | 700                          | 880   | 880   | 880   | 700   | 700   |      |      |
|                                                                                                                  |  |                                                   | <i>in.lb</i>          | 6196                          | 7789                            | 7789  | 7789  | 6196  | 6196  | 6196                         | 7789  | 7789  | 7789  | 6196  | 6196  |      |      |
| Nominal torque<br>(at <i>n</i> <sub>IN</sub> )                                                                   |  | <i>T</i> <sub>2N</sub>                            | <i>Nm</i>             | 289                           | 492                             | 379   | 469   | 465   | 488   | 289                          | 492   | 379   | 469   | 465   | 488   |      |      |
|                                                                                                                  |  |                                                   | <i>in.lb</i>          | 2554                          | 4355                            | 3357  | 4151  | 4117  | 4316  | 2554                         | 4355  | 3357  | 4151  | 4117  | 4316  |      |      |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |  | <i>T</i> <sub>2Not</sub>                          | <i>Nm</i>             | 2640                          | 2750                            | 2750  | 2750  | 2640  | 2640  | 2640                         | 2750  | 2750  | 2750  | 2640  | 2640  |      |      |
|                                                                                                                  |  |                                                   | <i>in.lb</i>          | 23366                         | 24340                           | 24340 | 24340 | 23366 | 23366 | 23366                        | 24340 | 24340 | 24340 | 23366 | 23366 |      |      |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>         |  | <i>n</i> <sub>1N</sub>                            | <i>rpm</i>            | 3000                          | 3500                            | 4500  | 4500  | 4500  | 4500  | 3000                         | 3500  | 4500  | 4500  | 4500  | 4500  |      |      |
| Max. input speed                                                                                                 |  | <i>n</i> <sub>1Max</sub>                          | <i>rpm</i>            | 4500                          | 6000                            | 6000  | 6000  | 6000  | 6000  | 4500                         | 6000  | 6000  | 6000  | 6000  | 6000  |      |      |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>1</sub> = 3000 rpm and 20 °C gearbox temperature) |  | <i>T</i> <sub>012</sub>                           | <i>Nm</i>             | 9.8                           | 8.2                             | 6.6   | 4.4   | 4.4   | 3.2   | 3.8                          | 3.0   | 2.3   | 1.8   | 1.7   | 1.6   |      |      |
|                                                                                                                  |  |                                                   | <i>in.lb</i>          | 87                            | 73                              | 58    | 39    | 39    | 28    | 34                           | 27    | 20    | 16    | 15    | 14    |      |      |
| Max. backlash                                                                                                    |  | <i>j</i> <sub>t</sub>                             | <i>arcmin</i>         | Standard ≤ 4 / Reduced ≤ 2    |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
| Torsional rigidity <sup>b)</sup>                                                                                 |  | <i>C</i> <sub>121</sub>                           | <i>Nm/arcmin</i>      | 175                           |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
|                                                                                                                  |  |                                                   | <i>in.lb/arcmin</i>   | 1549                          |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
| Max. axial force <sup>c)</sup>                                                                                   |  | <i>F</i> <sub>2AMax</sub>                         | <i>N</i>              | 14150                         |                                 |       |       |       |       | 5000                         |       |       |       |       |       |      |      |
|                                                                                                                  |  |                                                   | <i>lb<sub>f</sub></i> | 3184                          |                                 |       |       |       |       | 1125                         |       |       |       |       |       |      |      |
| Max. lateral force <sup>c)</sup>                                                                                 |  | <i>F</i> <sub>2QMax</sub>                         | <i>N</i>              | 15400                         |                                 |       |       |       |       | 2000                         |       |       |       |       |       |      |      |
|                                                                                                                  |  |                                                   | <i>lb<sub>f</sub></i> | 3465                          |                                 |       |       |       |       | 450                          |       |       |       |       |       |      |      |
| Max. tilting moment                                                                                              |  | <i>M</i> <sub>2KMax</sub>                         | <i>Nm</i>             | 1600                          |                                 |       |       |       |       | 208                          |       |       |       |       |       |      |      |
|                                                                                                                  |  |                                                   | <i>in.lb</i>          | 14161                         |                                 |       |       |       |       | 1841                         |       |       |       |       |       |      |      |
| Efficiency at full load                                                                                          |  | <i>η</i>                                          | %                     | 98.5                          |                                 |       |       |       |       | 99                           |       |       |       |       |       |      |      |
| Service life <sup>f)</sup>                                                                                       |  | <i>L</i> <sub>h</sub>                             | <i>h</i>              | > 30000                       |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
| Weight<br>(incl. standard adapter plate)                                                                         |  | <i>m</i>                                          | <i>kg</i>             | 34                            |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
|                                                                                                                  |  |                                                   | <i>lb<sub>m</sub></i> | 75.1                          |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)       |  | <i>L</i> <sub>PA</sub>                            | <i>dB(A)</i>          | ≤ 62                          |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
| Max. permitted housing temperature                                                                               |  |                                                   | °C                    | +90                           |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
|                                                                                                                  |  |                                                   | <i>F</i>              | 194                           |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
| Ambient temperature                                                                                              |  |                                                   | °C                    | –15 to +40                    |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
|                                                                                                                  |  |                                                   | <i>F</i>              | 5 to 104                      |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
| Lubrication                                                                                                      |  |                                                   |                       | Lubricated for life           |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
| Direction of rotation                                                                                            |  |                                                   |                       | In- and output same direction |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
| Protection class                                                                                                 |  |                                                   |                       | IP 65                         |                                 |       |       |       |       | IP 52                        |       |       |       |       |       |      |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |  |                                                   |                       | BC2-00800AA055.000-X          |                                 |       |       |       |       |                              |       |       |       |       |       |      |      |
|                                                                                                                  |  | Bore diameter of coupling on the application side |                       | <i>mm</i>                     | X = 040.000 - 075.000           |       |       |       |       |                              |       |       |       |       |       |      |      |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   |  | M                                                 | 48                    | <i>J</i> <sub>i</sub>         | <i>kgcm²</i>                    | 58.5  | 41.6  | 35.6  | 30.0  | 30.0                         | 26.9  | 58.5  | 41.6  | 35.6  | 30.0  | 30.0 | 26.9 |
|                                                                                                                  |  |                                                   |                       |                               | <i>10<sup>-3</sup> in.lb.s²</i> | 51.8  | 36.8  | 31.5  | 26.6  | 26.6                         | 23.8  | 51.8  | 36.8  | 31.5  | 26.6  | 26.6 | 23.8 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

