

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

|                                                                                                                    |   |    |                           |                                      | 2-stage                           |       |       |       |       |       |       |       |       |
|--------------------------------------------------------------------------------------------------------------------|---|----|---------------------------|--------------------------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio <sup>a)</sup>                                                                                                |   |    | <i>i</i>                  |                                      | 16                                | 20    | 25    | 28    | 35    | 40    | 50    | 70    | 100   |
| cymex®-optimized acceleration torque<br>(please contact us regarding the design)                                   |   |    | <i>T</i> <sub>2Bcym</sub> | Nm                                   | 710                               | 710   | 755   | 710   | 755   | 710   | 755   | 680   | 560   |
|                                                                                                                    |   |    |                           | in.lb                                | 6284                              | 6284  | 6682  | 6284  | 6682  | 6284  | 6682  | 6018  | 4956  |
| Max. acceleration torque<br>(max. 1000 cycles per hour)                                                            |   |    | <i>T</i> <sub>2B</sub>    | Nm                                   | 660                               | 660   | 660   | 660   | 660   | 660   | 660   | 660   | 530   |
|                                                                                                                    |   |    |                           | in.lb                                | 5841                              | 5841  | 5841  | 5841  | 5841  | 5841  | 5841  | 5841  | 5841  |
| Nominal output torque<br>(with <i>n</i> <sub>2N</sub> )                                                            |   |    | <i>T</i> <sub>2N</sub>    | Nm                                   | 360                               | 360   | 360   | 360   | 360   | 360   | 360   | 360   | 220   |
|                                                                                                                    |   |    |                           | in.lb                                | 3186                              | 3186  | 3186  | 3186  | 3186  | 3186  | 3186  | 3186  | 3186  |
| Emergency stop torque<br>(permitted 1000 times during the service life of the gearhead)                            |   |    | <i>T</i> <sub>2Not</sub>  | Nm                                   | 1250                              | 1250  | 1250  | 1250  | 1250  | 1250  | 1250  | 1250  | 1000  |
|                                                                                                                    |   |    |                           | in.lb                                | 11063                             | 11063 | 11063 | 11063 | 11063 | 11063 | 11063 | 11063 | 11063 |
| Nominal input speed<br>(with <i>T</i> <sub>2N</sub> and 20°C ambient temperature) <sup>b)</sup>                    |   |    | <i>n</i> <sub>1N</sub>    | rpm                                  | 2900                              | 2900  | 2900  | 2900  | 2900  | 2900  | 3200  | 3200  | 3900  |
| Max. input speed <sup>c)</sup>                                                                                     |   |    | <i>n</i> <sub>1Max</sub>  | rpm                                  | 5000                              | 5000  | 5000  | 5000  | 5000  | 5000  | 5000  | 5000  | 5000  |
| Mean no load running torque<br>(with <i>n</i> <sub>1</sub> = 3000 rpm and 20°C gearhead temperature) <sup>c)</sup> |   |    | <i>T</i> <sub>012</sub>   | Nm                                   | 3.3                               | 2.7   | 2.4   | 1.9   | 1.8   | 1.4   | 1.3   | 1.2   | 1.1   |
|                                                                                                                    |   |    |                           | in.lb                                | 29.2                              | 23.9  | 21.2  | 16.9  | 15.9  | 12.4  | 11.5  | 10.6  | 9.7   |
| Max. torsional backlash                                                                                            |   |    | <i>j</i> <sub>t</sub>     | arcmin                               | Standard ≤ 5 / Reduced ≤ 3        |       |       |       |       |       |       |       |       |
| Torsional rigidity                                                                                                 |   |    | <i>C</i> <sub>t21</sub>   | Nm/ arcmin                           | 53                                |       |       |       |       |       |       |       |       |
|                                                                                                                    |   |    |                           | in lb/ arcmin                        | 469                               |       |       |       |       |       |       |       |       |
| Max. axial force <sup>d)</sup>                                                                                     |   |    | <i>F</i> <sub>2AMax</sub> | N                                    | 9870                              |       |       |       |       |       |       |       |       |
|                                                                                                                    |   |    |                           | lb <sub>f</sub>                      | 2221                              |       |       |       |       |       |       |       |       |
| Max. radial force <sup>d)</sup>                                                                                    |   |    | <i>F</i> <sub>2RMax</sub> | N                                    | 9900                              |       |       |       |       |       |       |       |       |
|                                                                                                                    |   |    |                           | lb <sub>f</sub>                      | 2228                              |       |       |       |       |       |       |       |       |