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



# SP<sup>+</sup> 180 MC 2-stage

|                                                                                                                  |      |                                                   |                                       | 2-stage                       |       |       |       |       |       |       |       |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------|---------------------------------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                                                                                                            |      | <i>i</i>                                          |                                       | 16                            | 20    | 25    | 28    | 32    | 35    | 40    | 50    | 64    | 70    | 100   |       |
| Max. torque <sup>a) b) e)</sup>                                                                                  |      | <i>T</i> <sub>2a</sub>                            | Nm                                    | 880                           | 880   | 880   | 880   | 880   | 880   | 880   | 880   | 700   | 880   | 700   |       |
|                                                                                                                  |      |                                                   | in.lb                                 | 7789                          | 7789  | 7789  | 7789  | 7789  | 7789  | 7789  | 7789  | 7789  | 6196  | 7789  | 6196  |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |      | <i>T</i> <sub>2B</sub>                            | Nm                                    | 880                           | 880   | 880   | 880   | 880   | 880   | 880   | 880   | 700   | 880   | 700   |       |
|                                                                                                                  |      |                                                   | in.lb                                 | 7789                          | 7789  | 7789  | 7789  | 7789  | 7789  | 7789  | 7789  | 7789  | 6196  | 7789  | 6196  |
| Nominal torque<br>(at <i>n</i> <sub>n</sub> )                                                                    |      | <i>T</i> <sub>2N</sub>                            | Nm                                    | 696                           | 704   | 704   | 704   | 704   | 704   | 704   | 704   | 560   | 704   | 560   |       |
|                                                                                                                  |      |                                                   | in.lb                                 | 6156                          | 6231  | 6231  | 6231  | 6231  | 6231  | 6231  | 6231  | 6231  | 4956  | 6231  | 4956  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |      | <i>T</i> <sub>2Not</sub>                          | Nm                                    | 2750                          | 2750  | 2750  | 2750  | 2750  | 2750  | 2750  | 2750  | 2640  | 2750  | 2640  |       |
|                                                                                                                  |      |                                                   | in.lb                                 | 24340                         | 24340 | 24340 | 24340 | 24340 | 24340 | 24340 | 24340 | 24340 | 23366 | 24340 | 23366 |
| Permitted average input speed<br>(at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>         |      | <i>n</i> <sub>1N</sub>                            | rpm                                   | 4500                          | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  |       |
| Max. input speed                                                                                                 |      | <i>n</i> <sub>1Max</sub>                          | rpm                                   | 6000                          | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  |       |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 3000 rpm and 20 °C gearbox temperature) |      | <i>T</i> <sub>012</sub>                           | Nm                                    | 2.2                           | 2.3   | 1.8   | 1.7   | 1.7   | 1.4   | 1.2   | 1.2   | 1.2   | 0.95  | 1.0   |       |
|                                                                                                                  |      |                                                   | in.lb                                 | 20                            | 21    | 16    | 15    | 15    | 12    | 11    | 11    | 11    | 8.4   | 9.2   |       |
| Max. backlash                                                                                                    |      | <i>j</i> <sub>t</sub>                             | arcmin                                | Standard ≤ 6 / Reduced ≤ 4    |       |       |       |       |       |       |       |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                 |      | <i>C</i> <sub>121</sub>                           | Nm/arcmin                             | 175                           |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |      |                                                   | in.lb/arcmin                          | 1549                          |       |       |       |       |       |       |       |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                   |      | <i>F</i> <sub>2AMax</sub>                         | N                                     | 14150                         |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |      |                                                   | lb <sub>f</sub>                       | 3184                          |       |       |       |       |       |       |       |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                 |      | <i>F</i> <sub>2QMax</sub>                         | N                                     | 15400                         |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |      |                                                   | lb <sub>f</sub>                       | 3465                          |       |       |       |       |       |       |       |       |       |       |       |
| Max. tilting moment                                                                                              |      | <i>M</i> <sub>2KMax</sub>                         | Nm                                    | 1600                          |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |      |                                                   | in.lb                                 | 14161                         |       |       |       |       |       |       |       |       |       |       |       |
| Efficiency at full load                                                                                          |      | <i>η</i>                                          | %                                     | 96.5                          |       |       |       |       |       |       |       |       |       |       |       |
| Service life <sup>f)</sup>                                                                                       |      | <i>L</i> <sub>h</sub>                             | h                                     | > 30000                       |       |       |       |       |       |       |       |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                         |      | <i>m</i>                                          | kg                                    | 36.4                          |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |      |                                                   | lb <sub>m</sub>                       | 80.4                          |       |       |       |       |       |       |       |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)       |      | <i>L</i> <sub>PA</sub>                            | dB(A)                                 | ≤ 58                          |       |       |       |       |       |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                               |      |                                                   | °C                                    | +90                           |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |      |                                                   | F                                     | 194                           |       |       |       |       |       |       |       |       |       |       |       |
| Ambient temperature                                                                                              |      |                                                   | °C                                    | –15 to +40                    |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |      |                                                   | F                                     | 5 to 104                      |       |       |       |       |       |       |       |       |       |       |       |
| Lubrication                                                                                                      |      |                                                   |                                       | Lubricated for life           |       |       |       |       |       |       |       |       |       |       |       |
| Direction of rotation                                                                                            |      |                                                   |                                       | In- and output same direction |       |       |       |       |       |       |       |       |       |       |       |
| Protection class                                                                                                 |      |                                                   |                                       | IP 65                         |       |       |       |       |       |       |       |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |      |                                                   |                                       | BC2-00800AA055.000-X          |       |       |       |       |       |       |       |       |       |       |       |
|                                                                                                                  |      | Bore diameter of coupling on the application side | mm                                    | X = 040.000 - 075.000         |       |       |       |       |       |       |       |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   | K 38 | <i>J</i> <sub>i</sub>                             | kgcm <sup>2</sup>                     | 13.5                          | 12.0  | 11.7  | 10.6  | 10.6  | 10.4  | 9.74  | 9.68  | 5.45  | 9.63  | 9.60  |       |
|                                                                                                                  |      |                                                   | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 12.0                          | 10.6  | 10.4  | 9.34  | 9.34  | 9.23  | 8.62  | 8.57  | 4.82  | 8.52  | 8.50  |       |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

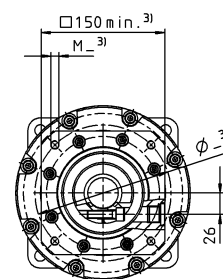
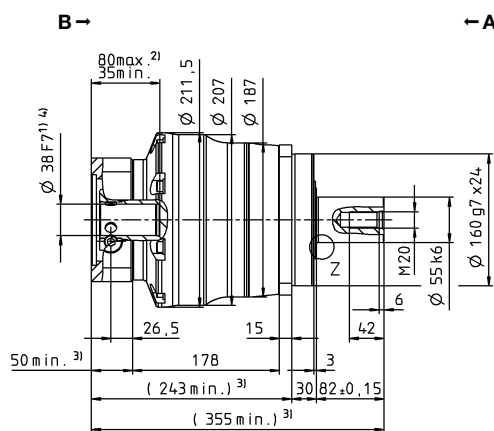
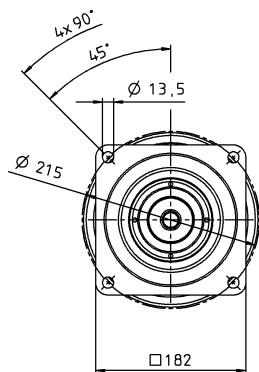
<sup>c)</sup> Refers to center of the output shaft or flange

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

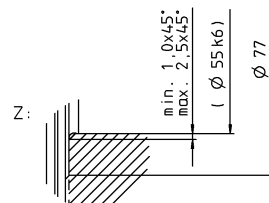
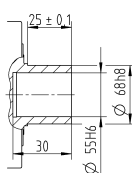
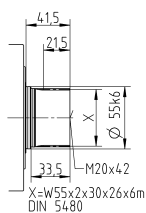
<sup>e)</sup> Smooth shaft

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

up to 38 <sup>4)</sup> (K) <sup>5)</sup>  
clamping hub  
diameter

 $\frac{d}{ds}$ 

MC

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 210 MC 1-stage

|                                                                                                                  |   |                                                   |                       | Standard version MC                         |                       |       |       |       | Friction optimized version L |       |       |       |       |      |
|------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------|-----------------------|---------------------------------------------|-----------------------|-------|-------|-------|------------------------------|-------|-------|-------|-------|------|
| Ratio                                                                                                            |   | <i>i</i>                                          |                       | 4                                           | 5                     | 7     | 8     | 10    | 4                            | 5     | 7     | 8     | 10    |      |
| Max. torque <sup>a) b) e)</sup>                                                                                  |   | <i>T</i> <sub>2a</sub>                            | <i>Nm</i>             | 2000                                        | 2000                  | 1700  | 1200  | 1200  | 2000                         | 2000  | 1700  | 1200  | 1200  |      |
|                                                                                                                  |   |                                                   | <i>in.lb</i>          | 17702                                       | 17702                 | 15046 | 10621 | 10621 | 17702                        | 17702 | 15046 | 10621 | 10621 |      |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |   | <i>T</i> <sub>2B</sub>                            | <i>Nm</i>             | 2000                                        | 2000                  | 1700  | 1200  | 1200  | 2000                         | 2000  | 1700  | 1200  | 1200  |      |
|                                                                                                                  |   |                                                   | <i>in.lb</i>          | 17702                                       | 17702                 | 15046 | 10621 | 10621 | 17702                        | 17702 | 15046 | 10621 | 10621 |      |
| Nominal torque<br>(at <i>n</i> <sub>n</sub> )                                                                    |   | <i>T</i> <sub>2N</sub>                            | <i>Nm</i>             | 1260                                        | 1141                  | 1169  | 960   | 960   | 1260                         | 1141  | 1169  | 960   | 960   |      |
|                                                                                                                  |   |                                                   | <i>in.lb</i>          | 11148                                       | 10098                 | 10347 | 8497  | 8497  | 11148                        | 10098 | 10347 | 8497  | 8497  |      |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |   | <i>T</i> <sub>2Not</sub>                          | <i>Nm</i>             | 5900                                        | 5900                  | 5900  | 5900  | 5900  | 5900                         | 5900  | 5900  | 5900  | 5900  |      |
|                                                                                                                  |   |                                                   | <i>in.lb</i>          | 52220                                       | 52220                 | 52220 | 52220 | 52220 | 52220                        | 52220 | 52220 | 52220 | 52220 |      |
| Permitted average input speed<br>(at <i>T</i> <sub>2a</sub> and 20 °C ambient temperature) <sup>d)</sup>         |   | <i>n</i> <sub>1N</sub>                            | <i>rpm</i>            | 2500                                        | 3500                  | 3500  | 3500  | 3500  | 2500                         | 3500  | 3500  | 3500  | 3500  |      |
| Max. input speed                                                                                                 |   | <i>n</i> <sub>1Max</sub>                          | <i>rpm</i>            | 6000                                        | 6000                  | 6000  | 6000  | 6000  | 6000                         | 6000  | 6000  | 6000  | 6000  |      |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature) |   | <i>T</i> <sub>012</sub>                           | <i>Nm</i>             | 11                                          | 8.4                   | 5.6   | 5.6   | 4.4   | 4.9                          | 4.6   | 4.0   | 3.8   | 3.6   |      |
|                                                                                                                  |   |                                                   | <i>in.lb</i>          | 99                                          | 74                    | 50    | 50    | 39    | 43                           | 41    | 35    | 34    | 32    |      |
| Max. backlash                                                                                                    |   | <i>j</i> <sub>t</sub>                             | <i>arcmin</i>         | Standard ≤ 4 / Reduced ≤ 2                  |                       |       |       |       |                              |       |       |       |       |      |
| Torsional rigidity <sup>b)</sup>                                                                                 |   | <i>C</i> <sub>121</sub>                           | <i>Nm/arcmin</i>      | 400                                         |                       |       |       |       |                              |       |       |       |       |      |
|                                                                                                                  |   |                                                   | <i>in.lb/arcmin</i>   | 3540                                        |                       |       |       |       |                              |       |       |       |       |      |
| Max. axial force <sup>c)</sup>                                                                                   |   | <i>F</i> <sub>2AMax</sub>                         | <i>N</i>              | 30000                                       |                       |       |       |       | 8000                         |       |       |       |       |      |
|                                                                                                                  |   |                                                   | <i>lb<sub>f</sub></i> | 6750                                        |                       |       |       |       | 1800                         |       |       |       |       |      |
| Max. lateral force <sup>c)</sup>                                                                                 |   | <i>F</i> <sub>2QMax</sub>                         | <i>N</i>              | 21000                                       |                       |       |       |       | 2500                         |       |       |       |       |      |
|                                                                                                                  |   |                                                   | <i>lb<sub>f</sub></i> | 4725                                        |                       |       |       |       | 563                          |       |       |       |       |      |
| Max. tilting moment                                                                                              |   | <i>M</i> <sub>2KMax</sub>                         | <i>Nm</i>             | 3100                                        |                       |       |       |       | 310                          |       |       |       |       |      |
|                                                                                                                  |   |                                                   | <i>in.lb</i>          | 27437                                       |                       |       |       |       | 2744                         |       |       |       |       |      |
| Efficiency at full load                                                                                          |   | <i>η</i>                                          | %                     | 98.5                                        |                       |       |       |       | 99                           |       |       |       |       |      |
| Service life <sup>f)</sup>                                                                                       |   | <i>L</i> <sub>h</sub>                             | <i>h</i>              | > 30000                                     |                       |       |       |       |                              |       |       |       |       |      |
| Weight<br>(incl. standard adapter plate)                                                                         |   | <i>m</i>                                          | <i>kg</i>             | 56                                          |                       |       |       |       |                              |       |       |       |       |      |
|                                                                                                                  |   |                                                   | <i>lb<sub>m</sub></i> | 123.8                                       |                       |       |       |       |                              |       |       |       |       |      |
| Operating noise<br>(at reference ratio and reference speed – ratio-specific values available in cymex®)          |   | <i>L</i> <sub>PA</sub>                            | <i>dB(A)</i>          | ≤ 64                                        |                       |       |       |       |                              |       |       |       |       |      |
| Max. permitted housing temperature                                                                               |   |                                                   | °C                    | +90                                         |                       |       |       |       |                              |       |       |       |       |      |
|                                                                                                                  |   |                                                   | <i>F</i>              | 194                                         |                       |       |       |       |                              |       |       |       |       |      |
| Ambient temperature                                                                                              |   |                                                   | °C                    | –15 to +40                                  |                       |       |       |       |                              |       |       |       |       |      |
|                                                                                                                  |   |                                                   | <i>F</i>              | 5 to 104                                    |                       |       |       |       |                              |       |       |       |       |      |
| Lubrication                                                                                                      |   |                                                   |                       | Lubricated for life                         |                       |       |       |       |                              |       |       |       |       |      |
| Direction of rotation                                                                                            |   |                                                   |                       | In- and output same direction               |                       |       |       |       |                              |       |       |       |       |      |
| Protection class                                                                                                 |   |                                                   |                       | IP 65                                       |                       |       |       |       | IP 52                        |       |       |       |       |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |   |                                                   |                       | BC2-04000AA075.000-X                        |                       |       |       |       |                              |       |       |       |       |      |
|                                                                                                                  |   | Bore diameter of coupling on the application side |                       | <i>mm</i>                                   | X = 050.000 - 090.000 |       |       |       |                              |       |       |       |       |      |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   | N | 55                                                | <i>J</i> <sub>i</sub> | <i>kgcm</i> <sup>2</sup>                    | 94.3                  | 76.9  | 61.5  | 61.5  | 53.1                         | 94.3  | 76.9  | 61.5  | 61.5  | 53.1 |
|                                                                                                                  |   |                                                   |                       | <i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup> | 83.5                  | 68.1  | 54.4  | 54.4  | 47.0                         | 83.5  | 68.1  | 54.4  | 54.4  | 47.0 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