| Max. tilting moment                                                                                                |   |    | <i>M</i> <sub>2KMax</sub> | Nm                                   | 952                               |       |       |       |       |       |       |       |       |
|                                                                                                                    |   |    |                           | in.lb                                | 8425                              |       |       |       |       |       |       |       |       |
| Efficiency at full load                                                                                            |   |    | η                         | %                                    | 94                                |       |       |       |       |       |       |       |       |
| Service life<br>(For calculation, see the Chapter "Information")                                                   |   |    | <i>L</i> <sub>h</sub>     | h                                    | > 20000                           |       |       |       |       |       |       |       |       |
| Weight incl. standard adapter plate                                                                                |   |    | <i>m</i>                  | kg                                   | 17                                |       |       |       |       |       |       |       |       |
|                                                                                                                    |   |    |                           | lb <sub>m</sub>                      | 37.6                              |       |       |       |       |       |       |       |       |
| Operating noise<br>(with <i>i</i> =100 and <i>n</i> <sub>1</sub> =3000 rpm no load)                                |   |    | <i>L</i> <sub>PA</sub>    | dB(A)                                | ≤ 63                              |       |       |       |       |       |       |       |       |
| Max. permitted housing temperature                                                                                 |   |    |                           | °C                                   | +90                               |       |       |       |       |       |       |       |       |
|                                                                                                                    |   |    |                           | F                                    | 194                               |       |       |       |       |       |       |       |       |
| Ambient temperature                                                                                                |   |    |                           | °C                                   | -15 to +40                        |       |       |       |       |       |       |       |       |
|                                                                                                                    |   |    |                           | F                                    | 5 to 104                          |       |       |       |       |       |       |       |       |
| Lubrication                                                                                                        |   |    |                           |                                      | Lubricated for life               |       |       |       |       |       |       |       |       |
| Paint                                                                                                              |   |    |                           |                                      | Blue RAL 5002                     |       |       |       |       |       |       |       |       |
| Direction of rotation                                                                                              |   |    |                           |                                      | Motor and gearhead same direction |       |       |       |       |       |       |       |       |
| Protection class                                                                                                   |   |    |                           |                                      | IP 65                             |       |       |       |       |       |       |       |       |
| Moment of inertia<br>(relates to the drive)                                                                        | E | 19 | <i>J</i> <sub>1</sub>     | kgcm <sup>2</sup>                    | 2.50                              | 2.01  | 1.97  | 1.65  | 1.63  | 1.40  | 1.39  | 1.38  | 1.38  |
|                                                                                                                    |   |    |                           | 10 <sup>-3</sup> in b s <sup>2</sup> | 2.21                              | 1.78  | 1.75  | 1.46  | 1.44  | 1.24  | 1.23  | 1.22  | 1.22  |
| Clamping hub diameter [mm]                                                                                         | G | 24 | <i>J</i> <sub>1</sub>     | kgcm <sup>2</sup>                    | 3.19                              | 2.71  | 2.67  | 2.34  | 2.32  | 2.10  | 2.08  | 2.08  | 2.07  |
|                                                                                                                    |   |    |                           | 10 <sup>-3</sup> in b s <sup>2</sup> | 2.82                              | 2.40  | 2.36  | 2.07  | 2.05  | 1.85  | 1.85  | 1.84  | 1.83  |
|                                                                                                                    | K | 38 | <i>J</i> <sub>1</sub>     | kgcm <sup>2</sup>                    | 10.3                              | 9.77  | 9.73  | 9.41  | 9.39  | 9.16  | 9.15  | 9.14  | 9.14  |
|                                                                                                                    |   |    |                           | 10 <sup>-3</sup> in b s <sup>2</sup> | 9.07                              | 8.65  | 8.61  | 8.33  | 8.31  | 8.11  | 8.10  | 8.09  | 8.09  |

Reduced mass moments of inertia available on request.

<sup>a)</sup> Other ratios available on request

<sup>b)</sup> For higher ambient temperatures, please contact us

<sup>c)</sup> Valid for clamping hub diameter of 24 mm

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