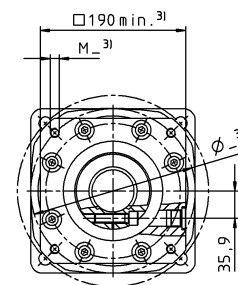
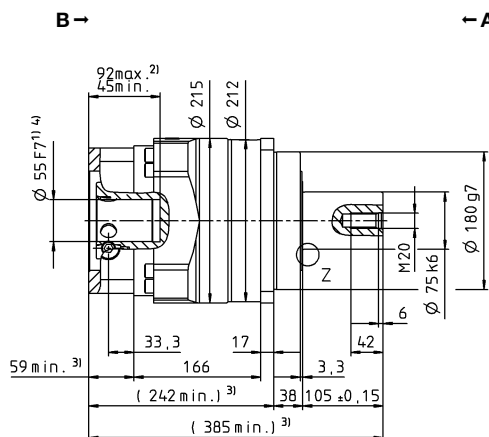
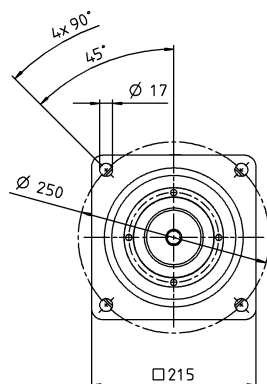
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

1-stage

up to 55 <sup>4)</sup> (N) <sup>5)</sup>  
clamping hub  
diameter


Planetary gearboxes

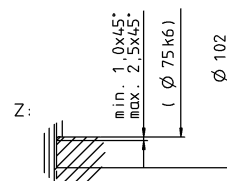
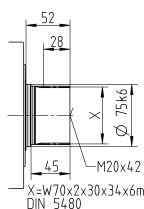
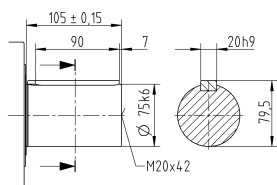
SP

MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 210 MC 2-stage

|                                                                                                            |   |    | 2-stage                                           |                                       |                               |       |       |       |       |       |       |       |       |       |       |
|------------------------------------------------------------------------------------------------------------|---|----|---------------------------------------------------|---------------------------------------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                                                                                                      |   |    | i                                                 |                                       | 16                            | 20    | 25    | 28    | 32    | 35    | 40    | 50    | 64    | 70    | 100   |
| Max. torque <sup>a) b) e)</sup>                                                                            |   |    | T <sub>2a</sub>                                   | Nm                                    | 1680                          | 1800  | 2000  | 1680  | 1680  | 1920  | 1040  | 1300  | 1200  | 1700  | 1200  |
|                                                                                                            |   |    |                                                   | in.lb                                 | 14869                         | 15931 | 17702 | 14869 | 14869 | 16994 | 9205  | 11506 | 10621 | 15046 | 10621 |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                   |   |    | T <sub>2B</sub>                                   | Nm                                    | 1680                          | 1800  | 2000  | 1680  | 1680  | 1920  | 1040  | 1300  | 1200  | 1700  | 1200  |
|                                                                                                            |   |    |                                                   | in.lb                                 | 14869                         | 15931 | 17702 | 14869 | 14869 | 16994 | 9205  | 11506 | 10621 | 15046 | 10621 |
| Nominal torque<br>(at n <sub>1N</sub> )                                                                    |   |    | T <sub>2N</sub>                                   | Nm                                    | 898                           | 728   | 910   | 744   | 1344  | 929   | 787   | 984   | 960   | 1360  | 960   |
|                                                                                                            |   |    |                                                   | in.lb                                 | 7949                          | 6445  | 8056  | 6581  | 11895 | 8226  | 6969  | 8711  | 8497  | 12037 | 8497  |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox) |   |    | T <sub>2Not</sub>                                 | Nm                                    | 5900                          | 5900  | 5900  | 5900  | 5900  | 5900  | 5900  | 5900  | 5900  | 5900  | 5900  |
|                                                                                                            |   |    |                                                   | in.lb                                 | 52220                         | 52220 | 52220 | 52220 | 52220 | 52220 | 52220 | 52220 | 52220 | 52220 | 52220 |
| Permitted average input speed<br>(at T <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>          |   |    | n <sub>1N</sub>                                   | rpm                                   | 3500                          | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  |
| Max. input speed                                                                                           |   |    | n <sub>1Max</sub>                                 | rpm                                   | 6000                          | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  |
| Mean no load running torque <sup>b)</sup><br>(at n <sub>1</sub> = 2000 rpm and 20 °C gearbox temperature)  |   |    | T <sub>012</sub>                                  | Nm                                    | 3.4                           | 3.1   | 2.9   | 2.6   | 2.6   | 2.0   | 2.0   | 1.8   | 1.8   | 1.6   | 1.6   |
|                                                                                                            |   |    |                                                   | in.lb                                 | 30                            | 27    | 25    | 23    | 23    | 18    | 18    | 16    | 16    | 14    | 14    |
| Max. backlash                                                                                              |   |    | j <sub>t</sub>                                    | arcmin                                | Standard ≤ 5 / Reduced ≤ 4    |       |       |       |       |       |       |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                           |   |    | C <sub>t21</sub>                                  | Nm/arcmin                             | 400                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                            |   |    |                                                   | in.lb/arcmin                          | 3540                          |       |       |       |       |       |       |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                             |   |    | F <sub>2AMax</sub>                                | N                                     | 30000                         |       |       |       |       |       |       |       |       |       |       |
|                                                                                                            |   |    |                                                   | lb <sub>f</sub>                       | 6750                          |       |       |       |       |       |       |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                           |   |    | F <sub>2QMax</sub>                                | N                                     | 21000                         |       |       |       |       |       |       |       |       |       |       |
|                                                                                                            |   |    |                                                   | lb <sub>f</sub>                       | 4725                          |       |       |       |       |       |       |       |       |       |       |
| Max. tilting moment                                                                                        |   |    | M <sub>2KMax</sub>                                | Nm                                    | 3100                          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                            |   |    |                                                   | in.lb                                 | 27437                         |       |       |       |       |       |       |       |       |       |       |
| Efficiency at full load                                                                                    |   |    | η                                                 | %                                     | 96.5                          |       |       |       |       |       |       |       |       |       |       |
| Service life <sup>f)</sup>                                                                                 |   |    | L <sub>h</sub>                                    | h                                     | > 30000                       |       |       |       |       |       |       |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                   |   |    | m                                                 | kg                                    | 53                            |       |       |       |       |       |       |       |       |       |       |
|                                                                                                            |   |    |                                                   | lb <sub>m</sub>                       | 117.1                         |       |       |       |       |       |       |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®) |   |    | L <sub>PA</sub>                                   | dB(A)                                 | ≤ 57                          |       |       |       |       |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                         |   |    |                                                   | °C                                    | +90                           |       |       |       |       |       |       |       |       |       |       |
|                                                                                                            |   |    |                                                   | F                                     | 194                           |       |       |       |       |       |       |       |       |       |       |
| Ambient temperature                                                                                        |   |    |                                                   | °C                                    | –15 to +40                    |       |       |       |       |       |       |       |       |       |       |
|                                                                                                            |   |    |                                                   | F                                     | 5 to 104                      |       |       |       |       |       |       |       |       |       |       |
| Lubrication                                                                                                |   |    |                                                   |                                       | Lubricated for life           |       |       |       |       |       |       |       |       |       |       |
| Direction of rotation                                                                                      |   |    |                                                   |                                       | In- and output same direction |       |       |       |       |       |       |       |       |       |       |
| Protection class                                                                                           |   |    |                                                   |                                       | IP 65                         |       |       |       |       |       |       |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                         |   |    |                                                   |                                       | BC2-04000AA075.000-X          |       |       |       |       |       |       |       |       |       |       |
|                                                                                                            |   |    | Bore diameter of coupling on the application side | mm                                    | X = 050.000 - 090.000         |       |       |       |       |       |       |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                             | M | 48 | J <sub>i</sub>                                    | kgcm <sup>2</sup>                     | 34.5                          | 31.5  | 30.8  | 30.0  | 30.0  | 29.7  | 28.5  | 28.3  | 28.3  | 28.1  | 28.0  |
|                                                                                                            |   |    |                                                   | 10 <sup>-3</sup> in.lb.s <sup>2</sup> | 30.5                          | 27.9  | 27.3  | 26.6  | 26.6  | 26.3  | 25.2  | 25.0  | 25.0  | 24.9  | 24.8  |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

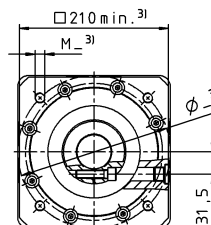
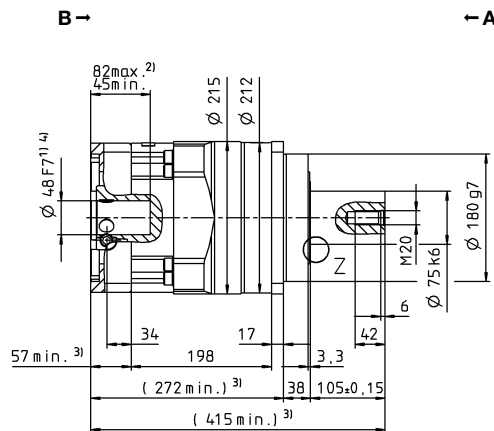
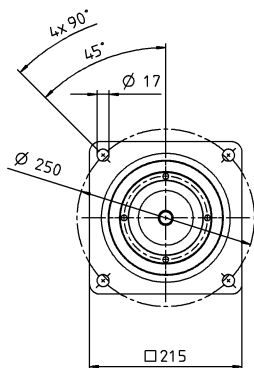
<sup>f)</sup> Please contact us to discuss application-specific service lifetimes

View A

View B

Motor shaft diameter [mm]

2-stage

up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub diameter


Planetary gearboxes

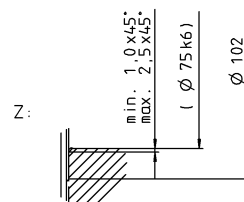
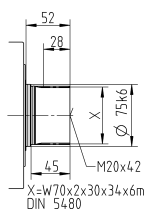
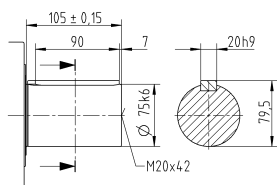
SP

MC

## Other output variants

Shaft with key

Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

<sup>1)</sup> Check motor shaft fit

<sup>2)</sup> Min./Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

<sup>3)</sup> The dimensions depend on the motor

<sup>4)</sup> Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 240 MC 1-stage

|                                                                                                                  |  |      | Standard version MC       |                                             |                               |       |       | Friction optimized version L |       |       |       |       |       |       |
|------------------------------------------------------------------------------------------------------------------|--|------|---------------------------|---------------------------------------------|-------------------------------|-------|-------|------------------------------|-------|-------|-------|-------|-------|-------|
| Ratio                                                                                                            |  |      | <i>i</i>                  |                                             | 4                             | 5     | 7     | 8                            | 10    | 4     | 5     | 7     | 8     | 10    |
| Max. torque <sup>a) b) e)</sup>                                                                                  |  |      | <i>T</i> <sub>2a</sub>    | <i>Nm</i>                                   | 3500                          | 3600  | 2700  | 1800                         | 1800  | 3500  | 3600  | 2700  | 1800  | 1800  |
|                                                                                                                  |  |      |                           | <i>in.lb</i>                                | 30978                         | 31863 | 23897 | 15931                        | 15931 | 30978 | 31863 | 23897 | 15931 | 15931 |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |  |      | <i>T</i> <sub>2B</sub>    | <i>Nm</i>                                   | 3500                          | 3600  | 2700  | 1800                         | 1800  | 3500  | 3600  | 2700  | 1800  | 1800  |
|                                                                                                                  |  |      |                           | <i>in.lb</i>                                | 30978                         | 31863 | 23897 | 15931                        | 15931 | 30978 | 31863 | 23897 | 15931 | 15931 |
| Nominal torque<br>(at <i>n</i> <sub>n</sub> )                                                                    |  |      | <i>T</i> <sub>2N</sub>    | <i>Nm</i>                                   | 2029                          | 1861  | 1910  | 1440                         | 1440  | 2029  | 1861  | 1910  | 1440  | 1440  |
|                                                                                                                  |  |      |                           | <i>in.lb</i>                                | 17955                         | 16471 | 16909 | 12745                        | 12745 | 17955 | 16471 | 16909 | 12745 | 12745 |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |  |      | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>                                   | 8500                          | 8500  | 8500  | 6850                         | 6850  | 8500  | 8500  | 8500  | 6850  | 6850  |
|                                                                                                                  |  |      |                           | <i>in.lb</i>                                | 75232                         | 75232 | 75232 | 60628                        | 60628 | 75232 | 75232 | 75232 | 60628 | 60628 |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>         |  |      | <i>n</i> <sub>1N</sub>    | <i>rpm</i>                                  | 2250                          | 3000  | 3000  | 3000                         | 3000  | 2250  | 3000  | 3000  | 3000  | 3000  |
| Max. input speed                                                                                                 |  |      | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>                                  | 4000                          | 5000  | 5000  | 5000                         | 5000  | 4000  | 5000  | 5000  | 5000  | 5000  |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature) |  |      | <i>T</i> <sub>012</sub>   | <i>Nm</i>                                   | 16                            | 12    | 8.6   | 8.6                          | 5.8   | 7.0   | 6.0   | 5.0   | 4.8   | 4.2   |
|                                                                                                                  |  |      |                           | <i>in.lb</i>                                | 141                           | 107   | 77    | 77                           | 51    | 62    | 53    | 44    | 43    | 37    |
| Max. backlash                                                                                                    |  |      | <i>j</i> <sub>t</sub>     | <i>arcmin</i>                               | Standard ≤ 4 / Reduced ≤ 2    |       |       |                              |       |       |       |       |       |       |
| Torsional rigidity <sup>b)</sup>                                                                                 |  |      | <i>C</i> <sub>121</sub>   | <i>Nm/arcmin</i>                            | 550                           |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |  |      |                           | <i>in.lb/arcmin</i>                         | 4868                          |       |       |                              |       |       |       |       |       |       |
| Max. axial force <sup>c)</sup>                                                                                   |  |      | <i>F</i> <sub>2AMax</sub> | <i>N</i>                                    | 33000                         |       |       |                              |       | 10000 |       |       |       |       |
|                                                                                                                  |  |      |                           | <i>lb<sub>f</sub></i>                       | 7425                          |       |       |                              |       | 2250  |       |       |       |       |
| Max. lateral force <sup>c)</sup>                                                                                 |  |      | <i>F</i> <sub>2QMax</sub> | <i>N</i>                                    | 30000                         |       |       |                              |       | 2000  |       |       |       |       |
|                                                                                                                  |  |      |                           | <i>lb<sub>f</sub></i>                       | 6750                          |       |       |                              |       | 450   |       |       |       |       |
| Max. tilting moment                                                                                              |  |      | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>                                   | 5000                          |       |       |                              |       | 280   |       |       |       |       |
|                                                                                                                  |  |      |                           | <i>in.lb</i>                                | 44254                         |       |       |                              |       | 2478  |       |       |       |       |
| Efficiency at full load                                                                                          |  |      | <i>η</i>                  | %                                           | 98.5                          |       |       |                              |       | 99    |       |       |       |       |
| Service life <sup>f)</sup>                                                                                       |  |      | <i>L</i> <sub>h</sub>     | <i>h</i>                                    | > 30000                       |       |       |                              |       |       |       |       |       |       |
| Weight<br>(incl. standard adapter plate)                                                                         |  |      | <i>m</i>                  | <i>kg</i>                                   | 77                            |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |  |      |                           | <i>lb<sub>m</sub></i>                       | 170.2                         |       |       |                              |       |       |       |       |       |       |
| Operating noise<br>(at reference ratio and reference speed – ratio-specific values available in cymex®)          |  |      | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>                                | ≤ 66                          |       |       |                              |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                               |  |      |                           | °C                                          | +90                           |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |  |      |                           | <i>F</i>                                    | 194                           |       |       |                              |       |       |       |       |       |       |
| Ambient temperature                                                                                              |  |      |                           | °C                                          | –15 to +40                    |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |  |      |                           | <i>F</i>                                    | 5 to 104                      |       |       |                              |       |       |       |       |       |       |
| Lubrication                                                                                                      |  |      |                           |                                             | Lubricated for life           |       |       |                              |       |       |       |       |       |       |
| Direction of rotation                                                                                            |  |      |                           |                                             | In- and output same direction |       |       |                              |       |       |       |       |       |       |
| Protection class                                                                                                 |  |      |                           |                                             | IP 65                         |       |       |                              |       | IP 52 |       |       |       |       |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |  |      |                           |                                             | BC2-04000AA085.000-X          |       |       |                              |       |       |       |       |       |       |
|                                                                                                                  |  |      |                           | <i>mm</i>                                   | X = 050.000 - 090.000         |       |       |                              |       |       |       |       |       |       |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   |  | O 60 | <i>J</i> <sub>i</sub>     | <i>kgcm</i> <sup>2</sup>                    | 198                           | 163   | 138   | 138                          | 125   | 198   | 163   | 138   | 138   | 125   |
|                                                                                                                  |  |      |                           | <i>10<sup>-3</sup> in.lb.s</i> <sup>2</sup> | 175                           | 144   | 122   | 122                          | 110   | 175   | 144   | 122   | 122   | 110   |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

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

MC

<sup>5)</sup> Standard clamping hub diameter

# SP<sup>+</sup> 240 MC 2-stage

|                                                                                                                  |   |                           |                       | 2-stage                                    |       |       |       |       |       |       |       |       |       |       |      |
|------------------------------------------------------------------------------------------------------------------|---|---------------------------|-----------------------|--------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Ratio                                                                                                            |   | <i>i</i>                  |                       | 16                                         | 20    | 25    | 28    | 32    | 35    | 40    | 50    | 64    | 70    | 100   |      |
| Max. torque <sup>a) b) e)</sup>                                                                                  |   | <i>T</i> <sub>2a</sub>    | <i>Nm</i>             | 3500                                       | 3500  | 3600  | 2900  | 2900  | 3600  | 1680  | 2100  | 1800  | 2700  | 1800  |      |
|                                                                                                                  |   |                           | <i>in.lb</i>          | 30978                                      | 30978 | 31863 | 25667 | 25667 | 31863 | 14869 | 18587 | 15931 | 23897 | 15931 |      |
| Max. acceleration torque <sup>b) e)</sup><br>(max. 1000 cycles per hour)                                         |   | <i>T</i> <sub>2B</sub>    | <i>Nm</i>             | 3500                                       | 3500  | 3600  | 2900  | 2900  | 3600  | 1680  | 2100  | 1800  | 2700  | 1800  |      |
|                                                                                                                  |   |                           | <i>in.lb</i>          | 30978                                      | 30978 | 31863 | 25667 | 25667 | 31863 | 14869 | 18587 | 15931 | 23897 | 15931 |      |
| Nominal torque<br>(at <i>n</i> <sub>n</sub> )                                                                    |   | <i>T</i> <sub>2N</sub>    | <i>Nm</i>             | 1950                                       | 1803  | 2266  | 1867  | 2320  | 2694  | 1344  | 1680  | 1440  | 2160  | 1440  |      |
|                                                                                                                  |   |                           | <i>in.lb</i>          | 17255                                      | 15960 | 20058 | 16521 | 20534 | 23843 | 11895 | 14869 | 12745 | 19118 | 12745 |      |
| Emergency stop torque <sup>a) b) e)</sup><br>(permitted 1000 times during the service life of the gearbox)       |   | <i>T</i> <sub>2Not</sub>  | <i>Nm</i>             | 8500                                       | 8500  | 8500  | 8500  | 8500  | 8500  | 8500  | 8500  | 6850  | 8500  | 6850  |      |
|                                                                                                                  |   |                           | <i>in.lb</i>          | 75232                                      | 75232 | 75232 | 75232 | 75232 | 75232 | 75232 | 75232 | 60628 | 75232 | 60628 |      |
| Permitted average input speed<br>(at <i>T</i> <sub>2N</sub> and 20 °C ambient temperature) <sup>d)</sup>         |   | <i>n</i> <sub>1N</sub>    | <i>rpm</i>            | 3500                                       | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  | 4500  |      |
| Max. input speed                                                                                                 |   | <i>n</i> <sub>1Max</sub>  | <i>rpm</i>            | 6000                                       | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  | 6000  |      |
| Mean no load running torque <sup>b)</sup><br>(at <i>n</i> <sub>i</sub> = 2000 rpm and 20 °C gearbox temperature) |   | <i>T</i> <sub>012</sub>   | <i>Nm</i>             | 4.8                                        | 4.4   | 4.0   | 3.6   | 3.6   | 2.8   | 2.4   | 2.0   | 2.0   | 1.6   | 1.4   |      |
|                                                                                                                  |   |                           | <i>in.lb</i>          | 43                                         | 39    | 35    | 32    | 32    | 25    | 21    | 18    | 18    | 14    | 13    |      |
| Max. backlash                                                                                                    |   | <i>j</i> <sub>t</sub>     | <i>arcmin</i>         | Standard ≤ 5 / Reduced ≤ 4                 |       |       |       |       |       |       |       |       |       |       |      |
| Torsional rigidity <sup>b)</sup>                                                                                 |   | <i>C</i> <sub>121</sub>   | <i>Nm/arcmin</i>      | 550                                        |       |       |       |       |       |       |       |       |       |       |      |
|                                                                                                                  |   |                           | <i>in.lb/arcmin</i>   | 4868                                       |       |       |       |       |       |       |       |       |       |       |      |
| Max. axial force <sup>c)</sup>                                                                                   |   | <i>F</i> <sub>2AMax</sub> | <i>N</i>              | 33000                                      |       |       |       |       |       |       |       |       |       |       |      |
|                                                                                                                  |   |                           | <i>lb<sub>f</sub></i> | 7425                                       |       |       |       |       |       |       |       |       |       |       |      |
| Max. lateral force <sup>c)</sup>                                                                                 |   | <i>F</i> <sub>2QMax</sub> | <i>N</i>              | 30000                                      |       |       |       |       |       |       |       |       |       |       |      |
|                                                                                                                  |   |                           | <i>lb<sub>f</sub></i> | 6750                                       |       |       |       |       |       |       |       |       |       |       |      |
| Max. tilting moment                                                                                              |   | <i>M</i> <sub>2KMax</sub> | <i>Nm</i>             | 5000                                       |       |       |       |       |       |       |       |       |       |       |      |
|                                                                                                                  |   |                           | <i>in.lb</i>          | 44254                                      |       |       |       |       |       |       |       |       |       |       |      |
| Efficiency at full load                                                                                          |   | <i>η</i>                  | %                     | 96.5                                       |       |       |       |       |       |       |       |       |       |       |      |
| Service life <sup>f)</sup>                                                                                       |   | <i>L</i> <sub>h</sub>     | <i>h</i>              | > 30000                                    |       |       |       |       |       |       |       |       |       |       |      |
| Weight<br>(incl. standard adapter plate)                                                                         |   | <i>m</i>                  | <i>kg</i>             | 76                                         |       |       |       |       |       |       |       |       |       |       |      |
|                                                                                                                  |   |                           | <i>lb<sub>m</sub></i> | 168.0                                      |       |       |       |       |       |       |       |       |       |       |      |
| Operating noise<br>(at reference ratio and reference speed –<br>ratio-specific values available in cymex®)       |   | <i>L</i> <sub>PA</sub>    | <i>dB(A)</i>          | ≤ 58                                       |       |       |       |       |       |       |       |       |       |       |      |
| Max. permitted housing temperature                                                                               |   |                           | °C                    | +90                                        |       |       |       |       |       |       |       |       |       |       |      |
|                                                                                                                  |   |                           | <i>F</i>              | 194                                        |       |       |       |       |       |       |       |       |       |       |      |
| Ambient temperature                                                                                              |   |                           | °C                    | -15 to +40                                 |       |       |       |       |       |       |       |       |       |       |      |
|                                                                                                                  |   |                           | <i>F</i>              | 5 to 104                                   |       |       |       |       |       |       |       |       |       |       |      |
| Lubrication                                                                                                      |   |                           |                       | Lubricated for life                        |       |       |       |       |       |       |       |       |       |       |      |
| Direction of rotation                                                                                            |   |                           |                       | In- and output same direction              |       |       |       |       |       |       |       |       |       |       |      |
| Protection class                                                                                                 |   |                           |                       | IP 65                                      |       |       |       |       |       |       |       |       |       |       |      |
| Metal bellows coupling<br>(recommended product type – validate sizing with cymex®)                               |   |                           |                       | BC2-04000AA085.000-X                       |       |       |       |       |       |       |       |       |       |       |      |
|                                                                                                                  |   |                           | <i>mm</i>             | X = 050.000 - 090.000                      |       |       |       |       |       |       |       |       |       |       |      |
| Mass moment of inertia<br>(relates to the drive)<br>Clamping hub diameter [mm]                                   | M | 48                        | <i>J</i> <sub>i</sub> | <i>kgcm<sup>2</sup></i>                    | 34.5  | 31.5  | 30.8  | 30.0  | 30.0  | 29.7  | 28.5  | 28.3  | 28.3  | 28.1  | 28.0 |
|                                                                                                                  |   |                           |                       | <i>10<sup>-3</sup> in.lb.s<sup>2</sup></i> | 30.5  | 27.9  | 27.3  | 26.6  | 26.6  | 26.3  | 25.2  | 25.1  | 25.1  | 24.9  | 24.8 |

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

<sup>a)</sup> At max. 10 %  $F_{2QMax}$

<sup>b)</sup> Valid for standard clamping hub diameter

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

<sup>d)</sup> Please reduce input speed at higher ambient temperatures

<sup>e)</sup> Smooth shaft

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

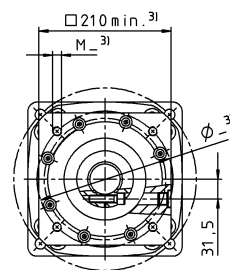
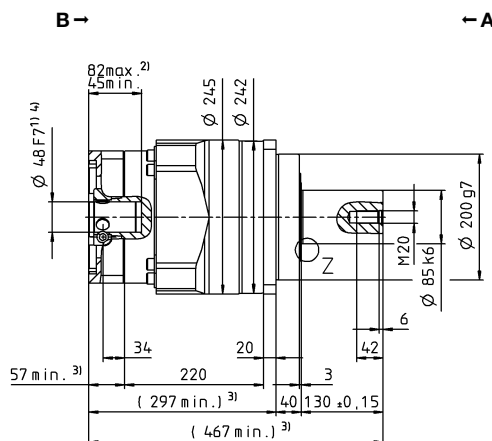
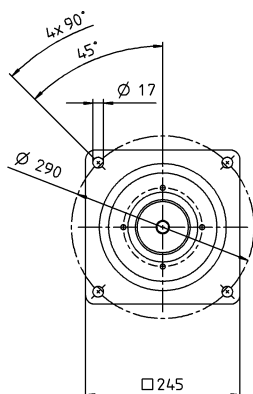
View A

View B

Motor shaft diameter [mm]

## 2-stage

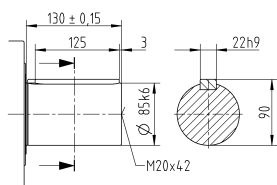
up to 48 <sup>4)</sup> (M) <sup>5)</sup>  
clamping hub  
diameter

 $\frac{d}{ds}$ 

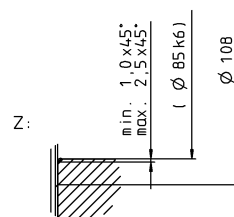
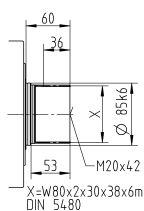
MC

## Other output variants

Shaft with key



Splined shaft (DIN 5480)



Non-tolerated dimensions are nominal dimensions

- 1) Check motor shaft fit

2) Min. / Max. permissible motor shaft length. Longer motor shafts are possible, please contact alpha.

3) The dimensions depend on the motor

4) Smaller motor shaft diameter is compensated by a bushing with a minimum wall thickness of 1 mm

<sup>5)</sup> Standard clamping hub diameter